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The effect of virtual sales agent (VSA) gender – product gender congruence on product advice credibility, trust in VSA and online vendor, and purchase intention



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ABSTRACT

Online vendors are increasingly using virtual sales assistants (VSA), either in the form of an animated picture or a photograph of a real person, to help customers with their product-related information needs. Currently, what is known is that the use of a VSA in an online web shop results in positive outcomes such as trust and purchase intention. What remains unknown, however, is whether or not VSA gender-product gender congruence has a positive effect on customers' attitude towards the product-related advice, the VSA, and the online vendor and on customers' online purchase intention.

To determine the hypothesized effect of VSA gender-product gender on variables such as trust and purchase intention, a 2 (VSA gender: male vs female) \times 3 (product gender: male, female, and neutral) experiment with 183 inhabitants (between the age of 18 and 30) of the Netherlands was implemented. Results of the multivariate analysis of variance (MANOVA) reveal that congruence between VSA gender and product gender (e.g. female VSA providing advice about a feminine product) positively influences customers' belief in the credibility of the product-related advice, their trust in the VSA and the online vendor, and their purchase intention. The separate main effects of VSA gender and product gender on the aforementioned dependent variables, however, are not statistically significant. Furthermore, customers' gender did not serve any moderating function in the relationship between VSA gender-product gender congruence and the dependent variables.

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1. Introduction

When shopping in a physical store, customers consider it important to receive relevant product- or service-related information from a knowledgeable salesperson (Burke, 2002). Since providing customers with the needed help through a flesh-and-blood salesperson is almost impossible in an online shopping context, online shops increasingly employ automated online assistants or virtual sales assistants to help online customers with product- or service-related queries (Zanker, Bricman, & Jessenitschnig, 2011). A virtual sales assistant (VSA), the phrase that will be used throughout this paper, is 'a personified e-commerce shopping agent that converses with online users in a

knowledgeable way and introduces them to items that might be of interest to them' (Zanker et al., 2011, p. 2). Such an assistant could be interactive animated avatars (Keeling, McGoldrick, & Beaty, 2010), animated pictures (Zanker et al., 2011), or pictures of an individual supposed to represent a salesperson (Aldiri, Hobbs, & Qahwayi, 2008; Verhagen, Van Nes, Feldberg, & Van Dolen, 2014).

Alaska Air, for instance, uses an animated picture of Jenn as the company's sales assistant, while Nova Scotia Power, a Canadian electric company, uses a photo of a woman named Kim alongside the site's customer service section. In the Netherlands, the customer service section of an online Dutch retailer, Wehkamp, is staffed by a VSA named Sanne, while a photograph of a woman named Tess will answer service- and product-related questions from customers of Ziggo, a Dutch cable operator. Photos of female customer service personnel, though unnamed, are also visible in the customer support sections of the websites of retailers (e.g. Blokker) and banks (e.g. ING) in the Netherlands.

The examples mentioned above point to the apparent

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popularity of female characters as VSAs, which could be attributed to the stereotypical notion of women as having caring, sincere, and empathic communication styles (Cameron, 2000), which are crucial in increasing customer satisfaction with a particular customer service (Sparks, Bradley, & Callan, 1997). While the use of female VSAs may be reasonably anchored on knowledge from previous research, one wonders whether or not the expected effects of such use would stay the same when product types differ. Specifically, the question on whether or not customers' appraisal of VSA advice quality and their attitude towards the VSA and the company the VSA represents would depend on the characteristics of a product (e.g. product exclusively intended for either male or female users) has not been adequately addressed in the literature. To the best of the authors' knowledge, nothing is still known about the impact of VSA gender-product gender congruence on customers' confidence in the VSA's message, their trust in the VSA and in the online shop, and on their purchase intention. This is one important gap that the research described in this paper aimed at filling.

This interest in the congruence between VSA gender and product gender emerges from a research finding that in a do-it-yourself (DIY) service encounter, customers prefer to obtain information about home improvements from a male salesperson since he is believed to have more knowledge of DIY than his female counterpart (Foster, 2004). In another study, it was also reported that when seeking information about cosmetics, customer would opt to approach a female salesperson based on the association between expert knowledge about the product and femininity (Foster & Resnick, 2013).

In an e-commerce context, VSA gender-product gender congruence is expected to positively impact not only customers' assessment of message quality (product advice credibility) and their attitude towards the VSA (VSA trust), but also their trust in the online vendor deploying the VSA and their intention to buy from the vendor through its website. The inclusion of the last two concepts as dependent variables is predicated on the premise that an online vendor's decision to integrate a VSA into its website is one strategy to win customers' trust within a context where social presence is missing (Gefen & Straub, 2004) and a mechanism to influence customers' behavioral intentions and behaviors (Keeling et al., 2010).

A 2 (VSA gender: male and female) \times 3 (product gender: male, female, and neutral) experimental design was implemented to address the central research question 'to what extent does VSA gender-product gender congruence influence customers' perception of product advice credibility, their trust in the VSA and in the online vendor, and their purchase intention? The hypotheses that emerged from the research question were tested with data from 183 Dutch respondents aged 18 to 30 years old.

The next section of this paper discusses the increasing popularity of VSAs in e-commerce websites and their importance for online vendors. Additionally, the concepts of VSA gender and product gender and the relationship between the two are also explained. The third section describes the data collection technique used for the study, while the fourth section describes the results of multivariate analysis of variance (MANOVA). Results of the experimental study, the results' theoretical and practical implications, and points for future research directions are discussed in the last section of the paper.

2. Increasing social presence: the photo of a virtual sales assistant will do

Purchasing from a shop's offline outlet allows customers to interact with a flesh-and-blood salesperson, whose appearance

(Ahearne, Gruen, & Jarvis, 1999; Shao, Baker, & Wagner, 2004), personality, and performance (Darian, Tucci, & Wiman, 2001) could critically influence customers' purchase intention and their attitude towards product or service quality. Online customers are clearly deprived of this face-to-face interaction, which makes the exchange highly impersonal, distant, and low in social presence.

Social presence in an online exchange is important since it has been found to influence customers' trust in an online vendor and their satisfaction with an online purchase experience (Cyr, Hassanein, Head, & Ivanov, 2007; Gefen & Straub, 2004). In an effort to replicate the interaction between a salesperson and a customer offline, webshops are deploying avatars or virtual sales assistants to represent generic salespersons, as they have been found effective in increasing either customers' satisfaction with the exchange experience or their purchase intention (Hassanein & Head, 2007; Keeling et al., 2010).

A virtual sales assistant (VSA) is 'a personified e-commerce shopping agent that converses with online users in a knowledgeable way and introduces them to items that might be of interest to them' (Zanker et al., 2011, p. 2). Such an assistant could be interactive animated avatars (Keeling et al., 2010), animated pictures (Zanker et al., 2011), or pictures of real people supposed to represent salespersons (Aldiri et al., 2008; Verhagen et al., 2014). Researchers claimed that a VSA has the potential to enhance both the technical and functional service quality of an online vendor, just as social support using a VSA can improve an online customer's perception of a retail site's functional quality (Shim, Kwon, Chattaraman, & Gilbert, 2012).

Interestingly, however, VSAs, either as animated images or photos of real people, tend to be women (Gustavsson, 2005), which could be attributed to the view that women are able to display care for their customers (Mathies & Burford, 2011). Despite the popularity of women as VSAs, one wonders whether or not they would still lead to positive customer evaluation of VSA advice and of the company the VSA represents if VSA gender-product gender is incongruent.

3. Product gender: cars are 'he', pans are 'she'

Products designed to resemble humanlike qualities proliferate in the marketplace. Cars (e.g. Volkswagen Bug), for instance, could sport a friendly face (Kiesler, 2006). While not all products can be 'humanized', those that could be are regarded to have strong market viability (Aggarwal & McGill, 2007), as users also tend to treat their products as human beings, enabling the former to form a relationship with the latter (Chandler & Schwarz, 2010). Customers' tendency to anthropomorphize their products, however, depends on the presence of product characteristics expressing a degree of humanness (Aggarwal & McGill, 2007).

Product anthropomorphization, referring to the transfer of human characteristics to inanimate products, takes various forms. Human personalities can be attached to products (e.g. a Volkswagen could be cheerful; Mugge, Govers, & Schoormans, 2010) and certain products could be assigned to a specific gender (Fugate & Phillips, 2010). Sirgy (1982) claimed that 'the personalizability of the product denotes the extent to which the use of a product can be attributed to a stereotypic image of the generalized user' (p. 288).

The typical user of a certain product also contributes to a product's genderization (Allison, Golden, Mullet, & Coogan, 1980). Hence, shaving creams, briefcases, and tool kits - with men as primary users - have masculine images; while scarves, hand lotions, gloves, and sandals - considered to be typical women's items - are highly feminine (Debevec & Iyer, 1986). According to Fugate and Phillips (2010), product users have a strong inclination to actively classify and interpret gender information about products.

4. Congruence between the VSA gender and product gender

The use of photos of women as VSAs is relatively common among online web shops, as evidenced by the examples described in the introductory section. In the marketing literature, it is underscored that a female salesperson displays a greater customer orientation than her male counterpart (O'Hara, Boles, & Johnston, 1991), as the former is more sensitive and nurturing of her customers than the latter (Goolsby, Lagace, & Boorum, 1992). Moreover, a female salesperson is reported to be less inclined to use assertive and pro-active tactics (e.g. self-promotion, self-enhancement) than his male counterpart (Strutton, Pelton, & Lumpkin, 1995). One pressing question, however, pertains to the credibility of men and women as information sources in various sales contexts. Credibility (measured in terms of trustworthiness, expertise, likeability) is critical in a customer-salesperson/customer service staff relationship since it significantly predicts customers' purchase-related intentions (Jones, Moore, Stanaland, & Wyatt, 1998).

It is claimed that although men and women do not significantly differ in four credibility dimensions (goodwill/fairness, expertise, prestige, and self-presentation), men are still perceived as more persuasive than women (Kenton, 1989). Such difference in persuasiveness is viewed as a result of the belief that men are generally more competent than women, despite equality between the two in terms of performance and behavior (Carli, 2001). Perception of competence, according to Quina, Wingard, and Bates (1987), is influenced by communication styles, as a more feminine style is seen as less competent than its non-feminine counterpart. In a more general sense, perception of one's credibility is strongly tied to communication styles attributed to either men or women. For instance, being loud and assertive (male-associated communication styles) could result in high credibility perception than being hesitant and dependent on hedging techniques (female-associated communication styles; Brownell, 1993).

However, one wonders whether or not this perception of credibility of male and female individuals as information sources is independent of message type or of the main theme of the message. Romer (1979), as cited by Kamins and Gupta (1994), claimed that persuasion occurs when the message is internalized, and this requires a degree of congruence between the speaker and his or her message. In two empirical studies, it is reported that customers' attitude towards a brand (Misra & Beatty, 1990) and their evaluation of product spokesperson effectiveness (Till & Busler, 2000) are positive when the spokesperson matches the brand and the product endorsed. Kamins and Gupta's (1994) study also revealed that a strong congruence between spokesperson type (in terms of age, gender, or ethnicity) and product type resulted in higher believability of the spokesperson.

In an offline purchase context, salesperson believability, prompting trust formation, is important because it shapes customers' attitude towards the company (e.g. company trustworthiness), especially if the former has no prior experience with and knowledge about the latter (Doney & Cannon, 1997). Believability, alongside expertise, is regarded as an important dimension of source credibility (Simpson & Kahler, 1980; Wynn, 1987).

The effect of congruence between the person promoting the product and the product itself on customers' evaluation of a product is not entirely a recent research interest. Kanungo and Pang (1973) reported that the extent to which customers viewed a product as either favorable or unfavorable depended on the match between the model's gender and the product he or she is promoting. Specifically, customers tended to have a favorable view of a car promoted by a male model than by a female model, while customers' views of a sofa were positive when a woman instead of a

man was promoting it.

5. The effect of VSA gender-product gender congruence on customers' trust in the VSA and in VSA product advice

According to Foster (2004), in a do-it-yourself (DIY) customer-salesperson encounter, customers prefer to obtain information about home improvements from a male salesperson since he is believed to have more knowledge of DIY items than his female counterpart. It has also been reported that when seeking information about cosmetics, customers would opt to approach a female salesperson based on the association between expert knowledge about the product and femininity (Foster & Resnick, 2013). Salesperson's expertise, or his or her knowledge about a product, has been found to result in customers' trust in the salesperson (Crosby, Evans, & Cowles, 1990).

Trust in this research is operationalized as 'a belief that a specific other will be able and willing, in a discretionary situation, to act in the trustor's best interest' (McLain & Hackman, 1999, p. 155). In assessing trust in the VSA, hence, two types of trust are considered: competence-based trust (ability) and character-based trust (will- ingness). This corresponds to Xiao and Benbasat (2007) claim that a VSA (a recommendation agent, as labeled in their research) could also be a trust target when one looks at its competence, benevolence, and integrity – with the last two forming the character-based trust construct of this study. While competence-based trust emerges from the trust target's knowledge and expertise; character-based trust is a result of customers' belief in the trustee's goodwill, honesty, and sincerity (Beldad & Kusumadewi, 2015).

Furthermore, the fact that customers prefer to receive information about a specific product from a salesperson of a specific gender implies that perception of message credibility depends on VSA gender-product gender congruence. In an offline customer-salesperson interaction, information about a lipstick may not be deemed highly credible when it comes from a male source, as his female counterpart may be perceived as being in a better position to say something about the item, which is primarily considered a woman's commodity. Based on the discussions above, the first set of research hypotheses is advanced:

Hypothesis 1. Perception of VSA advice credibility is higher when VSA gender-product gender is congruent than when VSA gender-product gender is incongruent.

Hypothesis 2. (a) Competence-based trust and (b) character-based trust are higher when VSA gender-product gender is congruent than when VSA gender-product gender is incongruent.

6. The effect of VSA gender-product gender congruence on customers' trust in the online shop the VSA represents and on their willingness to purchase from the online shop

In an offline buyer–seller relationship, customers' trust in a salesperson contributes to their trust in the company the salesperson represents (Doney & Cannon, 1997). Specifically, a competent salesperson can trigger the development of a buyer–seller trusting relationship (Kennedy, Ferrell, & LeClair, 2001; Swan, Bowers, & Richardson, 1999). On the contrary, incompetent salespersons dealing with customers may contribute to customers' negative emotions such as anger, anxiety, and displeasure (Yoo, Park, & MacInnis, 1998).

In the absence of physical salespersons in an online shopping context, online shops increasingly use automated customer agents to compensate for this absence (Komiak & Benbasat, 2004) and to increase social presence in a computer-mediated exchange

(Holzwarth, Janiszewski, & Neumann, 2006; Shim et al., 2012). Social presence, defined as the perception that there is a personal, sociable, and sensitive human contact in the medium', is considered pivotal in building online trust (Gefen & Straub, 2004, p. 10).

While infusing a website with social presence using a virtual sales assistant is known to enhance online trust (Almutairi & Rigas, 2014) and to increase customers' inclination to transact with the organization behind the website (Bente, Dratsch, Rehbach, Reyl, & Lushaj, 2014; Holzwarth et al., 2006), nothing is known about the impact of VSA gender-product gender congruence on the two variables mentioned. Efforts to match the type of VSA to the type of product being supported in an online exchange context may be regarded as an indication of the online vendor's technical competence and knowledge of customers' expectation of the suitable salesperson to aid them with their product-related concerns, which could eventually result in customers' trust in the vendor.

Additionally, research into VSA use in e-commerce has not yet investigated the impact of congruence on purchase intention. As previously underscored, congruence between the salesperson and the product being marketed leads to the belief in the salesperson's expertise and results in a positive evaluation of the product-related advice from the salesperson (Foster, 2004). Hence, when both the speaker and his or her message are regarded credible, persuasion on the part of the message recipient is most likely to occur (Pornpitakpan, 2004), which, in the context of the present study, can be translated into purchase intention.

Indeed, source credibility dimensions such as expertise and trustworthiness have been found to increase consumers' product purchase intention (Pornpitakpan, 2003). In a study into spokes-avatars as conversation partners or recommendation agents, it is known that customers who interacted with a competent avatar are more likely to purchase from an online vendor that deployed the competent avatar (Jin & Sung, 2010). It should be emphasized, nonetheless, that a competent virtual salesperson in this study is one whose gender matches the gender of the product he or she is supporting. The points just highlighted resulted in the second set of research hypotheses.

Hypothesis 3. Customers' level of trust in an online vendor is higher when VSA gender-product gender is congruent than when VSA gender-product gender is incongruent.

Hypothesis 4. Customers' online purchase intention is higher when VSA gender-product gender is congruent than when VSA gender-product gender is incongruent.

Fig. 1 illustrates the proposed relationship among the research variables. The figure underscores that VSA gender-product gender congruence results in a positive evaluation of VSA advice credibility, VSA trust, online vendor trust, and online purchase intention.

7. Method

7.1. Pretest

A pilot study was conducted to select three products used for the experiment's scenarios. Thirty respondents between the age of 18 and 30 were asked to rate the gender of 20 products that were selected based on their prices. Participants for the actual experiment also came from this age category. The decision to focus on this category of experimental participants is based on the finding that people between the age of 16 and 30 spend more time on the Internet and often make online purchases than individuals from other age clusters (Lester, Forman, & Loyd, 2005). A more recent report (Nielsen, 2014) also revealed that millennials or individuals between 21 and 34 years old have approximately 50–60 percent

chance of buying online compared to people belonging to the generation X (35–49) and the baby boomers (50–64) with online purchase probability of about 20 to 30 percent and 6 to 13 percent, respectively.

More expensive products were included in the list since perceptions of the risks involved in purchasing such products (e.g. monetary sacrifice) are much higher than the risks associated with the purchase of low-priced goods (Zeithaml, 1988). Beatty and Smith (1987) asserted that customers have a strong inclination to search for product-related information if the product is highly priced and complex. It is argued that a product's price shapes customers' perception of risk (Grewal, Gotlieb, & Marmorstein, 1994). However, buying a highly priced product that would turn out to be defective does not only result in financial risks for the customer, but also in time and psychological risks resulting from the repair of a defective product. Grewal et al. (1994) underscored that customers who are risk averse would first go through a thorough search for product-related information before making a purchase-related decision. Indeed, as noted in one study, when purchase-risk perceptions are high, customers are highly inclined to search for product- or purchase-related information (Bansal & Voyer, 2000).

Participants rated the masculinity, femininity, or neutrality of 3 high-involvement products that can be purchased online on a seven-point Likert scale (1 – extremely masculine, 4 – neutral, and 7 – extremely feminine). The results showed that a motorcycle was rated as a highly masculine product ($M = 1.53$; $SD = .68$), while a solarium was a highly feminine product ($M = 6.50$; $SD = .51$). A laptop was selected as a neutral product ($M = 3.83$; $SD = .59$). For the experiment, therefore, a motorcycle was selected as the masculine product, a solarium the feminine product, and a laptop the neutral product.

7.2. Procedure for the main study

A 2 (VSA gender: male vs. female) \times 3 (product gender: masculine vs. feminine vs. neutral) between-subjects factorial design, resulting in 6 conditions, was employed. A fictitious retail website was used to eliminate the effects of prior experience with the organization. All six conditions used the same framed-paged design and were created for ease of navigation and legibility.

The VSA presented to the experimental participants was in the form of photographed middle-aged salespersons (both male and female) wearing eyeglasses and sporting a business attire, based on the finding that older looking individuals may be perceived as more knowledgeable about products than younger salespersons (Foster & Resnick, 2013). The portrayal of an expert salesperson wearing eyeglasses was also similar to how an expert avatar was designed in Holzwarth et al.'s (2006) experiment.

Although a VSA could either be an interactive or a moving character (Keeling et al., 2010), static animated images (Zanker et al., 2011) and photographs of real people (Aldiri et al., 2008; Verhagen et al., 2014) have also been used to represent VSAs. The decision to use photographs of real people instead of animated pictures was based on findings that people tend to regard the conversation more natural and they would be more cooperative when interacting with a more realistic and human-like agent than with an unrealistic character (Groom et al., 2009).

Both individuals posing as VSAs were photographed from the same angle smiling at the camera in the same posture. The VSAs welcomed the user to the web shop and introduced themselves as experts for the three selected products, pointing out that they were ready to help customers with their product-related inquiries. Figs. 2 and 3 show the screenshots of the online vendor homepage with the male and female VSAs, respectively.

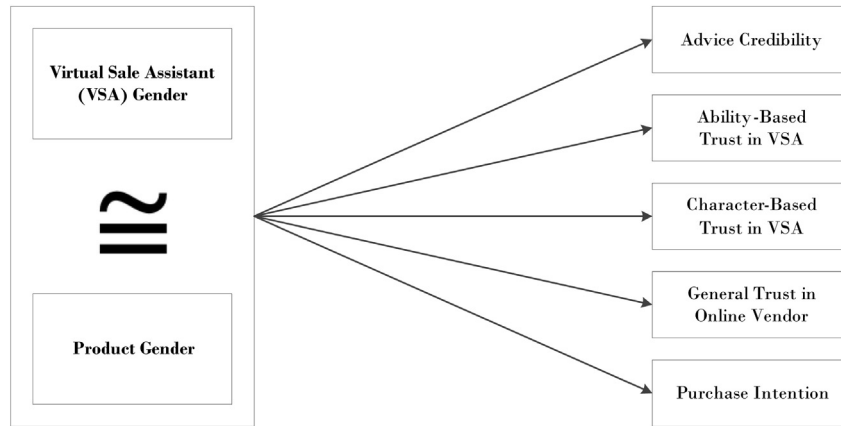


Fig. 1. Research framework illustrating the hypothesized relationship among the research variables.

Participants were asked to read a purchase scenario in which they were planning to buy either a motorcycle, a solarium, or a laptop. In the scenario it was highlighted that the participant still had no concrete idea about the specific type of motorcycle (or solarium or laptop) to buy. It is, however, important that the product is user-friendly and safe. This scenario provided participants with the opportunity to interact with the customer service unit of the online shop for the needed advice. The participants were requested to type in their product-related question and they were informed that a message would be generated for them (supposedly coming from the photographed VSA).

After the participants have read the advice from the virtual sales assistant, they were directed to an online questionnaire that collected their responses to items measuring the various dependent variables and their demographic information. A control question ('Is your choice dependent on the design?', with the expected answer being 'yes' since in all the scenarios it was

emphasized that a customer's decision on whether or not to choose a product depends on its design) was also used to identify individuals who read the text seriously and those who did not.

7.3. Participants for the main study

Initially, 203 respondents, with a mix of young professionals and students, residing in the various regions of the Netherlands were invited to participate in the study. The 203 respondents were randomly assigned to one of the six experimental conditions. After analyzing participants' responses to the control question, data from 20 participants who appeared to have incorrectly read the text were removed. Statistical analysis, hence, was performed using data from 183 participants, 94 (51%) of which were male. The participants' age ranged from 18 to 30 years ($M = 24.36$; $SD = 3.56$). As previously mentioned, individuals from the age range specified have a higher inclination to buy things online than their younger or

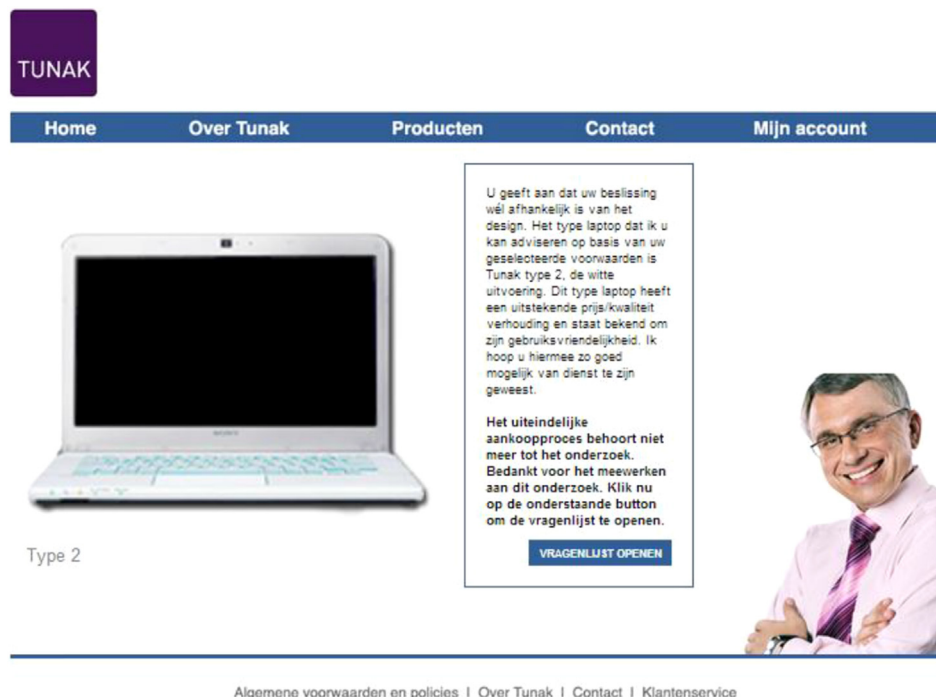


Fig. 2. Screenshot of the online vendor website with a male VSA.

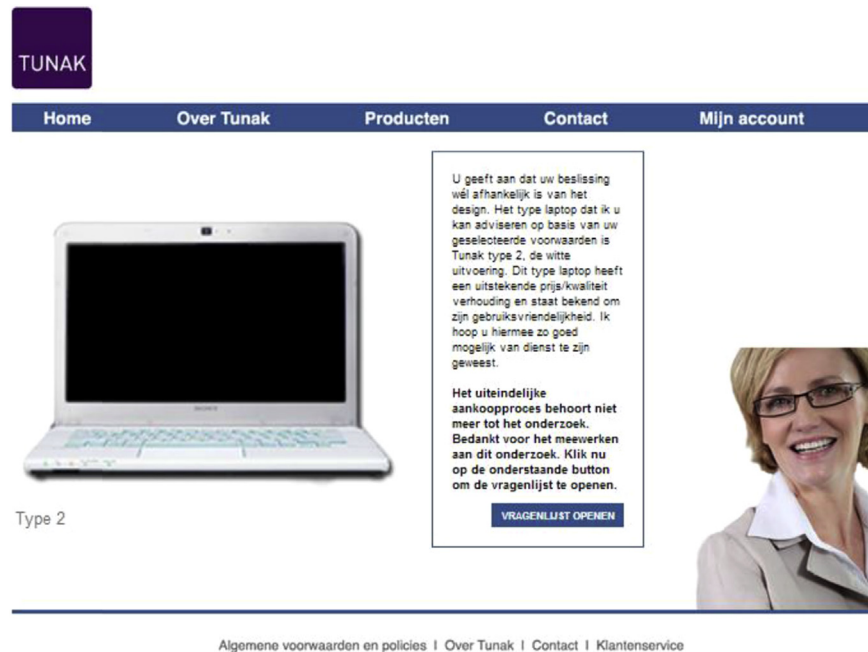


Fig. 3. Screenshot of the online vendor website with a female VSA.

older counterparts. Hence, it was decided to focus on people from that age bracket as research respondents.

Considering the complicated nature of the Dutch educational system, respondents were grouped into two with regards to their level of education: high (those who have obtained bachelor, graduate, or post-graduate degrees) and low (those who have completed technical or vocation education). Presented in Table 1 is the complete demographic information of the research respondents.

7.4. Measures

After being exposed to an experimental condition, participants first provided information about their gender, age, and educational qualification. Consequently, they were instructed to indicate their

responses to items measuring the dependent variables of the study (product advice credibility, trust in the VSA, trust in the online shop, and intention to purchase). Items were measured on a five-point Likert scale with 5 representing 'completely agree' and 1 'completely disagree'.

Exploratory factor analysis, using principal component analysis, was performed to determine whether the 19 items selected for the 5 constructs of the study really measured those constructs. The Kaiser-Meyer Olkin Measure of Sampling Adequacy has a value of .95, which is higher than the recommended value of .60 (Kaiser, 1974). The Bartlett's Test of Sphericity $X^2(171) = 2459.20$, $p < .001$ revealed that the correlations among the 19 items were sufficiently high for principal component analysis. Table 2 presents the factor loadings after rotation of the items measuring advice credibility, competence-based trust in VSA, character-based trust in

Table 1
Complete demographic information of the research respondents.

Variable		Frequency	Percentage	
Gender	Male	94	51.4	
	Female	89	48.6	
Age	18	7	3.8	
	19	5	2.7	
	20	13	7.1	
	21	9	4.9	
	22	10	5.5	
	23	37	20.2	
	24	19	10.4	
	25	25	13.7	
	26	16	8.7	
	27	11	6.0	
	28	9	4.9	
Education	29	7	3.8	
	30	15	8.2	
	High	44	24.0	
	Low	139	76.0	
	Internet Experience	Less than 5 years	1	.5
		5–10 years	54	29.5
		More than 10 years	128	70.0
Total		183	100	

VSA, trust in the online vendor, and purchase intention.

'VSA advice credibility' was originally measured with three items by Eastin (2001). Factor analysis indicated that one item did not load into the construct it was supposed to measure, hence it was removed from further analysis, resulting in a two-item credibility construct (Cronbach's $\alpha = .72$).

'VSA trust' was measured as a two-dimensional construct (character-based trust and competence-based trust) with items by McKnight, Choudhury, and Kacmar (2002). Items (4) for character-based trust (Cronbach's $\alpha = .86$) include 'The company's VSA is fair in dealing with me', while items (4) for competence-based trust (Cronbach's $\alpha = .90$) include 'The company's VSA is competent and effective in giving advice'.

Five items from Cyr et al. (2007) were used to measure 'trust in the online vendor' (Cronbach's $\alpha = .92$). These items include 'I can trust the company.' and 'The company is trustworthy in providing the right information about a product'. Finally, 'purchase intention' (Cronbach's $\alpha = .80$) was measured with three items by Holzwarth et al. (2006). An example of the item is 'I will consider buying a product through the company's website'.

8. Results

To see whether or not a male virtual sales assistant (VSA) is perceived as fitting a male product (motorcycle) and a female VSA is perceived as fitting a female product (solarium), a manipulation check was performed. For this check, three categories were created: one for fit between VSA gender and product gender, another for no fit between VSA gender and product gender, and another that combines VSA gender and a neutral product. Based on ANOVA results, respondents perceived a significantly higher fit in case of congruence between VSA gender and product gender ($M = 3.79$; $SD = .73$) compared to the combination of VSA and a neutral product ($M = 3.40$; $SD = .70$), as well as compared to the combination of opposite gender of VSA and product ($M = 2.48$; $SD = .95$) ($F(2,180) = 43.30$, $p < .001$).

Respondents' gender was included in the analysis as a control variable. Homophily, the extent to which interacting parties share similarities in several aspects (e.g. race, gender, age, values) (Rogers & Bhowmik, 1970), dictates the kind of information people receive, the attitudes they form, and the relationships they forge (McPherson, Smith-Lovin, & Cook, 2001). Simon, Berkowitz, and

Moyer (1970) claimed that homophily between a source and a receiver results in the former to be perceived as more credible and attractive by the latter. For this reason, it was decided to control for participants' gender in the analysis.

A multivariate analysis of variance (MANOVA) was performed to test the study's hypotheses. Results show that no main effects for product gender ($F(10, 334) = 1.201$, $p = .289$; Wilk's $\Lambda = .932$, partial $\eta^2 = .035$), gender of the virtual sales assistant ($F(5, 167) = .658$, $p = .566$; Wilk's $\Lambda = .977$, partial $\eta^2 = .023$), or participants' gender ($F(5, 167) = 1.071$, $p = .378$; Wilk's $\Lambda = .969$, partial $\eta^2 = .031$) were found. Results of MANOVA for the main effects of VSA gender, product gender, and participants' gender are presented in Table 3.

MANOVA results reveal that the interaction effect between VSA gender and product gender on the dependent variables is highly significant ($F(10, 334) = 6.080$, $p < .001$; Wilk's $\Lambda = .716$, partial $\eta^2 = .154$). This means that VSA gender-product gender congruence (e.g. a female VSA providing advice about a feminine product) prompts customers to perceive product-related advice from a VSA as highly credible (supporting hypothesis 1) and to trust the VSA (competence-based trust and character-based trust, supporting hypothesis 2a and hypothesis 2b, respectively). Furthermore, this congruence also increases customers' trust in the online vendor (supporting hypothesis 3) and their purchase intention (supporting hypothesis 4).

The interaction effects between product gender and participants' gender ($F(10, 334) = .645$, $p = .775$; Wilk's $\Lambda = .962$, partial $\eta^2 = .019$) and between VSA gender and participants' gender ($F(5, 167) = 1.252$, $p = .287$; Wilk's $\Lambda = .964$, partial $\eta^2 = .036$) are not statistically significant. The same holds true for the three-way interaction between VSA gender, product gender, and participants' gender ($F(10, 334) = .774$, $p = .654$; Wilk's $\Lambda = .955$, partial $\eta^2 = .023$). These results suggest that participants' gender does not play a role in the relationship between VSA gender-product gender congruence and the study's dependent variables. Table 4 presents the MANOVA results for the interaction effects of VSA gender, product gender, and participants' gender.

What is clear from the information in Table 5 is that participants exposed to a VSA gender-product gender congruence scenario perceived a product advice as more credible, trusted the VSA and the online vendor more, and indicated higher purchase intention than participants exposed to VSA gender-product gender

Table 2
Results of the factor analysis with VARIMAX rotation of the items measuring the five dependent variables.

Constructs	Items	Factors				
		1	2	3	4	5
Product Advice Credibility	The information provided by the virtual sales assistant (VSA) is accurate.		.62			
	The information provided by the VSA is credible.					.51
	The information provided by the VSA is factual.					.85
Character-Based Trust in the VSA	The company's VSA does business with my interests in mind.				.66	
	The company's VSA is interested in my welfare and not of the company's.				.77	
	The company's VSA is fair in dealing with me.	.53			.65	
	The company's VSA is honest.				.66	
Ability-Based Trust in the VSA	The company's VSA is competent and effective in giving advice.		.56			
	The company's VSA performs his/her role as an adviser well.		.75			
	The company's VSA is well informed.		.84			
	In general, the company's VSA is qualified and capable.		.66			
Trust in the Online Vendor	I can trust the company.	.79				
	The company is trustworthy in providing the right information about a product.	.78				
	The company is honest.	.75				
	I have the feeling that the company provides me with competent and honest advice.	.60				
	The company has my best interests in mind.	.53				
Purchase Intention	I will consider buying a product through the company's website.				.79	
	I would like to try a product from the company's website.				.68	
	I will surely buy a product from the company's website.				.80	

Table 3
MANOVA results for the main effects of VSA gender, product gender, and participants' gender.

Dependent variables	Virtual sales assistant (VSA) gender	Product gender (P)	Participants' gender (R)
Advice credibility	F = 1.590 p = .209	F = .752 p = .473	F = 2.638 p = .106
Ability-based trust in the VSA	F = .465 p = .496	F = .258 p = .773	F = .402 p = .527
Character-based trust in the VSA	F = 2.362 p = .126	F = .620 p = .539	F = 1.854 p = .175
Trust in the online vendor	F = .225 p = .636	F = .650 p = .523	F = .108 p = .743
Online purchase intention	F = .130 p = .719	F = 2.431 p = .091	F = .000 p = .984
Wilk's Λ (partial η^2)	.977 (.023)	.932 (.035)	.969 (.031)

Table 4
MANOVA results for the interaction effects between VSA gender, product gender, and participants' gender.

Dependent variable	VSA gender \times Product gender	Product gender \times Participants' gender	VSA gender \times Participants' gender	Product gender \times VSA gender \times Participants' gender
Advice credibility	F = 10.725 p < .001	F = .873 p = .419	F = .055 p = .815	F = 1.045 p = .364
Ability-based trust	F = 22.604 p < .001	F = 1.194 p = .306	F = 1.448 p = .231	F = .559 p = .573
Character-based trust	F = 22.032 p < .001	F = .757 p = .471	F = .156 p = .693	F = .570 p = .567
Trust in the online vendor	F = 21.533 p < .001	F = .525 p = .593	F = .922 p = .338	F = .599 p = .550
Online purchase intention	F = 17.744 p < .001	F = .585 p = .558	F = 1.619 p = .205	F = 1.219 p = .298
Wilk's Λ (partial η^2)	.716 (.154)	.962 (.019)	.964 (.036)	.955 (.023)

incongruence scenario. This is apparent when one looks at the mean values of the dependent variables across the six conditions. It is also notable that the mean values of the dependent variables in the VSA (male or female) neutral product combination are relatively higher than those in the condition of VSA gender-product gender incongruence. Table 5 shows the mean and standard deviation values for the dependent variables in each experimental condition.

9. Discussion

In an attempt to reduce the impersonal nature of online transactions, online web shops are increasingly introducing interactive elements into their websites. The lack of sociability inherent in online exchanges can be reduced with the use of virtual sales assistants (VSA) visually presented either in the form of animated avatars (Keeling et al., 2010) or photographs of individuals (Aldiri et al., 2008; Verhagen et al., 2014) supposedly representing a customer service staff.

A quick inspection of several online shops would indicate that animated avatars or photographs of women are commonly used as

VSAs. Such preference for female characters could be due to the feminization of the call center industry (Staritz & Reis, 2013), where women are viewed as suitable service agents because of their caring and empathic communication styles (Sparks et al., 1997). It remains unknown, however, whether or not a female VSA would still be regarded as believable and her message credible if she is providing information about a highly masculine product (e.g. motorcycle).

MANOVA results indicate that a VSA's gender does not have a main effect on the credibility of the VSA's product-related advice, and these findings support the assertion that men and women are not substantially different from each other in terms of credibility (Kenton, 1989). In fact, what is more important, as results of this study show, is that the VSA's gender should match the gender of the product the VSA is providing information for. The results support O'Keefe's (2002) claim that it is not only the source that shapes message credibility but also the fit between the source and his or her message and further corroborate Foster and Resnick's (2013) finding that customers establish connections between salesperson's gender and the type of product when seeking product-related information (e.g. that a female salesperson is a better

Table 5
Mean and standard deviation values for the dependent variables of each scenario.

Dependent variable	Male VSA			Female VSA		
	Masculine product N = 32	Neutral product N = 30	Feminine product N = 32	Masculine product N = 30	Neutral product N = 29	Feminine product N = 30
Advice credibility	3.65 (.85)	3.23 (.84)	3.09 (.83)	2.71 (.98)	3.15 (.73)	3.62 (.88)
Ability-based trust	3.91 (.86)	3.29 (.85)	3.04 (.94)	2.71 (.95)	3.48 (.60)	3.80 (.71)
Character-based trust	3.75 (.82)	3.07 (.64)	3.07 (.74)	2.53 (.83)	3.32 (.60)	3.52 (.69)
Trust in the online vendor	3.63 (.96)	3.18 (.76)	2.78 (.74)	2.57 (.83)	3.33 (.63)	3.52 (.61)
Online purchase intention	3.06 (1.12)	2.77 (.89)	2.30 (.75)	1.97 (.72)	2.97 (.78)	3.06 (.94)

source of information about a lipstick than her male counterpart).

Analysis also shows that VSA gender-product gender congruence has a significant effect on customers' trust in the VSA. In this study, trust in the VSA was measured in terms of his or her competence and character – two important dimensions in [McLain and Hackman \(1999\)](#) operationalization of trust. The fact that a female VSA is providing advice for a feminine product (and a male VSA for a male product) suffices to prompt customers to be positive about the VSA's competence. This evaluation of competence might be anchored on customers' belief that somebody who is not a typical user of a product does not possess the knowledge and expertise to say something about it – even if, in an offline environment, that individual has been adequately trained about the product's functionalities.

Additionally, research results indicate that VSA gender-product gender congruence substantially impacts perception of the VSA's authenticity and concern about the customer's interests. It is very likely that when customers are helped by a VSA whose gender does not match that of the product being supported, they would be less positive about the VSA's character. The finding that VSA gender-product gender congruence enhances customers' assessment of advice credibility and trust in the VSA supports results of studies in an offline customer-salesperson encounter – that customers would prefer to consult a male salesperson when inquiring about a highly masculine product (or a female salesperson when it concerns a feminine item; [Foster, 2004](#); [Foster & Resnick, 2013](#)).

It is claimed that customers who have no prior experience with and knowledge about a company normally base their trust in the company and on the quality of their interaction with its salesperson ([Doney & Cannon, 1997](#)). The same can probably be said of a VSA who functions as the immediate point of contact for a customer relatively unfamiliar with an online vendor and its activities. An important implication of the research findings is that having a VSA, regardless of gender, on a web shop does not automatically induce customers' trust. What is more important for the germination of such trust is VSA gender-product gender congruence.

There are two possible reasons behind the impact of VSA gender-product gender congruence on trust. First, an online shop's decision to employ a VSA whose gender fits that of the product being supported could be interpreted as an indication of the company's technical competence and knowledge of customers' expectations of the VSA suitable to provide the needed product-related advice. Second, the use of a VSA that fits product type could be viewed as the company's way of displaying concern for its customers, under the premise that customers may have a preference for a specific sales staff who knows more about a specific product. A knowledgeable and competent sales staff can easily be trusted ([Kennedy et al., 2001](#)) and this trust could eventually translate to customers' trust in the company ([Doney & Cannon, 1997](#)).

Finally, VSA gender-product gender congruence can also increase customers' purchase intention. [Jin and Sung \(2010\)](#) reported that people are more inclined to purchase online when helped by a competent virtual sales assistant. In this study, perception of VSA competence might already be embedded in VSA gender-product gender congruence, and, hence, results of the current study somehow support Jin and Sung's findings. Furthermore, customers may have regarded VSA gender-product gender congruence a potent persuasive cue that increases their attraction to the company, eventually amplifying their willingness to purchase online.

While VSA gender-product gender congruence is important for highly gendered products, congruence has no significant effect on product-advice credibility, trust in the VSA and the online vendor, and purchase intention when the product is not gendered (the neutral product). Interestingly, however, the mean scores of the

female VSA in the study's dependent variables are higher than those of the male VSA, although the difference is not statistically significant. This is a noteworthy point since the neutral product used was a laptop, a highly technical product in which men are known to have more competence than women ([Kay, 2006](#)). However, the fact that a laptop is regarded a genderless product, as its typical users can be both men and women, might have cultivated the belief that women can be as knowledgeable about a laptop as men are. And considering the way women communicate information (e.g. empathic, sincere), customers might be more positive about the message from a female VSA and towards her message, especially when a neutral product is the focus of support.

10. Theoretical implications

Studies into the effect of visual cues (e.g. photos, animated avatars) on online trust are gaining popularity. Previous studies have shown that the use of avatars is a powerful strategy to influence consumers' trust in an online organization ([Almutairi & Rigas, 2014](#)) and to prompt users to transact with an organization through its online channel ([Bente et al., 2014](#)). Results of the present study, nonetheless, suggest that simply using a VSA to enhance social presence in a seemingly impersonal online exchange may not suffice anymore to generate positive outcomes such as trust and exchange intention.

Thus far, studies into VSA use in e-commerce have not yet addressed the question pertaining to the relevance of VSA gender-product gender congruence for the outcomes mentioned. What the current study challenges is the notion that using a VSA (representing either a male or a female individual) without taking into account how it matches the type of product being marketed is already an effective persuasion tactic in an e-commerce context. The authors hope that, with this study, they have provided a starting point for research into the impact of VSA characteristics and product type congruence on a range of relevant variables such as brand perception and satisfaction with the interaction.

11. Practical implications

Results of this study indicate that VSA gender-product gender congruence can positively influence customers' attitude and behavioral intention. With e-commerce retaining its impersonal and anonymous character comes the pressing need for online vendors to continuously explore ways to make such form of exchange more personal.

For online shops, an important implication of the study's results is that having a VSA on their website is not enough. A female VSA might convey a more empathic and caring service, although such a VSA may not always be perceived as effective when 'she' is expected to provide information for a more masculine product. Online shops should, therefore, take the matchup principle as a basis for the use of a VSA on their websites. For instance, online shops that sell primarily masculine products should consider employing a male character as a VSA. This is important since results of this study suggest that customers have the tendency to associate the credibility of a product-related advice with the VSA's gender, especially if the product is highly gendered.

Instead of employing a female VSA as a standard rule, online shops could consider providing customers with the possibility to indicate the type of product they want information about before they can send their information requests. Doing this would enable the shop to select the most appropriate VSA to advise customers. Adjusting the VSA type to the product type that will be supported could send a signal to customers that the online shop has the technical competence to cater to its customers' needs and

expectation, and this would translate to customers' overall trust in the online shop.

12. Future research directions

Although this research has addressed the question on the importance of fit between the online salesperson and the type of product being marketed online, some questions remained unanswered. In this section, points for future research will be elaborated, as the use of VSAs in e-commerce is still a promising research theme.

The product used in this experimental study is a relatively expensive one, which increases the relevance of trust in the vendor and message credibility as factors that could lessen perception of a purchase-related risk. It is known that in the process of purchasing a relatively costly item, customers resort to an extensive information search to reduce purchase-related risk perception, an indication of their level of involvement with the product and the purchase process (Laurent & Kapferer, 1985). Results of this study support the congruence thesis in the context of product endorsement – that the effectiveness of the endorser depends on his or her fit with the product being endorsed, especially when customer involvement with the product is high (Rice, Ketting, & Lutz, 2012). Nonetheless, the question on whether or not this would hold true for low-involvement products should still be addressed.

The cultural characteristics of customers may have also contributed to the research results. One interesting finding is that for a neutral product like a laptop, despite insignificant differences in the effects of both a male VSA and a female VSA, the use of a female VSA results in a more positive customer attitude and intention than the use of a male VSA. While it is assumed that the statistically insignificant difference might be attributed to the increasing de-masculinization of a laptop as an artifact, since women are increasingly using it and acquiring more knowledge about its workings, the preference for a woman as a laptop spokesperson could also be due to the respondents' cultural traits. Dutch customers, with their very feminine culture, might have a strong preference for a more 'rapport talk' (establishing relationships) than a 'report talk' (preferable in masculine cultures; Hofstede, Hofstede, & Minkov, 2010). The results could be different in a study with respondents from a highly masculine culture.

The present study only concentrated on respondents from a very specific age cluster – between 18 and 30. Hence, the generalizability of the results to customers from other age cluster could somehow be limited. One wonders whether the findings would be applicable to older customers (e.g. between 31 and 50) and, even, to senior citizens. Pursuing this study with respondents from various age clusters would also be a worthy research pursuit, as customers from the age brackets 35–49 and 50–64 comprised over 40% of the total number of people who purchase online on a global scale (Nielsen, 2014).

Furthermore, the experiment only used predetermined VSAs from both genders. In a real world shopping context, customers normally have the possibility to choose which salesperson (from either gender) to approach when seeking product-related information. It might be a worthwhile research agenda to focus on the effects of providing customers with the possibility to choose the gender of the VSA they will be interacting with on those customers' attitude towards the product and towards the company and on their purchase intention. This recommendation is based on results of a very recent study by Hanus and Fox (2015), which indicated that people who were allowed to customize avatars (by manipulating avatars' appearances) during an online sales pitch tended to be more positive about a product and were more inclined to buy it compared to those who were not provided with customization

possibilities.

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