

THE IMPACT OF ONLINE REAL-TIME INTERACTIVITY ON PATRONAGE INTENTION: THE USE OF AVATARS

ABSTRACT

The objective of this paper is to examine the impact of online real-time interactivity on the desire of users to visit and to purchase products/services from the company in the future. Online real-time interactivity has been increased by the use of avatars. We also investigated the antecedents of online real-time interactivity by focusing on trust, emotional appeal, and social presence. As far as the methodology is concerned, we designated companies using avatars on their websites. We asked respondents to visit these websites and then fill in our questionnaire. We received 945 questionnaires back. As we had several latent variables, we used partial least squares (PLS), a variance-based structural equation modeling method. The results show that online real-time interactivity significantly increases the patronage intention. The results also illustrate the impact of the degree of trust and the emotional appeal on user's perception about the online real-time interactivity. Nevertheless, the impact of the emotional appeal is less relevant compared to the degree of trust. Moreover, the degree of trust in the information found on the website explains user's emotional appeal during the conversation. Finally, avatar's social presence has a significant impact on trust and emotional appeal. Our results have immediate and direct implications for avatars' developers and companies who want to invest in improving the real-time interactivity of their website.

Keywords Avatar, Website humanization, Social presence, Trust, Emotional appeal, Online real-time interactivity

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1. INTRODUCTION

Websites are the virtual personality of a company and they are evolving in an environment that responds to a variety of activities, including entertainment, exploration, communication, and learning (Huang, 2003). They can bring new customers to your business, strengthen current relationships or, in the worst case, frustrate and turn away potential customers. One of the main reasons for customer dissatisfaction on the websites is the lack of interaction and humanity. A humanized approach would incorporate various human-centric elements, such as emotive textual descriptions, relevant pictures of people, appropriate audio and video clips, virtual communities, and virtual shopping agents (Head *et al.*, 2003). By increasing the interactivity and humanizing the website through the use of an avatar, companies try to improve the customer online experience and in the same time to increase the firm online productivity. With advanced in the field of artificial intelligence and user interface, solutions can increase the online real-time interactivity.

Although many studies have focused on the impact of the avatar on user's online experience (e.g., Wang *et al.*, 2007; Bridges and Florsheim, 2008; Keeling *et al.*, 2010; Köhler *et al.*, 2011; Childers *et al.*, 2002; Gefen and Straub, 2004; Chung, 2005; Cyr *et al.*, 2007; Holzwarth *et al.*, 2006; Etemad-Sajadi and Ghachem, 2015), there is a lack of research about the effect of the avatar's real-time interactivity on the patronage intention (likelihood of visiting the company in the future) of current and potential customers. Therefore, this study makes the following academic contribution: We want to identify the impact of online real-time interactivity on patronage intention. In a research done on virtual worlds, Kohler *et al.* (2011) argued that when users have an involving experience, they participate more intensely. Prior research focused on the impact of this technology on the online purchase intention and

less on the real patronage intention. Moreover, whereas prior research investigating virtual agents has integrated basic verbal and visual cues (Wang *et al.*, 2007; Holzwarth *et al.*, 2006), we want to investigate how the increase of online real-time interactivity through the use of avatar can influence the desire of potential users to visit and to purchase products/services from the company in the future. This study has major implications for avatars' developers and companies who want to invest in improving the real-time interactivity of their website. In parallel, we want to investigate the antecedents of online real-time interactivity by focusing on trust, emotional appeal, and social presence, which are key dimensions found in the literature (Keeling *et al.*, 2010; Wang *et al.*, 2007; Holzwarth *et al.*, 2006; Etemad-Sajadi, 2014; Gefen and Straub, 2004).

2. THEORETICAL BACKGROUND AND HYPOTHESES

2.1 Online avatars

McGoldrick *et al.* (2008) summarized several terms found in the literature, such as “avatars” (Wood *et al.*, 2005; Holzwarth *et al.*, 2006), “virtual agents” (Abbattista *et al.*, 2002), “embodied conversational agents” (ECAs) (Cassell *et al.*, 2000), etc. They are animated characters that some companies use on their websites to mimic interaction with a human customer-service representative. These characters humanize the question-and-answer experience and simulate a real-time conversation (Wang *et al.*, 2007; Bridges and Florsheim, 2008); Keeling *et al.*, 2010; Köhler *et al.*, 2011; Etemad-Sajadi and Ghachem, 2015; Gefen and Straub, 2004). Despite very optimistic literatures, the virtual agents do not seem to keep always all their promises. According to Ben Mimoun *et al.* (2012), the reasons of that failure come from a lack of interactivity, intelligence, and autonomy. Corvello *et al.* (2011) also highlight the lack of interaction. Nevertheless, the majority of papers related to the topic confirmed the positive impact of virtual agents (Keeling *et al.*, 2010; Wang *et al.*, 2007;

Holzwarth *et al.*, 2006). Wang *et al.* (2007) found that hedonic and utilitarian values influence significantly the patronage intention of current and potential customers. They use an animated character with a computer voice in order to show the positive impact on users' perception. According to Holzwarth *et al.* (2006), the use of an avatar leads to a more positive attitude towards the company and a greater purchase intention. The design of the online avatar can also have an impact on users' perception. Indeed, Mull *et al.* (2015) focused on different types of 3D animated avatars as salespeople (human, fantasy, animal and humanoid). They found that the human avatar was perceived as the most credible/attractive and was regarded as the highest in relation to intention to interact. Köhler *et al.* (2011) examined how customers adjust to complex service contexts (banking industry) by way of their agent-based online interactions. They focused on the content and style of agent-customer interactions. The content was separated to two aspects which are functional and social. As far as the style was concerned, it was defined as reactive versus proactive. Analyzing agent-customer conversations, Köhler *et al.* (2011) argued that a higher level of functional content and a proactive style enhance the user's knowledge about what is expected of him/her (role clarity), how to perform service tasks (self-efficacy), and how the website works (social acceptance). They also found that social content has a positive impact on newcomer adjustment. However, if the conversation is largely dominated by social content, users become dissatisfied with the lack of substance in the interaction. This can also be explained by the fact that in their research, they focused on banking industry which can be considered as a utilitarian industry. In a research done on restaurant industry, Etemad-Sajadi (2014) found that hedonic value of the virtual agent increases significantly the desire of potential clients to visit the restaurant. The impact of the hedonic value of the virtual agent is even more relevant than its utilitarian value. Hence, the nature of the company or the website plays an important role in the success of the avatar's implementation.

2.2 Online real-time interactivity

According to Wang *et al.* (2007), interactivity is a social cue and can be explained by user's perception of connection. Establishing an online social connection is an important issue for companies. Zhang *et al.* (2014a) focused on the importance of commitment in the case of social virtual worlds. Compared to traditional shopping, in an online shopping environments customers do not have direct contacts with salespeople (Cyr *et al.*, 2007). According to the same authors, these face-to-face interactions have therefore been replaced by a complex socio-technical system, often not well understood by users. Liu and Shrum (2002) specified the three dimensions of interactivity as i) active control (user's ability to voluntarily participate in and instrumentally influence a communication), ii) two-way communication (ability for reciprocal communication between the company and the user), and iii) synchronicity (degree to which users' input into a communication and the response they receive from the communication are simultaneous). This third dimension can be considered as the "real-time" interactivity. Steuer (1992) focused on the real-time dimension and defined interactivity as "the extent to which users can participate in modifying the form and content of a mediated environment in real-time". His definition is based on a telepresence view of mediated communication and focused on properties of the mediated environment and the relationships of individuals to that environment. According to Kohler *et al.* (2011), when participants experience an online inspiring, involving and fun co-creation experience, they participate more intensely. Wang *et al.* (2007) found that the presence of the avatar can influence the patronage intention. According to Holzwarth *et al.* (2006), the use of an avatar leads to a more positive attitude towards the company and a greater purchase intention. Van Noort *et al.* (2012) argued that a higher level of website interactivity increases website visitors' online flow experience, which subsequently leads to positive outcomes of concern to marketers, such as favorable attitudes toward the website and the brand, increased number of

product-relevant thoughts, and favorable behavioral intentions. In our context with the use of avatars and based on the literature above, we want to focus on the relationship between online real-time interactivity and patronage intention. Hence, we propose the following hypothesis:

H1. The online real-time interactivity will positively influence user's patronage intention.

2.3 Trust

Trust is a key element of success in the online environment (Gefen and Straub, 2003; Corritore *et al.*, 2003). According to the literature, the facets of trust are reliability, ability, integrity, benevolence, and honesty (Giffin, 1967; Kumar, 1996; Gefen and Straub, 2004). Having trust in a website is primordial for increasing interaction (Gefen and Straub, 2003; Kim, 2012). Therefore, the degree of trust in the information found on the website and delivered by the avatar can potentially impact user's desire for interacting online. In parallel, trust can be positively related to user's enjoyment and emotional appeal (Hassanein and Head, 2004). Zhang *et al.* (2014c) also showed the relationship between the cognitive trust (beliefs) and the emotional feelings. Hence, we propose the following hypotheses:

H2. The degree of trust will positively influence user's desire for online real-time interactions.

H3. The degree of trust will positively influence user's emotional appeal.

2.4 Emotional appeal

Emotional appeal focuses on fun, playfulness, and emotional worth (Babin *et al.*, 1994). In an online context, the emotional appeal is the emotional effect of using the website and the intensity of the involvement (Barnes and Vidgen, 2001; Loiacono *et al.*, 2007). The emotional worth can increase user's desire for more interactions (Babin *et al.*, 1994). Wang

and Fodness (2010) also focused on the different roles of avatars and the users' emotional responses. Therefore, we propose the following hypothesis:

H4. The emotional appeal will positively influence user's desire for online real-time interactions.

2.5 Avatar's social presence

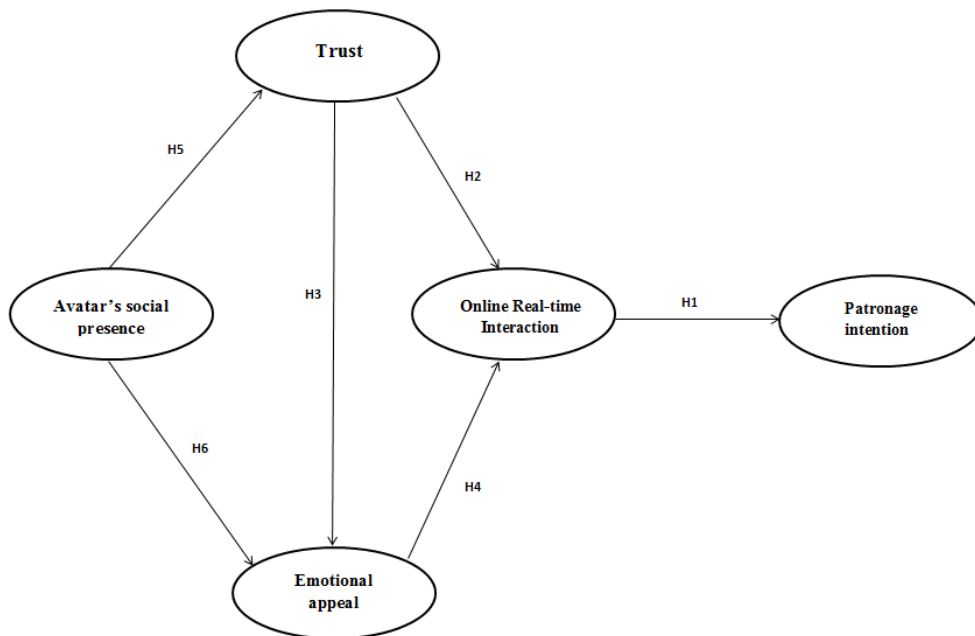
Social presence is described as the perception that there is personal, sociable, and sensitive human contact (Gefen and Straub, 2004). The definition is very close to telepresence which is defined as "the psychological state of 'being there' in a computer-mediated environment, augmented by focused attention. It is characterized by cognitive and sensory arousal, control, and immersion" (see Mollen and Wilson, 2010, pp. 921). Several authors identified that the perception of social presence can affect user trust in information given on a website (Sung and Mayer, 2012; Gefen and Straub, 2004; Hassanein and Head, 2007; Hess *et al.*, 2008). According to them, the inclusion of social cues on a website facilitates the building of online trust. Steinbrück *et al.* (2002) also found that social presence through the use of an avatar increases online trust. In the same time, as the avatar can reduce the social distance, one can suppose that the increase of online socialization can positively impact the pleasure for user to communicate with the avatar and to navigate on the website. Indeed, several authors (e.g., Heeter, 1995; Hassanein and Head, 2007) found that users enjoyed the experience more when they felt a strong social presence. Wang and Fodness (2010) also suggested that a consumer's emotional response will be more positive on a website with a highly likeable avatar. Therefore, we propose the following hypotheses:

H5. The social presence of the avatar will positively influence user's trust on the website.

H6. The social presence of the avatar will positively influence user's emotional appeal.

Figure 1 depicts our research model. The items will be explained below. In this research, we focused on the direct relationship between online real-time interactivity and patronage intention. Even, if the three other variables (trust, emotional appeal, and social presence) can directly impact the patronage intention, we wanted to identify the intermediary role of the online real-time interactivity. In this research, trust, emotional appeal, and social presence are considered as prerequisite for increasing the online real-time interactivity.

Figure 1: Research model



3 METHODOLOGY

3.1 Measures

Responses to the items presented below (which were taken from extant measures) were used to create this current study's measures and to assess this study's hypothesized structural model. Response options for each item ranged from 1 (*strongly disagree*) to 7 (*strongly agree*).

Social presence was assessed with items adapted from Gefen and Straub (2003). *Trust* was assessed with items adapted from Gefen and Straub (2003), Gefen and Straub (2004), and Cyr *et al.* (2005). *Emotional appeal* was assessed with items adapted from Agarwal and Karahanna (2000), Hassanein and Head (2007), and Heijden (2003). *Online real-time interactivity* was assessed with items adapted from Liu (2003) and Wu (1999). Finally, *patronage intention* was assessed with items adapted from Hellier *et al.* (2003). Table 1 summarizes our items.

Table 1: Questionnaire items

Constructs	Items
AVATAR'S SOCIAL PRESENCE	The virtual agent looks human. The virtual agent looks empathic. The virtual agent looks clever.
TRUST	I trust the reliability of information found on this website. I trust this website to keep personal information secure. The virtual agent looks trustworthy. I trust the information given by the virtual agent.
EMOTIONAL APPEAL	The design of the website is visually pleasing. I feel cheerful due to the friendliness of the website. The interaction with the virtual agent is pleasant. The interaction with the virtual agent is funny.
ONLINE REAL-TIME INTERACTIVITY	The website allows me to interact with it in order to receive information. The website has interactive features to meet my needs. The virtual agent allows to easily find the desired information without

having to call the company.

The virtual agent allows to easily find the desired information without having to write an email to the company.

The interaction with the virtual agent is efficient.

PATRONAGE INTENTION

Visiting this website increases my desire to make business with the company.

The website gives me the impression that making business with this company will be positive.

3.2 Sampling and data collection procedures

We launched several on-line surveys in parallel based on the following service companies using an avatar: Continental Airline, Alaska, Vueling, On the beach, Hispeed, Amtrak, Ikea, MGS. These companies operate in the following industries: airline carrier, online travel agency, telecommunications, rail transport, furniture retailing and health insurance. We selected the companies using relatively similar avatars (2D animated character). We used Amazon Mechanical Turk (94.9%) and the clients of firms selected (5.1%) for answering to our questionnaire. Overall, we received 945 questionnaires back. The sex of respondents was divided with 561 male and 384 female. The age of respondents is between 18 and 79, with an average age of 33.6. We asked respondents to take between 5 and 10 minutes to visit the website and interact with the virtual agent. Then, they had to answer our questionnaire.

3.3 Data analysis method

Structural equation modeling (SEM) was adopted to test the hypotheses due to the fact that the model contains several latent variables. SmartPLS 2.0 was used for the analysis. We employed a bootstrapping method (200 sub-samples) to test the significant level of

regression path coefficients (Hair *et al.*, 2011). We used the blindfolding approach (cross-validated communality and redundancy). The cross-validated communality index measures the quality of the measurement model of each block. The quality of each structural equation is measured by the cv-redundancy index (i.e. Stone-Geisser Q^2). The Stone-Geisser Q^2 for online real-time interactivity and patronage intention is respectively 0.44 and 0.35. Q^2 measures the extent to which observed values are reconstructed by the model and its parameter estimates (Chin, 1998). The technique represents a synthesis of function fitting and cross-validation (Henseler *et al.*, 2009). If it is negative, the model has no predictive relevance; values around 0.15 indicate a medium predictive relevance and around 0.35 a large predictive relevance (Henseler *et al.*, 2009; Hair *et al.*, 2012). In this model, the independent variables are therefore good predictors for online real-time interactivity and patronage intention.

4. RESULTS

4.1 Reliability and validity of measures

Table 2 shows that all latent variables have a composite reliability higher than 0.75, confirming that the scale reliabilities have adequate and stable measurement properties. Convergent and discriminant validity are components of a larger measurement concept known as construct validity (Straub *et al.*, 2004). Convergent validity is shown when each measurement item is strongly correlated with its construct. It is usually satisfied by retaining variables whose loadings are high, indicating that they share sufficient variance with their related construct. Discriminant validity is satisfied when each measurement item is weakly correlated with all other constructs except with the one to which it is theoretically associated (Gefen and Straub, 2005). With PLS, convergent and discriminant validities are confirmed if each construct AVE is larger than its correlation with other constructs. Moreover each item should load more highly on its assigned construct than on the other constructs (Gefen *et al.*,

2000; Straub *et al.*, 2004). Table 2 shows the intercorrelation of the research constructs. The diagonal of this matrix represents the square root of the average variance extracted. For adequate discriminant validity, the diagonal elements should be significantly larger than the correlation of the specific construct with any of the other constructs and should be at least 0.5 (Fornell and Larcker, 1981). In our case, one can claim that discriminant validity is confirmed and sufficient to support the model.

Table 2: Reliability and discriminant validity

Constructs	Composite reliability	1	2	3	4	5
1. Avatar's social presence	.91	.88 ^a				
2. Trust	.85	.61**	.77			
3. Emotional appeal	.78	.51**	.61**	.69		
4. Online real-time interactivity	.93	.49**	.76**	.60**	.85	
5. Patronage intention	.93	.40**	.65**	.68**	.64**	.93

Notes:

** Correlation is significant at the 0.01 level.

a Diagonal: (Average Variance Extracted)^{1/2} = ($\sum \lambda_i^2/n$)^{1/2}

4.2 Results and discussion

Figure 2 presents the results of the PLS analysis and the values of different path coefficients. One can observe that the online real-time interactivity significantly increases the patronage intention ($\gamma = 0.647$). Indeed, 41.8% of variance of patronage intention is explained by the online real-time interactivity. Hence *H1* is accepted. Prior research focused on the impact of this technology on the online purchase intention and less on the real patronage intention. This result is relevant as it shows that on-line real-time interaction increases the desire of users to visit and to purchase products/services from the company in the future. Companies can increase the patronage intention of their clients or potential clients by increasing the real-time interaction on their website.

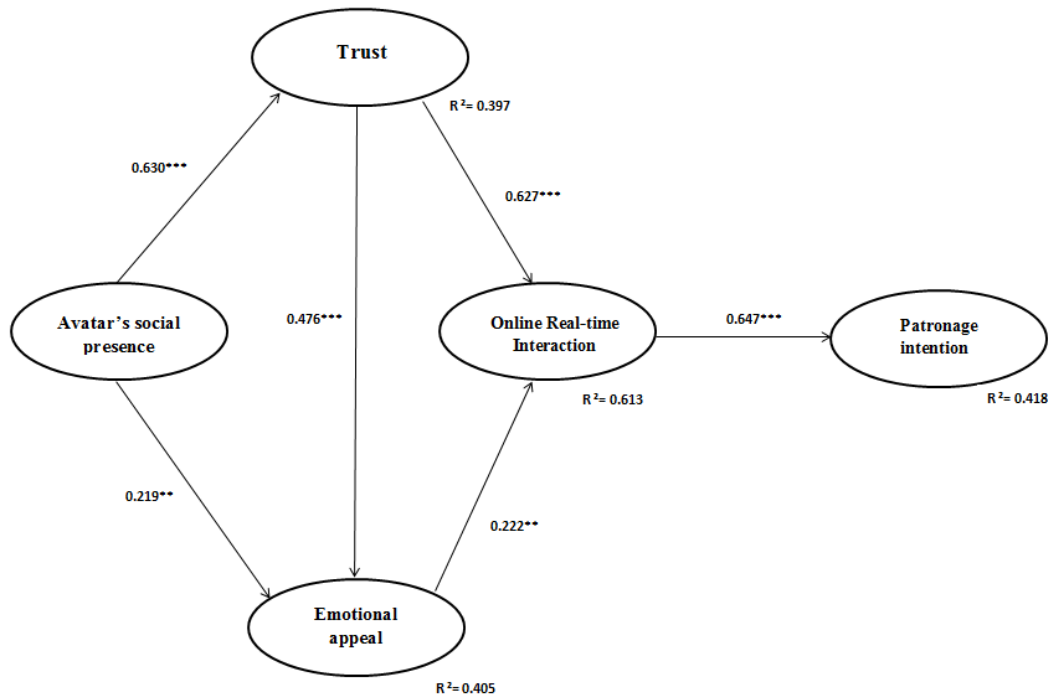
Trust in the information found on the website explains user's desire for online real-time interaction ($\gamma = 0.627$) and user's emotional appeal ($\gamma = 0.476$). Hence *H2* and *H3* are

both confirmed. These results confirm the important role of trust and firms should continuously control if all information given by their online avatar are up to date. It will significantly impact users' pleasure and desire to interact with the company through the online channel.

As far as the impact of the emotional appeal on online real-time interactivity is concerned, one can claim that it is significant ($\gamma = 0.222$). Hence, even if *H4* is less relevant compared to *H2*, it is also confirmed. Indeed, comparing the two variables impacting user's perception of online real-time interaction, we observe that the influence of trust is higher than the emotional appeal (respectively $\gamma = 0.627$ and $\gamma = 0.222$). Nevertheless, the pleasure and the emotional appeal are important issues and should be considered in the implementation of the avatar.

Finally, the avatar's social presence has a significant impact on trust ($\gamma = 0.630$). The humanization of the website through the use of avatar increases trust in the information found on the website. It explains 39.7% of variance of trust. In parallel, the avatar's social presence also impacts user's emotional appeal ($\gamma = 0.219$) even if the coefficient is less important compared to trust. Hence, the *H5* and *H6* are also confirmed. These results highlight the importance of human and social cues of the avatar. It increases the degree of trust in information found online and the pleasure of visiting the website.

Figure 2: Results of the PLS analysis



Notes:

- ** Significant at 0.01 level
- *** Significant at 0.001 level

5. CONCLUSION

Virtual worlds are receiving increased global attention in a wide range of areas (Zhang *et al.* 2014b). Companies often use their websites as an important tool to communicate the goods and services they provide. Additionally, certain companies may want to convey ascertain important values and convey services that are neither at the core of their business, nor explicitly offered to clients. It may be something as simple as wanting to express the level of quality clients can expect from that company, or something such as reinforcing positive company values. Subsequently, this research shows that *humanizing* websites through the use of avatars can offer solutions to achieve this goal and contribute to businesses significantly by increasing the online real-time interactivity. Indeed, our findings show that online real-time interactivity significantly increases the patronage intention. The results also illustrate the

impact of trust and emotional appeal on user's perception about the online real-time interactivity. The relationship between trust and online real-time interactivity is higher than the relationship between emotional appeal and online real-time interactivity. Moreover, the degree of trust in the information found on the website explains user's pleasure during the conversation. We also found that avatar's social presence has a significant impact on trust and emotional appeal. This provides the possibility for a company to develop a certain 'relationship' with site visitors. For example, if users are left with positive experiences after visiting the website, and these emotions are retained, this could perpetuate a positive word-of-mouth effect. These results have immediate and direct implications for avatars' developers and companies who want to invest in improving the real-time interactivity of their website.

In the future, it can be interesting to analyze the direct impact of trust, social presence, and emotional appeal on patronage intention. Indeed, in this paper we wanted to focus on the direct relationship between online real-time interactivity and patronage intention. Even, if the three other variables (trust, emotional appeal, and social presence) could directly impact the patronage intention, we wanted to identify the intermediary and the significant role of the online real-time interactivity.

One limitation of this research paper stems from the profile of respondents. Indeed, the average age is 33.6, which could create a bias in our findings. A second limitation comes from the fact that websites have been selected with an integrated avatar. Even if these avatars were relatively similar, they did not have the exact same profile. Nevertheless, the goal of our research was not to measure the performance of the avatar, but more its impact on users' perception about the degree of interactivity, trust, emotional appeal, and social presence. Moreover, in order to generalize our findings, we selected eight different websites with eight different avatars. Therefore, this limitation can be considered as controlled. We hope that this current study's findings foster future research on the humanization of websites.

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