

Visual Style of Embodied Virtual Sales Agents

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ABSTRACT

The present study explored the effects of naturalism-stylization visual style of embodied virtual agents in an e-commerce website. An experiment was conducted in which participants (n=110) were paired with either the naturalistic or stylized agent that simulated the roles of a virtual sales assistant. It was shown that stylized agent produced significantly higher social perceptions of agent, perceived website social presence, perceived website social support than naturalistic agent. Moreover, stylized agent evoked significantly higher sense of website trust and lower perceived website financial risk from participants as compared to naturalistic agent. Further, the effects of visual style of agent on perceived website social presence was fully mediated by social perceptions of agent whereas the effects of visual style of agent on perceived website social support was partially mediated by perceived website social presence. Theoretical and practical implications of these findings are discussed in this paper.

KEYWORDS

Avatars, Computers Are Social Actors, E-Commerce, Human-Agent Interaction, Media Equation, Naturalism, Social Presence, Stylization, Trust, Virtual Agent, Website Social Support

INTRODUCTION

In a traditional commerce environment, customers seek the social connection and personal consultation afforded by face-to-face interaction with company representatives. However, these elements are noticeably absent in an e-commerce website; thus making it cold, distant, and impersonal. This issue is one of the factors that drive the academia and industry to take interest in embodied virtual agents, as they are regarded as potential sources of social presence (Qiu and Bensabat, 2009; Mimoun and Poncin, 2015; Liew et al., 2017). Embodied virtual agents are computer-generated characters that are equipped with facial expressions, body animations, and spoken / text dialogues. Simulating the roles of a customer representative, embodied virtual agents delivers greetings, facilitates website navigation, provides answers to FAQ, and offers product recommendations (McGoldrick et al., 2008).

Through the portrayal of rich social cues, virtual agents induce higher perceptions of social presence and trust in online shoppers (Chattaraman et al., 2014; Beldad et al., 2016; Liew et al., 2017). Given that humans tend to form initial impressions and social judgements on others based on visual

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channel; it is therefore not surprising that the graphical designs of embodied virtual agents have been shown to influence affective and behavioural aspects of online shopping (Beldad et.al., 2016; Qiu and Benbasat, 2010). One of the theoretical premise commonly used and advocated in human-agent interaction research is the computer are social actors (CASA) paradigm (Nass and Moon, 2000). The CASA asserts that people will mindlessly apply social rules to computer agents the same way as they do to their fellow humans. Within this framework, the principles of social psychology i.e., emotional contagion (Tsai et al., 2012; KräMer et al., 2013; Liew et al., 2016; Liew et al., 2017), stereotyping (Liew et al., 2013; Liew and Tan, 2018; Rosenberg-Kima et al., 2008), and personality attribution (Siddique et at., 2017; Liew and Tan, 2016) have been recently investigated in relations to embodied virtual agents. The outcomes of these studies provided new insights and recommendations that inform the designs of digital characters in digital domains.

Focusing on e-commerce environments, recent studies have explored the effects of embodied virtual agent's visual properties such as gender (Lunardo and Bressolles, 2016; Beldad et.al., 2016), dressing style (Lunardo and Bressolles, 2016) and anthropomorphism (Mull et al., 2015). At a fundamental level, one of the key decision regarding the visual design of embodied virtual agent pertains to the naturalism-stylization framework (Gulz and Haake, 2006; Haake and Gulz, 2009). While some researches concerning anthropomorphism entail a range from human-like characters to non-human characters e.g., robots, humanoids and animals (Mull et al., 2015; Gong, 2008; Nowak and Rauh, 2005; Krumhuber, 2012), the naturalism-stylization framework focuses on graphical styles i.e., rendering and iconicity of digital human characters. Following the naturalism-stylization framework (Gulz and Haake, 2006; Haake and Gulz, 2009), a naturalistic agent gives a 3D or photorealistic replica of a human, while a stylized agent resembles a simulacrum of human character drawn in cartoonish manner. Simplified rendering is often required to create two-dimensional and stylized (cartoonish) human characters; whereas, three-dimensional and photorealistic rendering is necessary to design a naturalistic virtual human.

Despite naturalism-stylization visual style is one of the foundational factors of virtual agent design, scant research has been conducted on the effects of naturalism-stylization visual style of embodied digital humans in e-commerce websites. It is worth noting that the although certain researches have asserted that user's social responses appear to be more positive with more "human"-looking images, these studies involved comparisons of digital characters based on anthropomorphism e.g., human, animal or fantasy (Mull et al., 2015; Nowak and Rauh, 2005). Extending from these prior works, and focusing on virtual human characters; the present research aimed to shed light into the effects of virtual sales agent within the naturalism-stylization visual design framework. To this end, an experiment was conducted to compare the effects between stylized embodied virtual agent and naturalistic embodied virtual agent on social perceptions of agent, perceived website social presence, perceived website trust (i.e., competence and benevolence), and perceived website financial risk. The following sections describe the theoretical and literature reviews leading to the development of the hypotheses of this study.

THEORETICAL BACKGROUND

Agent's Visual Style, Agent Social Perceptions, and Website Social Presence

In the context of e-commerce sites, social presence refers to the to the sense of feeling of human contact, sociability, and sensitivity (Hassanein and Head, 2005) and offers a sense of connection to others (Yoo and Alavi, 2001). Prior research has shown that social presence can be attained via interactions with virtual agents (Chattaraman et al., 2014; Hassanein and Head, 2005; Liew et al., 2017). How might an agent's visual style affect perceptions of human contact, sociability, and sensitivity i.e., social presence in users?

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