

Singapore Management University

Institutional Knowledge at Singapore Management University

Research Collection School Of Computing and Information Systems

School of Computing and Information Systems

2-2009

An examination of perceptions of male and female avatars

D. DEWESTER

Fiona Fui-hoon NAH

Singapore Management University, fionanah@smu.edu.sg

S. GERVAIS

Keng SIAU

Singapore Management University, klsiau@smu.edu.sg

Follow this and additional works at: https://ink.library.smu.edu.sg/sis_research



Part of the [Databases and Information Systems Commons](#), and the [Graphics and Human Computer Interfaces Commons](#)

Citation

DEWESTER, D.; NAH, Fiona Fui-hoon; GERVAIS, S.; and SIAU, Keng. An examination of perceptions of male and female avatars. (2009). *Proceedings of the Sixteenth Mardi Gras Conference, Baton Rouge, Louisiana, USA, 2009 February 19-21*. 1-6.

Available at: https://ink.library.smu.edu.sg/sis_research/9415

This Conference Proceeding Article is brought to you for free and open access by the School of Computing and Information Systems at Institutional Knowledge at Singapore Management University. It has been accepted for inclusion in Research Collection School Of Computing and Information Systems by an authorized administrator of Institutional Knowledge at Singapore Management University. For more information, please email cherylids@smu.edu.sg.

An Examination of Perceptions of Male and Female Avatars

David DeWester

Department of Management
University of Nebraska – Lincoln
Lincoln, NE 68588-0491
ddewester2@unl.edu

Fiona Fui-Hoon Nah

Department of Management
University of Nebraska – Lincoln
Lincoln, NE 68588-0491
fnah@unl.edu

Sarah J. Gervais

Department of Psychology
University of Nebraska – Lincoln
Lincoln, NE 68588-0308
sgervais2@unl.edu

Keng Siau

Department of Management
University of Nebraska – Lincoln
Lincoln, NE 68588-0491
ksiau@unl.edu

ABSTRACT

Virtual worlds are three-dimensional, computer-generated worlds in which users take the form of avatars. Through their avatars, users can interact with objects and other avatars in the virtual world. Virtual worlds are growing in importance in both educational institutions and businesses. Educational institutions have adopted virtual worlds as a medium for instructional delivery whereas businesses are using virtual worlds for recruitment, training, collaboration, and marketing. Given these emerging phenomena, a better understanding of behavioral and perceptual issues in virtual worlds is warranted. In this paper, we propose a research model to study gender stereotypicality of male and female avatars and their effects on trust perceptions. Gender stereotypes have been widely studied in the real world along with their effects on trust perceptions. This research will assess if such gender stereotypes also exist in the virtual worlds.

Keywords

Virtual worlds, avatars, sexism, stereotyping, perception of avatars.

INTRODUCTION

Three-dimensional virtual worlds (3DVWs) are computer-generated environments in which people interact through avatars. Because 3DVWs bear resemblance to the real world, it is possible that people will respond to certain stimuli in virtual worlds in the same manner they respond to similar stimuli in the real world. One such category of stimuli is how people perceive others in virtual worlds.

Although people are present in virtual worlds only through their avatars and these avatars are completely customizable, it is possible that people still form perceptions of others based on the appearance of their avatars. As an example, Eastwick and Gardner (2008) found that dark-skinned avatars were less likely to succeed in getting other users to perform favors than light-skinned avatars, which implies that race-based opinions of others might carry over from the real world to the virtual world.

Given that people form opinions of others based on the skin-color of their avatars, it is also important to investigate if gender-based biases are present in virtual worlds. Gender is subject to further classification than just male or female. People of either gender also possess “stereotypical” appearance which is determined by the extent to which a person possesses features typical of their gender. People, or avatars, with typical features are stereotypic, those with above-average features, such as large muscles in men or large breasts in women, are hyper-stereotypic, and those with features of the other gender, such as being shorter than average in men or having wider waists in women, are counter-stereotypic. People of the same gender, but different stereotypical appearance, can be perceived differently (Gervais and Vescio, 2008; Rudman and Fairchild, 2004; Vescio et al, 2005).

Given the growing importance and potential of 3DVWs in pedagogy and businesses, it is important for current and potential adopters of 3DVWs to understand gender stereotypicality perceptions in the virtual worlds, which are areas yet unstudied. This paper proposes a research model to study the effect of the gender of an avatar and its physical gender stereotypicality on competence, integrity, and benevolence, which in turn influences trustworthiness perceptions. Implications for future research into gender biases and sexism will also be discussed.

The rest of the paper is organized as follows. We first provide a literature review on gender stereotypicality and social research in virtual worlds, as well as trust. Next, we discuss the theoretical foundation of our research and state our hypotheses. After that, we describe our proposed research methodology. Finally, our expected contributions and conclusion are presented in the last section.

LITERATURE REVIEW

3DVWs provide a means for people to interact with each other in a way that more closely resembles the real world than other computer-mediated environments such as e-mail or text-only chat rooms. In a 3DVW, each user is represented with an avatar and most 3DVWs allow users to customize their avatars. Not only can an avatar take a male or female form regardless of the gender of the user, but weight, height, skin color, apparent age and facial features can also be modified in nearly unlimited ways. Hence, the question of how an avatar's appearance may be perceived in the virtual world is of interest.

Gender Stereotypicality

Gender stereotyping is commonly found in the literature (Eagly and Wood, 1991). Most research shows that basic categorization processes underlie intergroup biases, like perceived differences due to gender stereotypes. Generally speaking, categorization occurs when a person sees another person as a member of a group instead of as an individual.

Importantly, within any group (e.g., men or women), people may vary in the degree to which they have stereotypic physical features and this influences categorization and subsequent behavioral biases (Fiske and Neuberg, 1990). Both men and women can have the standard, stereotypic physical features of their gender, have exaggerated hyper-stereotypic features, or have counter-stereotypic features that more closely resemble the other gender. A man, for example, can have physical features that closely resemble the social norm for a man, hyper-stereotypic features such as exceptionally large muscles or above average height, or counter-stereotypic features such as a narrow waist or lack of facial hair. Similarly, a woman can have a stereotypic body, hyper-stereotypic features such as exceptionally large breasts or a very narrow waist, or counter-stereotypic features such as small breasts or a wider waist.

Recent research suggests that having more or less stereotypic physical features affects categorization and stereotyping. In a study of racial stereotyping, for example, Blair et al. (2002) found more stereotyping for hyper-stereotypic African Americans than stereotypic and counter-stereotypic African Americans. Of particular importance to the current work, Gervais and Vescio (2008) similarly found that hyper-stereotypic men and women were categorized more than stereotypic men and women. In summary, it is clear that gender and appearance stereotypicality affect categorization and stereotyping, such that people with hyper-stereotypic physical features are categorized and stereotyped more than people with stereotypic or counter-stereotypic features. It is unclear, however, whether the same biases emerge in virtual worlds as do in the real world.

Social Research in Virtual Worlds

Several studies have examined how certain behaviors exhibited in the real world are modified and expressed in the virtual world. Because a user's avatar in a virtual world is able to act in many ways like the user's real body when interacting with other people, some expressions of body language continue to be displayed in the virtual world. For example, Bailenson et al. (2003) found that the concept of personal space still applies in virtual worlds and users maintain a proper interpersonal distance between their avatars and others. Despite the lack of a need to maintain personal distance in virtual space, people continue to do so in virtual worlds.

In addition to social behaviors, social attitudes and judgments also carry over into 3DVWs. Having an avatar mimic another avatar's body language, specifically head movements, can lead to greater trust between two people (Bailenson and Yee, 2005). Furthermore, people's own behavior can be influenced by the appearance of their own avatars. Yee and Bailenson (2007) assigned avatars to people and then observed their behavior in a virtual world. They found that having a taller avatar led to people behaving more confidently in a negotiation task and that having an attractive avatar lead to people disclosing more information about themselves to other people.

In the present work, we will examine whether gender-based judgments and behaviors that emerge in the real world also emerge in virtual worlds. Three research findings (Eastwick and Gardner, 2008; Yee et al., 2007; Nowak and Rauh, 2006), described below, are consistent with our suggestion that the gender and stereotypical appearance of an avatar in a virtual world will elicit similar judgments and behaviors as in the real world.

A recent study on differential treatment of avatars in 3DVWs was conducted by Eastwick and Gardner (2008). They examined whether the apparent race of an avatar resulted in different levels of compliance when the avatar asked others for a favor. They found that light-skinned avatars were significantly more likely to obtain favors than the dark-skinned avatars, which suggests that such stereotyping based on skin color (or race) in the real world also transfers to the virtual worlds.

There is also some research to suggest that gender differences transfer over from the real world to virtual worlds. For example, Yee et al. (2007) found that dyads of male avatars were less likely to look at each other than dyads of female avatars. This mimics the behavior of male and female dyads in the real world. They also found that male dyads kept their avatars further apart from each other than female dyads, mimicking the maintenance of interpersonal distance in the real world. Nowak and Rauh (2006) examined the perception of static images of avatars and found several effects related to gender. They found that avatars that were clearly male or female were perceived as more attractive than androgynous avatars (i.e., avatars having both masculine and feminine characteristics). They also found that men and women both preferred avatars of the same gender. These results suggest that gender biases are present in virtual worlds.

Extending this research, we examine how gender and stereotypicality affect trustworthiness. In particular, we examine how gender and stereotypicality affect trustworthiness via perceptions of competence, benevolence, and integrity.

Trust

Trust refers to “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (Mayer et al., 1995, p. 712). Trust determines if one is willing to engage another party in establishing a business relationship by bearing any risk associated with it. Thus, trust reduces the fear for manifestations of opportunism (Hill, 1990).

Trust involves at least two parties: a trusting party (trustor) and a party to be trusted (trustee). There are three components or attributes of trust — competence, benevolence, and integrity (Mayer et al. 1995). Competence refers to the trustee’s skills, knowledge, and abilities. Integrity refers to the trustor’s perception that the trustee will adhere to a set of principles or rules of exchange that is acceptable to the trustor. Benevolence is the extent to which a trustee is believed to want to do good to the trustor.

According to the literature, gender stereotypes can affect trust perceptions. The social role theory assumes that gender differences in social behavior are in part caused by the tendency for men and women to behave consistently with their gender roles (Eagly and Wood, 1991). Based on the social role theory, men and women differ in their agentic and communal dimensions (Bakan, 1966). Men are perceived to be more highly competent and independent than women, whereas women are perceived to be more unselfish, concerned with others, and emotionally expressive than men (Eagly and Wood, 1991). Fiske et al. (2002) also found that men are perceived as more competent than women whereas women are perceived to come across as having more warmth than men. In a study by Franke et al. (1997), it was found that women are more likely than men to perceive specific hypothetical business practices as unethical although such effects decline with work experience.

THEORETICAL FOUNDATION AND HYPOTHESES

Our research examines how people perceive avatars based on the gender and stereotypical appearance of the avatar. As explained earlier, avatars of standard stereotypicality look like average people of their gender, whereas hyper-stereotypic avatars have exaggerated features for that gender, and counter-stereotypic avatars have features of the opposite gender. In our study, we will control for attractiveness across stereotypic male and female avatars, and compare the perceptions of avatars across stereotypic dimensions – counter, standard, hyper.

Our research model is shown in Figure 1. The independent variable is gender of avatar. The mediating variables are perceived competence, integrity, and benevolence, and the dependent variable is trustworthiness. The relationships from gender of avatar to components of trust are moderated by the gender stereotypicality displayed by the avatar. Operationalization of the constructs is discussed in Section 4. The justifications for our hypotheses are given below.

Based on the social role theory, men are expected to possess higher levels of agentic qualities such as independence and competence when compared to women (Eagly and Wood, 1991; Fiske et al., 2002). Hence, we hypothesize that:

H1: Perceptions of competence are higher in male avatars than female avatars.

Based on our review of the literature, the relationship between gender stereotypes and perceived integrity is inconclusive. On one hand, based on the social role theory, women possess higher communal dimensions, such as selflessness, than men (Eagly and Wood, 1991). On the other hand, different patterns of development for girls and boys tend to develop feminine emphasis on relationships and masculine emphasis on justice (Gilligan, 1982).

Because the literature provides opposing support for both perspectives in terms of men’s and women’s integrity and ethical principles, we hypothesize that there is no perceived stereotypical relationship between gender of avatars and integrity. Hence,

H2: There is no difference in perceived integrity of female and male avatars.

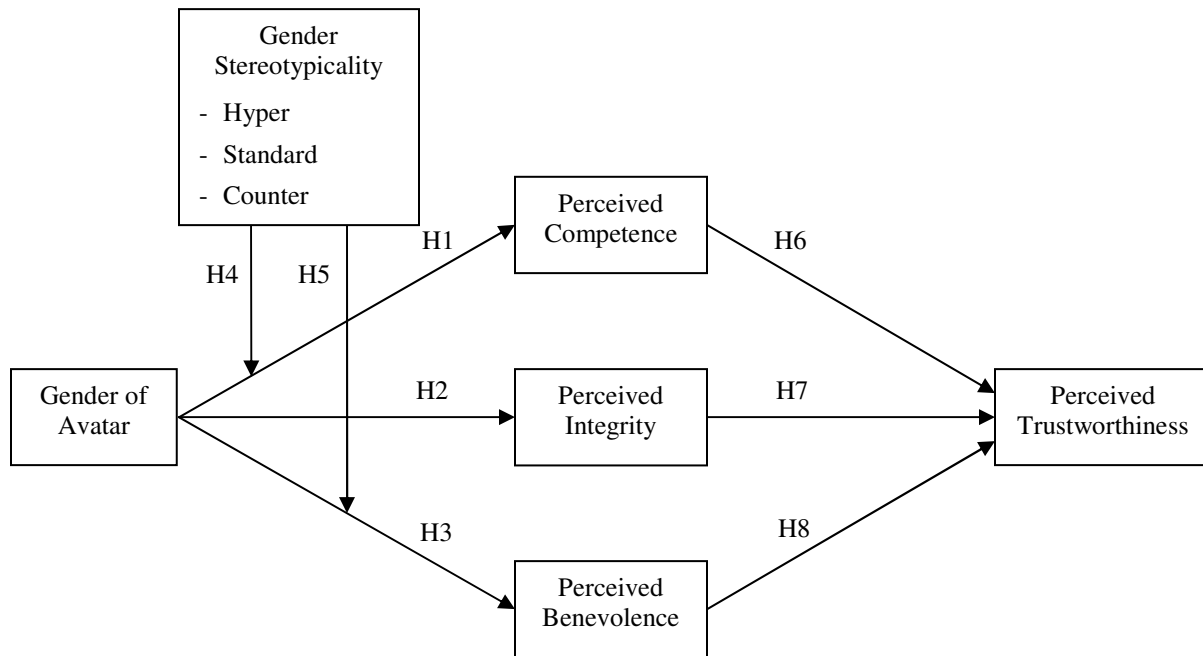


Figure 1. Research Model

Women, when compared to men, tend to show greater empathy for others (Eisenberg and Lennon, 1983) and are believed to have more benevolent intentions toward others (Fiske et al., 2002). Thus, we hypothesize that female avatars are perceived to have higher benevolence than male avatars.

H3: Perceptions of benevolence are higher in female avatars than male avatars.

The literature seems to suggest that masculinity is associated with higher competence while femininity is associated with lower competence (Fiske et al., 2002; Eagly and Wood, 1991). Hence, as a male avatar takes on an increasing masculine stereotypicality from counter- to hyper-stereotype, the perceived competence increases. On the other hand, as a female avatar takes on an increasing feminine stereotypicality from counter- to hyper-stereotype, the perceived competence decreases. Thus, we hypothesize an interaction effect between gender stereotypicality and gender of avatar on competence.

H4: Perceived competence increases as gender stereotypes increase from counter- to hyper-stereotypes for male avatars and decreases as gender stereotypes increase from counter- to hyper-stereotypes for female avatars.

Femininity is associated with benevolence since femininity characteristics are associated with unselfishness and empathy (Eagly and Wood, 1991). Hence, as a female avatar takes on an increasing feminine stereotypicality from counter- to hyper-stereotype, the perceived benevolence increases. On the other hand, as a male avatar takes on an increasing masculine stereotypicality from counter- to hyper-stereotype, the perceived benevolence decreases. Thus, we hypothesize an interaction effect between gender stereotypicality and gender of avatar on benevolence.

H5: Perceived benevolence increases as gender stereotypes increase from counter- to hyper-stereotypes for female avatars and decreases as gender stereotypes increase from counter- to hyper-stereotypes for male avatars.

Since perceived trustworthiness comprises three components or attributes – competence, integrity, and benevolence (Mayer et al., 1995), we hypothesize that perceived competence, integrity and benevolence of an avatar will influence its perceived trustworthiness, as shown in the three hypotheses below.

H6: Perceived competence of an avatar influences its perceived trustworthiness.

H7: Perceived integrity of an avatar influences its perceived trustworthiness.

H8: Perceived benevolence of an avatar influences its perceived trustworthiness.

RESEARCH METHODOLOGY

We propose using a 2x3 experimental design to assess the effects of the gender of avatars and their stereotypicality on the perceptions of the avatars in a 3DVW.

The gender of the avatar, i.e., male or female, will be manipulated and controlled by the researchers. Gender stereotypicality of the avatar will be manipulated as stereotypic, hyper-stereotypic, or counter-stereotypic. Operationalization of these variables, such as designing avatars with the correct levels of stereotypicality, will be finalized through pilot studies. Manipulation checks will be used to assess our manipulations. We will capture the gender of the subjects and use it as a covariate in our data analysis.

The mediating variables, perceived competence, integrity, and benevolence, will be assessed using the measures by McKnight et al. (2002), and the dependent variable, trustworthiness, will be assessed using the measure used by Galanxhi-Janaqi and Nah (2007).

Subjects will be recruited from business and psychology classes at a Midwestern university. The experiment will take place in the Second Life 3DVW. Subjects will be offered a small amount of extra credit (1% of their final grade) for participating in the study. Subjects will report to a computer lab on the university campus where they will be given a brief training session to familiarize them with Second Life. All computers and monitors in the lab are the same model with the same Internet connection speed.

To begin the study, subjects will enter Second Life where they will find another avatar which will be controlled by one of the researchers or their assistants. The subject will also be given an avatar that takes on the same gender as the subject in real life. The researcher's avatar will engage in a scripted interaction with the subject's avatar. The exact nature of the interaction will be determined later through further literature review and pilot studies. Both pre- and post-study questionnaires will be administered before and after the interaction. The pre-study questionnaire will capture propensity of trust and the subject's demographic information. The post-study questionnaire will include the manipulation check questions as well the mediating and dependent variables for the study.

EXPECTED CONTRIBUTION AND CONCLUSION

Virtual worlds are new phenomena and they are growing in importance in education, businesses, and entertainment. This paper proposes a research model to study gender biases and their effect on trust in virtual worlds. Avatars of both genders and three levels of stereotypic physical features will be studied. Experimental manipulations will be used and questionnaires collected from subjects will be used to examine the relationships between gender, stereotypes, three components of trust (competence, benevolence and integrity), and perceive trustworthiness. Our findings will provide insights into whether gender stereotypicality from the real world transfers into the virtual world.

For academics, the study provides empirical data on the research model, which can be further enhanced and extended. This study will also provide a basis for further studies that will specifically examine how gender biases lead to categorization of people in virtual worlds. For practitioners, the study provides insights on gender stereotypicality in virtual worlds. Specific suggestions can then be made on how to alleviate sexism and other related gender biases in virtual worlds, and how to select features and characteristics of avatars to reduce the negative aspects of gender stereotypicality in virtual worlds.

REFERENCES

1. Bailenson, J. N., Blascovich, J., Beall, A. C. and Loomis, J. M. (2003) Interpersonal distance in immersive virtual environments. *Personality and Social Psychology Bulletin*, 29, 7, 819-833.

2. Bailenson, J. N. and Yee, N. (2005) Digital chameleons: Automatic assimilation of nonverbal gestures in immersive virtual environments. *Psychological Science*, 16, 10, 814-819.
3. Bakan, D. (1966) The duality of human existence: An essay on psychology and religion, Rand McNally, Skokie, Illinois.
4. Blair, I. V., Judd, C. M., Sadler, M. S. and Jenkins, C. (2002) The role of Afrocentric features in person perception: Judging by features and categories. *Journal of Personality and Social Psychology*, 83, 1, 5-25.
5. Eagly, A.H. and Wood, W. (1991) Explaining sex differences in social behavior: A meta-analytic perspective. *Personality and Social Psychological Bulletin*, 17, 3, 306-315.
6. Eastwick, P. W. and Gardner, W. L. (2008) Is it a game? Evidence for social influence in the virtual world. *Social Influence*, 1, 1-15.
7. Eisenberg, N. and Lennon, R. (1983) Sex differences in empathy and related capacities. *Psychological Bulletin*, 94, 100-131.
8. Fiske, S. T., Cuddy, A. J. C., Glick, P. and Xu, J. (2002) A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, 82, 6, 878-902.
9. Fiske, S. T. and Neuberg, S. L. (1990) A continuum of impression formation, from category-based to individuating processes: Influences of information and motivation on attention and interpretation. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 23, pp. 1-74), Academic Press, New York.
10. Franke, G. R., Crown, D. F. and Spake, D. F. (1997) Gender difference in ethical perceptions of business practices: A social role theory perspective. *Journal of Applied Psychology*, 82, 6, 920-938.
11. Galanxhi-Janaqi H. and Nah, F. (2007) Deception in cyberspace: A comparison of text-only vs. avatar-supported medium. *International Journal of Human-Computer Studies*, 65, 9, 770-783.
12. Gervais, S. J. and Vescio, T. K. (2008) Why and how women are sexually objectified. Manuscript submitted for publication.
13. Gilligan, C. (1982) *In a Different Voice: Psychological theory and Women's Development*, Harvard University Press, Cambridge, Massachusetts.
14. Hill, C. L. (1990) Cooperation, opportunism, and the invisible hand: Implications for transaction cost theory, *Academy of Management Review*, 15, 3, 500-514.
15. Mayer, R. C., Davis, J. H. and Schoorman, F. D. (1995) An integrative model of organizational trust, *Academy of Management Review*, 20, 3, 709-734.
16. McKnight, D. H., Choudhury, V. and Kacmar, C. (2002) Developing and validating trust measures for e-commerce - An integrative typology. *Information Systems Research*, 13, 3, 334-359.
17. Nowak, K. L. and Rauh, C. (2005) The influence of the avatar on online perceptions of anthropomorphism, androgyny, credibility, homophily, and attraction. *Journal of Computer-Mediated Communication*, 11, 1, 153-178.
18. Rudman, L. and Fairchild, K. (2004) Reactions to counterstereotypic behavior: The role of backlash in cultural stereotype maintenance. *Journal of Personality and Social Psychology*, 87, 157-176.
19. Vescio, T. K., Gervais, S. J., Snyder, M. and Hoover, A. (2005) Power and the creation of patronizing environments: The stereotype-based behaviors of the powerful and their effects on female performance in masculine domains. *Journal of Personality and Social Psychology*, 88, 4, 658-672.
20. Yee, N. and Bailenson, J. N. (2007) The Proteus effect: The effect of transformed self representation on behavior. *Human Communication Research*, 33, 3, 271-290.
21. Yee, N., Bailenson, J. N., Urbanek, M., Chang, F. and Merget, D. (2007) The unbearable likeness of being digital: The persistence of nonverbal social norms in online virtual environments. *The Journal of CyberPsychology and Behavior*, 10, 1, 115-121.