Computers in Human Behavior 38 (2014) 17–24

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

The role of stereotypical beliefs in gender-based activation of the Proteus effect

Brett Sherrick *, Jennifer Hoewe, T. Franklin Waddell

The Pennsylvania State University, 115 Carnegie Building, University Park, PA 16802, United States

ARTICLE INFO

Article history:
Available online 11 June 2014

Keywords:
Proteus effect
Avatars
Stereotyping
Gender

ABSTRACT

Informed by the Proteus effect, the current study examined the moderating effect of belief in stereotypes on the relationship between avatar appearance and user behavior, via an interactive fiction. The results of a one-factor (avatar gender: male vs. female), between-subjects experiment revealed that female avatars elicited more frequent masculine behaviors (particularly among individuals high in feminine gender stereotypes) and that male avatars elicited more frequent feminine behaviors. Conversely, self-reported gender led to stereotypic behaviors as expected. A moderating effect of awareness of the avatar's influence on stereotypically gender-based decisions on frequency of gender-typed behavior was not found, suggesting individuals are not aware of the influence of avatars on their subsequent decisions.

1. Introduction

The original Proteus effect argument (e.g., Yee & Bailenson, 2007; Yee, Bailenson, & Ducheneaut, 2009) claimed that individuals would behave differently based on the appearance of their controlled avatars. Via self-perception theory, Yee and colleagues argued that the controller of an avatar would examine his or her avatar's appearance from a third-person perspective and subsequently behave in accordance with held expectations about how a person with that particular appearance will act. Initial research in this area suggested several avenues through which the Proteus effect can emerge: (1) individuals may behave more confidently if their avatars are taller (Yee & Bailenson, 2007; Yee et al., 2009); (2) individuals may act friendlier if their avatars are more attractive (Messinger et al., 2008; Yee & Bailenson, 2007); (3) individuals may report more negative and aggressive thoughts if their avatars are dressed in black or in Ku Klux Klan outfits (Peña, Hancock, & Merola, 2009); and (4) individuals may report less aggression if their avatars are males facing females in battle (Eastin, 2006). These researchers were able to successfully predict these behaviors and cognitions in their studies because the expected behaviors and cognitions are stereotypically associated with each relevant avatar appearance (friendliness with attractiveness, aggression with the KKK, etc.).

In other words, the Proteus effect is only predictable insomuch as the appearance of the avatar activates a stereotype upon which the avatar's controller can act or report thoughts. Thus far, however, no identified study has explicitly tested the potential moderating effect of belief in the relevant stereotype. If the Proteus effect is truly explained by held expectations based on avatar appearance (i.e., stereotypes), then people with stronger beliefs in the relevant stereotypes would presumably show stronger effects of a stereotyped avatar appearance. Conversely, people who do not hold the relevant stereotype at all would not show the expected Proteus effect. Therefore, this research will take the important next step for Proteus effect research by empirically examining the moderating role of stereotype internalization. More specifically, this study will test the hypothesis that people with male or female avatars will be more likely to behave in stereotypically gendered ways if they express greater belief in gender stereotypes.

Although this expectation would be in-line with Proteus effect predictions, parallel research posits that the Proteus effect is better considered as an effect of priming and not necessarily a conscious effect (Groom, Bailenson, & Nass, 2009; Peña, 2011; Peña et al., 2009). If the Proteus effect is distinct from priming, then people who experience the effect should be consciously aware of it and be able to report the influence of physical avatar traits on their behaviors. If not, then any evidenced effects may be the result of priming or some unwillingness to admit the influence of the avatar. While this study does not directly test the impact of an avatar's gender on individuals' implicit alterations of their behaviors, it does assess whether people are consciously aware of any Proteus-like effects on their behaviors when controlling an avatar. If the Proteus effect explains these effects on behaviors, then the users should be consciously aware of them since the Proteus effect

* Corresponding author. Tel.: +1 919 761 3014.
E-mail address: brettsherrick@gmail.com (B. Sherrick).

http://dx.doi.org/10.1016/j.chb.2014.05.010
0747-5632/

argument assumes that people make third-person appraisals of their avatars before making behavioral choices.

Finally, the context for this study also provides a novel approach for studying the Proteus effect. The stimulus material employs an interactive fiction: a short story in which the user makes impactful choices that (ostensibly) drive the narrative experience. In this way, an interactive fiction is much like a video game, since the user controls the protagonist and therefore the outcome of the narrative. This context not only extends the Proteus effect argument into new space, it also allows for a controlled test of the expectations of that argument that eliminates many potential confounds. In this study, the interactive fiction was coupled with an image of an avatar (either male or female). Participants were told to imagine themselves as this character, and their choices within the interactive fiction were recorded. For each decision point, participants could pick either a stereotypically feminine or a stereotypically masculine behavior for their respective avatar. According to the Proteus effect, participants assigned to control a female (male) character should be expected to choose the feminine (masculine) options more often.

As such, this study tests the interaction between gender stereotypical beliefs and the gender of the assigned avatar and their combined influence on the selection of stereotypical behaviors assigned to the avatar. Prior research on the Proteus effect is outlined as well as some possible explanations for the cognitive processes incurred following exposure to an avatar. Also, the influences of avatar gender, self-reported gender, and prior stereotypical beliefs about gender are considered based on prior research and the predictions set forth by original Proteus effect research. In order to test the explicit awareness of the avatar's influence on individual's behavioral decisions, a new measure that tests the Proteus effect is offered and recommended for future use.

1.1. The Proteus effect

The Proteus effect gets its name from the Greek god Proteus, who could easily alter his self-representation. Yee and colleagues (e.g., 2007, 2009) argue that virtual avatars provide ordinary people with protean powers, as they are able to instantly and easily change their avatar-based self-representations. Proteus research flips this phenomenon on its head and suggests that those changes in self-representation also change the self (Yee & Bailenson, 2007). More specifically, this research "expect[s] users to make inferences about their expected dispositions from their avatar's appearance and then conform to the expected attitudes and behavior" (Yee et al., 2009, p. 293–294). Thus far, evidence of the Proteus effect has been discovered in collaborative virtual environments (CVEs; Groom et al., 2009; Yee & Bailenson, 2007; Yee et al., 2009) and in digital games (e.g., Eastin, 2006; Messinger et al., 2008; Peña et al., 2009; Yee et al., 2009). This mounting research suggests that people do alter their cognitions and behaviors based on assumptions about the appearance of their avatars.

In the initial studies of the Proteus effect, Yee and colleagues (Yee & Bailenson, 2007; Yee et al., 2009) manipulated attractiveness and height of avatars in CVEs through experimental designs. Their first study (Yee & Bailenson, 2007, Experiment 1) presumed that more attractive people are friendlier and more confident, an assumption that prior research supports. Based on the expectations of the Proteus effect, then, users who control more attractive avatars should behave in friendlier and more confident ways because of their existing stereotypes about attractive people. In this study, participants were randomly assigned a gender-matched avatar of low, medium, or high attractiveness in a CVE. Participants were instructed to examine a mirror within the CVE so they were able to visualize their avatars' level of attractiveness. Subsequent interactions with a confederate – blind to condition – were then rated for the participants' physical proximity and self-disclosure to the confederate, both of which are meant to be measures of friendliness and confidence. As expected, when compared to participants in the unattractive avatar condition, participants in the attractive avatar condition walked significantly closer and revealed significantly more personal information to the confederate.

In subsequent studies on CVEs (Yee & Bailenson, 2007, Experiment 2; Yee et al., 2009, Study 2), participants who were assigned to taller avatars negotiated more aggressively and confidently in a task that required them to divide money with a confederate through turn-based negotiations. Again, these results were predicted based on research that suggests that taller people are generally perceived to be competent and self-confident. This effect was also found to carry over into subsequent face-to-face negotiations (Yee et al., 2009, Study 2).

Other research has examined the Proteus effect in digital gameplay through experiments and surveys. To provide ecological validity to their findings in CVEs, Yee et al. (2009, Study 1) recorded the avatar appearance and performance of 76,843 unique players from the popular online role-playing game *World of Warcraft*. Appearance was determined by avatar race, with each race coded for attractiveness and height, and performance was measured through player level – or progress through the game. Consistent with their previous findings, the researchers determined that tall and attractive avatars attained the highest average level.

Messinger et al. (2008) also predicted player behavior based on avatar attractiveness, focusing on the outcomes of outgoingness, extraversion, risk-taking, and loudness – stand-ins for confidence and friendliness. Their survey design was implemented in the persistent online game *Second Life*, a life-simulation game that attempts to mirror the real world. Respondents were recruited from within the game and answered questions about personal and avatar attractiveness and behaviors. Results of the survey showed that self-reported avatar attractiveness was significantly and positively related to in-game outgoingness, extraversion, risk-taking, and loudness, even when controlling for similar real-world behaviors. Messinger et al. (2008) also investigated the degree to which self-reported real-world attractiveness moderated the relationship between avatar attractiveness and the predicted behaviors, determining that the expected relationship was stronger for people with lower self-reported real-world attractiveness. This evidence suggests that – as with other media effects – the Proteus effect can depend on individual differences. Moreover these effects are assumed to be intrapersonal in nature (Van Der Heide, Schumaker, Peterson, & Jones, 2012) and strongest when users embody their avatar (Yee & Bailenson, 2009).

An important next step in Proteus effects research is identifying the optimal and boundary conditions for these effects – the situations in which Proteus-like effects should be more or less likely, depending on, for example, individual differences or the presentation of avatars. This study presents avatars in an interactive fiction, which no identified Proteus effects research has done. It also examines the individual difference of belief in gender stereotypes, which should be an important moderating variable if the Proteus effect is based on biased understandings of avatar traits from a third-person perspective.

1.2. The Proteus effect and avatar gender

It is common for avatar customization systems to provide users with the opportunity to choose the gender of their avatars (Ducheneaut, Wen, Yee, & Wadley, 2009). The selection of avatar gender is far more than a simple cosmetic choice, as past research has found that users will adjust their behavior to be congruent with the gender stereotypes associated with their avatars' genders. For example, one study found that users of virtual worlds varied