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**The Effects of Avatar Appearance in Virtual Worlds**

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**Abstract**

*In virtual worlds, users employ avatars to interact with their surroundings and with each other. However, while users exert influence on their avatar, their avatar can also exert influence on them. For instance, research has demonstrated that avatars can influence their users to be more negative, confident, aggressive, or intimate. In this paper, the ways through which subtle signals from an avatar's physical appearance can influence users and interaction partners are described. Suggestions for ways in which virtual world users, developers, and researchers can apply this knowledge to manage their virtual environment are also included.*

**Keywords:** virtual worlds; avatar appearance

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# The Effects of Avatar Appearance in Virtual Worlds

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As awareness, interest, and excitement about the possibilities of social interaction in virtual worlds continues to bloom, so, too, does the value of understanding how these worlds are different from our physical one and, also, how social norms and conventions of the physical world apply to virtual contexts. Ongoing investigations have uncovered intriguing social phenomena: while we exert influence over our digital embodiments (e.g., customizing an avatar for self-presentation purposes, see Vasalou & Joinson, 2009), our digital bodies also exert influence over us as users. For example, the extant research has demonstrated that the way avatars look (e.g., whether they are tall or short, or whether they have more evil or more pro-social appearances) influences the way the user thinks and behaves in video games and virtual worlds. As digital worlds increase in popularity and importance, researchers and practitioners must continue working to understand how and why, exactly, users are influenced by their avatars, as well as in which ways these mechanisms can be applied to engineer more compelling and foreseeable social experiences in virtual worlds.

In this paper, we examine some of the current findings and discuss the design implications of this research. The goal is to familiarize the reader with the mechanisms through which avatars can influence their users, provide examples from the literature of how we know that this takes place, and finally, to review our current knowledge through a lens of virtual world design and exploration.

## *Avatars as Virtual Clothing*

Jumping into the body of *Solid Snake*, a character from the *Metal Gear Solid* series who wears a sneaking suit and is lightly armed, it just seems right to skulk around. Logging on to a provocatively-dressed Second Life avatar, on the other hand, may encourage other sorts of behavior. To understand how we should behave, we rely on information provided by the looks of an avatar and decode the avatar by connecting its cues to our broader social knowledge (Isbister, 2006). Creators of avatars, whether developers creating character templates or players taking advantage of customization options, use visual stereotypes to create a “story” of the avatar that others can understand. For example, when developing an “executive” avatar, a designer might provide props such as a briefcase and business attire. When we use or encounter the avatar, we note the briefcase and stereotypical appearance, and understand the narrative behind the avatar (Isbister, 2006). Virtual world users apply these principles when customizing their own avatars, as well. For example, when asked to create avatars for dating, participants made them distinctly more attractive than avatars to be used for other purposes (Vasalou & Joinson, 2009). After connecting a Second Life avatar’s scanty clothing to a database of situations and concepts related to provocative attire, we are then able to understand how they (or we as they) should behave. Simply, we know how to behave when using an just by looking at the avatar.

Consider this example: upon logging in to an unfamiliar virtual world, a person is presented with their new body, an avatar. This avatar is hooded, and dressed in black robes.

Next, the person is given a task: interact with some other people and decide how harshly to punish a criminal. What does the person think? In this novel situation, the user might look at the black clothing of their avatar, the veiled identity, and connect this information with other knowledge: bad guys wear black, executioners hide their identities, and so forth. So, thinks the user, since they look like a bad guy in this virtual world, maybe they should behave accordingly.

These were the results we found in an initial study on how an avatar's appearance can affect the cognitions and behavior of the user (Peña, Hancock, & Merola, 2009, Study 1). As described above, participants were given avatars dressed in black robes and asked to interact and make decisions. We measured their intentions and attitudes, and compared them to those exhibited by participants using white-robed avatars. The black-robed avatar users showed a greater intention to attack other characters, were more aggressive, and endorsed anti-social behavior! These tendencies were not found in users who employed white-robed avatars, suggesting that the appearance of the black-robed avatar was influential to the user in a negative way.

Other researchers have found more positive effects from avatars' appearance. Yee and Bailenson (2007) found that participants using avatars which were more attractive behaved more intimately with a confederate. In their study, the participants interacted in a virtual reality system through a first-person perspective, but were briefly shown their avatars' appearance in a virtual mirror before beginning the interaction. A second study manipulated the relative height of the participants' avatars, and found participants made different decisions when their avatars were taller or shorter than normal (Yee & Bailenson, 2007). Users of tall avatars were more confident with offers in a bargaining task, while those assigned short avatars were more likely to accept an unfavorable decision. Clothing can also exert significant influence over the user's cognition: operating a "supermodel" avatar in Second Life evoked narratives with exotic names and exclusive brands, while operating a "professor" avatar encouraged mention of concepts connected to education (Peña, McGlone, Jarmon, & Sanchez, 2009).

### *Clothing as Cues*

To understand how avatars' appearance can influence their users, we can examine earlier research on how clothing influences the wearer. Frank and Gilovich (1988) did a series of studies on how black uniforms exert influence on their wearers. Initially, they looked at sports teams in hockey and American football, comparing the penalty records of teams with predominantly black uniforms to other teams in the leagues. They found that teams with black uniforms accrued significantly more penalties against them in both sports. Further, when teams switched from their own color to black uniforms, their penalties increased concurrently. Subsequent laboratory studies demonstrated that the effects of the black uniform were due to two factors: the influence of black uniforms on outside viewers (e.g., referees, the audience) and the influence of black uniforms on the wearer (Frank & Gilovich, 1988). Frank and Gilovich found that not only does the color of a sport uniform (e.g., black) predispose users to certain behaviors (e.g., aggression), but also that referees more often sanction sports teams dressed in black.

In virtual worlds, users of avatars contend with these same dual influences. We could reasonably explain part of the negative influence of black uniforms both through the direct influence of the avatar on the user as well as through perceivers' expectations about avatars in black uniforms. An external perceiver can influence the user of an avatar through a variety of means. For example, in computer-mediated contexts, people tend to commit to the identity they

portray in front of a public audience (Gonzales & Hancock, 2009). So, simply by assuming the identity of an avatar in front of others, users may identify more strongly with their avatar.

Behavioral confirmation, or “the self-fulfilling prophecy” effect, describes how one individual’s expectations about another person can influence that person’s behavior (Snyder & Stukas, 1999). In virtual worlds, when others view an avatar they may have certain expectations about the avatar that, in turn, can model the avatar user’s own cognitions and behaviors. When avatar users are treated in a particular way based on how their avatar appears, they may then modify their behavior to conform with outsiders’ expectations. For example, in the World of Warcraft (a multiplayer game which features warring alliances) encountering a member of an opposing faction may trigger a defensive reaction by them, provoking the user to attack in response. Public commitment and behavioral confirmation effects have not been exhaustively examined (for exceptions see Gonzales & Hancock, 2009; Walther, 1996) and could bear more examination in the context of virtual environments.

While these theories describe how an external perceiver can influence the user of an avatar, in several studies on avatar effects, either there have been no interaction partners (Peña et al., 2009, Study 2), or the partners have been blind to how the avatar appears to the participants (Yee & Bailenson, 2007). This confirms that avatars influence their users directly, and parallels Frank and Gilovich’s (1988) finding that clothing also exerts influence directly on the user. In the following section we describe how these direct influences are explained through psychological mechanisms such as priming and deindividuation, and how these effects operate in virtual worlds.

### *Deindividuation and Avatars*

Going beyond external perceptions, social psychological research further explains how clothing (and avatars) can, at times, very strongly influence the wearer, encouraging them to behave in ways they wouldn’t otherwise behave. In an experiment, Johnson and Downing (1979) dressed participants in a variety of garb and asked them to deliver shocks to a confederate when he failed to give a correct response in a learning task. The garb that participants wore resembled either that of nurses or Klu Klux Klan (KKK) members. Results showed that participants dressed as nurses shocked less severely than those dressed as KKK members.

Johnson and Downing (1979) linked these effects to priming and neo-associationist models which predict that the associations raised by uniforms can elicit behavior congruent with those cues (e.g., KKK uniforms augment antisocial behavior, nurse uniforms elicit more pro-social behavior). For example, priming has been conceived as an unconscious mechanism that affects cognition, emotion, and behavior (Bargh, Chen, & Burrows, 1996). In support of this view, participants remained unaware of the intended effect of their avatar when generating new intentions and attitudes and when writing spontaneous stories, thus implying that they did not intend to respond the way they did or simply complied to the expectations of the researchers (see Peña et al., 2009a, b). Priming effects as a theoretical explanation of the effects of avatar appearance were explored and updated in the Peña et al. (2009a, b) studies.

In their studies, Johnson and Downing (1979) manipulated an important variable – the participant’s state of deindividuation. Deindividuation is a psychological state that causes a reduction in self-awareness and heightened submersion into a group (Postmes & Spears, 1998). This deindividuation effect is brought about by circumstances that, broadly, cause an individual’s identity to be hidden: large crowds, dark rooms, anonymous circumstances. Germane to avatars and virtual worlds, deindividuation has specifically been studied with respect to online groups

and interactions, and theorists argue that computer-based interactions are by nature deindividuated as interactants are visually anonymous and physically isolated (Lea & Spears, 1991).

As a result of deindividuation, reliance on external information for guidance is increased (Postmes & Spears, 1998). From this perspective, external cues such as the appearance of one's avatar, are expected to be more influential to behavior and cognitions when people are deindividuated than when identifiable. In Johnson and Downing's (1979) study, they manipulated deindividuation by masking all participants, but requiring some to wear nametags. Thus, half the participants were deindividuated and half were not and had their real identity available. Among the deindividuated participants, Johnson and Downing (1979) found that the effects of wearing the nurse or KKK garb was increased – deindividuated “nurses” were nicer, while deindividuated “KKK” were crueler.

Applying this to avatar research, a deindividuated state should act as a lens that enhances the focus on cues provided by the avatar's appearance, increase identification with selected anonymous groups, and enhance conformity to group norms. For example, participants using the same avatar in a virtual group were less capable of identifying individual differences in group discussions, identified more with their group, and conformed more to the proposals of group members in comparison to participants using dissimilar avatars (Lee, 2004). If users of avatars are deindividuated, then they might be more influenced than they would be in other contexts.

In sum, avatars are a form of “virtual clothing” that influences the user, both directly and indirectly by influencing the behavior of others. In the remainder of this piece, we turn to the practical considerations instantiated by this research. We discuss how users who are able to configure their own avatars might be influenced, and we then examine how users and designers of virtual worlds can avail themselves of this knowledge to further their interaction goals.

### *User Customization of Avatar Appearance*

We probably imagine the virtual worlds of the future as allowing users to select or design their own digital representations. This is already true of many of the present games. Second Life offers a variety of self-customization opportunities. World of Warcraft, while using basic size and shape templates, allows users to customize other features of their avatar such as facial features, skin color, and adornments or jewelry. Even many first-person shooting games allow users to select an avatar (though it is usually only visible to the other players due to the first-person perspective). The level of customization available for avatars is ever increasing (for more on avatar personalization, see Ducheneaut, Wen, Yee, & Wadley, 2009).

When users select their own avatars, they are, in a sense, deciding how they will play the game. Users who wish to engage in sexual encounters select attractive avatars dressed provocatively. Users who wish to be “bad guys” choose suitable representations. When users choose avatars, they are furthering their own goals for interaction in the virtual world. Of course, though avatars usually directly reflect our goals, sometimes this is not the case. A clever “griefer” (a player who manipulates the game to cause emotional distress to others), certainly might disguise themselves and their intentions by choosing the most unlikely avatar possible.

Research on avatar effects doesn't give a clear indication of how self-selecting an avatar would change the influence the avatar exerts over the user. According to Vasalou and Joinson (2009), users do select and design avatars with some sense and relation to how they will interact within the virtual world. For instance, as noted above, users engaging in romance in virtual worlds design more physically attractive avatars (Vasalou & Joinson, 2009). It seems likely that

choosing or designing an avatar will intensify and sustain any effect the avatar exerts on the users' cognitions and behaviors through a feedback loop. For example, deciding to take on the role of a bad guy in a virtual world might be associated with more negative behavior and intentions. Then, using an avatar that has a "bad guy" appearance may encourage and reinforce negative intentions and reactions by others, further polarizing behavior. In any ambiguous situations the avatar user might encounter, they could rely on the avatar's appearance for information on how to behave (Bem, 1972). So, when users have the ability to choose or design avatars, their behavioral intentions are likely to be further strengthened by the reactions of others to that avatar and by the cues that the avatar itself exerts.

### *Employing Avatars*

Savvy users and designers can employ an understanding of avatar effects to encourage the interactions they wish to have in the digital world; indeed, many already do. It is not hard to imagine that the average attractiveness of the avatars populating Second Life far exceeds that which would be found on Earth. Particularly, we can use research on avatar effects to guide the incorporation or use of features to create ideal interactions in virtual worlds. As we have seen in an earlier issue of the *Journal of Virtual Worlds*, pedagogy in virtual worlds is an exciting frontier (Volume 2, Issue 1). Or, what administrator has not dreamed of a more harmonious, unified community? Virtual merchandise sellers certainly wish to increase their revenue. The skilful design and manipulation of avatar appearance is one tool likely to help them achieve each of these goals. By altering the physical appearance of avatars, we can also expect to alter the way the user of the avatar thinks, behaves, and is received by others.

The physical appearance of avatars is highly customizable, and increasingly so as designers capture a wider array of human phenotypes. Indeed, users may be able to create avatars that would be exceedingly rarely, if ever, expressed in the genome (e.g., see EA's "Spore," where users have extensive tools to manipulate the biological makeup of their avatars). Despite all of this variability, there are some common elements of physical attractiveness that can be manipulated in the service of positive avatar effects. Facial attractiveness is relatively consistent across cultures (Cunningham, Roberts, Barbee, Druen, & Cheng-Huan, 1995), and a feature that avatar users can intuitively manage.

More attractive avatars could be employed to create several positive effects. Those with physically attractive avatars are rated higher on social competence, social adjustment, and intellectual competence (Khan & De Angeli, 2009). People also self-disclose more to attractive others (Brundage, Derlega, & Cash, 1977). By adopting a physically attractive avatar, a virtual psychologist could encourage patients to self-disclose a greater amount than they would to a less-attractive representation. Generally, if one wishes to be well-received, it seems putting on an attractive virtual body is prudent.

Manipulating the relative height of avatars is also a consideration. As we have seen from Yee and Bailenson's (2007) work, there are significant differences between how those employing tall and short avatars behave. A teacher, wishing to exert control over a virtual class, might be able to reinforce hierarchy by giving students shorter avatars. Or, a salesperson, interested in negotiating better prices, could employ a taller avatar to gain an advantage when bargaining.

Research has shown ways in which behavior of digital representations can be altered for positive effects (see Bailenson, Yee, Blascovich, & Guadango, 2008). In this research, the behavior of avatars is altered in a way to make them more appealing or influential to participants.

For instance, the way an avatar is rendered is altered so that it appears to each of three interaction partners that the avatar is maintaining eye contact with them, thus giving the appearance of paying special attention (Bailenson, Blascovich, Loomis, & Turk, 2005). This alteration increases the persuasiveness of the avatar. Avatars made to mimic the head movement of participants have also been found to elicit more agreement from the participants (Bailenson & Yee, 2005).

Though these studies were done using a virtual reality system, the principles can be adopted for use in our current virtual worlds. Just as in real life, avatar users pay attention to the orientation of their avatar relative to others in the virtual world (e.g., Krikorian, Lee, Chock, & Harms, 2000). In *World of Warcraft*, computer-controlled characters are programmed to turn to face the users when clicked on. In many platforms, even though users are perfectly able to talk with the voice chat, they will often steer their avatars to be near each other during a conversation, an act that does not facilitate “better hearing” or anything of the sort. Providing an impression of this sort of special attention to each user could be a way for developers to increase persuasion or pro-social behavior. Adapting the research into speaker gaze by Bailenson et al. (2005) to virtual “lecture rooms,” where each user has the impression that the speaker is oriented towards them, could reproduce effects associated with speaker gaze (e.g., persuasiveness) among an entire audience.

Finally, colors are basic cues that should not be underestimated. Discussed earlier, Frank and Gilovich (1988) found black clothing encourages aggression in the wearer. On the other hand, females in red clothing appear more attractive and encourage males to devote more resources to them (Elliott & Niesta, 2008). In Olympic competition, competitors assigned to red clothing win more often than expected versus those assigned to blue (Hill & Barton, 2005), an effect which was also found in online first-person shooting games (Ilie, Loan, Zagrean, & Moldovan, 2008).

When designing avatars, users and developers should keep in mind how they wish to behave and be treated. If the goal is harmonious interactions, white garb should be chosen over black to increase cohesion (Peña et al., 2009). Users choosing avatars for competition should favor red avatars. Developers of games who wish to further a narrative or elicit a response from the player (e.g., “this is an enemy”) should exploit our stereotypes about those wearing black when designing computer-controlled characters, or at least avoid those with strong unwanted connotations. Imagine if, instead of a lovely shade of blue, the Na’vi alien race in the 2009 movie *Avatar* were black, or red? Their plight might not have evoked the same reactions from the audience.

### *Conclusion*

Using an avatar is in many ways like donning a Halloween costume: when in costume, the way one appears to outsiders is different, the ability to be personally identified is hindered, and, as a result of a hidden identity and wearing the costume itself, behavior changes. As shown in Frank and Gilovich (1988) and Johnson and Downing (1979), clothing influences not just the way people are perceived, but the way they act as well. The same is true for users of avatars – the effects of donning their “virtual costumes” are enhanced by deindividuation and the reactions of others.

The present manuscript reviewed some of the mechanisms related to the interplay between users and avatars, including self-presentation goals, public commitment and behavioral confirmation, priming, deindividuation, and self-perception. Combined, these elements help

explain how, while we are exerting influence over our avatars, they are able to influence us in turn. As we return to our own virtual communities, whether Second Life or the World of Warcraft, we can build better worlds by applying these fundamental theories. This knowledge will help us reach our goals, be they a harmonious and co-operative world, a new environment for learning, or just having fun.

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