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Avatars

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Abstract

Avatars are virtual characters that now belong to the popular culture around video games, social networks, and digital applications in general. However, using an avatar may not be as insignificant as it seems, because avatars, by providing us with a fresh new appearance, may impact the very perception of our own identity. The aim of this entry is to offer an overview of the sociocognitive processes influenced by the use of avatars and illustrate them with empirical findings from the literature, including examples related to the Proteus effect. Finally, we will open avenues as to what could become possible through avatars, in particular in the field of avatar-mediated creativity.

Keywords

Avatar · Proteus effect · Virtual world · Self-perception · Deindividuation · Creativity

Avatars are digital characters, often customizable, representing users' identity in a virtual environment (Meadows 2008). They are projections of users, or "tangible embodiment of their identity" (Ducheneaut et al. 2009). Users can create avatars looking like them, experience a multiplicity of identities or highlight certain aspects of their ideal self (Bessière et al. 2007). Thereby, the configuration of avatars allows users to change their appearance, their social roles, and their identity in the virtual world. The relationship between users and their avatars may even provide support to engage people with lifelong disability in activities and social interactions (Stendal et al. 2012). A recent line of research has also shown that users' behaviors are influenced congruently to their avatar's identity. This behavioral modulation was named Proteus effect (Yee and Bailenson 2007, 2009) after the Greek God Proteus who possessed the ability of metamorphosis.

At a theoretical level, explanations of the Proteus effect are primarily rooted in self-perception theory and deindividuation effects. Self-perception theory argues that individuals come to "know" their own attitudes, emotions, and other internal states partially by inferring them from observations of external cues, which include their appearance and overt behavior (Bem 1972). Individuals observe external cues on themselves to explain their own attitudes and internal states, just as an external observer would. This is why a change in self-representation (e.g., through an avatar) may lead to a change in behavior. Moreover, self-perception reliance on identity cues (and therefore on avatar's appearance) is likely to be enhanced when individuals find themselves in contexts of anonymity and deindividuation (see Yee et al. 2009). Deindividuation refers to

situations in which people are not identifiable as individuals (e.g., in large groups, but also in a virtual world, see Postmes and Spears 1998), and therefore experience a loss of self-awareness. This was shown to moderate the impact of contextual cues on individual behavior (Spivey and Prentice-Dunn 1990; Yee et al. 2009).

Because avatars constitute "our entire self-representation" and virtual contexts emphasize reliance on cues related to the visual appearance of one's avatar, the Proteus effect leads users to exhibit behaviors and rationalize them so as to remain consistent with the avatar's identity (Yee and Bailenson 2007). Instances of the Proteus effect have been found in various avatar-based systems, influencing a diverse range of decisions and behaviors (for a recent review, see Ratan et al. 2019): for example, attractive avatars lead to behave in a more intimate way in terms of self-disclosure and interpersonal distance (Yee and Bailenson 2007; see also Waddell and Ivory 2015). It should be noted that this phenomenon results from the mere exposure to a virtual mirror allowing the participant to see his/her avatar for about 1 min. In this respect, it can be considered that the Proteus effect is initiated almost instantly. In another study, Yee and Bailenson (2007), Yee et al. (2009)) have shown that tall avatars lead to more confident behavior than short avatars in a negotiation task. Recent studies have also shown that the appearance of the avatar may affect subsequent behavior in the real world (Yee et al. 2009; Rosenberg et al. 2013; Yoon and Vargas 2014). For example, the benefits of a tall avatar on negotiation endure in a subsequent negotiation task in a face-to-face situation (Yee et al. 2009). Likewise, it was found that the weight of avatars influence real life physical activity during motion gaming sessions (Peña et al. 2016; Peña and Kim 2014). This means that the appearance of an avatar influences users' behavior not only in the virtual world, but also in the real world.

Beyond behavior, it has also been shown that avatars could influence attitudes and productions of the users. For instance, the embodiment of female avatars, with an appearance more or less sexualized, can impact perceptions and judgments toward women (Fox et al. 2013), and the use of a

doctor versus a Ku Klux Klan avatar can influence the content of stories composed by the users (Peña et al. 2009).

Another line of reasoning argues that the effect of avatars' appearance on users may also be explained through priming (Bargh et al. 1996; Peña et al. 2009). According to Bargh et al. (1996), priming refers to "the incidental activation of knowledge structures, such as trait concepts and stereotypes, by the current situational context" (p. 230). Avatars could then be seen as a priming support leading to behavioral assimilation, i.e., an increase in the likelihood of behaviors congruent with the primed concept. For instance, embodying an avatar whose appearance is likely to activate antisocial concepts (e.g., violence, aggression, racism) could lead to behave in a more negative way.

It was shown that avatar appearance in video games impact subsequent aggressive cognition. For example participants displayed more aggressive attitudes and intentions toward other players when their avatar wore a black cloak – a color associated with death and evil (Adams and Osgood 1973) – than when they wore a white coat (Peña et al. 2009, Study 1). Eastin et al. (2009) found that White players displayed more postgame hostile thoughts after having embodied a Black avatar than a white avatar. Ash (2016) showed that players embodying a Black avatar in a boxing game exhibited greater aggressive in-game behavior than those embodying a White avatar. However, this effect was only present for players experiencing high levels of embodiment.

Moral orientation of the embodied character – heroic versus villainous – also impacts post-game behavior. Happ et al. (2013) showed that participants who had embodied Superman exhibited greater prosocial behavior and less hostile perception bias than those who had embodied a stereotypically evil character – the Joker. Rosenberg et al. (2013) showed that embodying an avatar possessing superheroes' powers (flying) volunteered more to help the experimenter pick up pens he had dropped than those who had flown as passengers of a virtual helicopter. Finally, Yoon and Vargas (2014) asked participants to play a game, embodying Superman or a villainous avatar

(Voldemort), and then to take part in a blind test of food – taste a dish and add an unspecified amount of chocolate (prosocial action) or chili sauce (antisocial action) for consumption by a future participant. Participants who had embodied Superman behaved in a more prosocial way than those who had embodied Voldemort.

The influence of avatars on users who embody them is now well established in the literature, and this effect may impact users' behavior and/or attitudes, both online and offline, for better and worse. Hence, this body of research suggests that a targeted use of avatars bears the potential of supporting the achievement of high goals and the opening of possible futures. In the following section, we address more particularly the issue of increasing creativity through the use of avatars.

Avatars, Creativity, and the Possible

In this series of experiments, we used avatars to modify self-perception in order to improve one's creative performance. To do so, the first step was to identify what kind of avatars would likely increase the perception of one's creative skills. These experiments being conducted with engineering students, we studied the cognitive representation of creativity in this population. This led us to identify the concept of the Inventor as a common relevant creative figure for engineers (Guegan et al. 2016). Accordingly, we designed and validated avatars featuring characteristics of inventors (e.g., looking like Einstein, wearing a lab coat or using scientist's instruments). We expected that users of these avatars, observing their digital appearance ("I embody an inventor"), would make implicit inferences about their creative skills ("I am creative") and improve their creative performance ("I have a lot of ideas/good ideas"). Consistently, our results show that engineering students using inventor avatars during a virtual brainstorming session performed significantly higher in fluency and originality in comparison to students using neutral avatars and students in a face-to-face electronic brainstorming situation (Guegan et al. 2016). Moreover, this benefit endured over time since participants

allocated to inventor condition continued to perform higher in a subsequent face-to-face brainstorming. Subjective data also showed that brainstorming in a virtual environment (either with a neutral or a creative avatar) was rated as funnier than electronic brainstorming system.

The previous experiment managed to increase creativity by making engineers identify with the figure of the inventor. In terms of innovation process, this is likely to emphasize engineers' talent to develop products of superior technological value and therefore support a Technology-Driver strategy (Jaruzelski et al. 2014) representing high degrees of R&D difficulty (Mantelet et al. 2016). Then we wondered whether avatars could be used to help engineers develop User-Centered innovations, motivated by customer needs instead of technological value. To investigate this question, we designed a case study with a major company from the transportation industry.

A group of highly qualified employees from the innovation department were attributed inventor avatars like in the previous experiment, and another group was attributed avatars representing users of public transportation (Persona avatars, e. g., a mother with a newborn, a child, an elderly person, a train manager). Both groups were immersed in a transportation situation (metro tour across a virtual Paris) and had to find applications for smart windows in public transportation. As expected, the content of ideas was influenced congruently to avatars' appearance: the inventor condition led to a techno-centered ideation profile, oriented toward technological solutions, while the Persona condition led to more user-centered, needs-oriented ideas (Buisine et al. 2016). Consistently, inventors' production tended to be better evaluated through industrial criteria and Personas' production tended to be better evaluated by transportation users. These results suggest that avatar-mediated brainstorming could be a powerful tool enabling innovation team to align ideation to their strategy (e.g., technology-centered or user-centered).

Beyond self-perception and personal identity, avatars may also be a convenient medium to emphasize social identity in a virtual environment (e.g., Guegan et al. 2015). Social identity is

defined as a part of self-concept linked to group membership (Tajfel and Turner 1979). In this way, a positive evaluation of one's in-group may contribute to a positive evaluation of the self, leading people to work as a group and for the group and exhibit increased performance (i.e., social laboring, Haslam 2004). Hence in a subsequent experiment, we introduced social identity cues on avatars' clothes as it could be implemented in various professional contexts (e.g., clothes in the colors and logo of a company, sport team jerseys). On the basis of the Social Identity Model of Deindividuation Effects (Reicher et al. 1995; Spears and Lea 1992, 1994), we assumed that virtual cues would exert a positive effect on group performance (see Tanis and Postmes 2008). By perceiving themselves as members of a group rather than coworkers who are "gathered together," individuals should be more likely to engage in online collaborative work. The results confirmed this assumption by showing that social identity cues on avatars' clothes increased both group identification and creative performance (Guegan et al. 2017). Hence avatars appeared as a valuable tool to reduce social loafing and support teamwork in a meaningful way (see also Buisine and Guegan 2020). Moreover, in the context of a creative assignment, group identification may influence not only the perception of group members ("we" instead of "I"), but also of their ideas ("our production" instead of "my production"). Because attention to others' ideas is key to creativity (Paulus and Brown 2007; Michinov 2012), increasing the salience of social identity may also improve cognitive stimulation.

The use of avatars may therefore open up the field of possible in the context of group brainstorming: group facilitation is similar to electronic brainstorming system and can be conducted remotely through the instant messaging tool of the virtual platform. The facilitator can be represented by an avatar like all participants, or can manage the group without being embodied or materialized in the virtual world. Classical efficiency factors such as cognitive stimulation and social comparison are supported and can be further enhanced with relevant avatars' appearance. Moreover, virtual sessions were repeatedly evaluated as fun in all our experiments, which may contribute to foster engagement and creativity. Virtual brainstorming can also involve large groups to promote diversity of views and increase cognitive stimulation, as there is potentially no limit to group size in a virtual world. Idea generation is still performed through the written channel to avoid production blocking and improve attention to others' ideas. Finally, avatars provide a unique means to stimulate creativity through modifications of individuals' perception of their personal and/or social identity, thereby reducing social loafing and self-censorship to help everyone reveal his/her best creative potential.

Conclusion

Avatars have the advantage of triggering self-perception mechanisms that may positively impact creative processes in multiple ways: anonymity and the use of carefully chosen avatars may reduce self-censorship and social loafing, to the benefit of creative performance and innovation strategies of companies. Avatars sharing social identity cues can help group members focus on team's issues and challenges, and create social laboring. They can also be used to infuse new dynamics, promote a new viewpoint, and change routines (e.g., hierarchical asymmetry, interpersonal relations, leadership) among regular coworkers. All these factors seem likely to help individuals develop their creativity, support innovation processes in organizations, and, more generally, build the possible.

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