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Player-Avatar Link: Interdisciplinary Embodiment Perspectives

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Synonyms

Bodily presence in digital games; Embodiment in digital games; Player-avatar relation

Definitions

Player-avatar link: experience of embodiment by the player, caused by the extension of the player's perception and agency through the avatar into the digital game world.

Introduction

In digital games research, the concept of the avatar is a much discussed topic. Many works have been dedicated to understanding every aspect of this phenomenon, ranging from the origin of the term all the way to its functioning as a game component (see Juul and Klevjer 2016 for a brief overview of key discussions). Once the aspect of the player is addressed, one of the most intriguing issues become the link between the player and the avatar they control. Why is it, for example, that players become distressed when they see their avatar in danger? And why do they refer to it as "I"? While it is widely acknowledged that some type of link indeed exists, there is still much disagreement on what the nature of this link actually is. This entry discusses the different embodiment perspectives of the player-avatar link. Specifically, we first examine phenomenological accounts of player embodiment in games from a Humanities background, and then investigate the sense of embodiment in virtual media from a Natural Sciences background.

Terminology

A few concise definitions are provided as a starting point for the main discussion. These definitions are simplified versions of what they may represent within different disciplines.

Avatar – The object over which the player can assert control.
Character – The figure that exists in the meaningful game world, including any form of backstory and personality.
Embodiment – The process of adjusting one's internal body representation to the current circumstances.

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Player embodiment – The experience that the avatar has changed the internal body representation and phenomenal body of the player.
Presence – The experience of being present to something.
Spatial presence – The experience of being present in a certain environment.
Immersion – The technological quality with respect to sensorial information.

In the following, the term "game figure" is used to refer to either avatar and/or character, when it is not specified by the author(s) of the cited article.

Perspectives Within the Humanities

In the Humanities there are several authors who acknowledge that the player-avatar link is exactly embodiment, in the form of extension of the player's body. In a number of his works, Wilhelmsson has argued that many aspects of a game experience are consequences of a Game Ego manifestation (Wilhelmsson 2001, 2006, 2008). The Game Ego is a bodily based function that enacts a point of being within the game environment through a tactile motor/kinesthetic link. This means that the player's sensory system is extended to the game environment, and the Game Ego becomes another body and/or an extension of the body. The consequences include identifying with the manifestation and more generally allowing the player to experience the game's narrative elements, and as a result evoking emotional responses and the experience of presence. Klevjer states that there is a paradoxical prosthetic relationship between player and avatar (Klevjer 2006, 2012). By applying Merleau-Ponty's philosophy on the body's duality (Merleau-Ponty 1945), it is argued that video games allow the player to relocate their intention for actions (as a subject) into screen space, while at the same time a proxy (as an object) exists in the game. Crick also draws upon Merleau-Ponty's reasoning to explain how the game can be perceived as another physical world during play (Crick 2010). That is, the player exists in two worlds and operates both on and in the game. It is emphasized that the video game experience must be of embodied perception, since we still require our body (and the combination of all senses) to perceive it, and it in turn affects our bodily state. The controller used by the player allows agency in the game world and can become an extension of our body through habit; the avatar's movement is incorporated within the player's body schema and becomes an extension of the bodily basis of consciousness. Lastly, Vella argues that, indeed, the player may embody the avatar and achieve a subject position in the game world, but as a character the game figure still has an autonomous identity that can be acted out (Vella 2013). Therefore, the act of avatar-play constitutes the enactment (or performance) of a character.

These works so far demonstrate an emphasis toward the roles of perception and cognition in embodiment: their combined impact on our experience of the real world is considered in the experience of game worlds. Farrow and Iacovides claim that exactly such reasoning is just one step too far (Farrow and Iacovides 2014) and describe three inconsistencies with respect to human embodiment aspects laid out by Merleau-Ponty. Firstly, on a physical level bodies within game worlds cannot conform to real world duality (e.g., tactile and pain), and we do not relate to bodies in virtual worlds in the same way that we do in the real world. Secondly, on an intentional level a player experiences the game as convincing when there is a sense of nonmediation, which is something only "invisible" game control systems can achieve. Lastly, on a worldliness level it is possible that game worlds only become meaningful through play with other humans. Together, this leads to a limit to the degree of digital embodiment.

There are also authors that explain that embodiment in games is not "simply" a process of perception. For example, Newman has argued that "video games are not interactive, or even ergodic," since they do not consist of continuous play and even have integral parts that are nonergodic (Newman 2002). Here, ergodicity refers to the definition by Aarseth: a user must use (active) effort in order to experience the medium (Aarseth 1997). Moreover,

there is a level of ergodicity in noncontrolling players (active spectators), which indicates that feelings of immersion, engagement, and being-in-the-game are separated from an interface-level control loop. During play, the degree to which the player embodies the game figure is not dependent on representation, since it is merely seen as a set of capabilities: it is equipment to be used by the player.

A last group of authors agree that the player-avatar link takes on more forms than just embodiment and that this is very related to different types of play. Linderoth demonstrated how children frame the game figures during certain moments of gameplay, which leads to three different functions of game figures (Linderoth 2005): they can become roles for socio-dramatic interaction, tools as extensions of the player agency, and props for self-presentation in the presence of others. Similarly, Bayliss argues there are three positions of game figure play: playing through (the avatar is equipment), playing as (sometimes character, sometimes avatar), and playing with the game figure (play with the game rather than play the game) (Bayliss 2007). The game figure embodies the intentions of the player as their avatar, and its limitations with respect to functionality simultaneously constitute it as an embodied character. It is highlighted that any sense of being-in-the-game-world relies on attitude of the player with respect to the three positions of play, and not the video game itself or the technological platform. Lastly, Banks found that players' motivation and attitude toward play went hand in hand with the social role the game figure fulfilled in the relation with the player (Banks 2015). From unsocial to social, the relations were game figure as object, as me, as symbiote, and as social other.

To summarize, there is a substantial group of authors that argues for embodiment of the player as a result of a perceptual link: the player's body is extended into the game through the avatar. However, others argue that real world embodiment assumptions cannot simply be translated to assumptions for the game world and that the function of the game figure depends on the type of gameplay, which in turn depends on the player's attitude toward the game.

Perspectives Within the Natural Sciences

In the Natural Sciences, there is little attention to the player-avatar link in games specifically; however, there are many works that discuss how the body schema can be changed by virtual bodies in, for example, virtual reality (VR). This corpus is a result of empirical studies in cognitive neuroscience on the more general experience of being connected to a body. Although there are many concepts that are part of this experience, there are three in particular that have gained a great deal of attention, that together form the sense of embodiment: body ownership (the sensation of owning a body), agency (the sensation of controlling a body), and self-location (the sensation that the locations of you and your body coincide in space) (Kilteni et al. 2012a; Longo et al. 2008). Here, spatial presence differs from self-location since the former concerns the relation between the self and the body, and the latter the self and the environment. A classic experiment to assess ownership over a limb is the rubber hand illusion (Botvinick and Cohen 1998). In this experiment, the rubber hand is stroked either synchronously or asynchronously with the real hand, which is out of sight. Synchronous feedback evokes a sense of ownership over the rubber hand, while asynchronous feedback diminishes it. With similar setups for not just limbs, but also entire bodies (i.e., the body transfer illusion), various studies have assessed the importance of seemingly relevant factors to the illusion, such as synchronous visual–tactile and visual–motor feedback (Tsakiris et al. 2006), viewing perspective (Petkova and Ehrsson 2008) and congruent body alignment and connectivity (Perez-Marcos et al. 2012). It has also become apparent what the roles of agency and self-location are in this regard (Kalckert and Ehrsson 2012; Maselli and Slater 2014; Tsakiris et al. 2006).

Using VR it became possible to inspect real-world factors that could not, or with much difficulty, be studied otherwise. Lugrin et al. examined the body transfer illusion during a full-body touch-the-target task in VR, where ownership over humanoid, robot, and block avatars were compared (Lugrin et al. 2015). They found that

there was no difference in ownership levels between the different avatars (the actual levels are not provided); however, the humanoid avatar caused the participants to experience having two bodies to a higher degree than the other non-humanoid avatars. The authors believe that this effect was related to the so-called uncanny valley effect. Besides full-body illusions, the extension and addition of body parts has also been examined. For example, Kilteni et al. examined how the degree of ownership over a virtual arm depended on elongation of the arm and found that with visual–tactile feedback the breaking point was four times arm's length (Kilteni et al. 2012b). Regarding supernumerary limbs, Steptoe et al. showed that participants could experience ownership and agency over a humanoid avatar with a long tail, while also performing better in a full body touch-the-target task when the tail could be controlled by hip movement than when it moved at random (Steptoe et al. 2013). In a similar study, Stevenson Won et al. compared performance in an armbased touch-the-target task between a humanoid avatar and one with an extra arm protruding from the chest, which could be controlled by wrist rotations (Stevenson Won et al. 2015). For targets outside of the normal arm's reach, but in reach of the additional arm, participants performed significantly better with the extended body than with the normal body. Interestingly, the measured levels of presence were low overall and did not differ between conditions. The authors explain that the low results could have occurred because participants were so involved with controlling the avatar in order to complete the task, making them less aware of the virtual surroundings. This is in contrast to many works in Natural Sciences that agree that there is in fact a positive relation between presence and task performance (an elaborate discussion can be found in Nash et al. 2000).

Although measuring embodiment in games directly (i.e., through ownership, agency, and self-location) is uncommon, there have been many works that measure presence and/or immersion in games for a variety of purposes. For example, in a series of studies, Weibel and Wissmath studied possible influences and effect of spatial presence and flow in a variety of games using both factor analysis and path analysis on questionnaire results (Weibel and Wissmath 2011). Firstly, they found that spatial presence and flow are separate constructs and that flow in turn consists of two subcomponents: absorption into the experience and smoothness of the experience. Secondly, they found that a participant's motivation generally influences flow, whereas a participant's immersive tendencies generally influence presence. Lastly, flow directly influenced enjoyment and performance of each game, whereas presence only did this indirectly through flow.

Besides subjective qualities of gameplay, objective qualities have also been examined. For example, Hou et al. studied players' immersive tendencies as a precondition of presence experience, and screen size as a media form variable (Hou et al. 2012). By analysis of questionnaire results they found that a larger screen had a positive effect on game figure evaluation, player mood, and both spatial and self-presence (i.e., when a player experiences that the avatar is him-/herself), but no difference in enjoyment. Also, immersive tendencies moderated the effect of screen size on presence, but not of the other game evaluation aspects. In particular, enjoyment was not affected, in contrast to the study by Weibel and Wissmath.

To summarize, although there is little research on the player-avatar link itself, there is an immense corpus of literature regarding the general experience of being connected to a body in reality and VR that prominently argue from a perception background: multimodal feedback can cause participant's to experience other (virtual) bodies as their own. There have also been studies that empirically show that a player's immersive tendencies are an important determining factor of the experience of spatial presence in games.

Body and Environment

Although the different disciplines study the same problem very differently, there are a few interesting similarities between the two, specifically regarding their interpretation of the problem. For example, both disciplines agree that during

gameplay the player's internal body representation changes. In Humanities, some authors draw upon the phenomenology of (natural) perception and argue that a part of the player must be represented in the game. In Natural Sciences, the reasoning is that if extra bodies (or body parts) are presented correctly, then they can be accepted by the player as belonging to them. Both sides argue for an extension of the player's body, and many results support this claim: players frequently refer to the avatar as "I," react emotionally and physiologically to avatar events as if it is their real body (Armel and Ramachandran 2003), while still experiencing ownership over their actual real bodies (Guterstam et al. 2011).

Another similarity is the important role of the experience of the game environment, in particular what the determining factor is of this experience. In computer science, it was until recently quite acceptable to regard presence as a consequence of a system's immersive and interactive capacities (and of nothing else). This is often a crude operationalization of Steuer's model on presence in VR (Steuer 1992); the statement concerning varying individual experiences of presence due to, for example, differences in the content is frequently ignored. Currently, a progressively growing number of studies are demonstrating the importance of the player's immersive tendencies to the experience of the environment. In game studies, system-versus-narrative discussions are nothing new: Is the experience of spatial presence (or being-in-the-game-world) a result of the vividness and interactivity of the system, or is this a result of the environment becoming meaningful through narrative? There are numerous authors that are inclined toward the latter (Bayliss 2007; Farrow and Iacovides 2014), although undoubtedly the answer is partially both. A possible reason for the exclusion of this view in computer science is one of pragmatic nature: there is not yet an existing measure for "the degree of narrative." This is absolutely logical when looking at the complexity of the matter; the experience of narrative can differ per person, per experience of gameplay, time of day, and so on, but that does not mean it is nonexistent.

For research in both disciplines, the experiences of self, body, and environment often go hand in hand. In many cases, it seems to (roughly) come down to two aspects: the role of mediation and the role of immersive tendencies. That is, the only way a person could experience a mediated situation as real is if the input is *realistic* (or convincing) enough, and if they allow themselves to *pretend* the experience is not mediated. It is not apparent what the interdependence is between these two aspects, nor whether they are of equal importance: acceptance in the second aspect allows experience of the first on the one hand, but it may very well be that if the first occurs perfectly then the second happens automatically (as suggested in Wilhelmsson 2008).

Conclusion

This entry has provided an interdisciplinary discussion of the player-avatar link. For Humanities we see that there is no consensus on the importance of perception over player attitude and narrative. In Natural Sciences, the experience of changing the body schema through perception is prominent; however, there is recently also noticeable focus on personal characteristics that might underlie the experience in the first place. Both disciplines are inclined to argue about the experiences of both body and environment and end up at the same important question: What are the roles of mediation and immersive tendencies in these experiences? In this sense, while the initial analysis from both disciplines seemed contradictory, one could say that for this particular problem the focus in both disciplines is converging, creating a interesting future research opportunity for interdisciplinary research in this area.

Cross-Reference

▶ Cognitive Psychology Applied to User Experience in Video Games

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