



# Playing online games against computer- vs. human-controlled opponents: Effects on presence, flow, and enjoyment

David Weibel<sup>a,b,\*</sup>, Bartholomäus Wissmath<sup>a</sup>, Stephan Habegger<sup>a</sup>,  
Yves Steiner<sup>a</sup>, Rudolf Groner<sup>a,b</sup>

<sup>a</sup> *Department of Psychology, University of Berne, Muesmattstrasse 45, 3000 Bern 9, Switzerland*

<sup>b</sup> *Swiss University, Institute of Distance Education, Ueberlandstrasse 12, 3900 Brig, Switzerland*

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## Abstract

The purpose of this study was to examine whether playing online games against other users leads to different experiences in comparison with playing against computer-controlled opponents. Thereby, a one-factorial multivariate design was used (computer-controlled vs. human-controlled opponent). Dependent variables were the participants' feelings of presence and flow. Additionally, the amount of enjoyment was measured. The findings indicate that the type of opponent influences playing experiences: participants who played against a human-controlled opponent reported more experiences of presence, flow, and enjoyment, whereby the strongest effect refers to the experience of presence. Furthermore, strong relations between presence, flow, and enjoyment were observed. Further analyzes suggest that flow mediates the relationship between presence and enjoyment.

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## 1. Introduction

Computer and video games enjoy an enormous and fast-growing popularity. There are more and more people, especially adolescents, spending plenty of time in front of the

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\* Corresponding author. Address: Department of Psychology, University of Berne, Muesmattstrasse 45, 3000 Bern 9, Switzerland. Tel.: +41 (0) 31 631 5434; fax: +41 (0) 31 631 3606.

*E-mail address:* [david.weibel@psy.unibe.ch](mailto:david.weibel@psy.unibe.ch) (D. Weibel).

screen playing games (cp. Lenhart, Madden, & Hitlin, 2005). The computer technology is progressing rapidly. One of the most recent developments are *online games*. Online games can be defined as computer or video games which are played over some form of computer network – most commonly the Internet. Thus, this kind of game makes it possible to play against other users. Early online games were text-based role playing games (RPG). Currently, online games are mostly characterized by complex and graphically highly realistic virtual environments (VE) which display everyday life settings as well as science fiction settings. These VE are often populated by many quasi-social beings, that means by virtual characters which are driven by human beings: “Although these beings might ‘look’ like computer-controlled entities, many are controlled by humans playing over the Internet who develop characters to take part in adventures” (Tamborini & Skalski, 2006, p. 232).

Many online games have associated online communities, making online games a form of social activity beyond single player games. Using avatars (virtual characters) to interact online is a booming trend. It was non-existent a decade ago, but today there are millions of subscribers worldwide to dozens of massively multiplayer online games (MMOG). With names like *World of Warcraft* and *EverQuest*, most of them challenge players to reach specified goals, usually with some degree of mayhem and derring-do involved. From 2000 to 2005, the number of online gamers in the USA increased by 52% to 17 million people; almost 90% of adolescents aged 12–17 use the Internet and of these, 81% play online games (Lenhart et al., 2005). According to Yee (2006) who collected data from 30,000 users of online games, the usage per week is on average 22 h. As mentioned above, one of the innovations online games bear, is the possibility to play against other users without being physically present in the same room. Before, playing computer games against human opponents was only possible with paddles or public forms of gaming such as LAN (local area network) parties, where computer networks covering a small geographic area, like a home, office, or group of buildings.

What is the consequence of this form of gaming? Does playing against a computer-controlled avatar rather lead to the feeling of being physically present in the virtual environment? Is enjoyment enhanced when other human beings are present in the virtual environment, and do players have more involving and autotelic experiences? The theoretical debate (e.g. Chan & Vorderer, 2006; Heeter, 1992; Vorderer, Hartmann, & Klimmt, 2006) shows the importance of this issue, but empirical results are still lacking. This is to be examined in our study. Thereby, the focus lies in the question, whether playing an online game against a human-controlled opponent leads to more feelings of presence and enjoyment than playing against a computer-controlled opponent. As the analysis of flow experiences while playing computer games is a relevant issue of recent research, it should also be analyzed to what extent feelings of flow play a crucial role.

## 2. Theoretical considerations

### 2.1. Presence

The term *telepresence* was introduced by Minsky (1980). It describes a state of consciousness that gives the impression of being physically present in a mediated world. According to Steuer (1992), (tele)presence is the extent to which one feels present in the mediated environment rather than in the immediate physical environment. Thus, *presence* refers to a subjective feeling of immersion into a virtual environment: Mediated contents

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