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Game Transfer Phenomena and its associated factors: An exploratory empirical online survey study

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ABSTRACT

Previous qualitative and quantitative studies examining Game Transfer Phenomena (GTP) have demonstrated that GTP experiences are common. These studies have shown that many gamers report altered perceptions, involuntary thoughts and behaviors after playing video games (e.g., pseudo-hallucinatory experiences, automatic motor activations, etc.). However, the factors associated with GTP are unknown. In the present study, a total of 2362 gamers were surveyed using an online questionnaire to examine the relationship between GTP and socio-demographic factors, gaming habits, individual characteristics, and motivations for playing. Results showed that having a pre-existing medical condition, playing for 3–6 h, and playing for immersion, exploration, customization, mechanics and escape from the real world were significantly associated with having experienced GTP. Those who were 33–38 years old, playing sessions for less than one hour, being a professional player, being self-employed, and never recalling dreams, were significantly more likely to have not experienced GTP. The findings suggest that attention should be paid to young adults and the length of gaming sessions, as well as taking into consideration underlying factors such as medical conditions that may make gamers more prone to GTP.

1. Introduction

Videogames can be pervasive in gamers' lives. This has been demonstrated from a variety of perspectives. For instance, research has reported how the perception of the real world is influenced by experiences in the game, particularly in relation to the content of the game (e.g., meta-narrative, activities in the game) (Lee, Peng, & Klein, 2010; Williams, 2006). A large variety of experimental research has demonstrated via cognitive tasks (e.g., go/no-go computer task, Stroop test, etc.) that frequent gamers and particularly those classified as problematic gamers show cognitive biases and response inhibition toward gaming-related cues (Decker & Gay, 2011; Van Holst et al., 2012). Research into Game Transfer Phenomena (GTP) has demonstrated how the game can keep on playing even after the game has been turned off. GTP are non-volitional phenomena such as altered perceptions, automatic mental processes, and involuntary behaviors (Ortiz de Gortari, 2015). The present paper takes a multimodal research approach in descriptively examining the effects of playing videogames and the underlying factors of GTP.

An analysis of more than 1600 gamers self-reports have shown that videogame playing can lead to (i) perceptual distortions of physical objects, environments, and/or sounds, (ii) misperceptions of objects and sounds that are similar to those in the videogame, (iii) interpretation of events in real life contexts that utilize the logic of the videogame, (iv) ghost perceptions and sensations of images, sounds, and tactile experiences, and (v) involuntary actions and behaviors based on experiences from the videogame (Ortiz de Gortari, 2010; Ortiz de Gortari, Aronsson, & Griffiths, 2011; Ortiz de Gortari & Griffiths, 2014a,b,c).

A recent descriptive analysis demonstrated that 96.6% of gamers had experienced GTP. The majority experienced GTP more than once (95.3%) and most of the gamers in the sample had experienced six or more different types of GTP at some point (78.9%) (Ortiz de Gortari & Griffiths, 2015). More specifically, GTP manifested as altered sensorial perceptions mostly as visualizations of videogame images or seeing videogame images with closed eyes (76.8%), hearing the music from the videogame after playing (73.9%), and experiencing bodily sensations of movement as in the videogame (50.9%). The most prominent automatic mental processes were desires to use videogame elements in real-life contexts (74.6%) and involuntary actions when gamers verbalized something related to the videogame without intention (57.9%).

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GTP appear to be short-lasting phenomena that mostly occur soon after stopping playing (Ortiz de Gortari & Griffiths, 2015). The emotional appraisal of GTP has been reported as both positive or negative, with some gamers wanting to induce GTP or wanting them to happen again (Ortiz de Gortari & Griffiths, 2014a, 2015). However, in one study, one-fifth of gamers reported distress after playing due to GTP experiences (Ortiz de Gortari & Griffiths, 2015) and experienced GTP in specific circumstances leading to risky situations (e.g., seeing images on the road while driving and trying to follow them) (Ortiz de Gortari & Griffiths, 2014a). Therefore it is important to understand what factors are associated with GTP and which individuals are susceptible to GTP so they can be assisted and reassured if needed. Based on the limited empirical literature about GTP, the factors that were considered to be important to examine in relation to GTP in the present study were: (i) socio-demographics, (ii) gaming habits, (iii) motivations for playing, (iv) underlying conditions (pre-existing medical conditions, drug use), and (v) dream recall (see literature below for the rationale).

1.1. Socio-demographic factors

Gender differences have been found in terms of playing videogames. Despite the increase of female gamers, gaming is still an activity dominated by males (52% males vs. 48%) although most females tend to play casual games (Entertainment Software Association., 2014). According to neuroimaging studies on gaming, males show greater activation in the mesocorticolimbic reward system compared to females, and this may partly explain why males are more attracted to rewarding activities such as gaming (Hoeft, Watson, Kesler, Bettinger, & Reiss, 2008). Moreover, some studies have claimed that males are more susceptible to develop gaming problems (e.g., gaming addiction) (Hsu, Wen, & Wu, 2009; Ko, Yen, Chen, Chen, & Yen, 2005). In terms of age, the average age of gamers in the USA is 31 years old (Entertainment Software Association, 2014) and in Europe, 51% of the gamers are under 35 years old (Interactive Software Federation of Europe., 2012). It has been speculated that GTP are related to failures in cognitive control (e.g., sustaining attention to the task at hand) (Ortiz de Gortari, 2015). According to some research studies, daydreaming and mind wandering tend to decrease with age (Giambra, 1989, 1993; Zavagnin, Borella, & De Beni, 2014) so younger people may be more likely to experience GTP.

1.2. Gaming habits

Excessive gaming has been suggested as a factor relating to GTP (Ortiz de Gortari, 2010, 2015; Ortiz de Gortari & Griffiths, 2012). Moreover, research has shown that virtual immersion decreases the sense of presence in objective reality and results in gamers feeling detached from objective reality (Aardema, O'Connor, Côté, & Taillon, 2010). More specifically, longer gaming sessions may enhance the effects of neural adaptation (e.g., motion sickness, cybersickness, visual motion after-effects, etc.) (Dyson, 2010; Kennedy, Stanney, & Dunlap, 2000), where duration is proportional to exposure time (Champney et al., 2007). In addition, gaming has been correlated with sleep deprivation (Achab et al., 2011; Choi et al., 2009; Rehbein, Kleimann, & Mossle, 2010; Tazawa & Okada, 2001). Unhealthy gaming habits such as carrying on playing when feeling fatigued or being sleep deprived or skipping meals to carry on playing (Custers & Van den Bulck, 2010; Seok & DaCosta, 2012; Spekman, Konijn, Roelofsma, & Griffiths, 2013) may make gamers more prone to experience altered perceptions (Babkoff, Sing, Thorne, Genser, & Hegge, 1989; Mahowald, Woods, & Schenck, 1998; Seok & DaCosta, 2012). In a very small minority of cases, players may suffer epileptic seizures (Bigal, Lipton, Cohen, & Silberstein, 2003). In a previous GTP study focusing on altered visual perceptions (Ortiz de Gortari & Griffiths, 2014a), some gamers reported being sleep-deprived or fatigued due to playing for prolonged periods of time when they experienced GTP. Also, experiencing cognitive failures such as the ones observed in previous GTP studies are likely as a result of being mentally fatigued (Van den Linden, Frese, & Meijman, 2003).

1.3. Motivations for playing

Motivation has an important role in initiating an activity, contributing to the maintenance of certain behaviors, and moderating the effects of pursuing an activity (Katz, 1996; King & Delfabbro, 2009). The playing of videogames offers an outlet for fulfilling basic needs (Hussain & Griffiths, 2008; Przybylski, Weinstein, Ryan, & Rigby, 2009; Ryan, Rigby, & Przybylski, 2006) and obtaining personal gratification (Sherry, Lucas, Greenberg, & Lachlan, 2006). Yee's (2006) typology of players' motivations (i.e., advancement, social, and immersion) is useful in examining which behaviors among gamers become involved in and provides an overview of cognitive mechanisms activated while playing (e.g., *explore* – paying attention to particular videogame elements, discovery, tracking, monitoring, and collecting artefacts; *customization* – paying attention to objects, shapes, contours, colors, manipulating and interchanging game elements, personalization of the game, identification). Therefore it is expected that motivations such as immersion, exploration, customization, and escape are significantly associated with GTP.

Studies suggest that hypnotic susceptibility and afterimage persistency are related to individuals' capacity for sustaining their attention to relevant cues and activities (Atkinson & Crawford, 1992), therefore GTP were not expected to be associated with activities such as finishing playing videogames as fast as possible. More specifically, wanting to finish the game as quickly as possible is the conceptual opposite to exploring and customizing that involve paying attention to elements in the videogame. It was also expected that the playing of videogames for socialization and competitive reasons would not be associated with GTP. This is because such players are less likely to get immersed in the game and interact with game elements and game atmosphere.

1.4. Medical conditions

Some of the GTP experiences appear to share similarities with a symptoms of other medical conditions (Ortiz de Gortari, 2015; Ortiz de Gortari & Griffiths, 2014a). These include photosensitive epilepsy, migraine aura (Panayiotopoulos, 1994) schizophrenia, and hallucinogen persisting perception disorder (American Psychiatric Association., 2013). Gamers have also reported seeing videogame images or hearing voices from videogames triggered by associations with external stimuli (Ortiz de Gortari & Griffiths, 2014a,b). These studies highlight the importance of investigating these variables. The comorbidity between online gaming addiction and mental disorders has been reported in several studies. More specifically, research has reported correlations between gaming addiction and symptoms of ADHD and depression (Hyun et al., 2015). Other comorbidities with gaming addiction include generalized anxiety disorders, social anxiety disorders, borderline personality, avoidant personality, eating disorders, and alcohol/substance abuse disorders (Choi et al., 2009; Gong et al., 2009; Lam, Peng, Mai, & Jing, 2009; Van Rooij et al., 2014).

1.5. Drug consumption

A previous descriptive GTP survey (Ortiz de Gortari & Griffiths, 2015) showed that the majority of the gamers were not under the