Dream Incorporation of Video Game Play: Interactivity, Fidelity and Presence

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Introduction

A wide range of evidence has supported the continuity hypothesis of dream function. Events, personality, and pathology (Schredl & Hofmann, 2003) have all been demonstrated to show a waking to dreaming impact. An easily controlled and impactful presleep event is the use of a film to demonstrate dream incorporation. As our media landscape is changing, so too are our opportunities to use media while awake to investigate issues of dream incorporation. Video gaming offers an ideal presleep stimulus to further investigate the continuity hypothesis.

The effects of video game play have been investigated in a variety of ways. This research has often focused on the potential negative effects of play like modeling aggression, and becoming addicted. Research focusing on the positive educational and psychological effects of video game play is also increasing. These positive effects include cognitive and perceptual benefits as well as psychosocial benefits including stress reduction. Thus, it is becoming increasingly clear that video game play represents a complex experience of childhood, and increasingly of adulthood, not easily reduced to simple condemnations or accolades.

Some early work has used the method of presleep video game. In the previous experimental studies on gaming incorporation (Stickgold, et al, 2001; Wamsley et al, 2010; Ribeiro & Pantoja as reported in Callaway, 2009; Nielsen, Saucier, Stenstrom, Lara-Carrasco and Solomonova, 2007) there was no manipulation of the presleep stimuli except by Nielsen et al (2007). They found differences in participant self-reports of stimuli incorporation into dreams over the two weeks following exposure to varying levels of sensory immersion and interactivity in a game like VR maze. Thus if video games are to be more widely used as a presleep stimuli the conditions of their presentation are important to consider.

Method

Participants: The participants were psychology students, who received course credit for participation in all phases of the study. Forty individuals fulfilled the prescreening requirements and fully fulfilled the research requirements. Those that had moderate to high dream recall, that were not susceptible to motion sickness, and were high end video game players were selected for this study.

Materials

1) Pre-screening Inventory: This inventory consisted of a set of questions concerning dream recall that Gackenbach and associates have used in past studies.

2) Multimedia Devices: Sony Playstation 3, Mirror's Edge (first person action-adventure game), Zetronix ZX920W 80 inch video goggles with surround sound speaker headphones were used for the high fidelity condition. The low fidelity condition used a 20 inch tube television with built-in mono speakers. A research associate was video-recorded going through the training map, a practice time trial, and through three time trial courses. The associate was instructed to play as if it was his first time playing the game, and the recorded gaming session was used in the low interactivity conditions (for those participants watching a pre-recorded gaming session). The duration of the entire video is 26 minutes.

3) Post-Game Play Questionnaire: Except for a few items the same presence inventory from Lombard and Ditton (1997) was used to inquire about the sense of being there in the game.

4) Dream & Media Use Collection: Participants were taught to use an online dream collection website that allowed for participants to immediately log on and record their dreams upon waking. This was done for 14 days following the gaming experience in the laboratory. Following each dream collection session, subjects were asked to fill out a questionnaire regarding what elements of the dream, if any, were related to the game play experience they had in the lab setting as well as the same post-game presence inventory adapted to dreams.

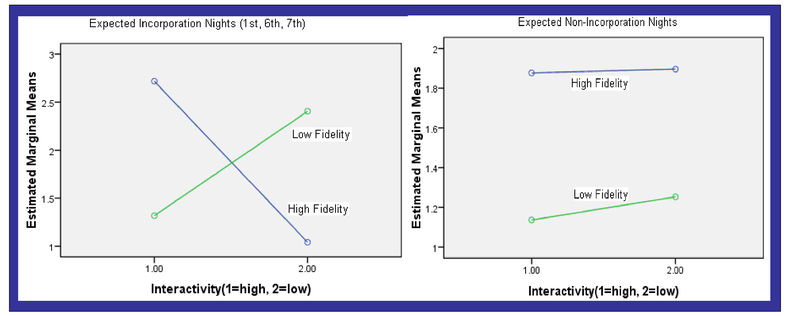
Procedure

Following pre-screening, subjects were randomly assigned to one of four conditions: 1) high immersion (goggles) and playing the game, 2) high immersion (goggles) and watching a recorded gaming session, 3) low immersion (TV) and playing the game and 4) low immersion (TV) and watching a recorded gaming session. In all four conditions the subject first went through the game's tutorial, either watching it or playing it. The playing and watching sessions each lasted between 20 to 30 minutes on average. Following the gaming session, subjects were asked to fill out the modified Lombard presence inventory (mounted online) while still in the laboratory. Finally, subjects were instructed on how to log on to the dream collection website and record their dreams upon waking for the next 14 days.

A dream content analysis tool focused on the video game Mirror's Edge was developed in order to analyze recorded dreams and to identify elements of Mirror's Edge appearing in dreams. Through an exhaustive grounded theory approach several categories were developed: primary in-game elements, secondary in-game elements, conceptual themes, physiological/psychological responses, and laboratory elements.

Results/Discussion

In total, 380 entries into the online dream recording system were identified, resulting in 124 total dreams in 120 entries, of which 117 were fully useful and were evenly distributed across conditions. The amount of dreams recorded per participant ranged from 0 dreams (N=4) to 12 dreams (N=1), with an average of 3.1 dreams. A 2 (interactivity: high/low) x 2 (fidelity: high/low) x 2 (incorporation: 1st,6th,7th/other nights) ANCOVA on self reported incorporation of Mirror's Edge into the dreams with number of words in the dream as a covariate was performed. There were two significant interactions (interactivity x fidelity: F (1, 107) = 5.636, p <.019; interactivity x fidelity x incorporation: F (1, 107) = 4.846, p < .043).



The dreams were analyzed by a trained judge using the Hall and Van de Castle dream coding system. This was done to determine if these dreams of relatively high end video gamers were generally like those collected in previous research by this laboratory (Gackenbach et al, 2009). They were and most notably, video gamers had more dead and imaginary characters, less misfortune, and fewer dreams with aggression but more intense aggression when aggression did occur.

An ANCOVA for interactivity x fidelity x incorporation on the judges assessments of primary elements with word count as a covariate returned a significant 2-way interaction (Interactivity x Fidelity: F(1, 107) = 10.49, p<0.002, partial Eta^2 = 0.089). The 'pure' conditions (i.e. high interactivity, high fidelity and low interactivity, low fidelity) showed the most primary elements, while the 'mixed' conditions showed the fewest primary elements. An ANCOVA for interactivity x fidelity x incorporation on laboratory elements originating from the experimental setting, with word count as a covariate, returned five significant or near significant results. The strongest effect was across dream incorporation days for interactivity x fidelity, low interactivity showed more laboratory incorporations under the high fidelity condition, than did high interactivity. This could be because the participants' attention was less on the game as they were not actually playing it and more on the setting they found themselves in which was quite unique in that they were wearing the high fidelity goggles.

In future research on the effects of video games on dreams fidelity and interactivity should be considered as should the novelty of technology used in differing conditions.