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The effects of digital games on undergraduate players' flow experiences and affect

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Abstract

The purpose of this study is to investigate the effects of digital games on undergraduate players' flow experiences and affect. Our findings suggested that both violent and nonviolent digital games would evoke undergraduate players' flow experiences and positive affect. Digital games may not arouse participants' real life aggression regardless of playing violent or nonviolent digital games. Undergraduate participants' flow experiences and positive affect after playing nonviolent digital games were higher than playing violent digital games. The authors suggested that experimental designs and sex in the participants' composition would have impacts on our results. The limitation was discussed as well.

1. Introduction

The purpose of this study is to investigate the effects of digital games on undergraduate players' flow experiences and affect. The popularity of digital games is phenomenal, with annual revenues from video games worldwide surpassing those of the film industry [1]. There is no doubt that digital games indeed give players short term relaxation and playfulness. Echoing the advocacy of positive psychology [2], in recent years some researchers have supported positive effects on various digital games, including flow experience [3], intrinsic motivation and positive mood[4]. Ferguson's [5] studies of video game violence suggested that there were no evidence for the hypothesis that violent video game playing was related to higher aggression. Accordingly, the authors sought to investigate the positive effects on digital games. Csikszentmihalyi [6] supposed that flow, the optimal experience, was one of the phenomena in the field of positive psychology. Flow refers to a state that someone concentrates

completely on a pleasant activity. Digital games per se have many features that encourage states of flow, such as providing rich immediate feedbacks to player actions, enjoyment, playfulness and appealing to players' attention. These characters are inclined to arouse players' flow experience. Accordingly, the authors attempted to examine the effects of digital game on players' flow experiences. Csikszentmihalyi [6] suggested flow would arouse people's positive affect. The authors sought to examine whether flow in digital games would evoke players' positive affect as well.

Chumbley and Griffiths [7] found that different contents in digital games would arouse different affective responses. Accordingly, the present study would like to explore whether the contents of digital games (violent versus nonviolent) would cause negative effects on players' flow experiences and positive affect.

The purpose of this paper is to investigate the positive effects of digital games: flow experiences and positive affect after players' playing violent and nonviolent digital games. We expected that digital games will contribute flow experiences and positive affect to players, but players' aggression would not be evoked after playing violent and nonviolent digital games. The authors supply a comparative test of two target games: violent versus nonviolent, the participants reported their flow experiences, positive affect and real life aggression after play sessions. In order to ensure the successful manipulate, an advance examination for participants' initial emotion state and appraisal of the playful traits of target games were conducted. The research questions are in the following section.

Are the pretest of participants' emotion before playing target games different?

Are the playfulness traits of target games in playing violent versus nonviolent games different?

Are flow experiences in playing violent versus nonviolent games different?

Are positive affects after playing violent versus nonviolent games different?

Are aggression thought after playing violent versus nonviolent games different?

2. Method

2.1. Samples and Procedure

A sample of 30 (11male; 19 female) undergraduates at National Chiao Tung University in Taiwan participated in return for research credit in their educational psychology course. The repeated-measures designs were used to assign each participant to play the target violent and nonviolent digital games. The 30 participants were randomly divided into two groups (Group A and B). Group A (16 participants) were assigned to play the target violent digital game and group B (14 participants) were assigned to play the target nonviolent digital game. Two weeks later, group A was assigned to play the target nonviolent digital game and group B was assigned to play the target nonviolent digital game. In each experimental process, firstly, they were asked to complete the emotion pretest questionnaire, then to learn how to operate the target games, and finally to complete the other questionnaires after a 30-minute play session.

Target digital games

Violent game: “Grand Theft Auto”. The game assigns a player to be a criminal in a big city. Various missions are set for completion by the figureheads of the city underworld, generally criminal, which must be completed to progress through the storyline.

Nonviolent game: “Super Mario, Crazy Racing”. In the game, the characters from the *Mario* series of videogames and race go-karts around a variety of tracks.

Questionnaires

The authors developed questionnaires consisting of items designed to collect the emotion pretest [8], digital game playfulness traits[9] flow in games [10], positive affect[10], and the real life aggression[11].

The authors used item analysis to delete items to ensure the reliability of the scale. The reliability coefficients (Cronbach’s alpha) of emotion pretest were .78. One item in the scale of was omitted. The reliability coefficients (Cronbach’s alpha) of scale digital game playfulness traits were .83. The reliability coefficients scale of flow in games and positive affect (Cronbach’s alpha) were .91, and .84 for the two scales. Two items in t were omitted, and the reliability

coefficients of the scale real life aggression (Cronbach’s alpha) were .88.

2.2. Statistical analyses

In order to examine the manipulation, the participants were asked to report their initial emotional state and the appraisal of playfulness for the two target games. The paired t-test measures were used to examine whether means from a within-subjects test group vary over the scores reported from scales of emotion pretest, digital game playfulness traits, flow in games, positive affect, and real life aggression after participants playing violent and nonviolent digital games.

3. Results

The T-test of violent and nonviolent games was depicted on Table 1. The participants’ mean scores in emotion pretest were under the midpoints (equal to 4 points) in the scale before playing violent and nonviolent games. The participants reported lower appraisal of playfulness trait for violent games than the midpoints (equal to 4 points) in the scale, but they reported higher appraisal of playfulness trait for nonviolent games than the midpoints (equal to 4 points). The participants reported higher scores than the midpoints (equal to 4 points) in the scale of flow experiences and positive affect.

Table1.Pair T tests between violent and nonviolent games. (N=30)

	Violent games		Nonviolent games		t -Value
	M	SD	M	SD	
Emotion Pretest	3.12	0.82	3.20	0.82	-0.58
Game Playful trait	3.98	1.47	4.38	1.02	-1.26
Flow Experiences	4.08	1.28	5.38	1.11	-5.22***
Positive Affect	4.30	1.45	5.67	1.08	-4.07***
Real life Aggression	2.33	0.95	2.33	0.95	-0.01

* $p < .05$ ** $p < .01$ *** $p < .001$

The findings of paired t test measurements indicated that there were no significantly differences between participants’ emotion pretest and appraisal of playful traits for target digital games. The findings could be used for manipulate check to ensure that participants’ the initial emotion and appraisal of the playfulness traits for the two target games were not

different, comparing the follow-up measurement: flow experiences, positive affects and real life aggression.

There were significant differences in flow experiences and positive affect between playing violent and nonviolent target games. Participants reported higher scores in flow experiences ($M=5.38$ vs. 4.08) and positive affect ($M=5.67$ vs. 4.30) after playing the target nonviolent game than after playing the target violent game.

Finally, the two group participants reported much less scores ($M=2.33$ vs. 2.33) in the scale of real life aggression than the midpoints (equal to 4 points). There were no significant differences in real life aggression after playing violent versus nonviolent target games.

4. Discussion

The results of study showed that playing both violent and nonviolent digital games could arouse participants' flow experience and positive affect. In addition, participants reported significant higher scores in flow experiences ($M=5.38$ vs. 4.08) and positive affect ($M=5.67$ vs. 4.30) after playing the target nonviolent game than after playing the target violent game. Echoing the findings of Chumbley and Griffiths [7], they found that different contents in digital games would arouse different affective responses. Our finding also appeared that violent digital games could not arouse players' higher positive affect than nonviolent digital games. The mean scores of real life aggression between the violent and nonviolent games were under the midpoints of responses. In addition, there were no significant differences in real life aggression after playing violent versus nonviolent target games. The results may explain that digital games could not evoke real life aggression regardless of violent or nonviolent digital games. Along with Ferguson's [5] research, our findings suggested that violent digital games were not associated with aggression and there might be publication bias on negative effects of violent digital games.

5. Limitation

Csikszentmihalyi(1990) suggested scholars to use the experience sample method to explore the human's flow experiences. In the current study, using an experiment and survey to investigate the flow experiences in digital games may not reflect the delicate and immediate appearance of players' flow experiences. The participants may report their belief in game experiences, but did not reflect the experiences of

the moment while playing. Researchers have suggested violent digital games will produce negative effect on adolescents, our samples were college students: late adolescents. They are possible mature enough to differentiate between good and evil from the digital games. The negative so-called negative effects of violent games were decreased. In addition, although the addicted players were not investigated here, it was possible that few samples were addicted. Addicted players' short term positive affect aroused by digital games may have impacts on our data analysis. The future research could design another experiments or use experience sample method to improve the construct validity and the reliability.

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