Full length article

When newbies and veterans play together: The effect of video game content, context and experience on cooperation

Yuchang Jin [a], [*], [1], Junyi Li [b], [c], [**], [1]

[a] College of Teacher Education and Psychology, Sichuan Normal University, Chengdu 610066, China
[b] School of Psychology, Central China Normal University, Wuhan 430079, China
[c] Key Laboratory of Adolescent Cyberpsychology and Behavior (CCNU), Ministry of Education, Wuhan 430079, China

ARTICLE INFO

ABSTRACT

This paper explores the effect of video game content, context and experience on cooperative behavior over three research studies. Study 1 is a cross-sectional correlation study exploring the relationship between the video game team-play frequency and pro-social behavior, Study 2 is a 2 (game content: violent video game and neutral video game) × 2 (game context: single-play and team-play) design with the dependent variable being cooperative behavior and Study 3 is a single factor design experiment which examines the effect of the gaming experience on cooperative behavior under a collaborative context. The main findings were that the team-play frequency had a positive correlation with pro-social behavior, and pro-social video game exposure significantly predicted pro-social behavior. Collaborative play was found to significantly increase cooperation in both violent and neutral video games. However, the level of gaming experience tended to moderate the relationship between collaborative play and the level of cooperation.

1. Introduction

Over the past 30 years, the video game industry has evolved from a novelty entertainment to a multi-billion dollar industry involving millions of participants all over the world. Playing methods have also evolved from a handful of games played on bulky stand-alone home systems to video games on specialized console systems, personal computers, handheld systems, PDAs, and even cell phones (Carnagey, Anderson, & Bushman, 2006). However, accompanying this video game market success, there has been a continuing public debate about the impact on players of sustained video game exposure (Ferguson, 2013), in which many people, both qualified and unqualified, have highlighted the risks of video game addiction such as violent behavior and learning disabilities. Studies which have examined the negative effects of video games have stated that prolonged playing can lead to aggressive behavior (Adachi & Willoughby, 2011; Ferguson, Miguel, Garza, & Jerabeck, 2012; Hasan, Begue, Scharkow, & Bushman, 2013), aggressive

cognition (Gilbert, Daffern, Talevski, & Ogloff, 2013; Krahe et al., 2011), aggressive affect (Hasan, Begue, & Bushman, 2012; Zhen, Xie, Zhang, & Wang, 2011) and physiological desensitization (Panee & Barllard, 2002). As a result of these studies, parents, educators and policymakers have tended to view video games as "bad". However, while these views have somewhat damaged the image of video games, in reality, different video game content has different outcomes for different players (Eastin, 2006; Gentile, 2011; Velez, Mahood, Ewoldsen, & Moyer-Guse, 2012).

2. Literature review

2.1. Game content

There is no standard definition for what constitutes video game content as most video games have tended to focus on the script elements or themes in the games (Gentile, 2011). While it is acknowledged that there are a wide range of video games, most

---

* Corresponding author. College of Teacher Education, Sichuan Normal University, No. 5, Jingan Road, Jinjiang District, Chengdu 610068, China.
** Corresponding author. School of Psychology, Central China Normal University, Wuhan, 430079, China.
E-mail addresses: Jinyuchang@gmail.com (Y. Jin), 48162003@qq.com (J. Li).
[1] The two authors contributed equally to the study. They should be regarded as joint first author.

studies have focused on the long and short-term effects of violent video games. Saleem, Anderson, and Gentile (2012a, 2012b) found that violent video games increased hurtful behavior and decreased empathic or helpful behavior. Huesmann (2010) suggested that violent video games increased participant aggressive cognition. Meta-analyses have shown that violent video game exposure can be a causal risk factor for increased aggressive behavior, aggressive cognition, aggressive affect, decreased empathy and anti-social behavior (Anderson et al., 2010).

Nonetheless, not all video games are violent and evoke aggressive behavior. Quite a lot of video games contain prosocial content, in which players and game characters help and support each other in nonviolent ways (Gentile, 2009). Some studies have also examined the possible effects of playing pro-social video games and it was found that games with pro-social content increased pro-social thoughts (Greitemeyer & Osswald, 2011; Hao et al., 2013), pro-social affect (Saleem et al., 2012a, 2012b), and empathic behavior (Gentile et al., 2009; Saleem et al., 2012a, 2012b), and reduced antisocial affects (Greitemeyer, Osswald, & Brauer, 2010), aggressive cognition and aggressive behavior (Greitemeyer & Osswald, 2009; Greitemeyer, Agthe, Turner, & Gschwendtner, 2012). These results indicated that depending on content, video games can have both positive and negative effects.

2.2. Game context

Most video game studies have focused on the influence of video game content. Gentile (2011), however, extended this focus and identified five dimensions of video game influence; time spent playing, game content, game context, game structure, and game play mechanics. Most studies have examined the influence of the time spent playing video games (e.g. the more time spent playing video games has been related to poor school performance) and content (e.g. violent video games vs. pro-social video games). Several prior studies have also tested the effect of structure (e.g. first-person vs. third-person perspective) and mechanics (e.g. playing a racing game with a wheel and pedals instead of keyboard, Gentile, 2011). Anderson's et al., 2010 meta-analysis tested the effects of player perspective, player role and target type as potential moderators of the violent game effect on aggressive behavior in experimental studies, and found no evidence of such moderation.

The least researched dimension of game effect, however, is how the game context alters or creates effect (Gentile, 2011). Video games are no longer simply solo activities played in isolation; instead, they can be played in a variety of social contexts. In China, 300 million people, or 66.5% of the total internet users, play internet-based video games (Zhang, Li, Song, Li, & Wei, 2009). Video game play context was first examined in a paper by Anderson and Morrow (1995) which looked at the effects of competitive and cooperative play in the Super Mario Bros games and found that people who were told to compete with one another in the game were more likely to kill, rather than bypass, enemy characters (Anderson & Morrow, 1995). Ewoldsen et al. (2012) found that compared with players in competitive play conditions, players in cooperative play conditions engaged in more reciprocal behavior—a pattern of behavior that typically precedes cooperative behavior. Lim and Lee (2009) also suggested that compared with solo play, collaborative play led to a significant decrease in arousal in response to violent tasks and a slight increase in arousal in response to nonviolent tasks. These findings point to the importance of understanding how game playing social contexts can shape psychological outcomes in cooperative games. From these insights, we propose hypothesis 1: Video game team-play frequency and pro-social behavior have a positive correlation.

Research has shown that playing cooperative team-player (rather than single-player) violent video games increases cooperative behavior toward a player who is not a video game partner (Greitemeyer, et al., 2012; 2012). This suggests that the cooperative effects may extend to different people and different contexts. In Greitemeyer's research, participants played a violent video game in either a single-play or a team-play condition. In the control condition, participants played a neutral single-player video game, but as there was no team-play neutral video game condition included in this experimental design, it was still unknown as to whether cooperative team-play increased cooperation compared to the single-player neutral video game condition. With this in mind, therefore, in this paper, we extend this experimental design and propose hypothesis 2: Playing cooperatively in a team-player neutral game condition increases cooperative behavior compared to the single-player neutral video game condition.

2.3. Game experience

In Gentile's multiple video game effect dimensions, the time, content, context, structure and mechanics are all about the game play. A player characteristic dimension, such as player experience, therefore, could also be a factor. Castel, Pratt, and Drummond (2005) demonstrated that with action video games, visual selective attention was influenced by the level of gaming experience. Compared to those who do not play video games (inexperienced gamers), video game players (experienced gamers) rely on similar types of visual processing strategies but possess faster stimulus-response mappings when faced with visual attention tasks. Some researchers have suggested that experienced action game players outperform inexperienced action game players on tests of visual short-term memory and processing speed (Blacker & Curby, 2013; McDermott, Bavelier, & Green, 2014). However, Unsworth et al. (2015) found nearly all of the relationships between video game experience and cognitive abilities were near zero. Although scholars have not reached a consensus, these studies have all demonstrated the importance of game experience. To our knowledge, there have been few experimental studies which have tested the effect of gaming ability or gaming experience on cooperation levels. Some studies have found that playing cooperative video games increases cooperative behavior (Greitemeyer, 2013), but these did not identify the boundaries or moderators of these effects. For example, an inexperienced player may become frustrated when they have little experience of a game's operation, which could lead to low team performance and drag down the participants' cooperative score. Unlike Gentile's multiple dimension game play focus, this paper focuses on both these aspects as well as gamer aspects. Therefore, we propose hypothesis 3: gamer experience moderates the relationship between cooperative game play and cooperative behavior.

2.4. The general learning model

Video game effects can be understood within the framework of the General Learning Model (GLM) (Buckley & Anderson, 2006; Maier & Gentile, 2012). The GLM includes both short-term and long-term learning models and starts with the assumption that actors exist within an environment and that both the person factors and the environment influence the learning opportunities (Gentile, Groves, & Gentile, 2014). Person factors include all aspects of the person at that moment in time, including all prior learning, genetic predisposition, personality traits, beliefs and attitudes, mood, gender, short and long-term goals, motivation, and attentional resources. The situational factors include all of the information and affordances available in the environment at any given moment, such as the physical environment, other potential actors in the