



Video games as virtual teachers: Prosocial video game use by children and adolescents from different socioeconomic groups is associated with increased empathy and prosocial behaviour



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ARTICLE INFO

Article history:

Received 13 December 2015

Received in revised form

3 April 2016

Accepted 23 May 2016

Keywords:

Prosocial video game use

Violent video game use

Prosocial behaviour

Empathy

Socioeconomic status

Young people

ABSTRACT

Objective: The main aim of this study was to determine if there was a positive relationship between prosocial video game use and prosocial behaviour in children and adolescents.

Method: This study had a cross-sectional correlational design. Data were collected from 538 9–15 year old children and adolescents between March and December 2014. Participants completed measures of empathy, prosocial behaviour and video game habits. Teachers rated the prosocial behaviour of participants. The socioeconomic status of participants was also gathered.

Results: Multiple linear regressions were conducted on these data. Prosocial video game use was positively associated with the tendency to maintain positive affective relationships, cooperation and sharing as well as empathy. This association remained significant after controlling for gender, age, school type (disadvantaged/non-disadvantaged), socioeconomic status, weekly game play and violent video game use.

Conclusions: These findings provide evidence that prosocial video game use could develop empathic concern and improve affective relationships in a diverse population of young people.

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1. Introduction

The increasing engagement of young people with media including video games is well documented (Rideout, Foehr, & Roberts, 2010). Computer and video game sales in the US have risen from 7 billion dollars in 2003 to 15.4 billion dollars in 2014 (Entertainment Software Association, 2015). Some researchers have suggested that video games could be used as teaching resources in schools as these games are based on learning principles that allow players to be producers rather than consumers (Gee, 2003). In this context the use of video games in both educational and clinical settings has received attention recently from researchers (Granic, Lobel, & Engels, 2014).

Anderson and Bushman (2001) ask if it is possible to create engaging video games “to teach and reinforce nonviolent solutions to social conflicts” (Anderson & Bushman, 2001, p.359). According to researchers in this area, a prosocial video game is a game in

which the player must help and cooperate in order to succeed. Examples of games with these characteristics that have been used in previous research are *Animal Crossing*, *Super Mario Sunshine*, *Zoo Vet* and *Lemmings* (Gentile et al., 2009; Greitemeyer & Osswald, 2010)¹.

The General Learning Model (GLM) (Gentile et al., 2009) proposes that each experience (eg. playing a video game) an individual has is a learning trial which temporarily alters cognitions, emotions and levels of physiological arousal. The GLM proposes that two short-term processes explain prosocial video game effects. Firstly, the cognitive effect of priming scripts predicts that games with

¹ Previous studies have used prosocial video games such as *Lemmings* (Greitemeyer & Osswald, 2010) in which there is no violence and the player performs prosocial acts such as protecting a lemming from harm. However, content analysis of 33 best-selling video games found that 79% of these games had some form of violent content (Dietz, 1998). Therefore as games with only prosocial content are less common, the present study uses the variable ‘prosocial video game use’ to refer to prosocial behaviour within a game and ‘violent video game use’ to refer to violent behaviour within a game. For example, in the game *Minecraft* it is possible to cooperate with other players and construct buildings; however it also possible to fight creatures.

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prosocial content will result in prosocial behavioural scripts being primed and rehearsed. Secondly, changes in cognitions, feelings and levels of physiological arousal while playing a prosocial video game are reciprocally reinforced through both classical and operant conditioning.

Repeated practice of video games could produce certain long-term effects such as changes to precognitive and cognitive constructs, cognitive-emotional constructs and affective traits. This model when applied to prosocial video game use predicts that a game which requires the player to use prosocial behaviours to succeed will create an increase in prosocial behaviours in the player immediately following completion of the game. The repeated practice producing these short-term effects could change personality traits in the individual playing prosocial video games. Conversely the amount of time spent playing violent video games could result in long-term aggressive behaviour according to the learning mechanism described in this model (Gentile et al., 2009).

A recent meta-analysis has provided evidence that video games have social outcomes (Greitemeyer & Mugge, 2014). This meta-analysis and other recent studies have concluded that violent video game use leads to desensitization and aggression while prosocial video game use increases empathy and therefore prosocial behaviour (Gentile et al., 2009; Greitemeyer & Mugge, 2014; Prot et al. 2014; Gentile, Khoo, Prot & Anderson, 2014).

1.1. Empathy and prosocial video game use

Researchers have suggested that the relationship between prosocial video game use and prosocial behaviour could be mediated by empathy as opposed to accessibility to prosocial thoughts (Bartlett & Anderson, 2013). Previous correlational research into prosocial video game effects in children and adolescents has found a significant positive association between prosocial video game use and empathy (Gentile et al., 2009). A recent longitudinal study found that prosocial video game use was a significant predictor of prosocial behaviour and that this change was mediated by empathy (Prot et al., 2014). Therefore in the context of previous research it is reasonable to expect that prosocial video game use should be positively associated with empathy.

1.2. Theoretically relevant confounding variables such as sociodemographic factors and weekly game play

Research has shown that when controlling for long-term causal factors for aggressive behaviour, such as personality and environmental factors, violent video game effects can disappear (Ferguson, San Miguel, Garza, & Jerabeck, 2012). Therefore in the case of prosocial video game effects, it is theoretically possible that when controlling for sociodemographic factors and weekly gameplay that prosocial video game effects could disappear.

The following independent variables could theoretically explain part of the variance in prosocial behaviour: age, gender, socioeconomic status (SES), school status and weekly gameplay. The relationship between age and prosocial behaviour has been extensively studied ranging from the impact of adverse childhood experiences on prosocial behaviour (Caprara & Pastorelli, 1993) to factors influencing the development of prosocial behaviours in childhood and adolescence (Eisenberg & Mussen, 1989). Gender differences in prosocial behaviour have focussed on the agentic theory of male gender role models (Eagly & Crowley, 1986) as well as differences in the levels of prosocial behaviour in male and female children (Calvo, Gonzalez, & Martorell, 2014). While experimental research found that lower levels of social status were associated with higher levels of prosocial behaviour (Guinote, Cotzia, Sandhu & Siwa, 2015), clinical and developmental psychologists have noted the

difficulty that parents in socially disadvantaged communities have in reinforcing prosocial behaviours in their children (Kazdin, 1987). A study examining the effect of family, school and classroom ecologies on children's social and emotional development found that first grade children who attended schools in disadvantaged communities had lower levels of prosocial behaviour (Hoglund & Leadbetter, 2004). Screen time in the form of weekly game play has also been found to be negatively associated with prosocial behaviour (Gentile et al., 2009). Therefore weekly game play could also explain some of the variance in prosocial behaviour.

If the relationship between prosocial video game use and prosocial behaviour remains significant after controlling for the abovementioned theoretically relevant independent variables it could be argued that this provides stronger evidence for a prosocial video game effect (Prot & Anderson, 2013).

1.3. Violent video game use and prosocial behaviour

Numerous studies have identified relationships between violent video game use and aggressive behaviour (Anderson et al., 2010; Gentile et al., 2014). There have also been a number of studies suggesting that violent video game use is associated with decreases in prosocial behaviour (Anderson et al., 2010; Gentile et al., 2009).

Therefore, based on previous research, it is reasonable to expect that violent video game use will be negatively associated with prosocial behaviour in children and adolescents.

1.4. The present study

Previous studies into violent and prosocial video game effects have generally accessed normative community-based samples (Anderson, Gentile, & Buckley, 2007). Boxer, Huesmann, Bushman, O'Brien and Mocerri (2008) sought to address this deficit in relation to violent media effects by including a sample of juvenile delinquents in a study into the relationship between violent media use and involvement in violent acts. In addition numerous studies have investigated the video game use of specific clinical samples such as individuals with Autistic Spectrum Disorder (Mazurek & Engelhardt, 2013). A recent study investigated the role of low educational ability as a risk factor for playing violent video games (Bijvank, Konijn, & Bushman, 2012). Prot et al. (2014) note that in studies investigating prosocial video game effects in both children and adolescents that socioeconomic status (SES) and parental education were measured. However, neither of these variables were controlled for in the statistical analysis. Therefore to our knowledge this is the first correlational study into prosocial video game effects to statistically control for both SES and school status.

The present study primarily aimed to determine if there was a positive relationship between prosocial video game use and prosocial behaviour in children and adolescents. In addition three related objectives were pursued. These objectives related to theoretically relevant variables that were identified based on a review of the literature on both video game effects and prosocial behaviour.

These three objectives were as follows:

- Objective 1 : To determine if prosocial video game use was positively associated with empathy in children and adolescents.
- Objective 2 To determine if the relationship between prosocial video game use and prosocial behaviour remained significant after controlling for theoretically relevant variables such as sociodemographic variables and weekly game play.

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