



Video game play and anxiety during late adolescence: The moderating effects of gender and social context



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ABSTRACT

Background: Few studies have examined factors that moderate the relationship between playing video games and adolescent psychological adjustment. Therefore, the primary goal of this study was to examine the relationship between playing video games and anxiety symptomatology in a sample of 441 11th and 12th grade students, while considering both gender and the social context (whether they played alone or with others).

Methods: Participants (66% non-Hispanic White) were administered a survey (including measures of technology use and anxiety symptomatology) in school at baseline and one year later.

Results: Both gender and the social context moderated the relationship between playing video games and anxiety symptomatology. Boys who played video games the most had the lowest levels of anxiety, whereas girls who played video games the most had the highest levels of anxiety. This relationship was exacerbated in the context of playing with others.

Limitations: Although the study has a number of strengths including the longitudinal design and the diverse sample, the study relied on self-report data. In addition, the sample was limited to adolescents residing in the Mid-Atlantic United States. Therefore, caution should be taken in regard to generalizing the results.

Conclusions: Findings from this study underscore the need to consider both gender and the social context when examining the relationship between playing video games and adolescent psychological adjustment.

1. Introduction

Technology use is a central component to contemporary adolescent behavior. Nearly all adolescents (95%) are online (Madden et al., 2013), with 24% reporting that they are online “almost constantly” (Lenhart, 2015). The majority of adolescents (78%) have their own cell phone (Lenhart, 2015; Madden et al., 2013) and most adolescents (72%) report playing video games (Lenhart, 2015). Of note, playing video games has become both increasingly complex and accessible. Adolescents no longer need to own a video game console and now can play online (on a computer or a hand-held electronic device such as a smartphone or tablet), alone or with others. Data from the Pew Research Center indicate that 89% of adolescents play video games with friends they know in person, 54% play with friends they know online, and 52% play with individuals who are not friends online (Lenhart et al., 2015). Playing video games online may provide adolescents with social connections to individuals with similar interests. In 2015, 57% of adolescents reported that they had met a new friend online, most through social networks or playing online video games (Lenhart et al.,

2015).

Research has shown that adolescent boys play video games more than adolescent girls (Lenhart et al., 2015; Ohannessian, 2009, 2015). More boys than girls own a gaming console (91% versus 70%, respectively), and adolescent boys are more likely to play video games online or on their phone than are adolescent girls (Lenhart et al., 2015).

Numerous studies have found playing video games to be linked to negative outcomes during adolescence including aggressive behavior, academic problems, physical inactivity, weight gain, body fat, and sleep difficulties (Adachi and Willoughby, 2016; Añez et al., 2016; Costigan et al., 2013; Greitemeyer and Mügge, 2014; Hofferth and Moon, 2012; Lemola et al., 2015; Suchert et al., 2015). Fewer studies have focused on positive effects that video game play may have on youth. However, recent research has indicated that playing video games is associated with positive self-competence and athletic competence, increased participation in sports, advanced cognitive skills, and more time spent with parents (Adachi and Willoughby, 2015; Añez et al., 2016; Costigan et al., 2013; Green and Bavelier, 2007; Hofferth and Moon, 2012; Ohannessian, 2016; Suchert et al., 2015). Of note, relatively few studies

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have focused on the link between playing video games and psychological adjustment during adolescence. Moreover, the relationship between playing video games and adolescent anxiety has been especially neglected. This is an important oversight given that approximately one-third of adolescents meet the criteria for an anxiety disorder (Maldonado et al., 2013; Merikangas et al., 2010). In addition, many more adolescents experience mild to moderate levels of anxiety; levels significant enough to negatively affect their development (Ohannessian et al., 1999). Notably, in a study examining 9th and 10th grade students, Ohannessian (2009) found that the amount of time playing video games consistently was associated with anxiety symptomatology. However, it currently is not clear whether playing video games is linked to anxiety during late adolescence. Therefore, a primary goal of this study was to replicate the Ohannessian (2009) study in a sample of older adolescents.

Relatively few studies have examined gender differences in the relationship between playing video games and adolescent adjustment. However, in the Ohannessian (2009) study, the relationship between playing video games and anxiety symptomatology was negative for boys, but positive for girls, suggesting that playing video games may be a protective factor for boys, but not for girls. In addition to neglecting to consider gender differences, few studies have examined the underlying mechanisms involved in the relationship between video game play and psychological adjustment. One potential mechanism involves the social context. For some adolescents, playing video games with others may provide them with needed social interactions and support. Interestingly, research has shown that online communication is related to reported closeness to friends (Valkenburg and Peter, 2007). For boys especially, video game play may serve as a central setting for the development and maintenance of friendships (Lenhart et al., 2015). Consistent with this reasoning, boys, much more than girls, have been found to use video games to interact with their peers and friends on a regular basis (Lenhart et al., 2015). As such, an important underlying mechanism involved in the relationship between video game play and psychological symptomatology may be the social context; specifically, whether adolescents play alone or with others.

The primary goal of this study was to extend the literature by addressing the following research questions in a large, diverse community sample of older adolescents (11th and 12th grade students) followed over time: 1) Does playing video games predict anxiety symptomatology during late adolescence? 2) Does gender moderate the relationship between playing video games and anxiety symptomatology? and 3) Does the social context (playing alone versus playing with others) moderate the relationship between playing video games and anxiety symptomatology?

2. Methods

2.1. Participants

The sample included 441 11th and 12th grade U.S. high school students (64% girls; M age = 17.14, SD = .78 years). All 11th and 12th grade students attending one of the seven participating public high schools in Delaware, Maryland, and Pennsylvania were invited to participate. The racial/ethnic breakdown of the sample was: 66% non-Hispanic White, 16% African American, 8% Hispanic, and 3% Asian (the remainder responded with “other”).

2.2. Procedures

The study was approved by the (University of Delaware) Institutional Review Board. Parents provided consent and students provided assent for participation. After assent was obtained, study staff administered a ~ 40 min survey to the participating students in school. Participants were given a movie pass for participation. Seventy-one percent of the students attending the participating schools completed

the survey. The majority of students that did not participate, did not do so because they were absent on the day of data collection. Only three percent of eligible students elected not to participate. All of the participants were invited to participate again one year later.

2.3. Measures

2.3.1. Video game play

The Technology Use Questionnaire (Ohannessian, 2009) assessed video game play. Participants specifically were asked to indicate how much time they spent playing video games (PlayStation, Nintendo, Xbox, computer games, etc.) “on an average/typical day”. The response options were 1 = none, 2 = less than 1 h, 3 = about 1 h, 4 = about 2 h, 5 = about 3 h, and 6 = 4 or more hours. Because video game play was skewed, it subsequently was trichotomized (to reflect relatively equal cell sizes) such that 0 = none (original response option 1), 1 = up to 1 h (original response options 2 and 3), and 2 = 2 h or more (original response options 4, 5, and 6). Participants also were asked to report whether they played video games alone or with others.

2.3.2. Anxiety symptomatology

The 41-item SCARED (Birmaher et al., 1995) was used to assess anxiety symptoms. A sample SCARED item is “I am nervous”. Respondents complete the SCARED in reference to the last three months using a scale ranging from 0 = not true or hardly ever true to 2 = very true or often true. A total score was calculated to reflect overall level of anxiety symptomatology. The SCARED has been shown to have strong psychometric properties (Muris et al., 2002). In our sample, the Cronbach alpha coefficient for the SCARED total score was .94.

3. Results

Preliminary analyses indicated that boys were more likely to play video games alone than were girls ($\chi^2(1) = 13.33, p < .001$). More specifically, 46% and 31% of boys and girls, respectively, reported that they usually played video games alone (versus with others).

A Factorial Analysis of Variance (ANOVA) model was conducted to examine the longitudinal relationship between playing video games and anxiety symptomatology. The design factors were gender and frequency of playing video games (at Time 1) and the dependent variable was anxiety symptomatology (at Time 2). Anxiety symptomatology (at Time 1) was included as a covariate. The model was significant, $F(12, 159) = 7.70, p < .001$. A two-way interaction was found between gender and playing video games, $F(2, 159) = 8.38, p < .001$. As shown in Fig. 1,

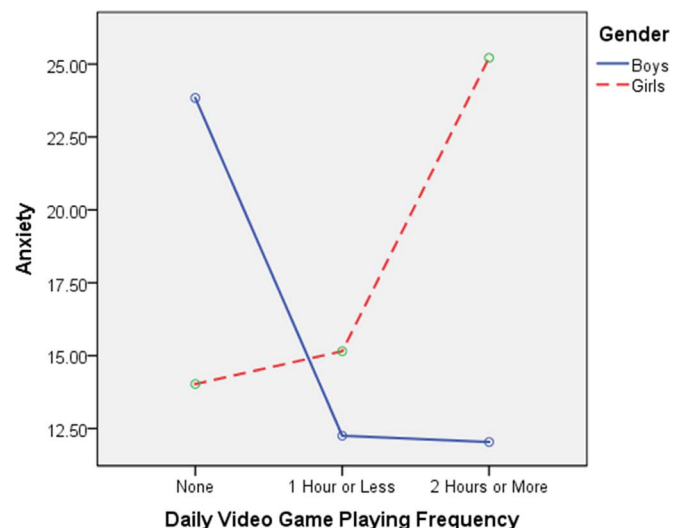


Fig. 1. Interaction between gender and video game playing.

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