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Video Game Play and Anxiety during Late Adolescence: The Moderating Effects of Gender and Social Context

Christine McCauley Ohannessian, Ph.D.^{1,2}

¹Center for Behavioral Health, Connecticut Children's Medical Center, 282 Washington Street, Hartford, CT, USA 06106

²Departments of Pediatrics and Psychiatry, University of Connecticut School of Medicine, 263 Farmington Avenue, Farmington, CT, USA 06030

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.

Correspondence: Christine McCauley Ohannessian, Ph.D., Director, Center for Behavioral Health, Connecticut Children's Medical Center, Associate Professor of Pediatrics and Psychiatry, University of Connecticut School of Medicine, 12 Charter Oak Place, Hartford, CT, USA 06106; Phone: (860) 837-5326; Fax: (860) 836-5342; COhannessian@connecticutchildrens.org.

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Keywords

video games; technology; media; anxiety; gender; longitudinal

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 that 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 & Willoughby, 2016; Añez et al., 2016; Costigan et al., 2013; Greitemeyer & Mügge, 2014; Hofferth & 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 & Willoughby, 2015; Añez et al., 2016; Costigan et al., 2013; Green & Bavelier, 2007; Hofferth & Moon, 2012; Ohannessian, 2016; Suchert et al., 2015). Of note, relatively few studies 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, Lerner, Lerner, & von Eye, 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 & 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?

Methods

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”).

Procedures

The study was approved by the (XXX) Institutional Review Board. Parents provided consent and students provided assent for participation. After assent was obtained, study staff administered a ~ 40 minute 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.

Measures

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 hour*, 3 = *about 1 hour*, 4 = *about 2 hours*, 5 = *about 3 hours*, 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 hour (original response options 2 and 3)*, and 2 = *2 hours or more (original response options 4, 5, and 6)*. Participants also were asked to report whether they played video games alone or with others.

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.

Results

Preliminary analyses indicated that boys were more likely to play video games alone than were girls ($X^2(1)=13.33, p<.001$). 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 Figure 1, girls who played video games the most had the highest levels of anxiety, whereas boys who played video games the most had the lowest levels of anxiety.

A separate ANOVA model was conducted including only individuals who played video games. The model was significant, $F(8, 105) = 8.10, p<.001$. A significant main effect was observed for gender, $F(1,105)=10.62, p<.01$, with girls reporting higher levels of anxiety than boys. Similar to the prior ANOVA, a two-way interaction was observed between gender and playing video games, $F(2, 105)=4.28, p<.05$. In addition, a two-way interaction was found between gender and social context (playing alone versus playing with others), $F(1, 105)=10.70, p<.01$, with girls who played with others reporting the highest levels of anxiety and boys who played with others reporting the lowest levels of anxiety. A three-way interaction between gender, frequency of playing video games, and social context also was

observed, $F(1, 105)=8.75, p< .01$. This interaction indicated that girls who played video games the most, and played with others, had the highest levels of anxiety, whereas boys who played video games the most, and played with others, had the lowest levels of anxiety (see Figure 2).

Discussion

In this study, playing video games was significantly related to anxiety symptomatology, but this relationship depended on gender. More specifically, the relationship between playing video games and anxiety symptomatology was positive for girls, but negative for boys. That is, girls who reported the most video game play reported the highest levels of anxiety, whereas boys who reported the most video game play reported the lowest levels of anxiety. These results are consistent with the Ohannessian (2009) study on video game play and psychological adjustment in middle adolescence and extend this pattern of results into late adolescence. Taken together, the results from these studies suggest that playing video games may be beneficial for boys.

It is not clear why playing video games is related to lower levels of anxiety for boys. One plausible explanation relates to social support. Many adolescents who play video games form friendships while playing. This is especially the case for those who play video games online regularly. Data from the Pew Research Center (Lenhart et al., 2015) indicate that approximately three-quarters of adolescents who play games online with others daily have made friends online and about one-third have made more than five friends online. Notably, boys are more likely to make friends online than are girls (34% of all adolescent boys versus 7% of all adolescent girls; Lenhart et al., 2015). Moreover, 84% of boys (in comparison to 62% of girls) report feeling more connected to friends while playing online. In addition, boys are much more likely than girls to use video games as a way to spend time and engage in day-to-day interactions with their friends, and these interactions occur in both face-to-face settings and in networked gaming environments (Lenhart et al., 2015). Data from the present study are consistent with these findings and suggest that the social connectedness that playing video games may provide may yield psychological benefits, particularly for boys. In the present study, boys who played video games the most, and who played with others (versus alone), had the lowest levels of anxiety.

A different pattern was observed for girls. Consistent with Ohannessian's (2009) study of middle adolescents, playing video games was linked to lower levels of anxiety for boys, but not for girls. In addition to the differences in degrees of social connectedness that video game play appears to provide for boys and girls, this gender difference also may be attributed to the differential manner in which boys and girls use video games. For instance, boys interact with others much more while playing video games than do girls. The majority (88%) of online video-gaming boys report that they talk with their friends while playing, in comparison to about one-half (52%) of online gaming girls (Lenhart et al., 2015). Taken together, these gender differences suggest that boys may reap greater social benefits from playing video games in comparison to girls. It is interesting to note that prior theory and research (Malooly, Flannery, & Ohannessian, 2017; Seiffge-Krenke, 2011; Tenenbaum et al., 2011) consistently have indicated that in comparison to boys, girls use social support and

seeking social connections with others more when coping with problems. However, research to date primarily has focused on face-to-face social support. Perhaps boys are more comfortable seeking out social connections in an anonymous online environment.

Consistent with the Ohannessian (2009) study, girls who played video games the most reported the highest levels of anxiety, especially if they played with others. Perhaps competition inherent in many games is more stressful for girls than for boys. In addition, many online games that involve others are violent. Research has shown that girls do not enjoy violent interactive games with others, whereas boys typically do enjoy such games (Lin, 2010). Such interactions with others may result in increases in levels of stress and anxiety for girls. Clearly, it would be important for future research to examine the types of video games played by boys and girls as a potential moderator and perceived stress as a potential underlying mechanism. Another important mechanism for future studies to address is coping. It is conceivable that playing video games enables boys to mentally disengage from their problems more so than girls. This may especially be the case if boys are more immersed in their game play in comparison to girls (which of course may be associated with the type of video game played). Additional research is needed to address these hypotheses.

In sum, this study contributes to the literature by considering gender and the social context of video game play on anxiety symptomatology in a sample of diverse, older adolescents over time. Nonetheless, limitations should be noted. Of note, the data were self-report. Although young people have been found to be accurate reporters of their own behaviors (Wissink et al., 2006), future studies should validate the results using other types of methodology. In addition, given the non-experimental design, it would be important for future experimental research to examine whether video game play alleviates anxiety for boys and whether it exacerbates anxiety for girls. The social context (playing alone or with others) could easily be incorporated into such a study as well. It also should be noted that the sample was limited to adolescents residing in the Mid-Atlantic United States. Therefore, caution should be taken in regard to generalizing the findings. Nevertheless, findings from this study suggest that playing video games may provide social and psychological benefits for adolescent boys. Future research should systematically examine underlying mechanisms that may be involved in the relationship between playing video games and psychological adjustment.

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Highlights

- Adolescent girls reported higher levels of anxiety than did adolescent boys.
- Adolescent boys who played video games the most had the lowest levels of anxiety.
- Adolescent girls who played video games the most had the highest levels of anxiety.
- The social context moderated the relationship between video game play and anxiety.

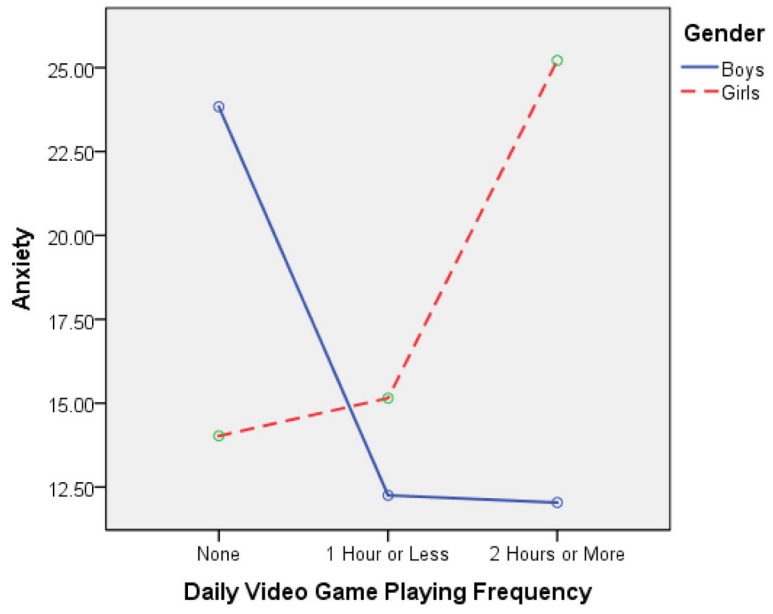


Figure 1.
Interaction Between Gender and Video Game Playing

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Figure-2a

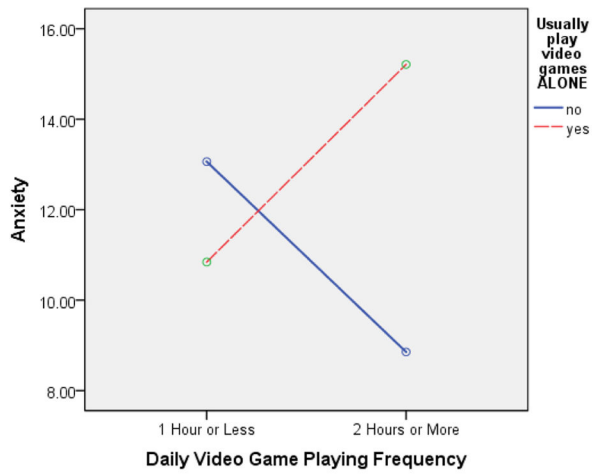


Figure-2b

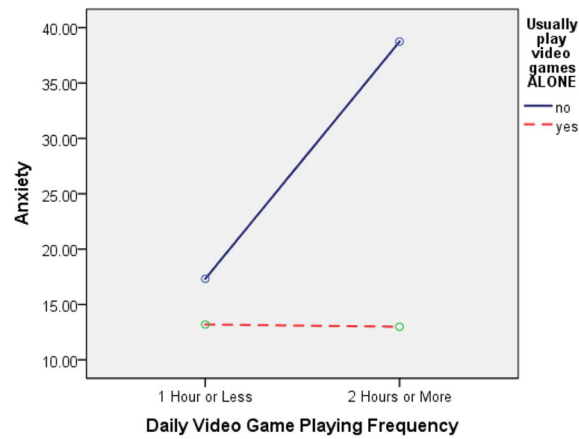


Figure 2.
Figure 2a. Interaction Between Video Game Playing and Social Context Boys
Figure 2b. Interaction Between Video Game Playing and Social Context Girls