Gender and player characteristics in video game play of preadolescents

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\textbf{A B S T R A C T}

The present study explores the relation among different characteristics of preadolescents and their video game habits and preferences. Specifically, the predictive power of age, gender, and psychological adjustment on time spent playing video games and game preference was explored. Children ages 10–15 were given two surveys: a video game habits survey and the BASC-II self-report assessment of personality. Results confirm previous findings of significant gender differences in both time spent playing video games and game type preference. For preadolescents, males were found to spend more time overall playing video games, but for both males and females time spent playing increased with age. No relation was found between time spent playing video games and negative psychological adjustment, as assessed by the BASC-II. Game type preference was predicted by several psychological characteristics. For example, females’ positive feelings about the self were associated with increased likelihood of electing First Person Shooters as a favored game type, and males’ internalizing difficulties were associated with decreased likelihood of electing Massively Multiplayer Online Role Playing Games (MMORPGs). The current findings confirm previous results with preadolescents, an under-studied age group, and lend novel insight into the psychological processes that contribute to video game preference.

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1. Introduction

1.1. Gender differences in preadolescent play

By the time children reach early adolescence, they have already garnered vast information and experience on the gendered nature of play and leisure activities in which they engage. While the gender typing of play is first learned in preschool, children tend to be more rigid in their application of gender rules in the early elementary years, and then become more flexible in their attitudes by preadolescence (Trautner et al., 2005). Expectations around which gender will engage in particular activities nonetheless persist through adolescence, often influenced by gender stereotypes held by parents, such that early adolescents’ perceptions of competence and activity choices in both academic and leisure domains are often gender differentiated (Eccles, Jacobs, & Harold, 1990). Despite increasingly egalitarian views about others as children reach middle school, Liben and Bigler (2002) demonstrated that by sixth grade, boys continue to identify with stereotypically masculine traits, while girls’ identification with stereotypically feminine traits declines somewhat. This suggests that preadolescent boys and girls continue to choose leisure activities, such as video game play, along gendered lines. However, this research indicates that we might expect girls of this age to be less rigid in their selection of video games, such that they prefer to play more stereotypically masculine games, while boys continue to be more rigid in their preference for masculine games.

1.2. Gender differences in video game play in preadolescence

Over the past decade, there has been a steady increase in the amount of time children and adolescents spend playing video games, with children ages 11–14 years spending more time playing video games than any other age group (Rideout, Foehr, & Roberts, 2010). Not surprisingly given gender differences in other domains, considerable gender differences have been found in both time spent playing video games and game preference (Hamlen, 2010, 2011; Ivory, 2006; Jenson & de Castell, 2010; Livingstone & Bovill, 1999). The 2005 Kaiser Family Foundation report indicate that boys ages 8–18 were spending three times as much time as girls playing video games (Roberts, Foehr, & Rideout, 2005); in the more recent 2010 report, however, this differed lessened as boys were found to spend twice as much time as girls playing videogames (Rideout et al., 2010). This suggests that the gender discrepancies in time spent playing video games may be diminishing as video game play becomes more and more ubiquitous.
Nonetheless, gender differences in game play are well established, and they extend beyond the time spent playing such games and into the types of games boys and girls prefer. Although there is some evidence that preadolescent boys and girls differ in game preferences (Greenberg, Sherry, Lachlan, Lucas, & Holmstrom, 2010; Hamlen, 2010, 2011; Livingstone & Bovill, 1999), this age is under-represented in games research. Hamlen (2011) investigated the relationship behind student’s learning strategies in video games and their gaming genre preferences. Using a mixed-methods approach, Hamlen analyzed survey responses from 118 fourth- and fifth-grade public school students. The survey asked students about their gaming habits, such as time spent playing games, and had the students name the two games they play most frequently. Results indicated that, for boys, games classified as falling within the Action genre were the most popular, followed by the Simulation genre. However, for girls, the Simulation genre was the most popular, followed by Action, Educational, and Adventure genres.

Greenberg et al. (2010) has also examined gender and age differences in relation to video gaming activity in younger populations. The study analyzed data from two samples consisting of 692 fifth-, eighth-, and eleventh-grade rural and urban public school students and 550 university students. Participants completed a self-report questionnaire pertaining to video game preferences, gratifications derived from playing video games, and time spent playing video games. The questionnaire asked participants to rate their enjoyment of 14 game types (Strategy, Fantasy/Role Play, Adventure, Shooter, Fighting, Simulation, Arcade, Card/Dice, Quiz/Trivia, Board Games, Kids Games, Sports, Racing/Speed, and Puzzles). These game types were ultimately grouped into three categories: Imaginative (Strategy, Fantasy, and Adventure), Traditional (Arcade, Card/Dice, Quiz/Trivia, Board Games, Puzzles), and Physical (Sports, Fighters, Shooters, and Racing/Speed). The results of the study indicated that males played video games significantly more than females, more than double the average hours per week. Among males, physical games were favored, followed by Imaginative and then Traditional games; in contrast, females favored Traditional games over Imaginative and Physical games, which followed in that order. Game playing time was found to increase with age up until 8th grade, at which point playing time peaked, and subsequently declined through later adolescence. Greenberg et al. also investigated the motivations of playing video games, and found that both boys and girls were motivated to engage in video game play as a form of diversion.

Given the peak in time spent playing video games evident in early adolescence (Greenberg et al., 2010; Rideout et al., 2010), as well as changes in gender-typing in leisure activities that occurs during this age range (Liben & Bigler, 2002), the video game habits of this age group warrants further investigation. In the current study, we examined gender in weekly game playing time and game-type preferences in children ages 10–15. The variables of game playing time and game type preference have been used in the past in similar research with populations of various ages and are considered representative indicators of player experience (Greenberg, Sherry, Lachlan, Lucas, & Holmstrom, 2010; Hamlen, 2010, 2011; Livingstone & Bovill, 1999).

1.3. Video game play as a predictor of personality

Much research on video games has explored the extent to which playing games predicts aspects of psychological maladjustment such as aggression, depression or anxiety. Many adults with little experience with video games assume that game play is an isolating or inherently anti-social activity (Olson, 2010). Though not an explicitly stated theoretical stance, research that stems from this perspective approaches video games as environmental influences that result in maladaptive psychological outcomes. Research in this vein often focuses on violent video games and aggressive behavior. For example, in a study with adolescents, Gentile, Lynch, Linder, and Walsh (2004) examined the amount of game play of violent games as related to aggressive behavior in 607 eighth and ninth grade students. Results from this study suggested that exposure to violent games results negative outcomes, such as arguments with teachers, poor grades, and physical fights, though these relationships were mediated by overall trait hostility.

Two recent meta-analyses, one conducted by Anderson et al. (2010), and another by Ferguson (2007), come to different conclusions regarding the association between exposure to violent video games and aggression. Anderson et al. concluded that exposure to violent video games results in higher instances of aggressive cognition and affect and lower levels of prosocial behavior and empathy. However, Ferguson concluded that, due to publication bias, the strength of the correlation between violent video game play and aggression has been overstated, and that playing violent video games does not lead to increases in aggression. Both meta-analyses cover a broad age range and therefore do not lend specific insight into aggression and video game play in middle school-aged children.

Ferguson (2011) has explored the relationship between video game play, along with television use, and attention problems among preadolescents. The study examined 603 participants ranging from 10 to 14 years of age and representing a predominantly Hispanic (96.8%) population. These results indicated that attention problems were best predicted by a variety of factors, such as male gender, anti-social traits, delinquent peers, negative associations with adults, and anxiety, rather than video game use and television viewing. With regard to television and video game use, path analysis indicated there was not a significant relationship between the amount of media use or exposure to violent content and attention problems.

Recent work has found little support for the notion that anxiety and depression results from video game play. In a study of 328 ninth and tenth graders, Ohannessian (2009) sought to explore the relationships between media use and psychological adjustment. In particular, the study investigated the use of popular media types among adolescents, and how these are related to gender, parental alcoholism, and adolescent anxiety and depression. Respondents completed self-report questionnaires. Analyses revealed a significant main effect for gender, with further analysis revealing that girls indicated spending significantly more time talking on the phone than boys, while boys reported significantly more time spent playing video games. In addition, the results indicated a significant interaction between gender and playing video games. Boys who reported a high level of video game playing reported the lowest levels of anxiety, while girls who responded with high levels of video game playing reported the highest levels of anxiety. Ohannessian (2009) did not find any links between any types of media and depression.

There are limitations to the research that investigates negative psychological adjustment as a result of video game play. As indicated by the results of Gentile et al. (2004) that trait hostility mediates the effect of violent game play on aggression, individual differences in players who elect to play video games may account for aggressive or maladaptive behavior. Similarly, Anderson and Dill (2000) found that the relationship between violent video game play and aggressive behavior was stronger in participants who were characterized as aggressive. Research in this domain often fails to consider potential risk factors that could also impact a child’s psychological adjustment. Furthermore, the correlational nature of this research makes it impossible to determine if the video games are causing violent behavior or if aggressive children have a tendency to play violent video games.
Research in this tradition investigates video game play as a predictor of personality such that the types of games an individual plays and the time spent playing video games are thought to be related to negative psychological outcomes. Accordingly, an individual who plays violent video games, such as First Person Shooter and Fighting games, may be hypothesized to have elevated levels of psychological maladjustment, possibly in the form of negative attitudes towards school and teachers and negative relationships with others. Another prediction from this perspective is that greater time spent playing video games will be related to attention or hyperactivity. Time spent playing video games may also be thought to be associated with internalizing symptoms, such as anxiety and depression. As discussed below, the current study employs an alternative theoretical approach, but nonetheless investigates the relationship between game play and players’ attitudes about school, interpersonal relationships, attention and hyperactivity, and internalizing behaviors.

1.4. Personality as a predictor of video game play

An alternative approach in video game research is to investigate video game play as a result of personality such that individuals choose the video games they play based on their psychological needs. The Uses and Gratifications approach to understanding media use suggests that features of personality, psychological and social needs, are thought to predict game play habits, rather than vice versa. First posited by Katz, Blumler, and Gurevitch (1973–1974), this approach theorizes that the social and psychological characteristics of individuals result in differing needs that in turn lead to differential patterns of media preference and selection for gratification of these needs. In other words, an individual’s profile of social and psychological attributes, such as gender, feelings about the self, or relationships with others, are thought to impact the media they seek out (Greenberg et al., 2010). This approach assumes an active audience making choices about what media with which to engage. Further, this approach assumes that through the course of typical development, individuals will have needs that may be met by media such as video game play. This is in contrast to the research that has been conducted that examines the maladaptive patterns in the development of those who in engage in video game play, a perspective that suggests that video game play is not part of the normative experience of children and adolescents.

Olson (2010) investigated children’s motivations in playing video games from the perspective that playing such games is a routine part of childhood and adolescence. Relying on survey data collected from over a thousand children ages 12–14, the author identified several key motivators or needs that are met by playing video games, as suggested by the Uses and Gratifications approach. Preadolescents in this sample identified several social needs met by video game play, including socializing with peers and making friends, as well as providing opportunities to lead or teach others. Further, children were motivated to play games were said to provide a context in which they felt good about the self, as games provided a sense of accomplishment and pride in winning. Several psychological motivators were also revealed, such as the role games play in providing general positive mood, feelings of relaxation, and an ability to cope with anger. Video game play also was reported to provide a venue in which individuals could enjoy the fun of “unreality,” or a setting in which the boundaries of everyday-life do not apply; video games seem to allow children to push the boundaries in a safe environment, just for the thrill of doing so.

In applying the Uses and Gratifications approach, in light of the motivators described by Olson, we might expect that the psychological and social profiles of game players would predict the types of games they play. In the current study, we will investigate whether psychological and social features of personality, such as interpersonal relationships, feelings about the self, and sensation seeking tendencies, predict game preferences. By examining these psychological characteristics, in addition to those typically investigated in game research such as internalizing issues, inattention, and attitudes towards schools, we hope to capture both adaptive and maladaptive aspects of the psychological experience that might motivate individuals to play particular types of video games.

1.5. The current study

Given previous research on gender-typing in preadolescent as well as on gender and gaming across ages, there is good reason to predict that preadolescent males and females will differ in their game habits. However, we also expect some flexibility among girls’ game preferences in particular, such that they prefer more masculine games in addition to feminine games. We predicted that psychological and social features of personality are associated with game preferences. In particular, given past research, we explored the extent to which game preferences are predicted by both adaptive and maladaptive features of personality, including interpersonal relationships, feelings about the self, sensation seeking habits, internalizing difficulties, inattention, and attitudes towards school. We are adopting the theoretical approach of the Uses and Gratifications perspective of media use, which suggests that the psychological and social characteristics of the individual motivate players to seek out particular types of video games.

In the current study, we explored gender, age and psychological adjustment as predictors of video game play in a middle school population. Specifically, we were interested in determining the extent to which previous findings of notable gender differences in game play time and preference for game types apply to preadolescent middle school children, and whether evidence of female gender-typing flexibility would be found in this preadolescent sample. Furthermore, we examined whether self-reported psychological and social features of personality are associated with preference for game types. Specifically, we were interested whether or not a player’s relationships, feelings about the self, sensation seeking, internalizing difficulties, inattention, and attitudes towards school predict the types of games they prefer. We also explored gender differences in these relationships.

2. Method

Participants, children ages 10–15 years (N = 213; 44% Female) from urban schools in the Northeastern United States, completed two questionnaires. A researcher supervised the administration of these questionnaires. The Demographics, Attitudes and Player Activity (DAPA) survey was used to gather information about players’ personal characteristics and habits. This survey was developed by the Games for Learning Institute (G4LI) and includes three subsections: Demographics, Player Activity, and Attitudes towards Game Play. The Demographics and Player Activity sections were used in the current study. Specifically, demographic information such as gender and age in years was utilized. Estimated time spent playing video games (play time) was assessed in the Player Activity section. Participants were asked to estimate how much time they spend playing computer games or video games on a school day for three separate parts of the day (“From wake up until lunch time,” “After lunch until dinner time,” and “After dinner until bedtime.”) Participants were then asked to make these estimates for a weekend day (Saturday and Sunday). Weekly totals were calculated from these estimates by multiplying the total weekday estimate by 5 and the weekend estimate by 2, and summing the two. Asking participants to report behavior for distinct time slots on different days is thought to be a more accurate means of
assessing autobiographical memory, as compared to asking participants to estimate the total hours per day or week (see Menon, 1994). A similar framework for estimating of game playing time has been used in research with 9- to 17-year olds (Greenberg et al., 2010). Play time data were available for 189 participants, though five participants with outlying scores were excluded, resulting in 184 participants for these analyses (47% Female). The excluded outliers reported playing video games 112 or more hours per week.

In completing the Player Activity section of the DAPA, participants were asked to choose up to three of their favorite game types from a list of thirteen. The game types included: First Person Shooter (player fires various forms of weaponry from a first person perspective; e.g., Halo), Fighting (player competes and fights against the computer or another player; e.g., Street Fighter), Sports (digital recreations of common sports such as football or basketball; e.g., Madden), Virtual Life/World (games take part in a life-like virtual environment; e.g., Animal Crossing), Massively Multiplayer Online Role Playing (MMORPG; online fantasy worlds where players interact with other players; e.g., World of Warcraft), Puzzle (players solve problems; e.g., Professor Layton), Role Playing (players are protagonists in a complex fantasy world; e.g., Elder Scrolls), Party (games played together by a group; e.g., Mario Party), Real Time Strategy (player controls the building, production, and use of structures and units in real-time battle situations; e.g., Starcraft), Simulations (games in which the real world is simulated as accurately as possible; e.g. Flight Simulator), Turn-Based (players must take turns against other players or the computer; e.g., Scrabble), Browser-Based (simple games that run on platforms such as Flash or HTML5 through the web; e.g., game at Kongregate.com), and Simple/2D (games without immersive graphics; e.g., Solitaire). The last five game types (Real Time Strategy, Simulations, Turn-Based, Browser-Based, and Simple/2D games) were not included in the analyses as 24 (11%) or fewer participants elected them as their favorite game type. Researchers provided a detailed description of the game type for clarification as necessary. Game preference data were available for all 213 participants. Game preference data was scored such that each participant was given a score of “1” for those game types they favored, and “0” for those they did not.

Participants also completed the Behavior Assessment System for Children – Second Edition Self-Report of Personality (BASC-II SRP; Reynolds & Kamphaus, 2004), an assessment of psychological attitudes and adjustment across 16 scales: Attitude to School, Attitude to Teachers, Sensation Seeking, Atypicality, Locus of Control, Social Stress, Anxiety, Depression, Sense of Inadequacy, Somatization, Attention Problems, Hyperactivity, Relations with Parents, Interpersonal Relations, Self-Esteem, and Self-Reliance. This measure was selected as it provides a broad range of both psychological and social indicators of personality, measuring both adaptive and maladaptive behaviors. The BASC-II SRP is reported to have good construct and content validity (Reynolds & Kamphaus, 2004). Participants indicated how accurately a series of statements characterizes themselves either by answer “True” or “False” or using a four-point likert-scale ranging from “Never” to “Almost Always.” T-scores, or standardized scores with a mean of 50 and a standard deviation of 10, were calculated for each subscale using a computerized scoring assistant. BASC-II data were available for 147 participants (46% Female). Twelve participants with outlying scores on one or more BASC subscales were excluded, resulting in 135 (47% Female) participants for these analyses. These outliers were distinct from the play time outliers; in other words, no participant was an outlier on both the BASC-II and the game play time measure.

In order to investigate the areas of interest implicated by prior research in games and personality, and also to reduce instances of multicollinearity, the set of 16 scales was reduced to six scores of theoretical interest: Relationships, Feelings about the Self, Sensation Seeking, Internalizing Problems, Attention & Hyperactivity, and Attitudes to School/Teachers.

2.1. Relationships

This score represents participants’ perceptions of their relationships with their parents and with their peers (e.g., “I am liked by others,” “My parents listen to what I say.”), and is a composite of the Relations with Parents and Interpersonal Relations scale t-scores. The score is comprised of 17 items. These two scales demonstrate high internal consistency, with alpha coefficients of .87 and .79, respectively, and sound test–retest reliability of .80 and .75, respectively (Reynolds & Kamphaus, 2004).

2.2. Feelings about the Self

This score assessed the extent to which participants had positive feelings of self-reliance and high self-esteem (e.g., “I am good at things,” “I like making decisions on my own.”) This score is a composite of the Self-Esteem and Self-Reliance scale t-scores, and includes 16 items. These two scales demonstrate good internal consistency, with alpha coefficients of .83 and .68, respectively, and a sound test–retest reliability of .78 and .63, respectively (Reynolds & Kamphaus, 2004).

2.3. Sensation Seeking

This score addressed the extent to which participants are drawn towards experiences that are novel, thrilling, or possibly risky (e.g., “I like loud music,” “I like to play rough sports,” “I like to experiment with new things.”) This is one of the BASC-II SRP 16 scale t-scores, and is comprised of 9 items. This scale demonstrates acceptable internal consistency, with an alpha coefficient of .69, as well as a good test–retest reliability of .77 (Reynolds & Kamphaus, 2004).

2.4. Internalizing Problems

This score represents participants’ experiences with inwardly directed distress, such as depression and anxiety (e.g., “I feel like my life is getting worse and worse.” “I worry about things but I don’t know why.” “I fail at things.”). This score is a composite of the t-scores from seven scales, including Atypicality, Locus of Control, Social Stress, Anxiety, Depression, Sense of Inadequacy, Somatization. The composite includes 70 items. The BASC-II Internalizing composite, which includes the same seven scales, has a very high internal consistency reliability, with an alpha coefficient of .96, and a test–retest reliability of .81 (Reynolds & Kamphaus, 2004).

2.5. Attention and Hyperactivity

This score assesses participants’ perceptions about their difficulties with inattention and hyperactivity (e.g., “I have trouble paying attention to what I am doing,” “People tell me to be still.”). This score is made up of the Attention Problems and Hyperactivity scale t-scores, and includes 16 items. The BASC-II Inattention/ Hyperactivity composite, which includes these two scales, has high internal consistency reliability, with an alpha coefficient of .84 and a good test–retest reliability of .79 (Reynolds & Kamphaus, 2004).

2.6. Attitudes to School/Teachers

This score was made up of items that addressed the participants’ general feelings about school and teachers (e.g., “I hate school,” “My teacher is proud of me.”). This score is a composite of the two BASC-II SRP scale t-scores, Attitudes to School and
Attitudes to Teachers, and included a total of 16 items. These two scales demonstrate high internal consistency, with alpha coefficients of .85 and .84, respectively, and a sound test–retest reliability of .84 and .70, respectively (Reynolds & Kamphaus, 2004).

3. Results

3.1. Gender differences and play time

Descriptive statistics for weekly time spent playing video games are presented in Figure 1. A linear regression with gender entered first, age entered second, and play time as the dependent variable was conducted. As gender differences are of particular interest in this study and are probable given prior research, gender was entered first into the model. Age differences warrant investigation given previous findings (Greenberg et al., 2010), though may be less pronounced given the limited range; therefore age was entered second into the model. This analysis revealed a significant effect for gender ($R^2$ change = .06, $\Delta F(1,182) = 11.60$, $p = .001$) and age ($R^2$ change = .04, $\Delta F(1,181) = 8.95$, $p = .003$). On average, Males ($M = 42.77$ h per week, $SD = 26.62$) were found to spend nearly 13 h more per week playing games than females ($M = 29.97$ h per week, $SD = 24.00$), and play time increased with age. The effect of a gender and age interaction term was not significant ($p = .737$).

3.2. Gender differences in game type preference

Direct logistic regressions confirmed gender differences in all game type preferences, with the exception of Role Playing games (Figure 2). The overall tests of gender as a predictor of game preference for each game type are discussed in the text below. The Wald test was used to evaluate the contribution of an individual predictor of gender to the model; the Wald statistic is the squared logistic regression coefficient divided by its squared error (Tabachnick & Fidell, 2007). The Wald test results for each game type are presented in Table 1.

The overall test of gender as a predictor of Role Playing game preference was not significant, $\chi^2(1, N = 213) = .60$, $p = .438$, indicating that gender does not reliably discriminate between individuals who prefer Role Playing games and those who do not. The overall test of gender as a predictor of First Person Shooter preference was significant, $\chi^2(1, N = 213) = 61.87$, $p < .001$; the odds ratio of .09 indicates that our model predicts a majority of males in this age range (77%) favoring First Person Shooter games, as compared to only a quarter of females (25%). Similarly, the overall test of gender as a predictor of Fighting preference was also significant, $\chi^2(1, N = 213) = 7.05$, $p = .008$; the odds ratio of .48 indicates that our model predicts over half of males (55%) will favor Fighting games, as compared to over a third of females (37%) favoring Fighting games. The overall test of gender as a predictor of Sports games was significant, $\chi^2(1, N = 213) = 4.90$, $p = .027$; the odds ratio of .51 indicates that the model predicts Sports games as favored by males more than females (39% versus 24%). The test of the model of gender predicting Virtual games group membership was also significant, $\chi^2(1, N = 213) = 47.17$, $p < .001$; the odds ratio of 9.71 indicates that Virtual games are favored by far more females than males, as one out two females (52%) is predicted to prefer these games as compared to 1 male out of 10 (10%). The overall model predicting MMORPG preference from gender was also significant, $\chi^2(1, N = 213) = 5.80$, $p = .016$; the odds ratio of .44 indicates that the model predicts that 29% of males favor MMORPGs, as compared to 15% of females. The test of the full model predicting Puzzle games from gender was significant, $\chi^2(1, N = 213) = 29.83$, $p < .001$; the odds ratio of 7.86 indicates that more females preferred Puzzle games compared to males, such that our model predicted 36% of females favor these types of games, as compared to 7% of males. Lastly, the overall model predicting Party games from gender was also significant, $\chi^2(1, N = 213) = 28.27$, $p < .001$; the odds ratio of 8.83 indicates that females preferred Party games far more than males, such that a third of females (32%) were predicted to favor them as compared to only 5% of males.

3.3. Psychological predictors of game preference

Direct logistic regressions predicting game preference from the six scores of psychological attitudes entered simultaneously were conducted separately for males and females due to the strong gender effect, except in the case for Role Playing games, for which there was no effect of gender. The test of the full model predicting First Person Shooter preference from the six scales was significant for girls, $\chi^2(6, N = 63) = 19.85$, $p = .003$, indicating that the predictors as a set reliably distinguished between females who preferred First Person Shooter games and those who did not. According to the Wald criterion, only the Feelings of the Self scale reliably predicted First Person Shooter group membership, $\chi^2(1, N = 63) = 9.00$, $p = .003$; specifically, among females, the odds ratio of 1.40 indicates that for every 1-point increase in positive feelings about the self, the odds of girls preferring First Person Shooter increases by 40%. For males, the test of the full model predicting First Person Shooter preference from the six scales was not significant, $\chi^2(6, N = 72) = 5.98$, $p = .425$.

The test of the full model predicting Fighting preference from the six scales was also significant for girls, $\chi^2(6, N = 63) = 24.07$, $p = .001$, indicating that the predictors as a set reliably distinguished between girls who preferred Fighting games and those who did not. According to the Wald criterion, only Sensation Seeking reliably predicted preference for Fighting games, $\chi^2(1, N = 63) = 6.79$, $p = .009$. The odds ratio of 1.13 indicated that for every 1-point increase in sensation seeking, the odds of girls preferring fighting games increases by 13%. For males, the test of the full model for predicting Fighting group membership was not significant, $\chi^2(6, N = 72) = 4.04$, $p = .671$.

Table 1

<table>
<thead>
<tr>
<th>Type</th>
<th>Favored by N = 213</th>
<th>Obs. Male N = 119</th>
<th>Obs. Female N = 94</th>
<th>$B$</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>$p$</th>
<th>Exp(B)</th>
</tr>
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<tr>
<td>FPS</td>
<td>115 (54%)</td>
<td>92</td>
<td>23</td>
<td>-2.35</td>
<td>.32</td>
<td>52.50</td>
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<td>&lt;.001</td>
<td>.095</td>
</tr>
<tr>
<td>Fighting</td>
<td>101 (47%)</td>
<td>66</td>
<td>35</td>
<td>.74</td>
<td>.28</td>
<td>6.91</td>
<td>1</td>
<td>.009</td>
<td>.476</td>
</tr>
<tr>
<td>Sports</td>
<td>69 (32%)</td>
<td>46</td>
<td>23</td>
<td>.66</td>
<td>.31</td>
<td>4.76</td>
<td>1</td>
<td>.029</td>
<td>.514</td>
</tr>
<tr>
<td>Virtual</td>
<td>61 (29%)</td>
<td>12</td>
<td>49</td>
<td>-2.27</td>
<td>.37</td>
<td>38.19</td>
<td>1</td>
<td>&lt;.001</td>
<td>9.71</td>
</tr>
<tr>
<td>MMORPG</td>
<td>48 (22%)</td>
<td>34</td>
<td>14</td>
<td>.83</td>
<td>.35</td>
<td>5.46</td>
<td>1</td>
<td>.019</td>
<td>.438</td>
</tr>
<tr>
<td>Puzzle</td>
<td>42 (20%)</td>
<td>8</td>
<td>34</td>
<td>-2.06</td>
<td>.42</td>
<td>23.61</td>
<td>1</td>
<td>&lt;.001</td>
<td>7.86</td>
</tr>
<tr>
<td>RPG</td>
<td>36 (17%)</td>
<td>18</td>
<td>18</td>
<td>-2.8</td>
<td>.37</td>
<td>5.0</td>
<td>1</td>
<td>.001</td>
<td>4.13</td>
</tr>
<tr>
<td>Party</td>
<td>36 (17%)</td>
<td>6</td>
<td>30</td>
<td>-2.18</td>
<td>.47</td>
<td>21.13</td>
<td>1</td>
<td>&lt;.001</td>
<td>8.83</td>
</tr>
</tbody>
</table>
For females, the test of the full model for Sports preference was not significant, $\chi^2 (6, N = 63) = 7.35, p = .290$, nor was the test of the full model significant for males, $\chi^2 (6, N = 72) = 6.29, p = .391$. Neither the full model for females nor males was significant for predicting preference for Virtual Life and Virtual World games, $\chi^2 (6, N = 63) = 5.95, p = .520$ and $\chi^2 (6, N = 72) = 5.19, p = .520$, respectively. For females, the test of the full model predicting MMORPG from the six scales was not significant, $\chi^2 (6, N = 63) = 6.90, p = .330$. For males, the test of the full model predicting MMORPG preference was marginally significant, $\chi^2 (6, N = 72) = 11.46, p = .075$. According to the Wald criterion, only the Internalizing Problems scale significantly predicted whether or not males would prefer MMORPG, $\chi^2 (1, N = 72) = 4.00, p = .046$. The odds ratio of .84 indicates that for every 1-point increase in Internalizing Problems, the odds of preferring a MMORPG decreases by 16%.

Neither the test of the full model for females nor males reliably distinguished between individuals who preferred Puzzle games and those who did not, $\chi^2 (6, N = 63) = 5.92, p = .433$ and $\chi^2 (6, N = 72) = 2.95, p = .815$, respectively. For females, the test of the full model for predicting Party games preference from the six scales was not significant, $\chi^2 (6, N = 63) = 3.21, p = .781$, nor was the test of the full model significant for males, $\chi^2 (6, N = 72) = 10.28, p = .113$.

Lastly, the test of the full model for all participants predicting Role Playing game preference from the six scales was not significant, $\chi^2 (6, N = 135) = 7.87, p = .248$, indicating that this set of predictors did not reliably distinguish between individuals who preferred Role Playing games and those who did not.

4. Discussion

Our findings confirm that, although there are significant gender differences, it is normative for both preadolescent boys and girls to spend considerable amounts of time playing video games. Boys reported playing an average of nearly 43 h per week, or over 6 h per day, and girls reported playing nearly 30 h per week, or over 4 h per day. For both boys and girls, the amount of time spent playing video games increases with age in preadolescence, perhaps reflecting the increased autonomy that often comes during this age period. These results therefore support the notion that video game play is routine and typical in the lives of early adolescents.

There were significant differences in game preferences associated with gender and with players’ behaviors and attitudes as measured by the BASC-II. The gender difference found in the current study in amount of time spent playing video games is less extreme than those reported in previous research. In the current study, boys were spending approximately 40% more time playing video games than were girls. In contrast, Greenberg et al. (2010), for example, found that boys were spending twice as much time playing video games as girls.
games as girls, though this sample included older adolescents in addition to middle school participants.

Research with children suggests that these differences in game playing time may stem from players' emotional experiences with the game itself. In a study of gender difference in video game play, Hamlen (2010) examined the role of feelings of success and time spent playing games. More specifically, the author investigated the endogenous relationship between success in game play and time spent playing video games, hypothesizing that success would increase playing time and vice versa. One-hundred and eighteen fourth- and fifth-grade students completed a self-report survey that asked about the time they spend playing games, how good they believe they are at the game they play most often, and completing a creativity assessment. The results indicated that girls and boys feel equally as competent at video games when the endogenous relationship between time spent playing and how good they think they are is accounted for. Girls reported the same initial ability and confidence as boys, but they choose not to spend as much time playing video games as boys. In addition, boys reported greater feelings of reward related to success in games. These feelings of success may influence boys to spend more time playing games.

Preadolescent boys and girls also differ significantly in the types of games they prefer. Middle school-aged boys' favorite game types are First Person Shooters, Fighting, and Sports games. The majority of males of this age favor First Person Shooter games and so it seems normative for preadolescent boys to favor these violent games, despite the mature rating of such games. Girls seem to prefer playing Virtual World and Virtual Life games to other game types. Our results indicate that many girls are also favoring stereotypically male video game types; for example, well over a third of girls are predicted by our findings to prefer Fighting games. In other words, the percentages of girls preferring to play Fighting games is roughly equal to girls preferring Puzzle games. Girls also prefer Party games, whereas boys seem to have little interest in these games.

It is of note that although there are more boys than girls electing stereotypically male video game types (e.g., First Person Shooter, Fighting, Sports), a good portion of girls favor these types as well. In contrast, very few boys stated preference for stereotypically female video game types (e.g., Virtual, Puzzle, Party). This is consistent with Liben and Bigler's (2002) findings that females tend to identify with more masculine traits by early adolescence, but that boys do not increase in their identification with feminine traits. Another possible explanation for girls preferring these stereotypically male video game types might be that given the ever increasing popularity of games with mature content (see Olson, 2010), girls are simply catching up to boys in their preference for violent games such as First Person Shooters or Fighting games. In this way, the gender difference in preference for such games may be diminishing as they become a part of mainstream media consumption.

Concerning psychological attitudes as predictive of preference, our findings further support the notion that game play is motivated by psychological and social characteristics of the individual, as suggested by the Uses and Gratifications theory (Katz et al., 1973–1974) and prior research (Olson, 2010). The current findings lend particular insight into the types of girls who prefer First Person Shooters and Fighting games. Specifically, girls who favor Fighting games are elevated in their sensation seeking behaviors and tend to engage in activities that are thrilling or risky. This is consistent with Olson's (2010) finding that children often are motivated to play video games as they provide an "unreal" environment in which push the boundaries and engage in thrill-seeking behavior. While sensation-seeking tendencies may be considered maladaptive in the real world, in the confines of a virtual environment, such behavior has few if any real risks.

Girls who favor First Person Shooter games seem to differ from their peers in that compared to others, they feel better about themselves. It seems such games may provide a competitive environment in which girls can feel proud of their success under high-stress conditions; this is in line with previous research that video games provide a venue in which preadolescents can feel accomplished and experience increased self-esteem (Olson, 2010). Alternatively, it may be that girls who feel better about themselves are more open to breaking gender stereotypes by playing games typically associated with boys.

Lastly, boys who favor MMORPGs were found to be less likely than their peers to have internalizing problems such as depression and anxiety. Again, this is in line with Olson's findings that preadolescents experience positive mood and relaxation when playing video games, and that these feelings motivate their choice to engage in such play. Alternatively, this surprising relationship may be an indirect result of the benefit from the online social environments that are built around such games. As boys approach adolescents, there is often social pressure that discourages close male friendships, which can lead to feelings of loss and isolation (Way, 2011). The social environment of the virtual worlds provided by MMORPGs may provide a "safe" environment for boys to have these relationships (Mesch & Talmud, 2010).

Contrary to the negative stereotypes commonly held about individuals who play violent video games, our findings suggest that preadolescents who prefer such games are not evidently depressed, inattentive, or aggressive. Our results offer little support for the notion that children who play violent games are atypical, with regard to their psychological or social features of personality. Boys who prefer First Person Shooter games were not found to evidence maladaptive behaviors, but rather to have normative psychological attitudes. Girls who prefer such games are non-normative only in the extent to which they feel positively about themselves or are sensation seekers. As argued by Olson (2010), it seems likely that engaging in playing violent video games may be emblematic of typical development, such that exposure to violent and scary themes may help children and adolescents master the physical and emotional experience of being frightened.

There are some limitations to the current study that should be noted. First, the correlational nature of this research makes it impossible to draw conclusions about causality. For example, as mentioned above, it may be that playing Fighting games improves girls' feelings about themselves, but it is also possible that girls who feel better about themselves choose to play Fighting games. While an experimental study addressing these issues is not feasible, longitudinal research could help clarify the directionality of the relationship between psychological adjustment and video game play. Another possible limitation of the current study is that the sample was drawn from a large urban population. Future research should attempt to replicate the current findings with a larger sample that also includes rural populations. Finally, qualitative research may be helpful to more fully explore the meaning of video game play in early adolescents lives.

There are some important implications of the current findings. First, although adolescent boys and girls in the current study spent considerable amounts of time playing video games, the amount of time spent playing video games was not related to psychological maladjustment. In fact, the current research suggests that there can be some significant psychological benefits of playing video games for young adolescents. Game developers, particularly developers trying to create educational video games, may be able to take these possible advantages into account. For example, if the social component of MMORPGs is beneficial to boys, then we may want to develop games that maximize this aspect of the game. Also, the current research clearly indicates that it is not only boys who
play Fighting games. Developers may want to keep girls in mind when developing what are typically male-oriented games.

In summary, our findings both confirm previous results regarding gender differences in amount of time spent playing video games among preadolescent boys and girls, an under-studied group. The current findings also lend novel insights into the psychological processes that may contribute to video game preference among preadolescents. Preadolescent boys and girls spend a considerable amount of their free time playing video games, and the current study provides support for the notion that game preferences may stem from psychological and social needs that are met in the virtual environment.

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References


