Computers & Education 58 (2012) 1260–1266

Contents lists available at SciVerse ScienceDirect

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

Video gameplay, personality and academic performance

Matthew Ventura*, Valerie Shute, Yoon Jeon Kim

Florida State University, 1114 W. Call St., Tallahassee, FL 32306, USA

ARTICLE INFO

Article history:
Received 14 November 2011
Received in revised form
29 November 2011
Accepted 30 November 2011

Keywords:
Interdisciplinary projects
Lifelong learning
Media in education
Multimedia/hypermedia systems

ABSTRACT

The relationship between video gameplay, video game genre preference, personality, and GPA was investigated in an online correlational study with university students. In addition to administering self-report measures of GPA and personality, we asked three different questions regarding styles of video gameplay. The first asked the average time spent playing video games per week (habitual players), the second asked the total time spent playing favorite video games (selective players), and the third asked the number of different video games played in a year (diverse players). Students who were medium in selective player style (spent 11–50 h) had significantly higher GPAs than students low on selective player style (spent 0–10 h). Students high on habitual playing style (7 or more hours a week) showed significantly lower levels of Conscientiousness compared to students low on habitual playing style (0–1 h a week). Students who were high on the diverse style (i.e., 7 or more games played a year) showed significantly higher Openness scores than students low on the diverse style (0–3 games a year). Finally, several notable relations were found between video game genre preference, GPA, and personality. Results are discussed in terms of the positive implications of video gameplay on academic performance.

1. Introduction

It doesn't matter if you win or lose – it's how you play the game!

Video games have been criticized and even condemned over the past couple of decades. Numerous studies have been published claiming that video games can have harmful effects on children. For example, research has shown playing violent video games is associated with poorer GPAs, more aggressive cognition and behavior, and receive more negative teacher ratings compared to children who do not play video games (Anderson, Gentile, & Buckley, 2007; Walsh, Gentile, Walsh, & Bennett, 2006). Additionally, playing video games appears to be negatively correlated with player well-being and adjustment (Grusser, Thalemann, & Griffiths, 2007; Wenzel, Bakken, Johansson, Götestam, & Øren, 2009).

In the past couple of years, however, many of the findings that were published on the negative effects of video games have been repudiated by both the US Supreme Court (Brown v EMA) and the Australian National government (2010). This reversal was due in large part to recent research showing the flawed methodological designs and analyses in many studies on violent video games (e.g., Ferguson, 2010; Kutner & Olson, 2008). Additionally, it was revealed in Brown v EMA that a conflict of interest may have fueled inappropriate conclusions in research that had been funded by anti-media activist groups (e.g., National Institute of Media and Family).

In counterpoint to the negative findings, a growing number of research studies are showing various positive effects of playing commercial and educational video games. In some cases, research has shown that playing violent video games can actually *improve* pro-social skills (e.g., Ferguson & Garza, 2011; Lenhart et al., 2008) and even reduce violent behavior in particular populations (Ferguson, Colwell, Mlacic, Milas, & Miklousic, 2011). Additionally, playing commercial video games for extended hours has been shown to enhance of visual–spatial skills (Green & Bavelier, 2007) and attention (Boot, Kramer, Simons, Fabiani, & Gratton, 2008), while playing educational video games has been shown to improve math (Kebritchi, Hirumi, & Bai, 2010), health (Bartholomew et al., 2000; Kato, Cole, Bradlyn, & Pollock, 2008), and mechanical engineering (Coller & Scott, 2009). Thus it appears that video games can potentially exert positive effects on children and adults.

Given the conflicting evidence regarding the effects video games on children and adults, more research is needed to understand which aspects of video games may be beneficial to players, and which aspects may be detrimental. For example, small negative relationships have

* Corresponding author. College of Education, Suite 1208C Stone Building, 1114 West Call St., Florida State University, Tallahassee, FL 32306-4450, USA.
E-mail addresses: mventura@fsu.edu (M. Ventura), vshute@fsu.edu (V. Shute), yjkim.fsu@gmail.com (Y.J. Kim).

0360-1315/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.compedu.2011.11.022

been found between playing video games and GPA in middle school samples (Jackson, von Eye, Fitzgerald, Witt, & Zhao, 2011) and in college samples (Anand, 2007). Other research, however, suggests that there is *no* relation between academic performance and video game usage in children (Ferguson, 2011), or small *positive* correlations (Skoric, Teo, & Neo, 2009). Finally video gameplay has been shown to have complex relationships with psychological well-being (Desai, Krishnan-Sarin, Cavallo, & Potenza, 2010). That is, players who reported problematic gaming (i.e., trying to cut back, reporting an irresistible urge to play) reported having more unhealthy behaviors (e.g., smoking) relative to non-problematic video game players. This correlational study tries to address some of the contradictions and limitations of previous research on video games by investigating specific questions regarding video gameplay.

2. Styles of video gameplay

Most studies investigating video game usage ask questions regarding how much time is spent playing video games in a set time period (e.g., *How often do you play video games*?). For example, Jackson et al. (2011) used the following scale to measure video game usage: 1 = *I do not use (play) at all*, 2 = *about once a month*, 3 = *a few times a month*, 4 = *a few times a week*, 5 = *everyday, for less than 1 h*, 6 = *everyday, for 1–3 h*, 7 = *everyday, for more than 3 h*. We believe that this type of question only gets at one aspect of video gameplay pertaining to what we call a *habitual* gameplay style (i.e., frequency index). But there are other styles of gameplay that should be considered as well.

We categorized different styles of video gameplay into: (a) average time spent playing video games per week (*habitual players*), (b) total time spent playing favorite video games (*selective players*), and (c) number of different video games played in a year (*diverse players*). We developed these categories because players may have different preferences for video gameplay. A habitual player plays video games consistently every week or month, a selective player plays video games heavily for sporadic periods of time, and a diverse player plays a large set of video games for varying amounts of time. Based on this notion we formulated three questions for the three styles of video gameplay: Habitual players – *On average, how many hours a week do you play video games?* Selective players – Think about your favorite video games. On average how many total hours did you spend across all these video games? Diverse players – *How many different video games do you typically play in a year?*

3. Video gameplay, academic performance, and personality

The present study aims to look more closely at different styles of video gameplay and how each one is related to academic performance and personality, specifically Openness and Conscientiousness. Openness is defined as a disposition to engage in intellectual experiences (McCrae & Costa, 1997), and is positively correlated with motivation to learn (Tempelaar, Gijselaers, van der Loeff, & Nijhuis, 2007; Vermetten Lodewijks, & Vermunt, 2001) and academic self-efficacy (Peterson & Whiteman, 2007). Meta-analyses have found a positive relationship between Openness and academic achievement in various age group populations (e.g., Poropat, 2009; Trapmann, Hell, Hirn, & Schuler, 2007).

Conscientiousness can be broadly defined as the motivation to work hard and has consistently been found to predict academic achievement from preschool (Abe, 2005) to high school (Noftle & Robins, 2007; Poropat, 2009), to the postsecondary level (O'Connor & Paunonen, 2007) and adulthood (e.g., De Fruyt & Mervielde, 1996; Shiner, Masten, & Roberts, 2003). Meta-analyses have shown a consistent positive relationship between Conscientiousness and grades and this relationship is independent of intelligence (e.g., Noftle & Robins, 2007; Proporat, 2009).

The relationship between video game usage and personality was recently investigated in middle school children (Witt, Massman, & Jackson, 2011) as well as in college samples (Chory & Goodboy, 2011). Regarding middle school students, those who were higher on Openness reported higher levels of video gameplay than students lower on Openness. Regarding college students, those who played violent video games were higher on Openness and Extroversion, but actually lower on Neuroticism than students who played non-violent video games. No relation was found between Conscientiousness and video game usage in either study.

We will treat Openness and Conscientiousness as dependent variables because video gameplay may play an indirect role on GPA through personality. Fig. 1 displays how video gameplay might affect personality and GPA. We use bidirectional arrows to show that the relationship between the amount of video gameplay and personality may be reciprocal. That is, a person high in relation to the Openness construct might play video games to satisfy a pervasive curiosity and desire for intellectual stimulation. Conversely, a person may learn to be Conscientious due to the challenging demands of video games.

The next section introduces a theory of how video games can actually improve valued outcomes such as academic performance, Conscientiousness, and Openness.

4. How video games can affect valued outcomes

Like many other forms of entertainment (e.g., movies, music), video games are so popular because they engage a particular (and rather broad) audience. This engagement in video games has been claimed to be a product of particular video game features including: arousal, challenge, competition, diversion, fantasy, and social interaction (Sherry, Lucas, Greenberg, & Lachlan, 2006). Additionally, problem solving is considered a pervasive activity in video games (Gee, 2005), which can be seen in everything from actually solving puzzles in games, to navigating through complex environments, to defeating smart enemies in combat. Two aspects of video games that could have an effect on the focal outcomes (i.e., Conscientiousness, Openness, and GPA) are a requirement for problem solving and challenge.

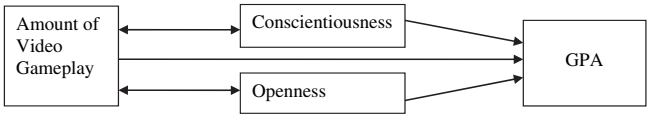

Fig. 1. Relationship between amount of video gameplay, personality, and GPA.

Challenge entails adjusting the optimal level of difficulty for a player and is consistent with the theory of the zone of proximal development (Vygotsky, 1978), which states that learning takes place right at the outer edges of one's abilities. The principle of challenge is pervasively used in video games (Pausch, Gold, Skelly, & Thiel, 1994), and has been shown to engage attention and enhance learning (Lepper & Malone, 1987; Rieber, 1996; Sweetser & Wyeth, 2005). If the challenge level is out of synch with the player's abilities (i.e., too hard or too easy), the player's interest can be lost (Rieber, 1996).

Thus video games can be seen as vehicles for exposing players to challenging problem solving activities. These problem solving activities become more difficult as the game progresses. This repeated exposure to problem solving can affect Conscientiousness, Openness, and academic performance in many ways. First, problem solving in video games requires many organizational skills important to Conscientiousness. Organizational skills in video games can be anything from managing time to solving an investigation case (e.g., L.A. Noir), managing resources (e.g., World of Goo), to maintaining skills to upgrade in characters (e.g., World of Warcraft). Additionally, problem solving in video games requires a willingness to work hard despite repeated failure, which is another important aspect of Conscientiousness.

Regarding Openness, video games enable the player to replay problems to unfold a different story (Gee, 2005), or to solve problems in unique ways (Shute, Ventura, Bauer, & Zapata-Rivera, 2009). Such video games that allow more freedom of problem solving can foster Openness since the player is allowed to explore multiple solutions to problems or even discover new problems to solve. Finally, the very act of playing a video game can be seen as evidence for Openness since playing video games often requires intellectual effort.

Different genres of video games (e.g., shooting, role playing) have varying qualities and amounts of problem solving, challenge, and control. Thus we expect to see a *greater* relationship between liking certain genres and GPA, Conscientiousness and Openness. For example, role playing games (RPGs), platformer, and puzzle games typically require cognitive effort and exploit the principle of challenge as compared to other game genres. RPGs allow the player enormous freedom to explore and solve problems in a variety of ways, thus RPGs should have a greater relationship to Openness than other genres of video games.

Based on our theory, our hypotheses are as follows:

- H1: *There will be a positive relationship between selective player style (the amount of time spent on favorite games) and GPA, and diverse player style (the number of different games played a year) and GPA.* Students who spend dedicated amounts of time playing their favorite video games will have higher GPAs relative to those who play a few hours on their favorite video games. This is due to increased exposure to challenging problem solving activities that can prepare students for the challenges of high school, college, and career.
- H2: *There will be a negative relationship between habitual player style (the amount of time spent playing games each week) and GPA.* Students who play many hours of video games a week will likely have lower GPAs relative to students who play fewer hours of video games a week due to lack of time available for studying.
- H3: *There will be a positive relationship between all styles of players (habitual, selective, and diverse) and Conscientiousness and Openness.* Overall, increasing amounts of video gameplay and number of different games played will positively affect Conscientiousness and Openness since video games are claimed to be intellectually challenging problem solving activities.
- H4: *Preference for puzzle, adventure, platformer, strategy, simulation, action adventure, and role playing games will be positively related to the outcome measures. While shooters, social media, and fighting games will not be related to the outcome measures.* Preference for certain genres should be positively linked to the outcome measures as they generally involve challenge and problem solving.

5. Materials and methods

5.1. Sample

We administered an online survey via email to undergraduate students enrolled at a small southeastern university. A total of 319 students (male = 161, female = 155) completed the survey. A total of 252 students were included in the GPA analysis since some students did not have a GPA yet due to being a freshman. The mean age of the students was 23.

5.2. Openness and conscientiousness

We used items from John (1990) to measure Openness and Conscientiousness. Each item was prefaced with *I see myself as someone who…*followed by statements (e.g., Openness – *Has an active imagination*, Conscientiousness – *Does a thorough job)* that were rated on a 1–5 scale (strongly disagree, disagree a little, neither agree nor disagree, agree a little, strongly agree). Reliability was good for the Openness measure ($\alpha = 0.82$) and the Conscientiousness measure ($\alpha = 0.81$).

5.3. Video game genre preference and GPA

We asked seven questions about video game genre preference (e.g., *I enjoy playing fighting games*). Each item was rated on a 1–5 scale (strongly disagree, disagree a little, neither agree nor disagree, agree a little, strongly agree). We also asked students to report their cumulative GPA (0–4). Appendix A displays the full survey.

Table 1
Three gameplay styles.

Style	Min	Max	K-S test	New coding
Habitual (average h/week)	0	60	4.09[a]	0–1 h, 2–6 h, 7 h or more
Selective (total h on favorite games)	0	5000	6.65[a]	1–10 h, 11–50 h, 51 h or more
Diverse (number of games/year)	0	100	4.71[a]	0–3 games, 4–6 games, 7 or more games

[a] $p < 0.001$.

Table 2
Results of ANOVAs for habitual playing style.

	0–1 h a week	2–6 h a week	7 h or more a week
GPA	3.18 (0.53)	3.17 (0.56)	3.00 (0.61)
O[a]	4.10 (0.60)	4.17 (0.58)	4.25 (0.63)
C[b,c]	3.88 (0.69)	3.72 (0.61)	3.58 (0.63)

[a] Openness.
[b] Conscientiousness.
[c] $p < 0.05$; *M* (SD).

6. Results

Based on the non-normality of the data from the three video gameplay style questions (see Kolmogorov-Smirnoz test in Table 1) we decided to recode responses into three levels. These levels were based on the cumulative percentile of responses (33%) to maintain equal sample sizes among the three levels in each question. Table 1 displays the original range, non-normality test, as well as the new three-level coding.

We then calculated correlations among the three styles to see if they could be combined to yield an overall *style score* (habitual × selective: $r = 0.39$; habitual × diverse: $r = 0.59$; selective × diverse: $r = 0.33$). These low to moderate correlations justify looking at each video gameplay style question separately.

We found the typical relationship between GPA and Conscientiousness ($r = 0.13$, $p < 0.05$). However, the relationship between GPA and Openness was not significant ($r = 0.06$, $p > 0.05$). Since the relation to Openness and GPA is typically weak even in large sample research, this may be due to lack of power in our study. The relation between Openness and Conscientiousness is weak but significant ($r = 0.17$, $p < 0.05$).

We decided to run separate ANOVAs for each dependent variable considering the non-linear relations among the independent variables and the dependent variables. Given the limited sample size, only main effects were investigated regarding the three independent variables.

Table 2 displays the results of three one-way ANOVAs for each dependent measure across the three levels of *habitual* player style.

There was a significant difference between the three levels for the Conscientiousness outcome $F(2, 312) = 5.87$, $p = 0.003$. Conscientiousness appears to show a significant decrease between low habitual (0–1 h a week) versus high habitual (7 h or more a week) style. A Bonferroni post hoc analysis confirmed that this difference was significant ($p = 0.002$). The effect size between low habitual and high habitual is moderate ($d = 0.45$). There were no significant differences in Conscientiousness between the high and medium habitual players, or medium and low habitual players ($p > 0.05$).

Table 3 displays the results of three one-way ANOVAs for each dependent measure across the three levels of *selective* player style.

There was a significant difference among levels of gameplay for the GPA outcome $F(2, 248) = 4.75$, $p = 0.009$. In addition, there appears to be a significant increase in GPA for the medium (11–50 h) over the low selective style (1–10 h). A Bonferroni post hoc analysis confirms this difference was significant ($p = 0.007$). The effect size between the medium and low selective style is moderate ($d = 0.46$). There were no significant differences in GPA between either (a) the high vs. low selective player styles, or (b) the medium vs. high selective player styles ($p > 0.05$).

Table 4 displays the results of three one-way ANOVAs for each dependent measure across the three levels of *diverse* player style. As can be seen, there was a significant difference among levels for the Openness outcome $F(2, 311) = 4.95$, $p = 0.008$. Openness appears to be significantly higher for the high diverse player style compared to the low diverse style. A Bonferroni post hoc analysis confirms this difference was significant ($p = 0.008$). The effect size between high diverse style and low diverse style is moderate ($d = 0.44$). There were no significant differences in Openness between high and medium, or between medium and low diverse styles ($p > 0.05$).

Table 5 displays the correlations involving video game genre preference and the three outcome measures. As can be seen, there are two significant negative correlations to GPA: Social media and Shooter types of games.

7. Discussion

This study shows that the relationship between video gameplay and value outcomes can be complex. By looking at different video gameplay styles we were able to see different relationships to personality as well as to academic performance.

Our hypotheses were partially confirmed. Regarding H1, students who were categorized as medium in relation to the *selective* player style (i.e., 11–50 h of gameplay) had significantly higher GPAs than students low on the selective player style (0–10 h of gameplay). This contradicts the common assumption that video games can adversely affect academic performance (e.g., Anand, 2007; Jackson, von Eye, Fitzgerald, Witt, & Zhao, 2011). However, we are unsure why the GPA for high selective player style did not differ from the GPA for low selective player style. Perhaps students in the high selective player style (more than 51 h) may be getting the benefits of video games but also

Table 3
Results of ANOVAs for selective playing style.

	1–10 h on a game	11–50 h on a game	51 h or more on a game
GPA[c]	2.98 (0.61)	3.25 (0.56)	3.13 (0.52)
O[a]	4.10 (0.62)	4.16 (0.58)	4.25 (0.61)
C[b]	3.84 (0.74)	3.63 (0.59)	3.72 (0.62)

[a] Openness.
[b] Conscientiousness.
[c] $p < 0.05$; *M* (SD).

Table 4
Results of ANOVAs for diverse playing style.

	0–3 games a year	4–6 games a year	7 or more games a year
GPA	3.15 (0.54)	3.06 (0.60)	3.16 (0.57)
O[a,c]	4.07 (0.59)	4.13 (0.65)	4.32 (0.55)
C[b]	3.83 (0.69)	3.63 (0.62)	3.72 (0.64)

[a] Openness.
[b] Conscientiousness.
[c] $p < 0.05$; *M* (SD).

have trouble managing their study time, much like habitual players. This suggests that video games should be played in moderation to reap the benefits they can have on academic performance. Finally, there was no mean difference in GPA among the three diverse playing styles. Perhaps having a high level of diverse playing style is not enough to affect GPA since merely playing more video games does not necessarily mean players were engaged in the video games they played. Thus players characterized as being "high" in terms of the diverse player style may not be getting the full benefits of video games.

Regarding H2, we did not find a significant negative effect of habitual style on GPA, although the effect size between high habitual and low habitual is notable ($d = 0.31$). This may be seen as consistent with the findings from Desai et al. (2010) who showed the negative effects of problematic gameplay.

H3 was not confirmed regarding Conscientiousness. Students high on the habitual playing style (7 or more hours a week) showed lower levels of Conscientiousness compared to students lower on habitual playing style (0–1 h a week). Thus players who habitually play many hours of video games a week may have difficulty managing their time (i.e., a component of Conscientiousness). Also Conscientiousness appears to be trending towards a negative relationship with regard to selective style ($p = 0.06$), but the difference was not significant. This finding is consistent with related research showing a negative association between Internet usage and Conscientiousness (Landers & Lounsbury, 2006). While Internet usage is not the same as video gameplay, they both involve the use of media devices which may be getting in the way of study time.

Regarding Openness, H3 was partially confirmed in that students who were high on the diverse style (i.e., 7 or more games played a year) showed significantly higher Openness scores than students low on the diverse style (0–3 games a year). Thus students who play many video games a year may be more likely to engage in intellectually challenging problem solving activities. However, Openness did not significantly differ among the three levels of selective style or habitual style—although in both cases, the trends were positive (i.e., more time was associated with higher Openness).

Finally, H4 was partially confirmed in that we found positive relations between Openness and game genre preferences (i.e., role playing, puzzle, strategy, platformer, action adventure, and simulation games). These positive relations can be seen as complementary to the positive relation found between diverse player style and Openness. That is, players who are high on Openness may tend to like these genres more than players scoring lower on Openness. Additionally, Openness is related to preferring fighting game genres, which is consistent with past research investigating violent video games and personality (Chory & Goodboy, 2011). Perhaps fighting games motivate players to explore various techniques to defeating other players.

We found several negative correlations involving GPA and Conscientiousness with various game genres (i.e., fighting, role playing games, action adventure, and shooters). This finding may be seen as consistent with the negative relationship found with habitual gameplay and Conscientiousness. The negative relationship between violent games and GPA is also consistent with past research (e.g., Jackson, von Eye, Fitzgerald, Witt, & Zhao, 2011).

The negative relationship between GPA and social media games could be related to the accessibility of social media video games. Today many social media video games can be played on mobile devices, which can have negative effects on study time.

8. Limitations

There are several limitations to this study. First, since this is a correlational study we cannot speculate on the causal direction of the relationships between game-playing styles and the focal outcomes. For example, students who play many video games a year may do so because they already are high in Openness. Second, a larger sample size would have allowed us to look at the moderating effects of game genre preferences and gender on the relationship between the dependent measures and styles of video gameplay. For example, what is the relationship between styles of video gameplay and GPA for students who like shooters versus RPG games? Finally, a larger sample size would have enabled us to investigate the interaction(s) between the three styles of video gameplay and the dependent measures.

Table 5
Correlations among video game preferences and outcomes.

	Fighting (street fighter)	Role playing (world of warcraft)	Action adventure (legend of Zelda)	Puzzle (Tetris)	Social media (Farmville)	Platformer (Super Mario Bros)	Strategy (civilization)	Simulations (Sims)	Shooter (call of duty)
GPA	−0.02	−0.01	0.02	0.07	−0.13[a]	−0.04	−0.04	−0.10	−0.14[a]
O	0.11[a]	0.20[b]	0.17[b]	0.14[b]	−0.03	0.11[a]	0.19[b]	0.14[a]	−0.02
C	−0.11[a]	−0.16[b]	−0.15[b]	0.04	−0.01	−0.09	−0.05	0.00	−0.17[b]

O = Openness; C = Conscientiousness.
[a] $p < 0.05$.
[b] $p < 0.001$

9. Conclusion

This study sheds light on some of the positive effects of playing video games when more specific questions are asked about styles of video gameplay and additional outcome variables are investigated (e.g., personality). Students with medium levels of *selective* player style have higher GPAs compared to students with low *selective* style. Students with high levels of *habitual* player style have lower Conscientiousness scores compared to students with low levels of *habitual* player style. Students with high levels of *diverse* player style have higher Openness scores compared to students with low levels of *diverse* player style. Finally, positive and negative relations were found between video game genre preference and the outcomes suggesting particular video games have different effects on valued outcomes. Future research should consider the interacting effects of video gameplay styles and video game genres preferences on academic performance. Understanding these interacting effects will bring more insight into how video games can be useful in education.

Appendix A. Survey

GPA
What is/was your cumulative undergraduate GPA?
Openness
1–5 scale: strongly disagree, disagree a little, neither agree nor disagree, agree a little, strongly agree
I see myself as someone who…
Is inventive
Is original, comes up with new ideas
Values artistic, esthetic experiences
Has an active imagination
Likes to reflect, play with ideas
Is sophisticated in art, music, or literature
Is a deep thinker
Is curious about many different things
Prefers work that is routine [R]
Has few artistic interests [R]
Conscientiousness
1–5 scale: strongly disagree, disagree a little, neither agree nor disagree, agree a little, strongly agree
I see myself as someone who…
Does a thorough job
Does things efficiently
Makes plans, follows through with them
Is a reliable worker
Perseveres until the task is finished
Is easily distracted [R]
Can be somewhat careless [R]
Tends to be lazy [R]
Tends to be disorganized [R]
Has trouble paying attention [R]
Amount of video gameplay
On average, how many hours a week do you play video games?
How many different video games do you typically play in a year?
Think about your favorite video games. On average how many total hours did you spend across all these video games?
Video game genre preference
Please rate how much you enjoy playing the following types of video games
1–5 scale: strongly disagree, disagree a little, neither agree nor disagree, agree a little, strongly agree
I enjoy playing the following types of video games…
Fighting (Street Fighter)
Role Playing (World of Warcraft)
Action Adventure (Legend of Zelda)
Puzzle (Tetris)
Social Media (Farmville)
Platformer (Super Mario Bros)
Strategy (Civilization)
Simulations (Sims)
Shooter (Call of Duty)

References

Abe, J. A. A. (2005). The predictive validity of the five-factor model of personality with preschool age children: a nine year follow-up study. *Journal of Research in Personality, 39*(4), 423–442.
Anand, V. (2007). A study of time management: the correlation between video game usage and academic performance markers. *CyberPsychology & Behavior, 10*(4), 552–559.
Anderson, C. A., Gentile, D. A., & Buckley, K. E. (2007). *Violent video game effects on children and adolescents: Theory, research, and public policy*. New York: Oxford University Press.

Australian Government, Attorney General's Department. (2010). *Literature review on the impact of playing violent video games on aggression*. Commonwealth of Australia.
Bartholomew, L. K., Gold, R. S., Parcel, G. S., Czyzewski, D. I., Sockrider, M. M., Fernandez, M., et al. (2000). Watch, discover, think, and act: evaluation of computer-assisted instruction to improve asthma self-management in inner-city children. *Patient Education and Counseling, 39*, 269–280.
Boot, W. R., Kramer, A. F., Simons, D. J., Fabiani, M., & Gratton, G. (2008). The effects of video game playing on attention, memory, and executive control. *Acta Psychologica, 129*(3), 387–398.
Chory, R. M., & Goodboy, A. K. (2011). Is basic personality related to violent and non-violent video game play and preferences? *Cyberpsychology, Behavior, and Social Networking, 14*(4), 191–198.
Coller, B. D., & Scott, M. J. (2009). Effectiveness of using a video game to teach a course in mechanical engineering. *Computers & Education, 53*(3), 900–912.
De Fruyt, F., & Mervielde, I. (1996). Personality and interests as predictors of educational streaming and achievement. *European Journal of Personality, 10*, 405–425.
Desai, R., Krishnan-Sarin, S., Cavallo, D., & Potenza, M. (2010). Video-gaming among high school students: health correlates, gender differences, and problematic gaming. *Pediatrics, 126*(6), e1414–e1424.
Ferguson, C. J. (2010). Blazing angels or resident evil? Can violent video games be a force for good? *Review of General Psychology, 14*(2), 68–81.
Ferguson, C. J. (2011). The influence of television and video game use on attention and school problems: a multivariate analysis with other risk factors controlled. *Journal of Psychiatric Research, 45*(6), 808–813.
Ferguson, C. J., Colwell, J., Mlacic, B., Milas, G., & Miklousic, I. (2011). Personality and media influences on violence and depression in a cross-national sample of young adults: data from Mexican-Americans, English and Croatians. *Computers in Human Behavior, 27*(3), 1195–1200.
Ferguson, C. J., & Garza, A. (2011). Call of (civic) duty: action games and civic behavior in a large sample of youth. *Computers in Human Behavior, 27*, 770–775.
Gee, J. P. (2005). Learning by design: good video games as learning machines. *E-Learning, 2*(1), 5–16.
Green, C. S., & Bavelier, D. (2007). Action-video-game experience alters the spatial resolution of vision. *Psychological Science, 18*(1), 88–94.
Grusser, S. M., Thalemann, R., & Griffiths, M. D. (2007). Excessive computer game playing: evidence for addiction and aggression? *Cyber- Psychology & Behavior, 10*, 290–292.
Jackson, L. A., von Eye, A., Fitzgerald, H. E., Witt, E. A., & Zhao, Y. (2011). Internet use, videogame playing and cell phone use as predictors of children's body mass index (BMI), body weight, academic performance and social and overall self-esteem. *Computers in Human Behavior, 27*, 599–604.
John, O. P. (1990). The "Big five" factor taxonomy: dimensions of personality in the natural language and in questionnaires. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 66–100). New York: Guilford.
Kato, P. M., Cole, S. W., Bradlyn, A. S., & Pollock, B. H. (2008). A video game improves behavioral outcomes in adolescents and young adults with cancer: a randomized trial. *Pediatrics, 122*(2), 305–317.
Kebritchi, M., Hirumi, A., & Bai, H. (2010). The effects of modern mathematics computer games on mathematics achievement and class motivation. *Computers & Education, 55*(2), 427–443.
Kutner, L., & Olson, C. (2008). *Grand theft childhood: The surprising truth about violent video games and what parents can do*. New York: Simon & Schuster.
Landers, R., & Lounsbury, J. (2006). An investigation of big five and narrow personality traits in relation to Internet usage. *Computers in Human Behavior, 22*, 283–293.
Lenhart, A., Kahne, J., Middaugh, E., MacGill, A., Evans, C., & Mitak, J. (2008). *Teens, video games and civics: teens gaming experiences are diverse and include significant social interaction and civic engagement*. The Pew Internet & American Life Project.
Lepper, M. R., & Malone, T. W. (1987). Intrinsic motivation and instructional effectiveness in computer-based education. In R. E. Snow, & M. J. Farr (Eds.), *Conative and affective process analysis* (pp. 255–286). Hillsdale: Lawrence Erlbaum Associates Inc.
McCrae, R. R., & Costa, P. T., Jr. (1997). Conceptions and correlates of openness to experience. In R. Hogan, J. A. Johnson, & S. R. Briggs (Eds.), *Handbook of personality psychology* (pp. 825–847). San Diego, CA, US: Academic Press.
Noftle, E. E., & Robins, R. W. (2007). Personality predictors of academic outcomes: big five correlates of GPA and SAT scores. *Journal of Personality and Social Psychology, 93*, 116–130.
O'Connor, M., & Paunonen, S. V. (2007). Big Five personality predictors of post-secondary academic performance. *Personality and Individual Differences, 43*, 971–990.
Pausch, R., Gold, R., Skelly, T., & Thiel, D. (1994). What HCI designers can learn from video game designers. In *Proceedings of the ACM conference on human factors in computing systems* (pp. 177–178). ACM Press.
Peterson, E. R., & Whiteman, M. C. (2007). 'I think I can, I think I can.': the interrelationships among self-assessed intelligence, self-concept, self-efficacy and the personality trait intellect in university students in Scotland and New Zealand. *Personality and Individual Differences, 43*, 959–968.
Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin, 135*, 322–338.
Rieber, L. P. (1996). Seriously considering play: designing interactive learning environments based on the blending of microworlds, simulations, and games. *Educational Technology Research and Development, 44*(2), 43–58.
Sherry, J. L., Lucas, K., Greenberg, B., & Lachlan, K. (2006). Video game uses and gratifications as predictors of use and game preference. In P. Vorderer, & J. Bryant (Eds.), *Playing computer games: Motives, responses, and consequences*. Mahwah, NJ: Erlbaum.
Shiner, R. L., Masten, A. S., & Roberts, J. M. (2003). Childhood personality foreshadows adult personality and life outcomes two decades later. *Journal of Personality, 71*, 1145–1170.
Shute, V. J., Ventura, M., Bauer, M. I., & Zapata-Rivera, D. (2009). Melding the power of serious games and embedded assessment to monitor and foster learning: flow and grow. In U. Ritterfeld, M. Cody, & P. Vorderer (Eds.), *Serious games: Mechanisms and effects* (pp. 295–321). Mahwah, NJ: Routledge, Taylor and Francis.
Skoric, M. M., Teo, L. L. C., & Neo, R. L. (2009). Children and video games: addiction, engagement, and scholastic achievement. *CyberPsychology & Behavior, 12*(5), 567–572.
Sweetser, P., & Wyeth, P. (2005). Gameflow: a model for evaluating player enjoyment in games. *ACM Computers in Entertainment, 3*(3), 1–24.
Trapmann, S., Hell, B., Hirn, J. W., & Schuler, H. (2007). Meta-analysis of the relationship between the big five and academic success at university. *Journal of Psychology, 215*, 132–151.
Tempelaar, D. T., Gijselaers, W. H., Schim Van Der Loeff, S., & Nijhuis, J. (2007). A structural equation model analyzing the relationship of student achievement motivations and personality factors in a range of academic subject-matter areas. *Contemporary Educational Psychology, 32*, 105–131.
Vermetten, Y. J., Lodewijks, H. G., & Vermunt, J. D. (2001). The role of personality traits and goal orientations in strategy use. *Contemporary Educational Psychology, 26*, 149–170.
Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.
Walsh, D., Gentile, D. A., Walsh, E., & Bennett, N. (2006). National Institute on Media and the Family. 11th Annual Video Game Report Card. www.mediawise.org.
Wenzel, H. G., Bakken, I. J., Johansson, A., Götestam, K. G., & Øren, A. (2009). Excessive computer game playing among norwegian adults: self-reported consequences of playing and association with mental health problems. *Psychological Reports, 105*(3), 1237–1247.
Witt, E. A., Massman, A. J., & Jackson, L. A. (2011). Trends in youth's videogame playing, overall computer use, and communication technology use: the impact of self-esteem and the big five personality factors. *Computers in Human Behavior, 27*(2), 763–769.