

Research Paper

Effects of Video Game Playing on Social Intelligence, Aggression, and Loneliness among University Students

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ABSTRACT

This study aimed to investigate the association between gender, game playing status, and psychosocial factors, including social intelligence, aggression, and loneliness, among college and university students. The study involved 200 college and university students aged 18-25, comprising 102 females and 98 males. Participants were categorized as game players (65%) and non-players (35%) based on their gaming status. Participants completed three questionnaires assessing social intelligence, aggression, and loneliness. Statistical analyses included chi-square tests, Kruskal-Wallis tests, correlation analysis, and linear regression to explore relationships between variables. Significant findings included a gender disparity in game playing status ($p < 0.001$), with more males playing video games. Social intelligence was significantly associated with gender ($p = 0.043$) and age ($p = 0.033$). No significant gender differences were observed in aggression or loneliness. Correlation analysis revealed weak relationships between variables. Social information processing significantly predicted aggression ($p = 0.020$). This study highlights gender differences in video game engagement, with males more inclined to play. Social intelligence was influenced by gender and age, but aggression and loneliness showed no significant gender differences. The study emphasizes the need for further research on the complex relationships between video game playing, psychosocial factors, and gender. These findings underscore the importance of considering gender and age in interventions related to social intelligence. Future research should explore the nuanced effects of video game content on psychosocial outcomes among college and university students and consider broader factors influencing loneliness.

Keywords: Video Games Playing, University Students, Social Intelligence, Aggression, Loneliness

Video games have been an integral part of modern entertainment, captivating the attention of people across various age groups. With the advancement of technology, video games have evolved into complex and immersive experiences that offer not only entertainment but also opportunities for social interaction and skill development.

According to the Entertainment Software Association (ESA), as of 2021, approximately 227 million Americans, accounting for over 66% of the population, play video games on various platforms. Anderson et al., (2010) conducted a meta-analysis revealing that exposure to

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violent video games is associated with increased aggression, decreased empathy, and reduced prosocial behavior in college students. These findings were consistent with the negative impact of violent games on aggression. Ferguson et al., (2017) found that violent video games were not significantly associated with aggressive behavior among college students. They emphasized the role of pre-existing aggression and personality traits. Saleem et al., (2012) found that playing prosocial video games can increase empathy and reduce aggression in college students. Greitemeyer and Mügge, (2014) conducted a meta-analysis indicating that prosocial video games can enhance empathy, altruism, and cooperation among players. Ferguson and Garza (2011) reported a negative association between violent video games and social intelligence, suggesting desensitization to violence as a potential hindrance.

Cole and Griffiths (2007) found that online video game players reported higher levels of social interaction and communication compared to non-players. Smahel et al., (2012) observed a positive association between online gaming and social intelligence among college students, suggesting that online interactions promote social skills. Adachi and Willoughby (2013) found that excessive video game playing was associated with lower levels of social competence among college students. Konijn et al., (2007) reported reduced empathy and prosocial behavior, vital components of social intelligence, linked to playing violent video games. Kühn and Gallinat (2014) demonstrated that playing video games can improve the ability to empathize with others, suggesting a potential positive effect. Greitemeyer and Osswald (2010) found that prosocial video games can lead to increased prosocial behavior in real life, indicating a potential for video games to foster empathy. Studies have explored the relationship between loneliness and video game playing, with mixed results. Some suggest that loneliness can lead to excessive gaming as an escape, while others highlight the potential for online gaming to alleviate loneliness through social interactions. Anderson et al. (2010) and Gentile et al., (2014), reported a positive association between violent video games and aggression, while others, including Ferguson et al., (2011), found no significant link. Similarly, research on prosocial video games, as highlighted by Gentile and colleagues (2017), has shown positive associations with social behavior. However, the relationship between video game playing and aggression appears to be influenced by individual and situational factors, as suggested by Anderson et al., (2010) and Greitemeyer and Mügge (2014).

Cole and Griffiths (2007) examined the social interactions of massively multiplayer online role-playing gamers and found that engaging in these games can provide a sense of belonging and social connection, potentially reducing loneliness. The study suggested that online gaming communities can serve as a platform for social interactions. However, Caplan et al., (2009) argued that problematic gaming can indeed contribute to loneliness and reduced social competence. Loneliness appears to be a complex factor in video game playing, with individuals using games both to cope with loneliness and seek social interaction. Recent research by Przybylski et al., (2016) sheds light on the broader psychological effects of video game playing on college students, including stress, depression, anxiety, and overall well-being. Caplan et al., (2009) found that problematic internet use among gamers could lead to reduced social competence and increased loneliness. A study by Przybylski and Wang (2016) found that moderate video game playing was associated with better psychological well-being among college students. The relationship between video game playing and loneliness can be moderated by various factors, including the type of game, motivation for playing, and individual differences (Van

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Rooji et al., 2014). This suggests that the context in which gaming occurs is essential in determining its impact on loneliness.

Online games often require teamwork, communication, and strategic thinking, which can enhance social intelligence. The social interactions within multiplayer games can provide opportunities for individuals to develop social skills, including cooperation, negotiation, and leadership. These experiences can contribute positively to social intelligence (Cole & Griffiths, 2007). Online games often involve competition and, in some cases, violent content, which can lead to heightened levels of aggression. The General Aggression Model (GAM) suggests that repeated exposure to violent media, such as violent video games, can desensitize individuals to aggressive stimuli and increase aggressive thoughts, feelings, and behaviors (Anderson et al., 2010). However, the relationship between video games and aggression is not one-size-fits-all. Factors like game content, time spent playing, and individual differences can moderate this relationship (Ferguson, 2007). Online games can serve as a double-edged sword regarding loneliness. On one hand, they offer a social platform where players can interact with others and build friendships, potentially reducing feelings of loneliness (Kowert et al., 2014). On the other hand, excessive gaming, particularly in isolation, can exacerbate loneliness as players may neglect offline social connections (Lemmens et al., 2011).

Research gaps exist regarding video game effects on aggression, prosocial games, loneliness, moderation factors, long-term psychological consequences, and the potential of online gaming communities. Inconsistent findings on violent games and aggression highlight the need for understanding moderating factors. Prosocial games' long-term impact on social intelligence and real-life behaviors is unclear. Loneliness in gaming, influenced by individual differences, needs further exploration. Examining moderation factors like game type is essential. Investigating long-term psychological effects is crucial due to gaming's prevalence among college students. The positive potential of online gaming communities requires more exploration within and beyond gaming contexts, contributing to a nuanced understanding.

Objectives

To explore a) if there is any significant association between gender and game playing status, b) if there is a significant mean difference of social intelligence, aggression, and loneliness on male and female, c) if there is any significant correlation of those who are game players between the measured variables on those who reported playing games for at least an hour a day, and finally to explore d) the extent to which social information processing would predict aggression in case of online game players.

METHOD

Participants

This study was conducted on college and university going students who mainly resides towards the urban part of this city. This study is done to see the main changes to the main dependent variables which are social intelligence and aggression while being invested in video games. During the pilot study we enquired if the responder is a regular game player or non-player. Three variables used in the study were social intelligence, loneliness and aggression scale. The variables social intelligence has three subscales which are social skills, social awareness and social information processing. There are total of 200 responses, out of which 140 are players and 60 are non-players, comprising of 66% and 34% of the players

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and non-players respectively. We collected data for this study from students who are regularly playing video games and who don't prefer playing video games. The median age is 20.0 and the mean standard deviation is 1.85. While collecting data we have kept a note about the demographic details, which includes the sex of the player, which kind of online games they like to play, do they like playing individually or play in a group. Two major variables that were prioritized were "game playing status" and "sex" as game players are more in number (65%), while there were 49% male participants and 51% female participants. A pilot study was also done on 30 participants to know which games they perceive having violent components and which ones have simple competitive components. The inclusion criteria for selecting the sample were age, sex, and game playing status.

Tools Used

Before collecting the main data for the final study. We conducted a pilot study to see the amount of active responses we collect from college and university students. Through the pilot study we identified the games which are mostly designated as either having more violent content or being considered as simple competitive one. The main factor we concentrated for the pilot study was "type of game". The responses were pretty positive and hence we started with our main data collection.

The main data collection was started with demographic details of the subject which included- name, age, gender, game playing status (game player or non player), and game playing preferences (violent games were: Call of duty, Blood war, Counter strike, God of war, Gar cry 2, Assassin's creed, Mortal Kombat, Valorant, Player unknown's battle grounds and Grand theft auto and competitive games were: Fifa, Rocket league, Dota, Asphalt 8, Valorant and Mobile legends- Bang bang).

Tromso Social Intelligence Scale (TSIS)

The scale was developed by Silvera et al., in 2001, assesses social intelligence, which is the ability to understand and manage people and navigate human relations wisely. Social intelligence is a vital component of emotional intelligence, which includes self-awareness, self-regulation, motivation, empathy, and social skills. TSIS demonstrates strong psychometric properties, including good internal consistency with Cronbach's alpha coefficients ranging from 0.81 to 0.90. It also exhibits reliable test-retest reliability over a 4-week period (correlation coefficient of 0.86) and strong construct validity, distinguishing social intelligence from related constructs like emotional intelligence, cognitive ability, and personality traits. The scale comprises 21 statements with seven response options, ranging from "describes me extremely poorly" to "describes me extremely well" where 1 means describes me extremely poorly and 7 means describes extremely well TSIS is divided into three subscales and each subscale is based on 7 items on a 7-point scale; thus, they have possible scores between 7 and 49. Social skills (items 4, 7, 10, 12, 15, 18, 20), Social awareness (items 2, 5, 8, 11, 13, 16, 21), and Social information processing (items 1, 3, 6, 9, 14, 17, 19). There are no reverse scores or items.

The Aggression scale

The scale was developed by Pamela Orpinas and Ralph Frankowsk (2001). According to Parmela Orpinas and Ralph Frankowski (2001), aggression refers to "behavior that is intended to cause harm or injury to another person who is motivated to avoid such treatment." The aggression scale had 11 statements on a 7-point scale from 0 time to 6+ more times where the higher score on this scale indicates a higher level of aggression or

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aggressive tendencies. The lowest possible score for aggression scale is 6 and the highest possible score is 66. There are no reversed items or scores. The Aggression Scale has shown good internal consistency in several studies, the internal consistency of the scale has been found to be high, with Cronbach's alpha coefficients ranging from 0.74 to 0.88 in various studies. The test-retest reliability of the scale has also been reported to be good, with correlation coefficients ranging from 0.68 to 0.82 over a period of one to two weeks. The Aggression Scale has been found to have good construct and criterion-related validity.

Revised UCLA Loneliness Scale

The scale was developed by Russell et al., (1978), assesses loneliness as a subjective experience characterized by a perceived gap between desired and actual social relationships. This scale has demonstrated strong psychometric properties, including high internal consistency, with Cronbach's alpha coefficients ranging from 0.89 to 0.94, indicating its reliability. It also exhibits good construct validity, as it positively correlates with other loneliness measures, effectively capturing the essence of loneliness. Importantly, the scale demonstrates discriminant validity by showing low correlations with measures of social support and satisfaction, ensuring that it specifically assesses loneliness rather than general social functioning. The Revised UCLA Loneliness Scale consists of 20 statements with four response options, ranging from "never" to "often." Higher scores on this scale indicate greater loneliness, while lower scores suggest lower levels of loneliness. The scale's scores can range from a minimum of 20 (indicating low loneliness) to a maximum of 80 (indicating high loneliness). Additionally, nine items within the scale are reverse-scored (items 1, 5, 6, 9, 10, 15, 16, 19, 20) to account for varying item valences.

Procedure

A pilot study was conducted on 30 samples to know which games according to them are simple competitive games and which ones are violent games. In the pilot study they were asked about their game preference, for how long do they play video games regularly. They were also asked to give suggestions of few online games and mention which type of game are they. According to the respondent's response, the games which had violent components were: Call of duty, Blood war, Counter strike, God of war, Gar cry 2, Assassin's creed, Mortal Kombat, Valorant, Player unknown's battle grounds and Grand theft auto and the games according to them had simple competitive components were: Fifa, Rocket league, Dota, Asphalt 8, Valorant and Mobile legends- Bang bang. In the actual data collection process, they were given 3 different questionnaires, Tromso Social Intelligence scale, The Aggression scale and Revised UCLA Loneliness scale. They were asked to read each statement carefully and mark the response which they feel are appropriate for them. When we were conducting the data collection for our final study, participants were provided with hard copy of the questionnaire and were allowed to ask questions if they were facing any problem while filling the questionnaire. This questionnaire was presented to college and university students who are in the age range of 18-25 years.

Analysis

While we were scoring the statistics for the main study we used an application called the JAMOVI (2022) version 2.3.6. It helped us to analyze our results very easily and made our work really very easily and smooth. The test we used for the study are descriptive statistics (SD= 1.85), chi-square, non-parametric one-way ANOVA, correlation analysis and linear regression. For our categorical variable we have two independent variables which are "game

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playing status” (categorized as players vs. non-players) and “Gender” have been categorized by male and female. Significance level has been kept at .05 level.

RESULTS

Table 1: Descriptive statistics of categorical variables.

Variables		Counts	% of total
Game playing status	Non-players	70	35%
	Players	130	65%
Sex	Male	98	49%
	Female	102	51%

To explore the possible association between game playing status and gender χ^2 Test has been performed.

Table 2: χ^2 Test of the categorical variables

	Value	Df	P
χ^2	47.7	1	< .001
N	200		

Table 2 shows that females significantly prefer to not to play online games than men and men are significantly more into game playing than the females. $X^2(N = 200, 1) = 47.70, p < .001$ (Figure 1).

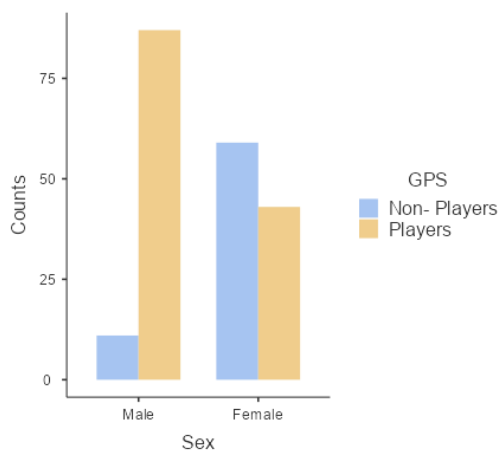


Figure 1: Gender differences in game playing status (GPS)

Table 3 shows the percentile values of each dataset of the measured variables. The variables showed mostly not-normal distribution of scores, hence percentile values were computed. The standard deviation values were also presented.

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Table 3: Descriptive Table – Continuous variables

	N	Median	SD	Shapiro-Wilk		Percentiles		
				W	p	25 th	50 th	75 th
Age	200	20.0	1.85	0.912	< .001	19.00	20.0	21.0
Social Intelligence	200	94.0	12.44	0.940	< .001	87.00	94.0	99.0
Aggression	200	10.0	13.18	0.879	< .001	4.00	10.0	21.3
Loneliness	200	46.0	8.69	0.988	0.106	39.00	46.0	52.3
Social Skills	200	30.0	4.99	0.953	< .001	27.00	30.0	33.0
Social Awareness	200	27.0	6.94	0.982	0.012	23.00	27.0	31.0
Social Information Processing	200	36.0	6.09	0.985	0.037	33.00	36.0	40.0

In order to explore if there is a significant mean difference of the measured variables on male and female participants, irrespective of the game playing status, the non-parametric one-way ANOVA (Kruskal-Wallis) tests have been performed.

Table 4: Non-parametric one-way ANOVA (Kruskal Wallis) assessing the measured variables on the two levels of gender

	χ^2	df	P
Age	4.5208	1	0.033*
Social Intelligence	4.0916	1	0.043*
Aggression	0.0403	1	0.841
Loneliness	0.0635	1	0.801
Social Skills	1.2169	1	0.270
Social Awareness	0.2384	1	0.625
Social Information Processing	2.3490	1	0.125

Note. $p < 0.05$.

By using the non-parametric one-way ANOVA (Kruskal-Wallis) it can be seen that there are significant mean differences of social intelligence ($p=0.043$) and age ($p=0.033$) on two levels of gender.

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Table 5: Correlation contingency of the measured variables of those who are game players.

Correlation Matrix		AGE	SI	AGG	LON	SK	SA	SIP
AGE	Pearson's r	—						
	p-value	—						
SI	Pearson's r	0.021	—					
	p-value	0.813	—					
AGG	Pearson's r	-0.095	-0.108	—				
	p-value	0.284	0.222	—				
LON	Pearson's r	0.030	0.020	0.132	—			
	p-value	0.732	0.825	0.136	—			
SK	Pearson's r	0.073	0.816	-0.097	-0.023	—		
	p-value	0.410	< .001	0.273	0.797	—		
SA	Pearson's r	0.029	0.717	0.061	0.142	0.519	—	
	p-value	0.745	< .001	0.492	0.107	< .001	—	
SIP	Pearson's r	-0.055	0.464	-0.20*	-0.109	0.18*	-0.19*	—
	p-value	0.534	< .001	0.020	0.219	0.045	0.034	—

Note: SI - social information, AGG – Aggression, LON – Loneliness, SK - Social Skills, SA - Social Awareness, and SIP- Social Information Processing.

The correlation matrix displays the relationships between measured variables among game players. Significant correlations ($p < .05$) were found between Social Information Processing (SIP) and several other variables: positive correlations with SK and SA and a negative correlation with AGG ($p > .05$).

In order to explore the extent to which Social Information Processing would predict aggression level of participants who regularly indulge themselves into online game playing linear regression has been performed.

Table 6: Social Information Processing predicting Aggression.

Model Coefficients – AGGRESSION					
Predictor	Estimate	SE	T	p	R ²
Intercept	30.773	6.940	4.43	< .001	0.0417
Social Information Processing	-0.442	0.187	-2.36	0.020	

Note. $p < 0.05$. The social information processing is significantly predicting aggression at .05 level.

DISCUSSION

The study aimed to investigate the association between gender, game playing status, and psychosocial factors such as social intelligence, aggression, and loneliness among college and university students. The results revealed several significant findings that can be discussed in the context of recent research on the effects of video game playing on these psychosocial factors among university students.

One notable finding was the significant association between gender and game playing status. The study found that more males were inclined to play online games compared to females. This result aligns with extensive previous research that consistently demonstrates a gender disparity in video game engagement, with males being more likely to play games (Granic et al., 2014). Several factors contribute to this gender difference, including social norms, cultural expectations, and game content preferences (Colwell & Kato, 2003). Males have traditionally been the dominant demographic in video gaming, and this trend continues.

Certain video games, especially those involving cooperative or multiplayer gameplay, can potentially enhance social intelligence by fostering collaboration, communication, and strategic thinking (Granic et al., 2014). These games often require players to work together to achieve common goals, improving their ability to understand and interact with others in real-life social situations. While the study did not delve into the specific types of games played by participants, future research could explore how different game genres influence social intelligence among university students. However, it's important to note that excessive play of isolating or single-player games may hinder the development of social skills due to the absence of face-to-face interactions (Przybylski et al., 2014). Therefore, the relationship between video game playing and social intelligence is nuanced and depends on the type of games and the context in which they are played.

The study did not find significant gender differences in aggression levels among university students. This result contrasts with some previous research indicating that males may exhibit higher levels of aggression after playing violent video games (Anderson et al., 2010). Recent meta-analyses suggest that the link between video game violence and real-world aggression is complex, with small effect sizes and various moderating factors (Ferguson, 2017). Research on the relationship between video game playing and aggression highlights the importance of considering game content and duration. Exposure to violent video games has been associated with short-term increases in aggressive thoughts and behaviors (Greitemeyer & Mügge, 2014; Elson & Ferguson, 2014). This phenomenon is often explained by the "hostile attribution bias," where individuals exposed to violent video games may interpret ambiguous social cues in a more hostile and aggressive manner (Anderson & Dill, 2000). The study did not explore the specific content of the games played by participants, which could have contributed to the absence of significant gender differences in aggression.

The study also found no significant gender differences in loneliness levels among college and university students. Loneliness is a complex emotional state influenced by multiple factors, including social connectedness and the quality of social relationships (Hawkley & Cacioppo, 2010). Video games can serve as both a social outlet and a source of loneliness, depending on how and with whom they are played. Some online games offer opportunities for social interaction and can alleviate loneliness, especially when played with friends or in gaming communities (Kowert et al., 2014). These findings suggest that video games, when used as a means of socializing and connecting with others, can have a positive impact on

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reducing loneliness. However, excessive gaming in isolation can contribute to feelings of loneliness (Lemmens et al., 2011). This negative aspect of gaming may not have been prevalent among the study participants, contributing to the lack of significant gender differences in loneliness levels.

In conclusion, the study's findings provide valuable insights into the association between gender, game playing status, and psychosocial factors among college and university students. While the study did not find significant gender differences in aggression or loneliness, it did reveal a gender disparity in game playing status. These findings align with existing research on gender differences in video game engagement.

Limitation and conclusion

The study aimed to examine the effects of video game playing on social intelligence, aggression and loneliness among college and university students. The findings suggest that there is significant mean difference between gender and age and also gender and social intelligence. Gender differences were also noted, with a higher proportion of males playing video games and gender being significantly associated with social intelligence. The study highlights the importance of considering the potential effects of video games on individuals' social development, particularly in the context of gender differences. However, further research is needed to investigate the underlying mechanisms and potential moderators of these associations. Overall, the study provides valuable insights into the impact of video game playing on social development and can inform future research in this area. The study's sample of 200 college and university students may not be broadly representative, limiting the generalizability of the findings. Reliance on self-report measures can introduce bias or inaccuracies due to social desirability or memory recall. The study's cross-sectional design hinders the establishment of causality or directionality as it captures data at a single point in time. Absence of a control group of non-video game players makes it challenging to draw conclusions about the impact of video game playing on social intelligence and aggression. The study primarily measures gaming frequency and overlooks game types and content, which could significantly affect social intelligence and aggression. The study's sample consists solely of college and university students, potentially excluding diversity in terms of age, gender, and other demographic factors. Unaccounted factors like personality traits, family background, or exposure to other media may influence social intelligence and aggression, introducing potential confounds.

Future research

These findings have several implications for understanding the relationships between gender, age, social intelligence, aggression, loneliness, social skills, social awareness, and social information processing among university and college students. Understanding these factors is crucial for promoting positive social interactions and psychological well-being among this population.

Future research could delve deeper into the underlying mechanisms driving the observed gender differences in social intelligence and social awareness. Additionally, investigating the role of cultural and contextual factors in shaping these gender differences may provide valuable insights.

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Further exploration of the complex relationship between age and aggression, as well as the potential moderating variables, is warranted. Longitudinal studies could shed light on the developmental trajectories of aggression and its interaction with age.

Regarding loneliness, future research should consider a broader range of contributing factors, such as social support, family dynamics, and online interactions, to provide a more comprehensive understanding of its determinants among university and college students.

The negative correlation between social awareness and social information processing raises questions about the impact of interventions aimed at improving social awareness on social information processing. Future studies could investigate the effectiveness of interventions, such as empathy training, in enhancing social information processing skills among college and university students.

In conclusion, this study contributes to the growing body of research on the social and psychological factors influencing university and college students. It highlights the complexity of these relationships and underscores the importance of considering gender, age, social intelligence, aggression, loneliness, social skills, social awareness, and social information processing in understanding the social dynamics of this population.

REFERENCES

- Adachi, P. J., & Willoughby, T. (2013). More than just fun and games: the longitudinal relationships between strategic video games, self-reported problem-solving skills, and academic grades. *Journal of youth and adolescence, 42*, 1041-1052.
- Anderson, C. A., & Dill, K. E. (2000). Video games and aggressive thoughts, feelings, and behavior in the laboratory and in life. *Journal of personality and social psychology, 78*(4), 772-790.
- Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., ... & Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: a meta-analytic review. *Psychological bulletin, 136*(2), 151.
- Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: development of a theory-based cognitive-behavioral measurement instrument. *Computers in human behavior, 18*(5), 553-575.
- Caplan, S., Williams, D., & Yee, N. (2009). Problematic Internet use and psychosocial well-being among MMO players. *Computers in human behavior, 25*(6), 1312-1319.
- Cole, H., & Griffiths, M. D. (2007). Social interactions in massively multiplayer online role-playing gamers. *Cyberpsychology & behavior, 10*(4), 575-583.
- Colwell, J., & Kato, M. (2003). Investigation of the relationship between social isolation, self-esteem, aggression and computer game play in Japanese adolescents. *Asian Journal of Social Psychology, 6*(2), 149-158.
- Elson, M., & Ferguson, C. J. (2014). Twenty-five years of research on violence in digital games and aggression. *European Psychologist.*
- Ferguson, C. J. (2007). Evidence for publication bias in video game violence effects literature: A meta-analytic review. *Aggression and Violent behavior, 12*(4), 470-482.
- 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*(2), 770-775.
- Ferguson, C. J. (2017). Everything in moderation: Moderate use of screens unassociated with child behavior problems. *Psychiatric quarterly, 88*, 797-805.
- Ferguson, C. J., San Miguel, C., Garza, A., & Jerabeck, J. M. (2012). A longitudinal test of video game violence influences on dating and aggression: A 3-year longitudinal study of adolescents. *Journal of psychiatric research, 46*(2), 141-146.

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- Granic, I., Lobel, A., & Engels, R. C. (2014). The benefits of playing video games. *American psychologist, 69*(1), 66.
- Gentile, D. A., Anderson, C. A., Yukawa, S., Ihori, N., Saleem, M., Ming, L. K., ... & Sakamoto, A. (2009). The effects of prosocial video games on prosocial behaviors: International evidence from correlational, longitudinal, and experimental studies. *Personality and Social Psychology Bulletin, 35*(6), 752-763.
- Greitemeyer, T., & Mügge, D. O. (2014). Video games do affect social outcomes: A meta-analytic review of the effects of violent and prosocial video game play. *Personality and social psychology bulletin, 40*(5), 578-589.
- Greitemeyer, T., & Osswald, S. (2010). Effects of prosocial video games on prosocial behavior. *Journal of personality and social psychology, 98*(2), 211.
- Hawkey, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of behavioral medicine, 40*(2), 218-227.
- Konijn, E. A., Nije Bijvank, M., & Bushman, B. J. (2007). I wish I were a warrior: the role of wishful identification in the effects of violent video games on aggression in adolescent boys. *Developmental psychology, 43*(4), 1038.
- Kowert, R., Domahidi, E., Festl, R., & Quandt, T. (2014). Social gaming, lonely life? The impact of digital game play on adolescents' social circles. *Computers in human behavior, 36*, 385-390.
- Kühn, S., & Gallinat, J. (2014). Amount of lifetime video gaming is positively associated with entorhinal, hippocampal and occipital volume. *Molecular psychiatry, 19*(7), 842-847.
- Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2011). The effects of pathological gaming on aggressive behavior. *Journal of youth and adolescence, 40*, 38-47.
- Orpinas, P., & Frankowski, R. (2001). The Aggression Scale: A self-report measure of aggressive behavior for young adolescents. *The Journal of Early Adolescence, 21*(1), 50-67.
- Przybylski, A. K., Weinstein, N., & Murayama, K. (2017). Internet gaming disorder: Investigating the clinical relevance of a new phenomenon. *American Journal of Psychiatry, 174*(3), 230-236.
- Przybylski, A. K., & Wang, J. C. (2016). A large scale test of the gaming-enhancement hypothesis. *PeerJ, 4*, e2710.
- Saleem, M., Anderson, C. A., & Gentile, D. A. (2012). Effects of prosocial, neutral, and violent video games on children's helpful and hurtful behaviors. *Aggressive behavior, 38*(4), 281-287.
- Silvera, D., Martinussen, M., & Dahl, T. I. (2001). The Tromsø Social Intelligence Scale, a self-report measure of social intelligence. *Scandinavian journal of psychology, 42*(4), 313-319.
- Smahel, D., Blinka, L., & Ledabyl, O. (2008). Playing MMORPGs: Connections between addiction and identifying with a character. *CyberPsychology & Behavior, 11*(6), 715-718.
- Van Rooij, A. J., Schoenmakers, T. M., Vermulst, A. A., Van Den Eijnden, R. J., & Van De Mheen, D. (2011). Online video game addiction: identification of addicted adolescent gamers. *addiction, 106*(1), 205-212.

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Conflict of Interest

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