CyberPsychology & Behavior
Volume 12, Number 2, 2009
© Mary Ann Liebert, Inc.
DOI: 10.1089/cpb.2008.0151

Rapid Communication

Relationships between Electronic Game Play, Obesity, and Psychosocial Functioning in Young Men

Elizabeth Wack, M.S. and Stacey Tantleff-Dunn, Ph.D.

Downloaded by Bar Ilan from www.liebertpub.com at 02/17/19. For personal use only.

Abstract

Most estimates suggest that American youth are spending a large amount of time playing video and computer games, spurring researchers to examine the impact this media has on various aspects of health and psychosocial functioning. The current study investigated relationships between frequency of electronic game play and obesity, the social/emotional context of electronic game play, and academic performance among 219 college-aged males. Current game players reported a weekly average of 9.73 hours of game play, with almost 10% of current players reporting an average of 35 hours of play per week. Results indicated that frequency of play was not significantly related to body mass index or grade point average. However, there was a significant positive correlation between frequency of play and self-reported frequency of playing when bored, lonely, or stressed. As opposed to the general conception of electronic gaming as detrimental to functioning, the results suggest that gaming among college-aged men may provide a healthy source of socialization, relaxation, and coping.

Introduction

The effects of extended electronic game play on human behavior and cognition is a controversial topic. Numerous studies suggest prolonged electronic game play as a catalyst for both sedentary[1] and aggressive behavior[2,3] as well as decreased academic performance among children and adolescents.[4,5] Market research indicates that young Americans are tremendous consumers of video and computer games. As of 1999, video games comprised 30% of the U.S. toy market, which helped the video game industry to earn between $6 billion and $9 billion, outselling even the motion picture industry.[6,7] A 2004 estimate of media consumption by the Kaiser Family Foundation suggests that the typical American youth between 8 and 18 years of age spends 6 hours and 47 minutes per day with electronic media and 43 minutes per day with print media.[8] While television remains the primary source of media exposure, video game play and non-school-related computer access occupies approximately 2 hours of a typical child's day.[8]

Available figures addressing the prevalence of and factors related to electronic game play focus primarily on children and adolescents younger than 18 years old, as this is the period wherein "gaming" is an increasingly frequent leisure activity.[9] Although a study as part of the 2003 Pew Internet and American Life Project reported that 65% of college students indicated being regular or occasional game players, there is surprisingly little information addressing the potential impact of electronic game play on young adults. Some studies that have examined electronic game play in this age group indicate that electronic game play may interfere with health, sleep, academic work, and socialization, while others suggest that electronic game play may actually facilitate the fulfillment of interpersonal and intrapersonal needs.[11] These conflicting findings indicate that a better understanding of this medium is needed before concrete conclusions about its clinical and health implications can be made.

Parallel to research examining age differences in electronic game play among children, recent research has indicated that gender differences exist across different age groups. Among college-aged populations, men are more likely than women to report video/computer game play as well as its interference with sleep and preparation for classes.[12] Given that men are the primary consumers of electronic media within this age group, the primary goal of the current study was to examine the electronic gaming habits of college-aged men as well as several factors related to game play within this generally overlooked population.

In light of the prevalence of media consumption and its impact on children and adolescents, the current study examined three issues often raised by researchers examining electronic game usage: links between frequency of play and obesity, academic performance, and aspects of social functioning. Research, as well as the mass media, generally en-

Department of Psychology, University of Central Florida, Orlando, Florida.

dorses the idea that electronic gaming inhibits academic potential[13] and encourages a sedentary lifestyle that may lead to obesity.[14,15] However, there have been findings that indicate media consumption, including video/computer game use, may not account for increases in childhood obesity to the extent previously suggested.[16] The main purpose of this study was to further clarify these inconsistent findings from past research and move toward a consensus in the scientific literature, which often serves as a basis for conclusions about the impact of this type of media on health and psychosocial functioning. Additionally, examining the prevalence of game play within this particular age group will be helpful in extending the conceptualization of the influence of this type of media across all age groups. A better understanding of the consequences, positive or negative, of electronic game play can be helpful in a variety of applied domains, particularly in the fields of health and education. If electronic game play is found to be beneficial to functioning, it may provide support for the use of electronic gaming in educational curricula or health programming and, if prolonged gaming is found to be detrimental, the findings will underscore the need for early intervention to mitigate negative consequences.

Based on previous research indicating that electronic game play is detrimental to psychosocial functioning, it was hypothesized that frequent video/computer game usage would be related to obesity, diminished academic performance, and decreased social interaction. An exploratory analysis examining the relationship between the frequency of electronic gaming and consumption of other types of media (watching television and reading magazines) also was conducted to account for the potentially confounding impact of high levels of consumption across all types of media. If participants consume other types of media less frequently than they play video/computer games, it can be argued that significant associations between the dependent variables and frequency of game play are better accounted for by electronic game play than by other types of media.

Downloaded by Bar Ilan from www.liebertpub.com at 02/17/19. For personal use only.

Method

Participants

Two hundred nineteen college-aged males from a metropolitan city in the southeastern United States participated in the survey; 172 of them were identified as current game players. Most of the participants were students at two colleges in the region: one large public university and one small private technical college. Participants' ages ranged from 18 to 32 years, with a mean age of 20.48 ($SD = 2.6$). Most participants were freshmen or sophomores in college. Participants were 73.5% Caucasian, 11.0% Latino/a, 5.9% Black/African American, 4.6% Asian American/Pacific Islander, and 5.0% Multiethnic or other. Participants were recruited through mass e-mails sent through institution-approved listservs. There was no monetary compensation for participation in the survey, and participants were invited to contact researchers with additional questions regarding participation.

Measures

The *demographic questionnaire* included specific items regarding game play habits (i.e., frequency of game play, preferred game genre, age of commencement of game play, specific items to gauge social context of electronic game play) as well as information about participant demographics, including age, ethnicity, grade point average (GPA), height, weight, and relationship status. Body mass index (BMI) was calculated from the information provided. Additionally, participants were asked to estimate the approximate number of hours they spend each week watching television and/or reading male-oriented entertainment magazines (e.g., *FHM, Maxim*).

The *Timeline Follow-Back* technique is a daily frequency estimation measure developed to gauge alcohol consumption.[17] This type of procedure has been shown to be equally as effective as other strategies designed to assess the quantity and frequency of particular behaviors while eliciting greater individual detail.[19] Adapted for the purposes of this study, respondents were asked to carefully recall their game play behavior and provide details regarding frequency of play, types of games played, and length of play in a retrospective daily diary format. It accounted for the last 3 days of game play from the date of data collection and was used exclusively in any analyses examining the "frequency" of game play. A mean weekly frequency was extrapolated from the 3-day mean, by creating a daily average (dividing the 3-day average by 3) and multiplying it by 7 to reflect the number of days in a week. The tracking of play over a 3-day period was assumed to yield a more accurate account of game play than that resulting from retrospective tracking over a longer period of time (4 to 7 days). The decision to use a 3-day period was made with consideration of the possibility that game play frequency might differ depending on the day of the week (weekdays versus weekends); however, due to the rather sporadic and nontraditional nature of college student schedules, it was anticipated that the day of the week would not have a distinct or identifiable impact on the daily frequency. Post hoc inspection of individual participant daily frequencies confirmed that playing time did not vary widely day to day, even from a weekday to a weekend.

Procedure

The study was conducted in accordance with ethical standards for human participants research and was approved by the sponsoring university's Institutional Review Board. Participants completed the online survey through a secure online survey host. They electronically signed an informed consent form, completed the online survey, received a debriefing form that they could print for their records, and were offered the opportunity to request results of the study after its completion.

Results

All data were screened for violations of the assumption of normality, skewedness and kurtosis, the presence of outliers, and for independence of errors. For those analyses involving multiple comparisons, a more conservative alpha of 0.005 was adopted to minimize the chance for familywise error.

Results revealed that 92.7% of participants reported that they had played electronic games within the last month. Additionally, 62.1% of participants reported that they played electronic games within the last 24 hours. Individuals who were identified as current game players (played electronic games within the last week) reported a weekly average of 9.73 hours of game play. Of those currently engaging in game play, 8.5% reported playing an average of 35 hours per week. The reported mean age of commencement of electronic game play was 7.5 years of age.

Downloaded by Bar Ilan from www.liebertpub.com at 02/17/19. For personal use only.

Results indicated that the sample mean BMI was 24.33 ($SD = 4.75$), ranging from 16.50 to 44.63. The correlation between BMI and frequency of play was not significant ($r = -0.05$, $p > 0.05$). Additionally, results from a one-sample chi square test revealed that participants who reported playing over 15 hours per week were no more likely to have a higher BMI than those participants who reported playing less than 15 hours per week or those who reported they did not play at all: χ^2 (1, with continuity correction) = 52.44, $p > 0.05$.

Further analyses were conducted to examine the relationship between frequency of electronic game play and academic performance (as measured by GPA). The relationship between reported GPA and frequency of electronic game play was not significant ($r = 0.05$, $p > 0.05$). Additionally, as with BMI, findings revealed that participants who reported playing over 15 hours per week were no more likely to have a lower GPA than participants who reported less than 15 hours of game play per week or no hours of game play per week: χ^2 (1, with continuity correction) = 121.95, $p > 0.05$.

Regarding the social context of game play, more than half of participants (51%) reported often or always playing with friends, while 7.8% indicated they always play alone. There was a significant relationship between frequency of play and self-reported frequency of engaging in electronic game play with others ($r = .217$, $p < 0.01$). Furthermore, 9.1% of participants indicated that they often or always prefer playing to going out with friends. A significant relationship existed between frequency of play and self-reported preference for game play over a social outing ($r = 0.399$, $p < 0.001$). Romantic relationship status was similarly unassociated with frequency of game play. The results of a one-sample t test revealed that there was no significant difference in weekly mean frequency of game play among individuals indicating they were currently involved in a romantic relationship or that they were single $t(218) = 10.94$, $p > 0.05$.

Findings also revealed the prevalence of game play in response to certain intrapersonal demands. Almost half of the participants (48.4%) reported that they often or always play when bored, 16.2% reported that they often or always play when lonely, and 35.1% indicated that they often or always play to relieve stress. A multiple correlation analysis revealed a significant positive correlation between frequency of play and self-reported frequency of playing when bored ($r = 0.350$, $p < 0.001$) as well as playing when lonely ($r = 0.279$, $p < 0.001$), and when stressed ($r = 0.294$, $p < 0.001$).

In regard to the consumption of other types of media, 67% of the sample reported watching television for 7 hours or less during the week (approximately 1 hour of television per day) with only 10.1% reporting that they watch television for more than 16 hours per week. Of the participants, 17.5% reported reading male-oriented entertainment magazines for more than 2 hours per week. There was a significant negative correlation between number of hours of electronic game play and number of hours of television watched ($r = -0.157$, $p < 0.05$), but no significant relationship between frequency of electronic game play and hours spent reading magazines.

Discussion

The results indicate that electronic game play is a popular form of entertainment among college-aged males with a sample mean of almost 10 hours per week and a subset (8.5%) engaging in play for an incredible average of over 35 hours per week. However, contrary to research suggesting the detrimental impact of electronic gaming on younger children, there were no significant correlations between participants' BMI or GPA and frequency of electronic game play. Furthermore, there were no significant mean differences between other variables related to social functioning (e.g., relationship status) and frequency of electronic game play, revealing no obvious trends in interpersonal functioning for those who play games more or less frequently. Interestingly, other media usage was either not related to frequency of electronic game play as for magazines or was inversely related, as with the frequency of consumption of television. This finding suggests that individuals may be more selective with their choice of media rather than, as has been the general assumption, generally consuming multiple forms of media at equivalent rates (depending on availability).

Beyond prevalence of general usage, the results suggest that college-aged males may be playing electronic games in a rather unique social and emotional context, wherein electronic game play is not always a solitary activity but often is a social activity involving many players. Emotional and social factors may motivate play as evidenced by the prevalence of game play in order to relieve stress, loneliness, and boredom. These findings are in line with other research suggesting that as with other forms of media, electronic games have received an overly negative reputation when they may actually facilitate positive relationships and coping skills to some extent.[11,12] However, because the current sample consists primarily of college students and is likely higher functioning than a primarily nonstudent sample of the same age, generalizations should be limited to male college students. It may be that individuals in the current sample are better able to manage the frequently conflicting academic, social, and intrapersonal demands of their developmental period.

It is thought that the negative consequences associated with gaming in younger populations are the result of the interference of electronic game play with other age-appropriate play and activities, particularly if there is no parental management of the child's electronic game play time. During young adulthood, there are an increased number of demands (both academic/work and social) on an individual's time, requiring a more developed time management strategy in order to successfully meet those demands. It appears that by college age, game players have learned how to manage their game play and have located the appropriate niches in which to more adaptively carry out this play. Perhaps the novelty of game play experienced at a younger age is later replaced by its facilitation of psychosocial adjustment.

There are some important limitations to the current study, particularly related to the generalizability of the findings. The data were collected from a self-selected sample of college students and, given that the survey was presented in an online format, it is possible that participants more inclined to use technology and electronic media participated in the study. In the future, it will be important to acquire data from a more randomly selected and controlled sample.

Another limitation inherent to the nature of a correlational study is the inability to ascertain directionality in the relationships between variables, particularly for those variables related to managing intrapersonal needs. Do individuals who experience loneliness increase their frequency of electronic game play, or does loneliness increase as the frequency

of electronic game play increases? It is difficult to discern the answer given the correlational design of the current study, and the issue warrants further investigation. Experimental and longitudinal studies will be necessary to ascertain the impact of prolonged gaming on social functioning. Longitudinal methodology also will serve to further elucidate the role that electronic gaming plays across the lifespan. Given that this media "came of age" about the same time that college-aged individuals were young children, it can be assumed that this population is unique in that it has had access to electronic games throughout development. Examining how the prevalence and frequency of electronic gaming changes across developmental stages will reveal more about what kind of role this media plays in an increasingly technology saturated society.

To further increase the validity of the study, future research should attempt to operationalize the variables in a more comprehensive manner. For instance, it will be helpful to include additional measures of academic performance and functioning beyond GPA. Furthermore, the inclusion of additional social and intrapersonal functioning variables would help to advance the conceptualization of electronic game play as a potentially developmentally appropriate activity.

Despite the tremendous amount of game play reported by college-aged males, these findings suggest that prolonged electronic game play is not directly linked to obesity, decreased academic performance, or social impairment and may even serve emotion regulation purposes during this developmental period. Perhaps more than in young children, college-aged men may rely upon moderated levels of electronic gaming as a healthy source of socialization, relaxation, and coping during their college years. The results of this study further suggest that attempts to minimize the detrimental consequences thought to be associated with frequent and prolonged electronic game play may be less important than analyzing the specific mechanisms inherent in this media that may be associated with positive behaviors.

Downloaded by Bar Ilan from www.liebertpub.com at 02/17/19. For personal use only.

Disclosure Statement

The authors have no conflict of interest.

References

1. Gortmaker SL, Dietz WH, Cheung LWY. Inactivity, diet, and the fattening of America. Journal of the American Dietetic Association 1990; 90:1247–52, 1255.
2. Anderson C, Berkowitz L, Donnerstein E, et al. The influence of media violence in youth. Psychological Science in the Public Interest 2003; 4:81–110.
3. Anderson C, Bushman B. Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: a meta-analytic review of the scientific literature. Psychological Science 2001; 12:353–9.
4. Gentile DA, Lynch PJ, Linder JR, et al. The effects of violent video game habits on adolescent hostility, aggressive behaviors, and school performance. Journal of Adolescence 2002; 27:5–22.
5. Harris MB, Williams R. Video games and school performance. Education 1985; 105:306–9.
6. Dickinson A. Video playground. Time 2000; 19:98.
7. Jenkin H. Art form for the digital age. Technology Review 2000; 103:117–20.
8. Rideout VG, Roberts DF, Foehr UG. (2005) *Generation M: media in the lives of 8-18 year-olds*. Kaiser Family Foundation: Menlo Park, California.
9. Buchman DD, Funk JB. Video and computer games in the '90s: Children's time commitment and game preference. Children Today 1996; 24:12–6.
10. Smyth JM. Beyond self-selection in video game play: an experimental examination of the consequences of massively multiplayer online role-playing game play. CyberPsychology & Behavior 2007; 10:717–21.
11. Colwell J. Needs met through computer game play among adolescents. Personality & Individual Differences 2007; 43:2072–82.
12. Ogletree SM, Drake R. College students' video game participation and perceptions: gender differences and implications. Sex Roles 2007; 56:537–42.
13. Anand V. A study of time management: the correlation between video game usage and academic performance markers. CyberPsychology & Behavior 2007; 10:552–9.
14. Huston AC, Donnerstein E, Fairchild H, et al. (1992) *Big world, small screen: the role of television in American society*. Lincoln: University of Nebraska Press.
15. Robinson TN. Reducing children's television viewing to prevent obesity. Journal of the American Medical Association 1999; 2822:1561–7.
16. Marshall SJ, Biddle SJH, Gorely T, et al. Relationships between media use, body fatness and physical activity in children and youth: a meta-analysis. International Journal of Obesity 2004; 28:1238–46.
17. Sobell LC, Sobell MB. (1992) Timeline follow-back: a technique for assessing self-reported alcohol consumption. In Litten RZ, Allen JP, eds. *Measuring alcohol consumption: psychosocial and biological methods*. Totowa, NJ: Humana Press pp. 41–72.
18. Carter Sobell L, Agrawal S, Sobell MB, et al. Comparison of a quick drinking screen with the timeline followback for individuals with alcohol problems. Journal of Studies on Alcohol 2003; 64:858–61.

Address reprint requests to:
Elizabeth Wack
Department of Psychology
University of Central Florida
P.O. Box 161390
Orlando, Florida 32816

E-mail: betsywack@gmail.com