Research on Video Games

Ordered most recent to earliest

1. Anderson, D. R., J. Bryant, et al. (2006). "Brainmapping -- An introduction to a new approach to studying media processes and effects." Media Psychology 8(1): 1-6.
Objective: To explain the pros and cons of the new brain imaging studies of media use and effects.

Design: Review of fMRI studies, especially the 3 in issue 8 of Media Psychology.

Subjects and Setting: N/A

Intervention: N/A

Outcome Measure(s): N/A

Results: The authors present 3 notes of caution: interdisciplinary collaboration can be challenging because specialists from the different fields have very different approaches and use different jargon, facilities are expensive and are not always readily available and, finally, designing and interpreting the study is labor-intensive and requires a great deal of background research. The results of the 3 other Media Psychology articles are briefly summarized.

Conclusion: Studies that enable researchers to collaborate and study actual brain processes during media exposure hold great promise for the field of media studies. There are several hurdles that these types of studies must overcome in order to be successful.

2. Weber, R., U. Ritterfield, et al. (2006). "Does playing violent video games induce aggression? Empirical evidence of a functional magnetic resonance imaging study." Media Psychology 8(1): 39-60.
Objective: To find out if playing violent video games produces the same activity in the cortex and amygdala that physical aggression produces.

Design: Participants played a "Mature" rated video game for 5 12-minute rounds while in an fMRI scanner. Brain activity and activity on the video game were analyzed.

Subjects and Setting: 13 German males between 18 and 29 years-old (Mean age = 23) who played video games for an average of 15 hours per week and had been playing video games since age 12.

Intervention: N/A

Outcome Measure(s): Frame by frame content analysis of game play, pulse, skin conductance, brain activity, post-test questionnaire.

Results: The post-test questionnaire indicated that the participants played the game like they do normally. Activity in the Anterior Cingulate Cortex correlated negatively with activity in the Amygdala during and immediately after violent phases of play. 11 of the 13 participants showed large effect sizes in the Anterior Cingulate Cortex (dACC = .56%, rACC = -1.56%) and in the Amygdala (-.81%) for violent conditions. No specific analysis of video game behavior was performed, but the experimenters noted different patterns in brain activity when violent behavior was seen without provocation.

Conclusion: Virtual violence experienced in video games produces the same brain activity patterns as is seen during aggressive behavior and ideation. The experimenters suggest that this could be a result of aggressive or fear-related emotions because both could be present in the face of danger. They also note that while virtual and real aggression may produce similar brain activity, subjective experiences may still be different. It should also be taken into consideration that the participants were regular users of violent video games, so these results could be specific to that population. © Center on Media and Child Health

3. Richmond, T. K., A. E. Field, et al. (2006). "Can neighborhoods explain racial/ethnic differences in adolescent media use?" Journal of Adolescent Health 38(2): 133-134.
Objective: Investigate whether there are racial/ethnic disparities in media use by adolescent boys and girls and if so, do perceptions or objective measurements of neighborhood attributes contribute to this disparity.

Design: Cross-sectional. Self-reports on media use. Information on ethnicity/race, demographics, attitudes, behavior and health.
Subjects and Setting: 17,007 teenagers participating in National Longitudinal Study of Adolescent Health.

Intervention: N/A

Outcome Measure(s): Media use.

Results: Adolescents lived in segregated neighborhoods. Black and Hispanic adolescents were heavier media users than white adolescents (21 v. 15. v. 13 hours/week, $p<0.001$ for girls; 26 v. 20 v. 17 hours/week, $p<0.001$ for boys). Increased media use could be attributed to neighborhood of residence for Hispanic girls (gamma=-0.20, p=0.86). Depression and BMI were related to increased media use.

Conclusion: Media use varies by ethnicity/race and gender. More research necessary to explain the differences in media use between racial/ethnic groups. © Center on Media and Child Health

4. Motl, R. W., E. McAuley, et al. (2006). "Naturally occurring changes in time spent watching television are inversely related to frequency of physical activity during early adolescence." Journal of Adolescence 29(1): 19-32.
Objective: To investigate the relationship between television viewing and video game playing and physical activity.

Design : Longitudinal study (2 year period) using data extracted from the Teens Eating for Energy and Nutrition at School (TEENS) study (Lytle and Perry, 2001). This was a school-based group randomized trial investigating cancer risk factors in adolescents. Data were collected 3 times over a 2 year period - fall 1998, spring 1999, and spring 2000.

Subjects and Setting: 4594 total 7th and 8th grade students in study. 3878 completed 1998 survey, 3798 completed 1999 survey, 3588 completed 2000 survey. 49% female, 51% male. 62.6% White, 13.8% African American, 3.8% Hispanic, 7.2% Asian, 1.7% Native American, 6.5% Multiethnic, 4.4% other. Subjects were recruited from 16 schools within a 30 mile radius of St. Paul/Minneapolis, MN.
Intervention(s): The original TEENS study employed dietary interventions, but did not target physical activity.

Outcome Measures: Physical activity, time spent watching television and playing video games, smoking behavior, gender, and value the participants placed on their health, appearance and achievement were measured through answers on a questionnaire. Socioeconomic status was measured by participation in school lunch programs, parents educational level, job status, and how many parents lived at home.

Results: Changes in television (but not video game) use over the 2 year period were inversely associated with changes in physical activity level. Gender, socioeconomic status, smoking, and value the subjects placed on their health, appearance, and achievement did not affect this relationship.

Conclusions: Decreasing the amount of time adolescents spend watching TV is likely to increase their physical activity level. Interventions parents can make to decrease their teen's television watching are discussed. © Center on Media and Child Health

5. Bushman, B. J. and L. R. Huesmann (2006). "Short-term and Long-term Effects of Violent Media on Aggression in Children and Adults." Arch Pediatr Adolesc Med 160(4): 348-352.
Objectives To test whether the results of the accumulated studies on media violence and aggressive behavior are consistent with the theories that have evolved to explain the effects. We tested for the existence of both short-term and long-term effects for aggressive behavior. We also tested the theory-driven hypothesis that short-term effects should be greater for adults and long-term effects should be greater for children. Design Meta-analysis. Participants Children younger than 18 years and adults. Main Exposures Violent media, including TV, movies, video games, music, and comic books. Main Outcome Measures Measures of aggressive behavior, aggressive thoughts, angry feelings, physiological arousal (eg, heart rate, blood pressure), and helping behavior. Results Effect size estimates were combined using meta-analytic procedures. As

expected, the short-term effects of violent media were greater for adults than for children whereas the long-term effects were greater for children than for adults. The results also showed that there were overall modest but significant effect sizes for exposure to media violence on aggressive behaviors, aggressive thoughts, angry feelings, arousal levels, and helping behavior. Conclusions The results are consistent with the theory that short-term effects are mostly due to the priming of existing well-encoded scripts, schemas, or beliefs, which adults have had more time to encode. In contrast, long-term effects require the learning (encoding) of scripts, schemas, or beliefs. Children can encode new scripts, schemas, and beliefs via observational learning with less interference and effort than adults.

6. Wang, X. and A. C. Perry (2006). "Metabolic and Physiologic Responses to Video Game Play in 7- to 10-Year-Old Boys." Arch Pediatr Adolesc Med 160(4): 411-415.

Objective To examine the metabolic, physiologic, and hemostatic responses to action video game play in a group of young boys. Design Comparison study. Setting Laboratory of Clinical and Applied Physiology, University of Miami. Participants Twenty-one boys aged 7 to 10 years. Main Outcome Measures Blood pressure monitored before and during game play and blood glucose and lactate levels measured before and immediately after game play. Measurements were continuously recorded throughout game play. Dependent t tests were used to compare measurements recorded at baseline and during or after game play. Effect sizes using the Cohen d were examined for comparisons. Results Significant increases from baseline were found for heart rate (18.8%; P<.001), systolic (22.3%; P<.001) and diastolic (5.8%; P = .006) blood pressure, ventilation (51.9%; P<.001), respiratory rate (54.8%; P<.001), oxygen consumption (49.0%; P<.001), and energy expenditure (52.9%; P<.001). Effect sizes for these comparisons were medium or large. No significant changes were found from baseline to after video game play for lactate (18.2% increase; P = .07) and glucose (0.9% decrease; P = .59) levels. Conclusions Video game play results in significant increases in various metabolic and physiologic variables in young children. Thus, it should not be combined with television viewing for the evaluation of sedentary activities. The magnitude of change, however, was lower than that observed during standard physical exercise and below national health recommendations. As such, video game play should not be considered a substitute for regular physical activities that significantly stress the metabolic pathways required for the promotion of cardiovascular conditioning.

7. Thompson, K. M., K. Tepichin, et al. (2006). "Content and Ratings of Mature-Rated Video Games." Arch Pediatr Adolesc Med 160(4): 402-410.

Objectives To quantify the depiction of violence, blood, sexual themes, profanity, substances, and gambling in video games rated M (for "mature") and to measure agreement between the content observed and the rating information provided to consumers on the game box by the Entertainment Software Rating Board. Design We created a database of M-rated video game titles, selected a random sample, recorded at least 1 hour of game play, quantitatively assessed the content, performed statistical analyses to describe the content, and compared our observations with the Entertainment Software Rating Board content descriptors and results of our prior studies. Setting Harvard University, Boston, Mass. Participants Authors and 1 hired game player. Main Exposure M-rated video games. Main Outcome Measures Percentages of game play depicting violence, blood, sexual themes, gambling, alcohol, tobacco, or other drugs; use of

profanity in dialogue, song lyrics, or gestures. Results Although the Entertainment Software Rating Board content descriptors for violence and blood provide a good indication of such content in the game, we identified 45 observations of content that could warrant a content descriptor in 29 games (81%) that lacked these content descriptors. M-rated video games are significantly more likely to contain blood, profanity, and substances; depict more severe injuries to human and nonhuman characters; and have a higher rate of human deaths than video games rated T (for "teen"). Conclusion Parents and physicians should recognize that popular M-rated video games contain a wide range of unlabeled content and may expose children and adolescents to messages that may negatively influence their perceptions, attitudes, and behaviors.

8. Bushman, B. J. and L. R. Huesmann (2006). "Short-term and Long-term Effects of Violent Media on Aggression in Children and Adults." Arch Pediatr Adolesc Med 160(4): 348-352.

Objectives To test whether the results of the accumulated studies on media violence and aggressive behavior are consistent with the theories that have evolved to explain the effects. We tested for the existence of both short-term and long-term effects for aggressive behavior. We also tested the theory-driven hypothesis that short-term effects should be greater for adults and long-term effects should be greater for children. Design Meta-analysis. Participants Children younger than 18 years and adults. Main Exposures Violent media, including TV, movies, video games, music, and comic books. Main Outcome Measures Measures of aggressive behavior, aggressive thoughts, angry feelings, physiological arousal (eg, heart rate, blood pressure), and helping behavior. Results Effect size estimates were combined using meta-analytic procedures. As expected, the short-term effects of violent media were greater for adults than for children whereas the long-term effects were greater for children than for adults. The results also showed that there were overall modest but significant effect sizes for exposure to media violence on aggressive behaviors, aggressive thoughts, angry feelings, arousal levels, and helping behavior. Conclusions The results are consistent with the theory that short-term effects are mostly due to the priming of existing well-encoded scripts, schemas, or beliefs, which adults have had more time to encode. In contrast, long-term effects require the learning (encoding) of scripts, schemas, or beliefs. Children can encode new scripts, schemas, and beliefs via observational learning with less interference and effort than adults.

9. Williams, D. (2005). "Bridging the methodological divide in game research." Simulation & Gaming 36(4): 447-463.

The study of video game effects has been marked by two very different approaches. The first approach is represented by social scientists, who, with some exceptions, seek to understand the effects of games on users. The second approach is favored by humanists, who seek to understand the meaning and context of games. To date, these two groups have largely talked past one another due to their different goals and their different methodologies. Yet, for the advancement of science and understanding, both sets of scholarship are important and relevant Each has contributions to make. However unless these two groups come to possess at least a cursory understanding of the other's methodology, there will be little synthesis. This is a missed opportunity for scholars of every stripe, and ways are suggested to bridge these gaps.ABSTRACT FROM AUTHOR

10. Habgood, M. P. J., S. E. Ainsworth, et al. (2005). "Endogenous fantasy and learning in digital games." Simulation & Gaming 36(4): 483-498.

Many people believe that educational games are effective because they motivate children to actively engage in a learning activity as part of playing the game. However; seminal work by Malone, exploring the motivational aspects of digital games, concluded that the educational effectiveness ofa digital game depends on the way in which learning content is integrated into the fantasy context of the game. in particular; he claimed that content that is intrinsically related to the fantasy will produce better learning than that which is merely extrinsically related. However; this distinction between intrinsic and extrinsic (or endogenous and exogenous)fantasy is a concept that has developed a confused standing over the following years. This article will address this confusion by providing a review and critique of the empirical and theoretical foundations of endogenous fantasy and its relevance to creating educational digital games. Substantial concerns are raised about the empirical basis of this work and a theoretical critique of endogenous fantasy is offered, concluding that endogenous fantasy is a misnomer; insofar as the "integral and continuing relationship" of fantasy cannot be justified as a critical means of improving the effectiveness of educational digital games. An alternative perspective on the intrinsic integration of learning content is described, incorporating game mechanics, flow, and representations.ABSTRACT FROM AUTHOR

11. Colwell, J. and M. Kato (2005). "Video game play in British and Japanese adolescents." Simulation & Gaming
36(4): 518-530.

Results from research into negative correlates of computer/video game play in the United Kingdom and in Japan are presented, with new analyses across cultures. Patterns of play are similar although Japanese adolescents have been playing for longer they play fewer aggressive games, and there is greater perceived concern by Japanese parents. Principal components analyses of a scale to measure needs met by game play produce essentially the same factors: "companionship," which correlates with play in the United Kingdom only, and "prefer to friends," which in Japan correlates with play for both genders, but only for boys in tile United Kingdom. Aggression scores are predicted by frequency of play in both cultures, but years of play explain none of the variance. A preference for aggressive games predicts lower aggression scores in Japan. These findings would seem to provide little support for the causal link hypothesis.ABSTRACT FROM AUTHOR

12. Terlecki, M. S. and N. S. Newcombe (2005). "How Important Is the Digital Divide? The Relation of Computer and Videogame Usage to Gender Differences in Mental Rotation Ability." Sex Roles
53(5/6): 433-441.

Researchers interested in the associations of gender with spatial experience and spatial ability have not yet focused on several activities that have become common in the modern digital age. In this study, using a new questionnaire called the Survey of Spatial Representation and Activities (SSRA), we examined spatial experiences with computers and videogames in a sample of nearly 1,300 undergraduate students. Large gender differences, which favored men, were found in computer experience. Although men and women also differed on SAT scores, gender differences in computer experience were still apparent with SAT factored out. Furthermore, men and women with high and low levels of computer experience, who were selected for more

intensive study, were found to differ significantly on the Mental Rotations Test (MRT). Path analyses showed that computer experience substantially mediates the gender difference in spatial ability observed on the MRT. These results collectively suggest that the â€œDigital Divideâ€□ is an important phenomenon and that encouraging women and girls to gain spatial experiences, such as computer usage, might help to bridge the gap in spatial ability between the sexes.ABSTRACT FROM AUTHOR

13. Carnagey, N. L. and C. A. Anderson (2005). "The Effects of Reward and Punishment in Violent Video Games on Aggressive Affect, Cognition, and Behavior." Psychological Science
16(11): 882-889.
Three experiments examined the effects of rewarding and punishing violent actions in video games on later aggression-related variables. Participants played one of three versions of the same race-car video game: (a) a version in which all violence was rewarded, (b) a version in which all violence was punished, and (c) a nonviolent version. Participants were then measured for aggressive affect (Experiment 1), aggressive cognition (Experiment 2), and aggressive behavior (Experiment 3). Rewarding violent game actions increased hostile emotion, aggressive thinking, and aggressive behavior. Punishing violent actions increased hostile emotion, but did not increase aggressive thinking or aggressive behavior. Results suggest that games that reward violent actions can increase aggressive behavior by increasing aggressive thinking.ABSTRACT FROM AUTHOR

14. Griffiths, M. (2005). "RELATIONSHIP BETWEEN GAMBLING AND VIDEO-GAME PLAYING: A RESPONSE TO JOHANSSON AND GOTESTAM." Psychological Reports 96(3): 644-646.
This paper reviews the many similarities and commonalities between video-game playing and slot machine gambling in response to Johansson and Gotestam in 2004.ABSTRACT FROM AUTHOR

15. Escobar-Chaves, S. L., S. R. Tortolero, et al. (2005). "Impact of the media on adolescent sexual attitudes and behaviors." Pediatrics 116(1): 303-326.
Objective: To review existing research, published 1983-2004, regarding the effects of exposure to mass media on the sexual attitudes and behaviors of adolescents.

Design: Literature review.

Subjects and Setting: 2522 studies, published 1983-2004, on adolescent exposure to sexual-content media and its effect on sexual attitudes and behaviors. All studies were peer-reviewed or otherwise authoritative, published in English, and concerning adolescents, ages 11-19, in U.S. and other postindustrial English-speaking countries.

Intervention(s): N/A

Outcome Measure(s): Study results concerning sexual content in mass media, adolescent exposure, and effects of exposure on adolescent sexual attitudes and behaviors.

Results: Studies indicate that adolescents watch significant amounts of television and are frequently exposed to sexual content on television, as well as through other media outlets. Sexual-content media is pervasive and increasing. <1% of the 2522 studies concerned the effects of exposure on adolescent sexual attitudes and behaviors. Of the studies that did address effects, most concerned television exposure and did not demonstrate causality.

Conclusion: Although many studies indicate that adolescents are exposed to significant amounts of media with sexual content, few studies have rigorously examined the effect of this exposure on adolescents' sexual attitudes and behaviors. © Center on Media and Child Health

16. Norman, G. J., B. A. Schmid, et al. (2005). "Psychosocial and environmental correlates of adolescent sedentary behaviors." Pediatrics 116(4): 908-16.
Objective: To determine the correlates of adolescent sedentary behavior by examining psychological, social, and environmental factors.

Design: Cross-sectional survey of adolescents and their parents.
Subjects and Setting: 3366 households in the San Diego, CA area were contacted over a 13 month period. Final sample size 878 adolescents (64% of eligible contacts). Age range 11-15 years. 3.4% Asian/Pacific Islander, 6.6% black, 0.7% Native American, 13.1% Hispanic, 57.9% white, 18.3% multiethnic/other.

Intervention(s): N/A

Outcome Measures: Height, weight, and BMI were determined. Adolescents filled out a questionnaire asking about their sedentary behaviors, behavior change strategies, how they felt about the pros and cons of change, their level of self-efficacy, family support for being less sedentary, their enjoyment of sedentary behaviors, and household rules regarding TV and video use. Parents filled out questionnaires asking about their support of their child's physical activity.

Results: Total sedentary time was not significantly different between boys and girls, but boys spent more time playing video games while girls were more likely to spend time listening to music and talking on the phone. Girls were less likely to be in the high-sedentary-behavior group if they had higher scores on change strategies, pros of change, self-efficacy, and TV/video household rules. They were more likely to be in the high-sedentary-behavior group if they were older, scored high in cons of change, enjoyment of sedentary behaviors, or lived in hilly neighborhoods. Boys were less likely to be in the high-sedentary-behavior group if they had higher scores on self-efficacy and TV/video household rules. Boys were more likely to be in the high-sedentary-behavior group if they were older, non-white, in the >85th percentile BMI category, scored high in the cons of change and enjoyment of sedentary behaviors.

Conclusions: Taking into account age, ethnicity, psychosocial and environmental factors can help target adolescents who are more likely to be in high-sedentary-behavior groups. The study has implications for how parents and pediatricians can tailor strategies to decrease sedentary behaviors in individual adolescents. © Center on Media and Child Health

17. Kirsh, S. J., P. V. Olczak, et al. (2005). "Violent Video Games Induce an Affect Processing Bias." Media Psychology 7(3): 239-250.
This study investigated the effects of violent video game play and trait hostility on attentional bias toward negatively valenced words. Following video game play, participants completed an emotional Stroop task. Results indicated greater Stroop interference for participants high in trait hostility and for participants playing violent video games. Implications of these findings are discussed with respect to current models of aggressive behavior.ABSTRACT FROM AUTHOR

18. Hebert, S., R. Beland, et al. (2005). "Physiological stress response to video-game playing: the contribution of built-in music." Life Sciences 76(20): 2371-2380.
Abstract: Recent studies on video game playing have uncovered a wide range of measurable physiological effects on the organism, such as increases in cardiovascular activity and breathing responses. However, the exact source of these effects remains unclear. Given the well-known effects of sound on physiological activity, especially those of noise and of music, and on the secretion of the stress hormone cortisol in particular, we hypothesized that music may be a major source of stress during video game playing. We thus examined the effect of built-in music on cortisol secretion as a consequence of video game playing. Players were assigned quasi-randomly to either a Music or a Silence condition. Four saliva samples were taken, that is, after practice (T1), immediately after having played for 10 minutes (T2), 15 minutes after the end of the experiment (T3), and 30 minutes after the end of the experiment (T4). The results show that the Music group had significantly higher cortisol levels at T3, that is, when cortisol levels are assumed to reflect the stress induced by the game. These findings suggest for the first time that the auditory input contributes significantly to the stress response found during video game playing.ABSTRACT FROM AUTHOR; Copyright 2005 Elsevier

19. Nippold, M. A., J. K. Duthie, et al. (2005). "Literacy as a Leisure Activity: Free-Time Preferences of Older Children and Young Adolescents." Language, Speech, & Hearing Services in Schools 36(2): 93-102.
Purpose: Literacy plays an important role in the development of language in school-age children and adolescents. For example, by reading a variety of books, magazines, and newspapers, students gain exposure to complex vocabulary, and reading becomes a prime opportunity for learning new words. Despite the importance of reading for lexical development, little is known about the pleasure reading habits of today's youth. The first goal of this investigation was to examine the preferences of older children and young adolescents with respect to reading as a leisure-time activity and its relationship to other free-time options that are likely to compete for their attention. The second goal was to examine the amount of time that young people spend reading for pleasure each day and the types of materials they most enjoy reading. The third goal was to determine if preferences for free-time activities and reading materials would evince age- and gender-related differences during the period of development from late childhood through early adolescence (ages 11-15 years). The findings could serve as a reference point for understanding what is reasonable to expect of students during this age range. Method: The participants were 100 sixth graders (mean age 11 ;7 Iyears;months]) and 100 ninth graders (mean age 14;8) attending public schools in western Oregon. Each group contained an equal number of boys and girls, all of whom spoke English as their primary language and were considered to be typical achievers. All participants completed a survey concerning their preferred free-time activities and reading materials. They also reported the average amount of time they spent

reading for pleasure each day. Results: The most popular free-time activities were listening to music/going to concerts, watching television or videos, playing sports, and playing computer or video games. Least preferred activities were cooking, running or walking, writing, and arts and crafts. Reading was...ABSTRACT FROM AUTHOR

20. Browne, K. D. and C. Hamilton-Giachritsis (2005). "The influence of violent media on children and adolescents: A public-health approach." Lancet 365(9460): 702-710.
Objective: To consider evidence from research studies that examine the effect violence in the media has on children and young people.

Data Sources: Articles from 1998 to 2004 on the effects of media violence on children up to 18 years from North America. Search engines commonly used in social sciences and public health (e.g. OVID, ATLAS) were utilized to extract articles. The terms included all combinations of the words media, television, film, video, song lyrics, radio, music, computer games, video games, AND violence, crime, aggression.

Study Selection: Publications included experimental and cohort studies including meta-analytic reviews and quasi-systematic reviews.

Results: Small, but statistically significant, association between aggression and violence on television and film has been demonstrated in studies, reviews, meta-analyses. Consistent evidence of an association between younger children watching violent media (television, film, video, computer games) and demonstrating more short-term aggressive play and behavior. Evidence is less consistent for older children. There is weak evidence that links media violence directly to crime.

Conclusions: Studies need to consider sociodemographic factors and utilize more sophisticated statistical analyses techniques in order to establish a causal relationship between violence in the media and influence on children.

21. Kerin, R. (2005). "New Literacies: Changing Knowledge and Classroom Learning/What Video Games Have to Teach Us about Learning and Literacy/Multimodal Literacy." Journal of Early Childhood Literacy 5(2): 175-184.
Reviews several books about early childhood literacy. "New Literacies: Changing Knowledge and Classroom Learning," by Colin Lankshear and Michel Knobel; "What Video Games Have to Teach Us about Learning and Literacy," by James Paul Gee; "Multimodal Literacy," by Carey Jewitt and Gunther Kress.

22. James, A. and C. Taylor (2005). "Video Games: Some Pitfalls of Video Evidence." Journal of Criminal Law 69(3): 264-276.
CCTV evidence is regularly employed in criminal cases, yet there has been relatively little consideration of the manner in which such evidence is collected and subsequently handled. The use of CCTV evidence raises issues of disclosure, data protection and human rights, all of which have a far-reaching impact not only on the accused but also on others who find themselves recorded by surveillance systems. In addition, much of the video evidence collected during

criminal investigations comes from third parties, such as shops and commercial premises, which are outside the direct control of the police. This only serves to compound the difficulty of managing such material within the investigative and trial processes.ABSTRACT FROM AUTHOR

23. Kronenberger, W. G., V. P. Mathews, et al. (2005). "Media violence exposure and executive functioning in aggressive and control adolescents." Journal of Clinical Psychology 61(6): 725-737.

The relationship between media violence exposure and executive functioning was investigated in samples of adolescents with no psychiatric diagnosis or with a history of aggressiveâ€“disruptive behavior. Age-, gender-, and IQ-matched samples of adolescents who had no Diagnostic and Statistical Manual of Mental Disordersâ€”fourth edition (DSM-IV; American Psychiatric Association, 1994) diagnosis (N = 27) and of adolescents who had DSM-IV Disruptive Behavior Disorder diagnoses (N = 27) completed measures of media violence exposure and tests of executive functioning. Moderate to strong relationships were found between higher amounts of media violence exposure and deficits in self-report, parent-report, and laboratory-based measures of executive functioning. A significant diagnosis by media violence exposure interaction effect was found for Conners' Continuous Performance Test scores, such that the media violence exposureâ€“executive functioning relationship was stronger for adolescents who had Disruptive Behavior Disorder diagnoses. Results indicate that media violence exposure is related to poorer executive functioning, and this relationship may be stronger for adolescents who have a history of aggressiveâ€“disruptive behavior. Â© 2004 Wiley Periodicals, Inc. J Clin Psychol. 61: 725â€“737, 2005ABSTRACT FROM AUTHOR

24. Cicchirillo, V. and R. M. Chory-Assad (2005). "Effects of Affective Orientation and Video Game Play on Aggressive Thoughts and Behaviors." Journal of Broadcasting & Electronic Media 49(4): 435-449.

This study examined the effects of playing a violent video game on aggressive thoughts and behaviors and the moderating role of affective orientation in the violent video gameâ€“aggression relationship. Approximately 2 weeks after having their affective orientation measured, 59 participants (plus 5 additional participants) played a violent or nonviolent video game for 10 minutes. Participants then performed a word completion task and judged the researcher's competence, courtesy, and deservedness of financial support. Results show that participants who played the violent video game rated the researcher as less courteous and less deserving of financial support than did participants who played the nonviolent video game, and affective orientation and video game condition interacted to predict evaluations of courtesy and deservedness of financial support.ABSTRACT FROM AUTHOR

25. Chen, Y.-C., P. S. Chen, et al. (2005). "An analysis of online gaming crime characteristics." Internet Research 15(3): 246-261.

Purpose - To arouse the public awareness of online gaming-related crimes and other societal influences so that these problems can be solved through education, laws and appropriate technologies. Design/methodology/approach - A total of 613 criminal cases of online gaming crimes that happened in Taiwan during 2002 were gathered and analyzed. They were analyzed for special features then focusing on the tendency for online gaming crime. Related prosecutions,

offenders, victims, criminal methods, and so on, were analyzed. Findings - According to our analysis of online gaming characteristics in Taiwan, the majority of online gaming crime is theft (73.7 percent) and fraud (20.2 percent). The crime scene is mainly in internet cafÃ©s (54.8 percent). Most crimes are committed within the 12:00 to 14:00 time period (11.9 percent). Identity theft (43.4 percent) and social engineering (43.9 percent) are the major criminal means. The offenders (95.8 percent) and victims (87.8 percent) are mainly male and offenders always proceed alone (88.3 percent). The age of offenders is quite low (63.3 percent in the age range of 15-20), and 8.3 percent of offenders are under 15 years old. The offenders are mostly students (46.7 percent) and the unemployed (24 percent), most of them (81.9 percent) not having criminal records. The type of game giving rise to most of the criminal cases is Lineage Online (93.3 percent). The average value of the online gaming loss is about US$459 and 34.3 percent of criminal loss is between $100 and $300. Research limitations/implications - These criminal cases were retrieved from Taiwan in 2002. Some criminal behavior may have been limited to a certain area or a certain period. Practical implications - Provides a useful source of information and constructive advice for the public who will sense the seriousness and influence of online gaming crimes. Further, this topic may have implications on e-commence, e-services, or web-based activities beyond gaming...ABSTRACT FROM AUTHOR

26. Piccioli, M., F. Vigevano, et al. (2005). "Do video games evoke specific types of epileptic seizures?" Epilepsy & Behavior
7(3): 524-530.

Abstract: We determined whether epileptic clinical manifestations evoked by playing video games (VG) differ from those evoked by intermittent photic stimulation (IPS) or striped patterns (P). We exposed nine children who had TV- and VG-evoked seizures in daily life to 12 VG after standardized photic stimulation and pattern stimulation. Their EEGs were recorded continuously, analyzed, and then correlated with a video of their behavior. Similar types of clinical signs were seen during VG, P, and IPS, but the signs we observed were more subtle during the VG. Eight patients showed a clear lateralization. A new observation was the lowering of the eyelids to a state of half-closed. Our study suggests that the type of visual stimulus provoking a photoparoxysmal response or seizure is not particularly relevant. The children belonged to different epilepsy groups, and our findings add to the discussion on the boundaries of the epilepsy types.ABSTRACT FROM AUTHOR; Copyright 2005 Elsevier

27. Bonanno, P. and P. A. M. Kommers (2005). "Gender Differences and Styles in the Use of Digital Games." Educational Psychology 25(1): 13-41.

This paper reports work in progress investigating gender differences and styles in the use of digital games amongst advanced level biology students. It is an elaboration on previous work exploring the relationship between cognitive style and academic performance in Maltese students taking biology at advanced level. In this previous work the cognitive style of 581 (212 male and 369 female) advanced biology students was correlated with their academic performance in five different subjects. Pearson's correlation showed that the wholist-analytic dimension, the verbal-imagery' dimension, and gender were not correlated. Regression analysis showed that none of the style dimension combinations had a significant effect on performance in any of the subjects. However, gender proved to be a stronger determinant of performance. These results were interpreted from a cognitive neuroscience perspective. Numerous studies have consistently found gender differences in language and visuospatial skills. Female superiority is seen on tests of both

receptive and productive language, and on more complex tasks such as making analogies and creative writing. Males have an advantage in visuospatial reasoning, being more adept at performing disembedding and internal spatial transformations. In view of these results and the constantly reported gender difference in the use of digital games, this paper describes the initial stage of an investigation about gender-determined propensities to digital media. Different studies claim that males dedicate more time than female students to playing digital games. A marked emphasis on the use of particular game genres by the different sexes is also reported. This reported phenomenon is investigated within the context of Maltese students taking advanced biology. Through a questionnaire, data were collected about the time students spend playing digital games, their preferred platform, and their preferred games. Data were analysed to establish gender...ABSTRACT FROM AUTHOR

28. Lachlan, K. A., S. L. Smith, et al. (2005). "Models for Aggressive Behavior: The Attributes of Violent Characters in Popular Video Games." Communication Studies 56(4): 313-329.

Americans are increasingly concerned about video games, presumably due to the amount and graphicness of violence they contain. Social Cognitive Theory suggests that people are more likely to imitate characters they see as attractive or similar to self. To date, however, little research has examined attributes of violent characters in video games related to this issue. This content analysis examined 10 minutes of play from 60 of the most popular video games. Adapting the coding scheme from the National Television Violence Study (Smith et al., 1998; Wilson et al., 1997, 1998), various demographic and contextual features of violent characters and violent interactions were assessed. The results show that violent game characters have attributes that are likely to increase the extent to which some players perceive them as attractive and similar. Moreover, these violent characters engage in aggression that is presented as justified or graphic.ABSTRACT FROM AUTHOR

29. Nelson, M. C., P. Gordon-Larsen, et al. (2005). "Adolescent physical activity and sedentary behavior: Patterning and long-term maintenance." American Journal of Preventive Medicine 28(3): 259-266.

Objective: To identify adolescent patterns of physical activity (PA) and sedentary behavior and their associations with sustainable and healthy physical activity in young adulthood.

Design: Longitudinal survey utilizing cluster analysis. Data collected in 3 waves via National Longitudinal Study of Adolescent Health (1994-95, 1996, 2001-02). At each wave, subjects completed 7-day recall questionnaire regarding PA and sedentary behavior. Subjects separated into 7 homogenous, non-overlapping groups based on PA, sedentary behavior characteristics. Researchers used Wave III data to assess probability of meeting national activity recommendations by cluster.

Subjects and Setting: Nationally representative sample of 5978 male and 5979 female adolescents, with mean age of 14.9 yrs at Wave I. Pregnant, severely disabled and Native American (small sample size) respondents excluded.

Intervention(s): N/A

Outcome Measure(s): Odds of meeting PA guidelines (? 5 weekly bouts of moderate/vigorous PA and ? 2 hrs daily of "screen time") in Wave III.

Results: All clusters declined in bouts of PA from Waves I and II to Wave III. Certain clusters were more likely to meet PA guidelines in young adulthood than others: OR = 1.77 for cluster #2 (skaters and gamers), OR = 2.58 for cluster #3 (participates in sports with parents), OR = 2.26 for cluster #4 (uses recreation center), and OR = 2.35 for cluster #7 (active in school). Adolescents whose parents limited TV viewing were among the least likely to meet PA guidelines.

Conclusion: Although all groups of adolescents surveyed reported declines in physical activity from adolescence to young adulthood, adolescents who participated in recreational sports and were active in school were more likely to meet national activity recommendations in young adulthood. © Center on Media and Child Health

30. Vandewater, E. A., D. S. Bickham, et al. (2005). "When the television is always on: Heavy television exposure and young children's development." American Behavioral Scientist 48(5): 562-577.

Objective: To examine the prevalence and influence of heavy television exposure among infants, toddlers, and preschoolers in the U.S.

Design: Survey study of parents of young children, to determine variables related to heavy-TV exposure and the influence of TV exposure on developmental outcomes.

Subjects and Setting: 1,065 parents of children, ages 6 mos - 6 yrs. Parents were contacted via telephone, using random-digit-dialing, with 10 attempts at each number and 40% response rate. 765 respondents with complete information used in final analysis. Children divided into 3 groups: 0-2 yrs (n = 288), 3-4 yrs (n = 249), and 5-6 yrs (n = 219).

Intervention(s): N/A

Outcome Measure(s): Child's membership in a heavy-TV household (TV always or almost always on). Child's reading ability, behavior imitative of TV programming.

Results: 35.8% of children lived in heavy-TV households. Among children 0-2 yrs, heavy-TV exposure was significantly related to the parental belief that educational TV is important and use of TV as a babysitter (OR = 2.10 and OR = 1.86, respectively, with p<.05). Among children 3-4 yrs and 5-6 yrs, heavy-TV exposure was significantly related to TV availability (OR = 1.35, p<.05, and OR = 1.68, p<.01, respectively). Children from heavy-TV households in the two older groups were significantly more likely to be non-readers, controlling for parental education (OR = .42, p<.05, for 3-4 yrs, and OR = .35, p<.01, for 5-6 yrs).

Conclusion: Parental attitudes towards TV viewing and household TV availability were common determinates of heavy-TV exposure among young children; children in heavy-TV households spent less time reading and were more likely to be unable to read. © Center on Media and Child Health

31. Anand, S. and J. A. Krosnick (2005). "Demographic predictors of media use among infants, toddlers, and preschoolers." American Behavioral Scientist 48(5): 539-561.
Objective: To determine social and demographic predictors of media use among young children, ages 6 months - 6 years.

Design: Cross-sectional survey study, utilizing 2003 Kaiser Family Foundation national survey data. Parents of children ages 6 months - 6 years completed telephone interviews regarding their children's typical media use and demographic information.

Subjects and Setting: Nationally representative sample of 1,065 children, ages 6 months - 6 years. Data provided by parents.

Intervention(s): N/A

Outcome Measure(s): Time spent watching television, watching videos/DVDs, reading, playing video games, and using the computer.

Results: Age predicted all surveyed media use variables. Television viewing, video game playing, and video/DVD watching increased from 6 months to approximately 4 years and then decreased. Black children watched significantly more television ($p<.01$) and read more ($p<.05$) than white children. Boys spent significantly more time than girls playing video games ($p<.01$); this was the only gender difference. Time spent watching television significantly decreased with father's education level ($p<.05$). Children residing with married parents spent more time watching television, reading, and using computers than those residing in other family arrangements. Income did not predict any media use variable.

Conclusion: Age, race, parents' education levels, and marital status consistently predicted media use among children, ages 6 months - 6 years; income was not a predictor of use. © Center on Media and Child Health

32. Kronenberger, W. G., V. P. Mathews, et al. (2005). "Media violence exposure in aggressive and control adolescents: Differences in self- and parent-reported exposure to violence on television and in video games." Aggressive Behavior 31(3): 201-216.
Objective: To examine differences in exposure to media violence between groups of adolescents with and without Disruptive Behavior Disorders

Design: Case-control study using semi-structured interviews to assess correlations between television and video game violence exposure and Disruptive Behavior Disorder

Subjects and Setting: 54 adolescents, age 13-17, evenly split between those with diagnoses of Disruptive Behavior Disorder with Aggressive Features and age-gender-IQ matched controls without psychiatric diagnoses. Adolescents in the Disruptive Behavior Disorder group had either Oppositional Defiant Disorder or Conduct Disorder, as defined by DSM-IV, as well as at least one recurrent aggressive behavior in the past 6 months. Groups did not differ in terms of race (11 Caucasians per group, 13 African Americans with Disruptive Disorder and 14 control, and 3

mixed-race on Disruptive Disorder and 2 in control). Participants were recruited by flyers in schools/community agencies/clinics. Phone screening produced 38 Disruptive Disorder adolescents and 54 controls, of which 8 and 5, respectively, did not come to their appointments, and 1 and 3 refused to participate. Caregiver questionnaires were completed by individuals who identified themselves as the primary caregivers (50 mothers, 3 fathers, 1 grandmother). Data was collected at Visit 1 as part of a larger study that involved a psychological assessment battery. Interviews were conducted by trained Bachelor's and Master's level technicians and were supervised by doctoral-level clinical psychologists.

Intervention(s): N/A

Outcome Measure(s): Kiddie-SADS (semi-structured interview template based on DSM-IV), Adolescent Symptom Inventory-4 (120-item parent-completed questionnaire of adolescent behavior), Media Exposure Measure (semi-structured self-report adolescent interview and parent questionnaire)

Results: Based on Kiddie-SADS and the Adolescent Symptom Inventory-4, 23 adolescents in the study group met criteria for Conduct Disorder and 4 met criteria for Oppositional Defiant Disorder, while no controls met criteria for either Disruptive Behavior Disorder. The two groups differed significantly in their reports of violent media viewing in the week prior to the study. Adolescents in the Disruptive Behavior disorder watched 385 minutes of television during which some injury was portrayed and 227 minutes in which graphic injury was portrayed, compared with 213 and 113 minutes, respectively, in the controls ($p<.02$). The Disruptive Behavior group played more video games (30min-1hr/day versus 10-15min/day) and reported significantly more exposure to violent video games compared to controls ($p<.07$). Measures produced by parents of both groups were moderately to strongly correlated with information in the adolescent interviews, with parents of children with Disruptive Behavior Disorders reporting more violent media exposure than controls.

Conclusions: Extending upon findings from prior research, this study demonstrated a correlation in adolescents between an aggressive Disruptive Behavior Disorder diagnosis and exposure to violent television and video game media even when age, gender and IQ were controlled. Further research is needed to examine causality in this association and to explore the potentially different impacts of television and video game violence exposure on severe adolescent aggression. © Center on Media and Child Health

33. Castel, A. D., J. Pratt, et al. (2005). "The effects of action video game experience on the time course of inhibition of return and the efficiency of visual search." Acta Psychol (Amst) 119(2): 217-30.

The ability to efficiently search the visual environment is a critical function of the visual system, and recent research has shown that experience playing action video games can influence visual selective attention. The present research examined the similarities and differences between video game players (VGPs) and non-video game players (NVGPs) in terms of the ability to inhibit attention from returning to previously attended locations, and the efficiency of visual search in easy and more demanding search environments. Both groups were equally good at inhibiting the return of attention to previously cued locations, although VGPs displayed overall faster reaction

times to detect targets. VGPs also showed overall faster response time for easy and difficult visual search tasks compared to NVGPs, largely attributed to faster stimulus-response mapping. The findings suggest that relative to NVGPs, VGPs rely on similar types of visual processing strategies but possess faster stimulus-response mappings in visual attention tasks.

34. van den Bulck, J. (2004). "Television viewing, computer game playing, and Internet use and self-reported time to bed and time out of bed in secondary-school children." Sleep 27(1): 101-4.

OBJECTIVE: To investigate the relationship between the presence of a television set, a gaming computer, and/or an Internet connection in the room of adolescents and television viewing, computer game playing, and Internet use on the one hand, and time to bed, time up, time spent in bed, and overall tiredness in first- and fourth-year secondary-school children on the other hand. METHODS: A random sample of students from 15 schools in Flanders, Belgium, yielded 2546 children who completed a questionnaire with questions about media presence in bedrooms; volume of television viewing, computer game playing, and Internet use; time to bed and time up on average weekdays and average weekend days; and questions regarding the level of tiredness in the morning, at school, after a day at school, and after the weekend. RESULTS: Children with a television set in their rooms went to bed significantly later on weekdays and weekend days and got up significantly later on weekend days. Overall, they spent less time in bed on weekdays. Children with a gaming computer in their rooms went to bed significantly later on weekdays. On weekdays, they spent significantly less time in bed. Children who watched more television went to bed later on weekdays and weekend days and got up later on weekend days. They spent less time in bed on weekdays. They reported higher overall levels of being tired. Children who spent more time playing computer games went to bed later on weekdays and weekend days and got up later on weekend days. On weekdays, they actually got up significantly earlier. They spent less time in bed on weekdays and reported higher levels of tiredness. Children who spent more time using the Internet went to bed significantly later during the week and during the weekend. They got up later on weekend days. They spent less time in bed during the week and reported higher levels of tiredness. Going out was also significantly related to sleeping later and less. CONCLUSION: Concerns about media use should not be limited to television. Computer game playing and Internet use are related to sleep behavior as well. Leisure activities that are unstructured seem to be negatively related to good sleep patterns. Imposing more structure (eg, end times) might reduce impact.

35. Ogletree, S. M., C. N. Martinez, et al. (2004). "Pokemon: Exploring the role of gender." Sex Roles 50(11-12): 851-859.

Objective: To determine how character roles in the Pokémon cartoon series influences adults' and children's perceptions of gender

Design: Experimental studies. Study 1: Students completed questionnaires and viewed 2 different Pokémon episodes at one of nine sessions. 18 different Pokémon episodes recorded during the month of August 2000 from WB network weekday morning programming. Personality traits of one of four Pokémon trainers (2 male and 2 female humans who train creatures called Pokémon) rated after viewing using adjective pairs (e.g. confident-unsure). MANOVA of ratings conducted with trainer sex and "good/bad" status as independent variables and one-way ANOVA comparisons conducted on personality trait pairs. Post-hoc comparisons

of means evaluated using Tukey's HSD. Study 2: Data collected via individual interviews with children. Appeal and personality traits of Pokémon trainers rated. Two-way within-subjects ANOVA on ten personality characteristics conducted with character sex and "goodness/badness" as independent variables. Bonferroni post-hoc comparisons conducted on adjectives with significant ANOVA results.

Subjects and Setting:
Study 1: 151 college students (47 males, 104 females) enrolled in introductory psychology and human sexuality classes; 83% twenty-one years or younger; 91% middle or upper-middle class; 67% European American, 19% Hispanic, 7% African American. Students received extra credit for participation.

Study 2: 62 children (28 girls, 34 boys) from kindergarten through fourth grade belonging to two after-school programs in central Texas town. Original sample was 42% Hispanic, 42% European American, 10% African American. 32 children from original sample (12 girls, 20 boys) completed adjective descriptors of the four Pokémon trainers.

Intervention(s): N/A

Outcome Measure(s):
Study 1: Experience with and interest in Pokémon movies, television cartoons, and trading cards; five-point ratings of four Pokémon trainers on 28 adjective pairs.

Study 2: Favorite cartoons, frequency of Pokémon and Digimon cartoon/movies viewed and video games played, participation in collection of Pokémon cards, Digimon cards, baseball cards or other cards; appeal and gender-related ratings of favorite Pokémon characters and trainers; ratings of ten characteristics of four Pokémon trainers.

Results:
Study 1: Male students liked Pokémon cartoons more than female students, $t(90.1, \text{unequal variances}) = 2.09$, $p < .05$. Female trainers rated as more assertive, more controlling, more certain, more attractive, and more sexy (main effect trainer sex, $F(1,113)=4.62$, $p<0.001$). Two "bad" trainers rated more negatively on 13 adjective pairs than the two "good" trainers (main effect "good/bad" status, $F(1,113)=16.80$, $p<0.001$). Significant trainer sex/"good/bad" interaction, $F(1,113)=2.79$, $p<0.001$. James (male "bad" trainer) rated lowest on typically masculine traits and more unsure and passive than Ash (male "good" trainer) and Jesse (female "bad" trainer). Jesse rated as sexiest and most aggressive of four trainers, Ash more important than other three trainers, and Misty (female "good" trainer) more romantic than the others.

Study 2: Only 44% could name one girl Pokémon character. Male trainers chosen more often as favorites, ?2(1)=17.04, $p<0.001$. Boys rated Jesse less favorably than girls, $t(30)= -2.83$, $p<0.01$. "Goodness/badness" significant for all adjectives except "sexy" ($p<0.001$), character sex significant for "aggression" ($p<0.001$), and significant interaction for being a leader ($p<0.01$). Ash rated significantly higher as a leader than others; Jesse rated highest in aggression (significantly higher than Ash and Misty).

Conclusions: Male characters and trainers seem to be more central to the cartoon than females. "Bad" male characters portrayed with female characteristics may be perceived as more bad. These depictions, particularly in popular shows like Pokémon do influence and may impact on adults' and children's understanding of and beliefs about roles of men and women in society. © Center on Media and Child Health

36. Li, X. and M. S. Atkins (2004). "Early childhood computer experience and cognitive and motor development." Pediatrics 113(6): 1715-1722.
Objective: To explore the effects of early computer accessibility and exposure on cognitive and psychomotor development.

Design: Cross-sectional survey. Data from the fall 2001 assessment of a randomized controlled trial of early computer use on cognitive and motor development. Early computer experience defined as access to a computer or video games (at home and otherwise) and frequency of using them (daily, weekly, infrequently).

Subjects and Setting: 122 preschool children enrolled in the Monongalia County Head Start Program (VA). 57 boys, 65 girls; mean age = 52 months; median family income = $11,662.

Intervention(s): N/A

Outcome Measure(s): Bender Visual Motor Gestalt Test assessed visual motor development by having children draw sample figures. Boehm Test of Basic Concepts, 3rd Ed. Preschool assessed concepts of size, direction, position, time, quantity, and classification. Object control and locomotor skills measured by Test of Gross Motor Development, 2nd Ed. Cognitive development measured by the Wechsler Preschool and Primary Scale of Intelligence estimate of IQ.

Results: Overall, 56% of children had access to a computer. 53% of children had a computer at home and 49% had video games at home. Of those with access to a computer, 25% used it daily and another 43% used it weekly. Greater computer accessibility was associated with older age, fewer siblings, and higher family SES. 83% of those with computers at home had children's software on it. Greater computer accessibility was correlated with higher IQ estimates and school readiness scores ($F = 5.30$, $p < 0.01$ and $F = 3.30$, $p < 0.05$ respectively). No significant main effects between frequency of use and cognitive/psychomotor test scores.

Conclusions: Early computer access is associated with the development of preschool concepts and cognition, while frequency of access did not. Future studies should examine the context of home computer use among young children. © Center on Media and Child Health

37. Cheng, T. L., R. A. Brenner, et al. (2004). "Children's violent television viewing: Are parents monitoring?" Pediatrics 114(1): 94-99.
Objective: To assess parental attitudes about and monitoring of violent television viewing.

Design: Self-report, anonymous survey. Subjects completed questionnaire regarding child-rearing practices, socio-demographic information, television viewing.

Subjects and Setting: Convenience sample of parents/guardians (n = 677) visiting child health providers in 3 Washington, DC settings: urban children's hospital clinic (29%), urban managed care clinic (43%), and suburban private practice (28%). All English-speaking. 84% female, 53% black, 38% white. 27% with yearly income less than $25,000, 50% greater than $50,000.

Intervention(s): N/A

Outcome Measure(s): Parenting practices on television viewing: limitations, extent of media exposure, parental accompaniment, assessment of violent TV viewing. Child-rearing attitudes.

Results: 25% reported that their youngest child did not watch TV. Of those who reported viewing, 53% reported always limiting violent TV viewing, with 73% believing that their children saw violent TV at least once a week. 81% usually or always limited sexual content. Children who watched TV averaged 2.6 hours per day of viewing. Parental monitoring of content was significantly more likely with younger children and among female parents ($p<.0001$).

Conclusion: A majority of parents limited their children's violent TV viewing, but acknowledged that their children were exposed to it nonetheless; monitoring was associated most strongly with younger children and female parents. © Center on Media and Child Health

38. Carnagey, N. L. and C. A. Anderson (2004). "Violent video game exposure and aggression: A literature review." Minerva Psichiatrica 45(1): 1-18.
Objective: Review current literature on effects of violent video game exposure on aggression.

Data Sources: Research (published and unpublished) on the effects of media violence, in particular video game violence, on aggression,

Study Selection: N/A

Data Synthesis: Research shows that playing violent video games increases aggressive behavior, cognition and affect, physiological arousal and decreases prosocial behavior.
Effects of violence in video games on aggression probably even stronger than effects of violence on television. This is due to graphical quality, identification of violent characters, level of attention and active involvement, reinforcement of violent acts and continuous violence in video games. General Aggression Model (GAM) can be used in understanding media violence research: cyclical pattern of interaction between person and environment.

Conclusion: Parents should monitor child's media use, teach children to become media savvy, reduce amount of time spent on media activities and learn more about video games children are playing. More longitudinal research, funded by government, on effects of violent video games should be done. © Center on Media and Child Health

39. Haninger, K., M. S. Ryan, et al. (2004). "Violence in teen-rated video games." Medscape General Medicine 6(1).
Objective: To quantify and characterize the depiction of violence and blood in T-rated video games.

Design: Construction of database of all 396 T-rated video game titles released on major video game consoles in the United States by April 1, 2001. Random sampling of game titles, followed by 1-hour game playing and content analysis. Assessment of 2 R-rated films associated with corresponding T-related video games.

Subjects and Setting: 81 randomly sampled T-rated video games (of a database of 396). R-rated films: The Matrix and The Matrix: Reloaded

Outcome Measures: game genre, percentage of game play depicting violence, depiction of injury, nonhuman fatalities, weapon types, weapon use

Interventions: N/A

Results: Of 396 T-rated video game titles, content descriptors were assigned as follows: 93 (23%) for both violence and blood, 280 (71%) for violence, 9 (2%) for blood, 14 (4%) no content descriptors for violence or blood. Of 81 played T-rated video games, 79 games (98%) involved intentional violence for an average of 36% of game playtime, 34 games (42%) contained blood. 51% depicted 5 or more types of weapons, with players able to select weapons in 48 games (59%). 37 games (46%) rewarded/required the player to destroy objects, 73 games (90%) rewarded/required the player to injure characters, and 56 games (69%) rewarded/required player to kill. 11,499 character deaths in 81 games, 122 deaths/hr of game play (range 0 to 1310): 5689 human deaths (61 human deaths/hr of game play) (range 0 to 1291). 44 games (54%) depicted deaths to nonhuman characters, 51 games (63%) depicted deaths to human characters.

Conclusion: Content analysis suggests a significant amount of violence, injury, and death in T-rated video games. T-rated video games do not realistically portray the consequences of violence. Physicians and parents should appreciate that T-rated video games may be a source of exposure to violence and some unexpected content for children and adolescents. © Center on Media and Child Health

40. Scharrer, E. (2004). "Virtual violence: Gender and aggression in video game advertisements." Mass Communication & Society 7(4): 393-412.
Objective: Study examined portrayal of violence and gender in video game advertisements.

Design: Content analysis of advertisements appearing in 6 issues of 3 high-circulating general video game magazines (Game Informer, Game Now, Electronic Gaming Monthly).

Subjects and Setting: 1054 advertisements appearing in video game magazines. The advertisement had to be for a video game, a video game console or video game equipment. Several characteristics were coded such as background factors, demographic factors, game genre, violence, sex, hypermasculinity, hyperfeminity and user-reader identification.

Intervention: N/A

Outcome Measure(s): average number of violent content, sexual content, and portrayal of gender per advertisement.

Results: T-tests and ANOVA analyses showed that violent content, physical appearance of characters as well as humor, fear and user identification are used in video game ads to appeal to young male audience. Most characters in ads were white males and there was a lack of female characters. When shown, female characters portrayed as highly sexualized and attractive. Male characters often stereotyped as highly masculine. Violent content was more common in games rated for older audiences. Not much sexual content in ads.

Conclusions: Future research should study television commercials for video games and study video games themselves to determine messages sent out when playing games. © Center on Media and Child Health

41. Haninger, K. and K. M. Thompson (2004). "Content and ratings of teen-rated video games." Journal of the American Medical Association 291(7): 856-865.
Objective: To determine the type of content found in video games rated T for Teen and to compare it to the content described on the game packaging by the ESRB (Entertainment Software Rating Board).

Design: Content analysis of video games rated T for Teen by the ESRB, played for 1 hour by an undergraduate student.

Subjects and Setting: 81 video games rated T for Teen randomly sampled from a total possible 396 games available 4/1/2001 in the United States to play on Nintendo 64, Sega Dreamcast, Sony PlayStation and/or Sony PlayStation 2.

Interventions: N/A

Outcome Measures: Whether or not the following were observed in one hour of game play: violence, blood, sexual themes (including type of sexual content and sex of characters), profanity, substance use (alcohol, tobacco, drugs), gambling. Whether or not games rewarded or required the injuring or killing of characters.

Results: 98% of the games contained intentional violence (95% had ESRB content descriptors for violence). 90% rewarded or required injuring and 69% killing characters. 42% contained blood (only 27% had content descriptors). 27% contained sexual themes (20% had content descriptors). Females were significantly more likely to be partially nude or engaged in sexual behaviors than were males ($p < .001$ for both by two-sided binomial test). 27% contained profanity (17% had content descriptors). 15% contained substance use (1% had content descriptors). 1% contained gambling (none had content descriptors). 48% contained content that called for an ESRB content descriptor, but did not have one. 9% of the games had an ESRB content descriptor for content not observed in one hour of game play.

Conclusions: Parents and physicians should be aware that a lack of an ESRB content descriptor for a specific type of content in video games rated T for Teen does not guarantee the absence of that content. © Center on Media and Child Health

42. Vastag, B. (2004). "Does video game violence sow aggression? Studies probe effects of virtual violence on children." Journal of the American Medical Association 291(15): 1822-1824.

Since long-term experiments with violent video games would be unethical, researchers must rely on weaker studies demonstrating a correlation between violent content and heightened frustration after game playing. These studies consistently demonstrate that children under 10 years old show higher aggression levels after playing violent video games. Laws passed to prevent youth from purchasing violent games are worked around by game producers who also point the finger to parents who need to be more involved in monitoring their children's activities. The largest study on video game violence showed that parental involvement seems to be the key to this issue - children whose parents set limits and monitored game purchases were much less likely to be argumentative. © Center on Media and Child Health

43. Christakis, D. A., B. E. Ebel, et al. (2004). "Television, video, and computer game usage in children under 11 years of age." Journal of Pediatrics 145(5): 652-656.

Objective: Examine total media use among children under age of 11, proportion of children who have television in bedroom and who eat in front of television. Explore predictors of parental concern about amount of television child watches.

Design: Cross-sectional survey administered by telephone. Parents asked to report on amount of media child had used on average weekday in past 7 days (open-ended questions). Parents also asked yes-no questions about television in bedroom, eating meals in front of television and concern about amount of television child watched. Demographic information gathered.

Subjects and Setting: 1454 parents of children younger than 11 from diverse clinic population in Washington State. Mean age of child 5.05 years. 25% of respondents had only high school education or less; 43% had college degree; 63% white.

Outcome Measure(s): Television and media usage; presence of television in child's bedroom; whether or not child eats meals in front of television; parental concern about amount of television child watches.

Intervention: N/A

Results: Children engaged on average in 1.45 hours of television (SD= 1.5), 1.1 hours of video (SD=1.30) and 0.54 hours of computer games (SD= 0.96). 26% of parents reported child to have TV in bedroom and 30% said child had consumed meals in front of television. 22% of parents were concerned about amount of television child watched. Higher parental education associated with fewer hours watching television and video. Higher education also related to be less likely of having TV in bedroom and more concerned about amount of TV child watches. Older children more likely to eat meals in front of TV and to have TV in bedroom.

Conclusion: Children from both low and high SES parents are at risk for behaviors associated with media usage. © Center on Media and Child Health

44. Blumberg, F. C. and L. M. Sokol (2004). "Boys' and girls' use of cognitive strategy when learning to play video games." Journal of General Psychology 131(2): 151-8.
Objective: To examine gender differences in children's cognitive strategies used when learning to play a video game.

Design: Cross-sectional survey. Survey conducted prior to children playing Sonic the Hedgehog 2 for 10 minutes. Survey assessed frequency of video game play, experience with Sonic, and strategies for understanding game play. Strategies coded as internally (reading instructions, trial and error) or externally (asking for instructions, watching others play) based.

Subjects and Setting: 46 second- and 58 fifth- graders attending an ethnically diverse, middle-class school in New York. 41.3% female. Those without parental consent were excluded. Almost all children had experience with the Sonic game.

Intervention(s): N/A

Outcome Measure(s): Game performance assessed by highest number of levels completed and attained, number of free Sonics obtained, number of Sonics lost, and number of games started.

Results: Boys tended to be more frequent video game players (?2 = 5.82, $p < 0.02$). The fifth-graders and frequent video game players were more likely to use internally based game learning strategies compare to second-graders ($z = -3.73$, $p < 0.05$ and $z = -1.78$, $p < 0.05$ respectively). No gender differences in using internally based strategies. Children using internally based strategies had better game performance than those using external strategies ($p < 0.06$). Older children and frequent video game players also predicted better game performance.

Conclusions: No gender differences in types of strategy used to learn video game play. The informal educational gains of video game play attributed to boys, may not include cognitive strategies. © Center on Media and Child Health

45. Kuntsche, E. N. (2004). "Hostility among adolescents in Switzerland? Multivariate relations between excessive media use and forms of violence." Journal of Adolescent Health 34(3): 230-236.
Objective: To determine effects of excessive media use among adolescents as it relates to direct versus indirect violence-related behavior in Switzerland.

Design: Analysis of data from the survey Health Behavior in School-aged Children (conducted every 4 years in 29 European countries).

Subjects and Setting: 4222 7th and 8th graders, mean age 13.9; 49.2% boys, 50.8% girls. Random cluster sampling procedure used on a list of all public schools compiled by Swiss

Federal Statistics Office. Overall response rate = 88.1%. Teachers administered questionnaires during 45 minute school lessons.

Interventions: N/A

Outcome Measures: Television viewing, electronic game-playing, feeling unsafe at school, bullying others, hitting others, fighting with others.

Results: All bivariate relationships between television viewing/electronic game-playing and each violence-related variable are significant ($p<.001$ for feeling unsafe, bullying others, hitting others, $p<.05$ for fighting with others). In multivariate comparisons, physical violence among boys ceases to be significant. For girls, only television viewing is linked to indirect violence ($p<.05$).

Conclusion: Results suggest that exposure to violence in television and electronic game-playing are not related to direct real-world violence, but do, especially in the case of television viewing, show a relationship with hostility and indirect violence. It is concluded that further experimental study is needed to further relate gender and violence to excessive media use of different types. © Center on Media and Child Health

46. van Mierlo, J. and J. van den Bulck (2004). "Benchmarking the cultivation approach to video game effects: A comparison of the correlates of TV viewing and game play." Journal of Adolescence 27(1 [special issue on video games and youth]): 97-111.
Objective: To examine the utility of applying cultivation theory, which explores the influences of television on children's beliefs, to video game play. Cultivation theory, developed by Gerber et. al, hypothesizes that heavy television viewers are more likely to perceive the real world in ways that reflect the television world.

Design: Cross-sectional study to evaluate the correlation between video game play and indicators of cultivation, as measured by cultivation theory surveys completed by secondary school students.

Subjects and Setting: 322 Flemish secondary school students in 3rd year (mean age 15.33) and 6th year (mean age 18.43) classes from four randomly selected schools in Belgium. 48% of respondents were male and 54% were in their 3rd year. Respondents completed questionnaires during regular class time.

Intervention: N/A

Outcome Measures: Amount of time spent watching television and playing video games, preference for various video game genres (racing games, combat/fighting games, etc.), and first- and second-order cultivation measures (perception of violence, causes of death, crime likelihood, safety, fear of crime, law and order, and anomie), as measured by previously defined survey items.

Results: Overall mean television viewing was 74hr 15min per month (SD 39hr 44min) and video game playing was 18hr 29min per month (SD 25hr 15min). 3rd year students watched more television and played more video games than 6th year students (80:30hr tv and 22:05hr video games versus 66:52hr tv and 14:16hr video games). Gender differences also existed, with boys playing significantly more hours of video games (31hr 15 min per month versus 6hr 39 min per month) and girls watching more television (78hr 22min per month versus 69hr 48 min per month). In multivariate analysis, television viewing was positively related to higher estimates of death by murder, by accident, and by heart attack, and to scales measuring Law and Order and anomie (all with $p<0.05$). However, violent video game play was not related to any of the first- or second-order cultivation measures. Among a small sample of students who answered some of the questions open-endedly, violent video game play did predict higher estimates of the prevalence of violent crime and of the number of policemen in the workforce.

Conclusion: This study reproduced cultivation effects of television viewing, previously reported within the Unites States, in a European country. However, it failed to demonstrate a correlation between violent video game play and cultivation effects in the forced choice questions. Further research is needed to develop models to better understand the relationship between video game playing and cultivation effects.

47. Griffiths, M. D., M. N. Davies, et al. (2004). "Online computer gaming: A comparison of adolescent and adult gamers." Journal of Adolescence 27(1 [special issue on video games and youth]): 87-96.

Objective: To examine differences between adolescent and adult online game players

Design: Analysis of online questionnaire data. Game players visiting Everquest fansites were directed to link for the questionnaire, asked to click their selections, and submit answers. ?2 and trend analyses of data were conducted.

Subjects and Setting: Self-selected sample of 544 online gamers who played Everquest and visited one of three Everquest fansites. 16% adolescents (n = 88, defined as person 19 years and younger), mean age 17 years (SD=1.66, range 12-19 years). Adult mean age 30 years (SD=7.97, range 20-70 years).

Intervention(s): N/A

Outcome Measure(s): Demographic information, playing frequency, playing history, favorite and least favorite aspects of playing the game, types of sacrifices made to play game

Results: More males in both adolescent (93.2% male, 6.8% female) and adult (79.6% male, 20.4% female) groups. More male adolescent gamers than male adult gamers (?2=9.071, d.f.=1, $p < 0.003$). More adolescents from North America than non-North American countries (18.7% vs. 9.6%; ?2=5.28, d.f.=1, $p < 0.022$). Significant linear trend of older players playing for more months than younger players, $F(1514)=6.88$, $p < 0.01$. More adult gamers reported playing a different gendered character, ?2=8.078, d.f.=1, $p=0.0004$. Age was related to frequency of play but relationship was not linear, $F(4499)=3.23$, $p<0.05$. Mean play frequency of the three younger groups greater than that of the two older groups, $F(1499)=10.866$, $p<0.001$. Adults and

adolescents most liked social aspects of the game (44.3% and 54.5% respectively). More adolescents report game violence as favorite aspect of the game (?2=17.18, d.f.=1, p=0.000), while more adults report violence as least favorite (?2=12.47, d.f.=1, p=0.000). Adults more likely to sacrifice socializing than adolescents (20.8% vs. 12.5%; ?2=3.24, d.f.=1, p=0.045), while adolescents more likely to sacrifice education or work (22.7% vs. 7.3%; ?2=19.48, d.f.=1, p=0.000).

Conclusions: Adult and adolescent game players were predominantly male and seemed most attracted to social aspects of playing. Adolescents, in particular, were more likely to be male, less likely to gender swap characters, more likely to sacrifice education and work, and particularly attracted to violent aspects of the game. In general, as players get older they spend more time playing the game. Excessive game-play by both adults and adolescents was found to have some negative consequences. © Center on Media and Child Health

48. Funk, J. B., H. B. Baldacci, et al. (2004). "Violence exposure in real-life, video games, television, movies, and the internet: Is there desensitization?" Journal of Adolescence 27(1 [special issue on video games and youth]): 23-39.
Objective: To determine if a relationship exists between exposure to real-life or media violence and desensitization.

Design: Cross-sectional cohort study. Questionnaires administered at school/day care assessed demographics, media use (time spent using video games, TV, movies, Internet), and media preferences (figuring out, educational, cartoons, sports, fighting/destruction, chat rooms, games, etc.). Frequency of real-life violence exposure measured by KID-SAVE.

Subjects and Setting: 130 students from elementary schools (private, Catholic) and day care centers (public-school affiliated) in a mid-sized, Midwestern city. 45.3% female; mean age = 9.99; 58% European American, 24% African American. Those without parental consent or who did not complete the questionnaires were excluded.

Intervention(s): N/A

Outcome Measure(s): Desensitization measured as empathy and attitudes towards violence. Attitudes Towards Violence Scale: Child Version (ATVC) asked children to endorse various attitudes towards violence including Reactive and Culture violence. Level of empathy measured by the Children's Empathy Questionnaire (CEQ).

Results: Boys generally had higher rates of exposure to violence and stronger proviolent attitudes ($t = 2.62$, $p < 0.05$), while girls were generally more empathetic ($t = -3.72$, $p < 0.01$). Aside from gender, only higher exposure to video game violence predicted lower empathy scores ($ß = -0.19$, $p < 0.05$). Higher exposure to video game or movie violence predicted more positive attitudes towards violence ($ß = 0.23$, $p < 0.01$ and $ß = 0.28$, $p < 0.01$ respectively). No significant differences between boys and girls on the effect of video game/movie violence on proviolent attitudes or empathy.

Conclusions: Higher exposure to video game or movie violence was associated with less empathy and stronger pro-violence attitudes. Suggest future research examine the relationships between several indices of desensitization and all facets of violence exposure. © Center on Media and Child Health

49. Uhlmann, E. and J. Swanson (2004). "Exposure to violent video games increases automatic aggressiveness." Journal of Adolescence 27(1 [special issue on video games and youth]): 41-52.
Objective: To determine the effects of violent video games on automatic associations of the self with aggression.

Design: Randomized control study. Participants assigned to play Doom (violent game) or a puzzle game for 10 minutes before completing aggression measures.

Subjects and Setting: 121 introductory psychology students. 54% female.

Intervention(s): N/A

Outcome Measure(s): Automatic aggressive self-concept measured by the Implicit Association Test (IAT) using the categories of Self, Other, Aggressive, and Peaceful. Feeling thermometers assessed aggressiveness of the self and others. Participants also rated themselves on a scale of aggressive-peaceful, fighter-quiet to combative-gentle. The Buss and Perry Aggression Questionnaire additionally measured trait aggression.

Results: Those that played Doom were more likely to associate themselves with aggression than others ($F = 4.50$, $p = 0.036$). Men were generally more automatically aggressive than women ($F = 5.35$, $p = 0.023$), but there were no differences between genders on the effects of playing the violent game. Participants considered themselves less aggressive than other people on the feeling thermometer ($t = -7.5$, $p < 0.001$) and semantic differential measures ($t = -10.6$, $p < 0.001$) with no significant changes to self-reported aggression after playing Doom. Prior exposure to violent video games predicted higher IAT scores ($r = 0.32$, $p < 0.001$) and higher self-reported aggressiveness ($r = 0.28$, $p < 0.01$).

Conclusions: In addition to long-term effects, after short-term exposure to a violent video game, participants associated the self with more aggressive traits and actions on an IAT, but not on self-report measures. Suggest future studies determine the mechanism through which violent media exert their effects, including deliberative learning and priming. © Center on Media and Child Health

50. Krahe, B. and I. Moller (2004). "Playing violent electronic games, hostile attributional style, and aggression-related norms in German adolescents." Journal of Adolescence 27(1 [special issue on video games and youth]): 53-69.
Objective: To examine the relationship between exposure to and preference for violent video games and aggressive norms and hostile attributional style.

Design: Cross-sectional study. Subjects indicated overall weekly frequency of play, and frequency of playing 25 popular games selected by game sales and pilot study ratings. Participants asked to select up to 5 games from the list they would recommend. Three computer magazine journalists and three computer game researchers rated games for realism of violent content.

Subjects and Setting: 8th grade students (n = 231). Mean age = 13.6; 50.2% female. Predominantly German nationals. 4.3% had no previous experience with video games.

Intervention(s): N/A

Outcome Measure(s): Normative acceptance of relational (i.e. spreading rumors) and physical aggression measured by self-reported acceptance of 15 aggressive acts. Hostile attributional measured as the subject's tendency to interpret four ambiguous interactions as hostile. Two scenarios led to physical harm/property damage and two led to relational harm.

Results: Boys spent more time playing video games (?2 = 39.9, p < 0.001) and played more regularly (?2 = 75.1, p < 0.001). Greater total time spent playing video games was associated with higher exposure to violent games (ß = 0.98, p < 0.001). Frequency of playing violent video games and recommending violent games were associated with endorsing physical aggression norms (ß = 0.15, p < 0.05 and ß = 0.27, p < 0.001 respectively). Boys more frequently played violent games (ß = 0.52, p < 0.001) and recommended more violent games (ß = 0.45, p < 0.001). No significant effects of violent video game play on attributional style. However, boys and those more accepting of physical aggression scored higher for hostile attributional style for physical aggression (ß = 0.18, p < 0.05 and ß = 0.37, p < 0.001 respectively).

Conclusions: Preferences for and greater exposure to violent video games increases aggressive cognitions, especially the acceptance of physical aggression. Suggest future studies explore the cumulative impact of long-term exposure to violent video games. © Center on Media and Child Health

51. Vandewater, E. A., M.-s. Shim, et al. (2004). "Linking obesity and activity level with children's television and video game use." Journal of Adolescence 27(1 [special issue on video games and youth]): 71-85.
Objective: To examine the link between childhood obesity, activity participation, and television and video game use.

Design: Secondary data analysis of nationally representative sample, from the Panel Study of Income dynamics, and the Child Development Supplement.

Subjects and Setting: 2831 children ages 1-12 years old. Average age: 6 years, 51% boys, 49% girls. Whites = 49%, Blacks =39%, Hispanics=7%, Asians=2%, Other = 4%. Male head of household families = 72.7%, Female heads of household =27.3%.

Outcome Measure: Children's time use, children's media use, children's activity participation, children's weight status.

Intervention: N/A

Results: Analyses showed no relation between children's weight status and television viewing ($p<.001$). The model indicated negative linear and positive curvilinear relationships between children's weight status and print use ($p<.001$). No relationships were found between children's weight status and either highly active or moderately active activities. However, the overall regression indicated a positive linear relationship between the time children spend in sedentary activities and their weight status with those children with a higher weight status spending more time in sedentary activities than those with lower weight status ($p<.001$).

Conclusion: At present, currently available data do not support the notion that turning off the television or unplugging the video games amounts to a "magic bullet" which will reduce the prevalence of childhood obesity. The data point to a complex and interrelated pattern of factors contributing to obesity in children and adolescents. © Center on Media and Child Health

52. Griffiths, M. (2004). "Can videogames be good for your health?" J Health Psychol: 339-44, 2004 May.

53. Schneider, E. F., A. Lang, et al. (2004). "Death with a Story: How Story Impacts Emotional, Motivational, and Physiological Responses to First-Person Shooter Video Games." Human Communication Research 30(3): 361-375.
Objective: To determine the influence of narrative structure in 1st-person shooter video games on the psychological, physiological, and motivational experience of players.

Design: 2 (story-based or non-story-based) × 2 (game) within-subjects design. Participant played 4 different games (Doom 2, Quake 2, Outlaws, and Half-Life), presented in randomized order, for 8-min each. Applied electrodes measured skin conductance responses (as gauge of physiological responses). After 8-min session, participant exited game and completed game-specific questionnaire.

Subjects and Setting: 30 undergraduates (6 women, 24 men) with game-playing experience, enrolled in video game course at Indiana University. Participants received extra course credit.

Intervention(s): N/A

Outcome Measure(s): Identification with characters, goals of game. Sense of presence (immersion in game). Emotional responses (self-reported and physiological).

Results: Participants identified more with their characters (F = 39.73, p<.001), had a greater desire to defeat their characters' opponents (F = 7.37, p = .01), and verbally reported a greater sense of presence [F(1, 28) = 62.05, p<.001] when playing story games. Participants liked the story games more [F(1, 28) = 20.39, p<.001] and experienced more physiological arousal while playing them than they did while playing non-story-games.

Conclusion: Story-based video games led to significantly more character and game identification, physiological arousal, and personal enjoyment among players than games without storylines, highlighting the potential for storylines to increase desensitization to violence and the likelihood of violent behavior. © Center on Media and Child Health

54. van den Bulck, J. (2004). "Media use and dreaming: The relationship among television viewing, computer game play, and nightmares or pleasant dreams." Dreaming 14(1): 43-49.

Objective: To examine the extent to which watching television and playing computer games are related to nightmares caused by the use of these media.

Design: Cross-sectional study. Participants completed a self-administered questionnaire. Amount of time spent watching TV and the frequency of computer game play was assessed. The content of the television shows the participants watched was assessed (e.g. violent). In addition, the frequency of nightmares and pleasant dreams about shows seen TV or playing computer games was assessed.

Subjects and Setting: Children (N=2,546) in the 1st and 4th year of in 15 secondary schools in Belgium.

Intervention:N/A

Outcome Measure(s): Average weekly TV viewing, Average monthly computer game play, frequency of nightmares or pleasant dreams about TV shows viewed or computer games played.

Results: Boys watched significantly more TV and played significantly more computer games as compared to girls (p<0.05). The children in the 4th year of secondary school had less nightmares than the children in the 1st year. The dreams/nightmares were related to TV viewing or game play only marginally. The correlation between amount of TV viewed and TV nightmares was small r=0.007, p=0.0001. A preference for entertainment and action television genres was significantly related to an increase in self-reported nightmares. A preference for entertainment viewing, humor viewing, and action viewing were also positively related to higher levels of self-reported pleasant dreams.

Conclusions: Media may continue to occupy children's minds after they go to sleep. Future research should examine the severity of nightmares resulting from media use. © Center on Media and Child Health

55. Wood, R. T. A., M. D. Griffiths, et al. (2004). "The structural characteristics of video games: A psycho-structural analysis." Cyberpsychology & Behavior 7(1): 1-10.

Objective: To identify what characteristics in video games invites people to start playing and what factors cause people to continue playing.

Design: Exploratory study. Respondents played a variety of video games in an online survey. They were asked to rate the importance of the following: sound, graphics, background and setting, duration of game, rate of play, advancement rate, use of humor, control options, game dynamics, winning and losing features, character development, brand assurance, and multi-player features.

Subjects and Setting: On line study of people aged 14-50 years, 232 male, 140 female (N=382). Mean age 21.1 years. Initial contact with respondents was made via email request sent to university students who then forwarded the e-mail on to others they thought would be interested. Intervention:

Outcome Measure(s): Importance of features: Not important, neutral, important

Results: Realistic sound was the most important feature to 65% of the sample. High quality realistic graphics was important to 80.7% of the sample. More females (35.7%) rated cartoon style graphics as important compared to males (16.9%). More males (63.0%) than females (37.9%) reported that realistic settings were important. Humor was important to 52.2% of the sample. Brand loyalty was considered important to 48.3%. Character development was important to 65.8%. Meduim duration games were rated as most enjoyable by 47.5% of the sample. Males (52.3%) preferred longer games to females (24.3%). How quickly a person can get into a game was important to 76.5% of the sample. The ability to customize game options was important by more males (71.2%) than females (60.0%). Multi-player features were preferred by 53.3% of the population

Conclusions: There are many gender differences in terms of what players think are important characteristics of video games. © Center on Media and Child Health

56. Leung, L. (2004). "Net-generation attributes and seductive properties of the Internet as predictors of online activities and Internet addiction." CyberPsychology & Behavior 7(3): 333-348.

Objective: To determine the ways in which properties of the Internet and personal characteristics of users are related to online activities among members of the Net-Generation, born 1977-1997.

Design: Survey study, conducted via telephone interviews.

Subjects and Setting: Sample of 976 Hong Kong residents, ages 16-24 (mean age 19.8). Subjects were selected randomly from telephone directory, with 71.6% response rate (699 completed interviews). 50.5% male, 30.4% with university degrees.

Intervention(s): N/A

Outcome Measure(s): Internet addiction. Nature and frequency of online activities.

Results: 37.9% of respondents were classified as having Internet addictions; these respondents, overwhelmingly female students, tended to be emotionally open and enjoyed the control offered by the Internet. Among all respondents, those who were technologically savvy tended to engage in marketing activities (p<.01), social interactions (p<.05), and email use (p<.05) while online. Those who were influenced by the seductive qualities of the Internet (control and fluidity of identity) were likely to engage in social interactions while online (p<.001). Those with higher education were likely to use the Internet for the purposes of marketing, information gathering, and email.

Conclusion: Among members of the Net-Generation, personal characteristics and seductive qualities of the Internet significantly influenced Internet usage patterns; in particular, those respondents who were classified as Internet addicts tended to be female students who derived pleasure from control over Internet activities. © Center on Media and Child Health

57. Chiu, S.-I., J.-Z. Lee, et al. (2004). "Video game addiction in children and teenagers in Taiwan." CyberPsychology & Behavior 7(5): 571-581.
Objective: To examine the relationships between video game addiction and a variety of social, family, and academic variables among Taiwanese teenagers.

Design: Survey study. Subjects completed questionnaire regarding their personal and family characteristics and video game use.

Subjects and Setting: 1,228 students in grades 5-8, attending 20 schools in northern Taiwan.

Intervention(s): N/A

Outcome Measure(s): Social skills, animosity, and academic achievement.

Results: Game addiction was more likely among males (p<.001), sensation seekers (p<.05), and those with low family function (p<.001) and high boredom (p<.001). Game addiction predicted animosity and negatively predicted academic performance.

Conclusion: Video game addictions were more common among males and those with low family involvement, and were associated with animosity and poor academic performance. © Center on Media and Child Health

58. Slater, M. D., K. L. Henry, et al. (2004). "Vulnerable teens, vulnerable times: How sensation seeking, alienation, and victimization moderate the violent media content–aggressiveness relation." Communication Research 31(6): 642-668.
Objective: To explore if the relationship between violent media content and aggression is contingent upon sensation seeking and alienation from family, peers, and school.

Design: Cross sectional cohort study part of a longitudinal study assessing exposure to media violent and subsequent aggression over 2 years. Use of violent media measured as frequency of watching action movies, playing computer/video games involving a firearm, and visiting violent Internet sites. Time defined as the respondent's age at each data collection point. Covariates

were gender, sensation seeking, general Internet use, and age. Moderators were peer alienation, peer victimization, family alienation, school alienation, and sensation seeking.

Subjects and Setting: 6th or 7th graders (n = 2,550) attending 20 middle schools across the U.S. Mean age = 12.34.

Intervention(s): N/A

Outcome Measure(s): Aggressiveness measures assessed cognitions, values, and engagement related to aggressive behavior.

Results: Students were more aggressive during periods they more frequently used violent media (ß = 0.084, $p < 0.0001$). Students who felt alienated from their peers were more aggressive (ß = 0.169, $p < 0.0001$). However, during specific times when this alienation was heightened, aggression was moderate (ß = -0.061, $p < 0.0001$). Peer victimized students were marginally more aggressive overall (ß = 0.072, $p < 0.0551$), especially during heightened periods of victimization (ß = 0.561, $p < 0.0001$). Students experiencing family alienation or school alienation were also more aggressive (ß = 0.438, $p < 0.0001$ and ß = 0.203, $p < 0.0001$ respectively). Sensation seekers were more aggressive overall and during times of elevated sensation seeking (ß = 0.091, $p < 0.0001$ and ß = 0.117, $p < 0.0001$ respectively). Sensation seeking, school alienation, and peer victimization were significant moderators of violent media use increasing aggression.

Conclusions: Future research should examine the mechanisms through which sensation seeking, school alienation, and peer victimization moderate the violent media-aggression relationship. © Center on Media and Child Health

59. Murrin, R. J. (2004). "Is prolonged use of computer games a risk factor for deep venous thrombosis in children?[comment]." Clin Med: 190-1.

60. Anderson, C. A., N. L. Carnagey, et al. (2004). "Violent video games: Specific effects of violent content of aggressive thought and behavior." Advances in Experimental Social Psychology 36: 199-249.
CMCH Abstract for Experiments 1-4:
Objective: To assess the short- and long-term effects of violent video game exposure.

Design: Three randomized control trials. Experiment 1: subjects played one of 10 popular video games (50% violent). Previous video game experience self-reported and video games rated by subjects for graphics and violent content post-play. Experiment 2: subjects played one of two games from Exp. 1 matched on various dimensions. Experiment 3: Same as 2, with 2 games added (one non-violent). Video game and TV exposure assessed by questionnaire. One Correlational Study: Cross-sectional study of the association between repeated exposure to violent video games and aggressive behavior/cognitions and personality indicators.

Subjects and Setting: Experiment 1: 130 undergraduates (53.1% female) who refrained from alcohol, tobacco, and caffeine and exercise 12 hours prior to the study. Experiment 2: 190

undergraduates (51% female) selected from the top and bottom thirds of Trait Hostility scale scores. Experiment 3: 214 undergraduates (62.6% female). Correlational Study: 806 students from a large Midwestern university (60.7% female).

Intervention(s): Experiment 2: subjects debriefed that a computer assigned noise blasts.

Outcome Measure(s): Experiment 1: Accessibility of aggressive thoughts measured by a word completion task. Hear rate and blood pressure (systolic and diastolic) assessed during game play and afterwards. Experiment 2: Aggressive behavior assessed as the noise intensity chosen on the Taylor Competitive Reaction Time (CRT) task. Subjects provoked by a random or increasing noise pattern. Blood pressure and heart rate measured throughout. Self-perceived anger and rationale assessed by questionnaire. Experiment 3: Same as 2, but without provocation. Revenge motivation, instrumental aggressive motivation, and physical aggression measured by questionnaire. Correlational Study: Basic personality factors measured by Goldberg's Big Five measure as well as narcissism and emotional susceptibility. Attitudes towards violence and aggression (physical and verbal).

Results: Experiment 1: Violent video game play raised blood pressure during play compared to gradual blood pressure decrease throughout study among non-violent game players [$F(2,172) = 5.37$, $p < 0.01$]. No differences in heart rate. Violent game players, produced a higher percentage of aggressive words in the completion task [$F(1, 120) = 4.26$, $p < 0.05$], but the rated violence of the game was a strong covariate. Experiment 2: Violent game players receiving random provocation delivered higher noise punishments [$F(1, 179) = 5.72$, $p < 0.02$]. Those receiving increasing provocation were unaffected by type of game played. Experienced players reported more revenge ($r = 0.21$, $p < 0.01$) and instrumental aggressive motivation ($r = 0.15$, $p < 0.05$). Experiment 3: Violent game players set higher punishment levels than nonviolent players [$F(1, 195) = 7.17$, $p < 0.01$]. Trait physical aggression was correlated with exposure to media violent and hours spent with electronic entertainment [$F(1, 200) = 18.79$, $p < 0.001$ and $F(1, 199) = 6.68$, $p < 0.02$ respectively]. Higher violent content provoked more revenge motivations [$F(1, 195) = 8.24$, $p < 0.01$]. Correlational Study: Video game violence positively correlated with verbal aggression ($ß = 0.0182$, $p < 0.001$), mild physical aggression ($ß = 0.0286$, $p < 0.001$), severe physical aggression ($ß = 0.0097$, $p < 0.001$), and narcissism ($ß = 0.159$, $p < 0.001$). Aggreeableness, conscientiousness, and emotional susceptibility were negatively associated with video game violence exposure ($ß = -0.161$, $ß = -0.121$, and $ß = -0.170$, $p < 0.001$ respectively).

Conclusions: Brief exposure to violent video games increases aggressive behavior compared to nonviolent games. Revenge motives are one way highly hostile people are predisposed to aggression against others. Highly aggressive people seem to be more strongly influenced by violent media exposure. Suggest longitudinal research to more strongly establish long-term effects as well as consider possible positive effects.

CMCH Abstract for Meta-analysis within paper:
Objective: To assess the short- and long-term effects of violent video game exposure.

Data Sources: N/A

Study Selection: Studies with data testing a link between exposure to violent video games and aggressive behavior, aggressive cognition, aggressive affect, helping behavior, and physiological arousal.

Data Extraction: Samples were analyzed for "weaknesses" according to a predetermined Best Practices.

Data Synthesis: The best practices sample yielded average effect sizes and were generally larger than methodologically weaker samples. Correlational studies yielded larger average effects on aggressive and helping behavior than experimental studies.

Conclusions: Despite the relatively small size of such research, there is considerable correlational and experimental evidence that violent video games increase aggressive behavior and aggression-related variables. © Center on Media and Child Health

61. Anderson, C. A., L. Berkowitz, et al. (2003). "The influence of media violence on youth." Psychological Science in the Public Interest 4(3): 81-110.
Objective: To review current scientific knowledge about media violence and its impact on aggressive and violent behavior

Data Sources: Specific data sources not provided. Sources included empirical research studies (randomized experiments, cross-sectional surveys, longitudinal surveys), theoretical sources, and research studies on moderator effects, media use and content, interventions.

Study Selection: Details of selection process not provided. Recent critiques of the field not included. Studies selected based on their relevance to five critical questions - 1) What does research say about the relation (short-term and long-term) between media violence and aggressive and violent behavior? 2) How does media violence produce its effects on aggressive and violent behavior? 3) What characteristics of media violence are most influential, and who is most susceptible to such influences? 4) How widespread and accessible is violence in the media? 5) How can individuals and society counteract the influence of media violence?

Data Extraction: N/A

Data Synthesis: Empirical research shows that media violence has modest direct effect on serious forms of violent behavior (r=.13 to .32) and larger effect on aggressive behavior (r=.18 to .38 including violence). Regular childhood exposure can cause negative effects into adulthood. Those not typically aggressive are negatively affected when exposed to violent media. Theory suggests that media violence causes short-term increases in aggression through priming of aggressive thoughts, increasing physiological arousal, and activating tendency to imitate observed behaviors. Long-term increases due to creation of aggression-supporting scripts, schemas, beliefs and attitudes about appropriate social behavior. Repeated exposure causes desensitization to violence. Research on moderator effects reveals vital role of parents in supervising, influencing, and moderating children's exposure to violent media, and that all consumers are vulnerable to the deleterious effects of violent media. Research on media use and content shows that most youths are exposed to many hours of violent media each week, but with

changing media formats, new and more extensive data on exposure is needed. Review of intervention research suggests that the many forms of intervention methods (e.g. V-chip, media education) have yet to be systematically studied.

Conclusions: Children's consumption of violent media is great and may result in increased aggression or violence. Limiting exposure to this content would have positive effects. Though it seems clear that families play a critical role, more research is needed to determine how best to limit and mediate the effects of media violence. © Center on Media and Child Health

62. Berkey, C. S., H. R. H. Rockett, et al. (2003). "One-year changes in activity and in inactivity among 10- to 15-year-old boys and girls: Relationship to change in body mass index." Pediatrics 111(4): 836-843.
Objective: Study the association between change in body mass index (BMI) over 1 year and change in recreational activity (TV/video games).

Design: Cohort study using data from mailed questionnaires (Growing Up Today Study)one year apart (1997, 1998).

Subjects and Setting: 11,887 boys and girls, aged 10-13 who returned questionnaires in both 1997 and 1998 as part of the Growing Up Today Study. White (94.7%), Black (0.9%), Hispanic (1.5%), Asian (1.5%), other (1.4%). Children not returning survey in 1997: slightly older (girls-0.3 years, boys-0.4 years), at baseline more physically active-.1 hr/day, and inactive-0.3 hr/day). No difference in age-adjusted BMI.

Intervention: N/A

Outcome Measures: Change in BMI from 1997-1998, accounting for increases in BMI associated with growth and development.

Results: Regression models (including S and J models) showed an increase in physical activity from 1997-98 associated with decreasing relative BMI in girls (-.06 kg/m2 per hr increase in daily activity, 93% CI: -.11, -.01), and in overweight boys (-0.22 kg/m2, CI: -.33, -.10). Increase in inactivity associated with increasing BMI in girls (+.05 kg/m2 per hour increase in daily TV/video/video games; CI: +.02, +.08). Effects generally stronger among overweight children.

Conclusion: Many children may benefit by increasing their physical activity and by reducing time watching TV or videos and playing video games. Because most physical activity in youth takes place in organized programs outside of school, increasing physical activity and reducing inactivity in children will likely require multiple approaches, including policy changes, environmental planning and educational efforts in schools and communities. © Center on Media and Child Health

63. Waller, C. E., S. Du, et al. (2003). "Patterns of overweight, inactivity, and snacking in Chinese children." Obesity Research 11(8): 957-961.
Objective: To determine the relationship between patterns of inactivity and snacking, and overweight status in Chinese children.

Design: Cross-sectional study. Researchers weighed subjects' household food intake over 3 day period. Subjects recalled food intake over 3 24-hr. periods. Subjects traveled to a clinical setting for anthropometry, interviewed at home regarding inactivity and snacking.

Subjects and Setting: 1385 6-11 year old Chinese children, selected at random from 9 geographically diverse provinces. Data collected as part of ongoing, longitudinal national health survey. Physical measures completed in clinical setting; other data gathered in homes.

Intervention(s): N/A

Outcome Measure(s): BMI, height, weight. Time spent inactive/active, snacking behaviors. Demographic information.

Results: Households of non-overweight children had significantly higher incomes than the households of overweight children (?2 = 5.76, p = .02). Studying (4.7 hr/wk) amounted to almost as much inactive time as watching TV (5.3 hr/wk). 11% of subjects reported snacking, and the total energy derived from snacking did not differ significantly by overweight status.

Conclusion: Chinese children have low levels of inactivity, snacking, and obesity, all measures which have strikingly higher levels in the United States, suggesting the relationship between inactivity and obesity in youth. © Center on Media and Child Health

64. Green, C. S. and D. Bavelier (2003). "Action video game modifies visual selective attention." Nature 423(6939): 534-7.
As video-game playing has become a ubiquitous activity in today's society, it is worth considering its potential consequences on perceptual and motor skills. It is well known that exposing an organism to an altered visual environment often results in modification of the visual system of the organism. The field of perceptual learning provides many examples of training-induced increases in performance. But perceptual learning, when it occurs, tends to be specific to the trained task; that is, generalization to new tasks is rarely found. Here we show, by contrast, that action-video-game playing is capable of altering a range of visual skills. Four experiments establish changes in different aspects of visual attention in habitual video-game players as compared with non-video-game players. In a fifth experiment, non-players trained on an action video game show marked improvement from their pre-training abilities, thereby establishing the role of playing in this effect.

65. Cantor, J. and B. J. Wilson (2003). "Media and violence: Intervention strategies for reducing aggression." Media Psychology 5(4): 363-403.
The author discusses how effective several media intervention strategies are. After an overview of the effects of violent media in encouraging aggression, the strategies discussed include parental intervention, simple intervention messages during viewing, media literacy curricula in schools, and the use of media itself in anti-violence interventions. The evaluation concludes that while each method offers limited successes, further research is needed to determine exactly which aspects of each method are successful in counteracting the effects of violent media. © Center on Media and Child Health

66. Bickham, D. S., E. A. Vandewater, et al. (2003). "Predictors of children's electronic media use: An examination of three ethnic groups." Media Psychology 5(2): 107-137.
Objective: To determine predictors of electronic media use, both educational and entertainment, among European American, African American, and Hispanic American children.

Design: Survey. Data gathered from 1997 Child Development Supplement to Panel Study of Income Dynamics. Primary caregiver completed 2 24-hr time-use diaries, reporting child's daily activities, including TV use, for 1 randomly selected weekday and 1 weekend day. Caregiver also completed demographic questionnaire.

Subjects and Setting: 1,819 children ages 1-12 (1009 European Americans, 682 African Americans and 128 Hispanic Americans). Subsamples reported TV content (n = 1,304), electronic game content (n = 408; analysis performed for Europeans and African Americans only). Over-sampling of low-income (mostly African American) families.

Intervention(s): N/A

Outcome Measure(s): Total, percent educational, and percent cartoon television. Total, percent educational, and percent sensorimotor electronic games.

Results: Age, parental education level, neighborhood problems, and negative home environments were significantly correlated with total television use for European Americans. Child characteristics and demographics accounted for significant variance among Hispanic Americans. For African Americans, parental psychosocial well-being was significantly related to total viewing. The principal predictors for electronic game playing, among all 3 groups, were child characteristics.

Conclusion: Child and family characteristics, as well as socioeconomic variables, explained much of the variation in television and game exposure for European American and Hispanic American children, but less for African American children, who watched more television and played more electronic games, all with less educational content, than the two other groups. © Center on Media and Child Health

67. Wake, M., K. Hesketh, et al. (2003). "Television, computer use and body mass index in Australian primary school children." Journal of Paediatric & Child Health 39(2): 130-134.
Objective: To examine the impact of TV, computer, and video game use on children's BMI..

Design: Cross-sectional cohort study part of the Health of Young Victorians Study. Subjects stratified by type of primary school, one class from each grade level randomly selected from the 24 schools. Measurements of hours spent per school-day and non-school day of watching TV and using video games/computer based on parental reports. Eating and activity habits (food intake, diet, exercise, general activity level, and fidgetiness) also assessed by parental report.

Subjects and Setting: Children (n = 2862) age 5 - 13 years old from Victoria, Australia. Mean age = 9.1; 50.5% male.

Intervention(s): N/A

Outcome Measure(s): Trained observers measured weight and height for BMI calculations. BMIs transformed to standard deviation scores using the British 1990 Growth Reference and based on age and sex. Overweight and obese status based on international cut-points.

Results: 79% of children spent more than 10 hours/week watching TV, but only 8% spent more than 10.5 hours/week on the computer or with video games. The strongest predictors of BMI were food intake (F 74.5 = $p < 0.001$) and maternal and paternal BMI (F = 27.3, $p < 0.001$ and F = 21.4, $p < 0.001$ respectively). Participation in organized exercise was a weaker predictor (F = 4.2, $p < 0.01$). TV viewing and use of video games/computers were not significantly related to child BMI. Watching TV more frequently moderately increased children's odds of being overweight or obese.

Conclusions: Television is probably a small factor in explaining child obesity. Sociodemographic factors such as parental BMI are much higher risk factors. Suggests interventions be more multifactorial. © Center on Media and Child Health

68. Slater, M. D. (2003). "Alienation, aggression, and sensation seeking as predictors of adolescent use of violent film, computer, and website content." Journal of Communication 53(1): 105-121.
Objective: To examine the role of alienation, aggression, sensation seeking, and anger as predictors of exposure to violent media content, especially computer games and Internet websites.

Design: Cross-sectional survey study. Survey was part of larger drug abuse prevention study. Purposive school sample with districts recruited based on census classification. Alienation, aggressiveness, and anger assessed by items from the American Drug and Alcohol Survey. Sensation seeking measured by two self-report items of frequency of participation in dangerous activities.

Subjects and Setting: 8th graders from 10 small towns and rural communities around the United States. Mean age 14; 48.7% males; 79.1% White, 14.1% African American; 3.2% Latino. Those refusing to participate or without parental consent were excluded.

Intervention(s): N/A

Outcome Measure(s): Questionnaire asked respondents how often they watched action movies, played video games which involved firing a weapon, and visited websites describing or recommending violence.

Results: Sensation seeking and aggression predicted used of violent media content (ß = 0.279, $p < 0.001$ and ß = 0.174, $p < 0.001$ respectively). Alienation was not a significant predictor of general exposure to violent media content although there were slight associations with alienation from peers (ß = 0.036). However, when considering specific types of media, alienation from family and from school predicted use of violent content websites (ß = 0.066, $p < 0.001$ for both). Some evidence alienation from family and school were partial mediators in the relationships between sensation seeking, aggression, and use of violent Internet sites.

Conclusions: Sensation seeking and aggressiveness are strong predictors of using violent media content. The relationship between adolescent alienation and use of violent Internet content seems to be separate from general interest in violent media. Youth that are disconnected from family or school are more likely to seek out antisocial media. Recommend interventions at the family or school level. Future studies should consider whether use of violent media exacerbates alienation or antisocial behavior. © Center on Media and Child Health

69. Curri, T. B., T. L. Palmieri, et al. (2003). "Playing with fire: Images of fire on toy packaging." Journal of Burn Care & Rehabilitation 24(3): 163-165.
Objective: Determine frequency of male fire-related injuries and investigate use of fire images in toy packaging targeted at males and females.

Design: Content analysis. Toys inspected for having fire on toy itself or on packaging in toy store. Data collected on toy: category, name of toy, manufacturer, setting of fire display, targeted ages, targeted gender. Admissions to regional pediatric burn center reviewed for age, gender, hospital length of stay, TBSA burn.

Subjects and Setting: 404 toys with fire on packaging. Children with burns admitted to burn center between April 1997 and May 1999. Average age: 10 years (+/- .6 years).

Intervention: N/A

Outcome Measure(s): display of fire on children's toys; number of burn victims.

Results: 97% of toys with fire displays targeted at males. Video games had most fire images on packaging (208 of 404), then toy car/truck displays (84 of 404). Packaging for girls' toys usually safe and had fire-related items such as birthday candles and fireplaces. For boys' toys, settings

uncontrolled and often associated with speed and weapons. 58 children with burns. 90% male. Mean TBSA burn 12.3 +/- 2.1%. Average hospital stay 15.1 days (+/- 3.7).

Conclusion: Advertising reflects societal norms regarding gender behaviors. Media sends messages that (playing with) fire is cool, in particular for boys. This might encourage dangerous behavior in boys and can lead to severe burn trauma. © Center on Media and Child Health

70. Smith, S. L., K. Lachlan, et al. (2003). "Popular video games: Quantifying the presentation of violence and its context." Journal of Broadcasting and Electronic Media: 58-76.
Objective: To explore the amount and context of violence in popular video games.

Design: Content analysis. 10-minute segments of game play were video taped for coding. Violence defined as an overt depiction of a credible threat or actual use of physical force.

Subjects and Setting: The 20 most popular games (based on sales figures) in each of the major gaming systems: Sony PlayStation, Nintendo (N64), and Sega DreamCast.

Intervention(s): N/A

Outcome Measure(s): Overall prevalence of violence (at least one act) and rate of violence per minute. Context of violence measured through NTVS variables assessing demographics of perpetrators/victims, reason for violence, means used (type of weaponry), extent of means used (one time vs. repeated), extent of consequences, and player's visual perspective. Rewards and punishments for violence also coded.

Results: Video games rated for older audiences were more likely to feature violent content than games for all age groups (?2 = 6.51, p = 0.001), featuring almost four times as many violent acts per minute (?2 = 2.81, p < 0.05). Older audience-oriented games featured perpetrators that were more often human ((?2 = 362.81, p = 0.000) and children (?2 = 23.92, p = 0.000), while general audience games more often used robotic or male perpetrators. General audience game victims were more likely robots (?2 = 287.21, p = 0.000), male (?2 = 46.77, p = 0.000), and White (?2 = 9.98, p = 0.002). Justified violence, unconventional weapons, guns, and blood and gore were found more often in games for older children/adults. No differences in rewards, humor, and unrealistic pain. Mature audience games more often were played from the 1st person perspective (?2 = 118.10, p = 0.000).

Conclusions: Video game violence and its presentation context vary by rating. Games aimed at teen/mature audiences have a high prevalence of violence and feature elements increasing their risk of heightening their aggressiveness and social development. © Center on Media and Child Health

71. Funk, J. B., D. D. Buchman, et al. (2003). "Playing violent video games, desensitization, and moral evaluation in children." Journal of Applied Developmental Psychology 24(4): 413-436.
Objective: To determine the short- and long-term effects of violent video game exposure on desensitization, specifically moral evaluation.

Design: Randomized control study. Children assigned to play a violent or nonviolent game for 15 minutes. Questionnaire assessed game-playing habits (weekly playing time, months of game playing, etc.), three favorite games, and baseline attitudes towards violence (ATVC) and empathy (Index of Empathy for Children and Adolescents).

Subjects and Setting: 35 children ages 8 - 12 (65% European American, 20% African American) and 31 children ages 5 - 7 (70% European American, 16% African American.). Those refusing consent or without parental approval were excluded.

Intervention(s): N/A

Outcome Measure(s): Moral evaluation measured by responses to 10 vignettes describing everyday situations, 4 with aggressive actions and 6 with empathic responses. Responses coded for degree of aggressiveness (physical or verbal) and empathy.

Results: Older children had higher vignette scores for empathy [$F(1, 62) = 114.02$, $p < 0.00$] and aggression [$F(1, 62) = 8.12$, $p < 0.01$]. No correlation between type of game played and aggression or empathy vignette scores. Higher vignette empathy scores were predicted by older age [$ß = -0.80$, $p < 0.001$] and higher baseline empathy scores [$ß = 0.21$, $p < 0.01$]. Greater exposure to video game violence was related to lower empathy vignette scores [$ß = -0.15$, $p < 0.05$]. Similarly, older age and higher baseline ATVC scores predicted higher aggression vignette scores [$ß = -0.34$, $p < 0.01$ and $ß = 0.33$, $p < 0.01$ respectively], however violent video game exposure was not correlated.

Conclusions: Long-term exposure to violent video games was associated with lower empathy scores. No short-term effects found. Future research should consider moderators (reasons for violence, degree of realism, and identification with characters) and children's perception of game content. Suggest parents monitor children's video game playing and have discussions with them about the real-life consequences of aggression. Recommend the reevaluation of the game rating system and continued federal regulation. © Center on Media and Child Health

72. Kimata, H. (2003). "Enhancement of allergic skin wheal responses in patients with atopic eczema/dermatitis syndrome by playing video games or by a frequently ringing mobile phone." European Journal of Clinical Investigation 33(6): 513-517.
Researchers studied the effects of video games and ringing cell phones on patients with atopic eczema, with a control group of allergic rhinitis (hay fever allergies) or normal subjects. Both video game play and repeated cell phone ringing caused an increase in skin allergy response in the eczema group, while no effect was observed in the other two groups. The researchers explain

this effect as a result of increased stress conditions measured by heart rate and blood pressure increases in these patients. © Center on Media and Child Health

Objective: Examine whether playing video games or exposure to frequently ringing mobile phone modulates allergic skin wheal responses in patients with atopic eczema/dermatitis.

Design: Experimental. Video game study: subjects played video game (Street Fighter II) for 2 hours. Blood was drawn, skin prick tests performed, wheal sizes measured. Mobile phone study: subjects watched 30-min. non-humorous video while mobile phone rang every minute. Same physical measures as in video game study.

Subjects and Setting: Video game study: 25 normal subjects (13 women, 12 men), Mean age: 24 years (range: 21-31 years); 25 subjects (12 women, 13 men) with moderate allergic rhinitis (AR), Mean age: 24 years (range: 21-32 years); 25 subjects with moderate atopic eczema/dermatitis syndrome (AEDS), Mean age: 24 years (range: 21-32 years). Mobile phone study: 27 normal subjects (14 women, 13 men), mean age: 35 years (range: 22-42 years); 27 subjects (14 women, 13 men) with mild AR, mean age: 32 years (range: 23-44 years); 27 subjects with mild AEDS (14 women, 13 men), mean age: 33 (range: 23-44 years).

Intervention: N/A

Outcome Measure(s): wheal responses, plasma levels.

Results: Playing video games and exposure to frequently ringing mobile phones increased skin wheal responses among patients with AEDS. Playing video games or frequently ringing mobile phones had no effects on normal subjects or subjects with AR.

Conclusion: Stress can exacerbate atopic eczema/dermatitis syndrome. High technology in modern society such as playing video games and exposure to mobile phones may be stressful to patients with AEDS and increase their symptoms. © Center on Media and Child Health

73. Morgan, C. and S. R. Cotten (2003). "The relationship between internet activities and depressive symptoms in a sample of college freshmen." Cyberpsychology & Behavior. 6(2): 133-142.

Objective: To determine the impact of Internet communication and non-communication activities on social support and well-being.

Design: Cross-sectional cohort survey conducted via the Internet. Survey assessed demographics, attitudes toward Internet usage, and sources of social support and well-being. Internet usage measured as frequency of using the Internet for email, chat rooms, instant messaging, shopping, games, and conducting research each week.

Subjects and Setting: 287 college freshman (out of a total class of 500) a mid-sized, mid-Atlantic public university. 54% female; mean age = 18; mean social support score = 3.61; mean CES-D score = 10.3.

Intervention(s): N/A

Outcome Measure(s): Depression measured by the Center for Epidemiologic Studies Depression Scale (CES-D) based on self-reported depression symptoms. Social support assessed how much friend/family make subjects feel loved and are willing to listen or add pressure or criticize their lives.

Results: Students spent about 3.9 hours/week emailing, 16.3 hours/week in a chat room or instant messaging, and an additional 11.9 hours/week on other Internet activities. Increased email usage decreased depression symptoms with each additional hour of e-mail usage decreasing CES-D depression scores by 1.1% ($p = 0.04$). Chat rooms similarly decreased CES-D scores by 0.5% per each additional hour of usage ($p = 0.002$). Depression symptoms increased by 0.6% for each additional hour spent using the Internet for non-communication activities ($p = 0.002$). Social support does not mediate these effects. The protective effects of email usage on depression were more pronounced for males, decreasing CES-D scores by 1.68% per additional hour of email usage ($p = 0.008$).

Conclusions: Increased use of the Internet for email, instant messaging, or chat rooms decreases depressive symptoms, while non-communication activities increase them. Email may be an important intervention strategy for males to increase social support for better well-being. Suggest future studies use longitudinal methods and more diverse groups to determine the applicability of findings.

74. Walshe, D. G., E. J. Lewis, et al. (2003). "Exploring the use of computer games and virtual reality in exposure therapy for fear of driving following a motor vehicle accident." Cyberpsychology & Behavior 6(3): 329-334.
Objective: Investigate the effectiveness of combined use of computer-generated environments involving driving games and virtual reality driving environment in exposure therapy for treatment of driving phobia following a motor vehicle accident program.

Design: Experiment. Half of subjects showed 'immersion' during screening and half did not. Immersion group received treatment.

Subjects and Setting: 14 subjects with driving phobia after motor vehicle accident. Subjects met DSM-IV criteria for specific phobia, situational type-driving, or posttraumatic stress disorder with clinical criteria for specific phobia, situational driving.
Subjects were exposed to virtual reality driving environment and game reality simulation with computer driving games.

Intervention: Cognitive behavioral program involving graded driving simulation tasks with self-monitoring, physiological feedback, diaphragmatic breathing and cognitive reappraisal. 12 weekly sessions of 1 hour broken into 3 driving exposures lasting 15 minutes.

Outcome Measure(s): physiological responsivity (heart rate), subjective ratings of distress (SUD), rating scales for severity of fear of driving (FDI), Posttraumatic Stress Disorder (CAPS), depression (HAM-D), achievement of target behaviors.

Results: Treatment group showed significant reductions on all measures: Subjective distress (SUD; p=0.008), driving anxiety (FDI; p=0.008), post-traumatic stress disorder rating (Caps=0.008), heart rate rise (HR; p=0.008), depression rating (HAM-D; p=0.031). Subscale analysis of driving anxiety (FDI) showed significant reductions in travel distress (p=0.008), travel avoidance (p=0.008), mal-adaptive driving strategies (p=0.016).

Conclusion: Virtual reality and driving games may play useful role in treating driving phobias after accidents, even when subjects also suffer from post-traumatic stress disorder and depression. © Center on Media and Child Health

75. Rosas, R., M. Nussbaum, et al. (2003). "Beyond Nintendo: design and assessment of educational video games for first and second grade students." Computers & Education 40(1): 71.

The main objective of this study was to evaluate the effects of the introduction of educational videogames into the classroom, on learning, motivation, and classroom dynamics. These effects were studied using a sample of 1274 students from economically disadvantaged schools in Chile. The videogames were specifically designed to address the educational goals of the first and second years of school, for basic mathematics and reading comprehension. The sample was divided into experimental groups (EG), internal control groups (IC) and external control groups (EC). Students in the EG groups, used the experimental video games during an average of 30 h over a 3-month period. They were evaluated on their acquisition of reading comprehension, spelling, and mathematical skills, and on their motivation to use video games. Teachers' expectations of change due to the use of video games, their technological transfer, and handling of classroom dynamics, were assessed through ad hoc tests and classroom observations. The results show significant differences between the EG and IC groups in relation to the EC group in Math, Reading Comprehension and Spelling, but no significant differences in these aspects were found between the EG and the IC groups. Teacher reports and classroom observations confirm an improvement in motivation to learn, and a positive technological transfer of the experimental tool. Although further studies regarding the effects of learning through videogame use are imperative, positive effects on motivation and classroom dynamics, indicate that the introduction of educational video games can be a useful tool in promoting learning within the classroom.Copyright 2003 Elsevier

76. Slater, M. D., K. L. Henry, et al. (2003). "Violent media content and aggressiveness in adolescents: A downward spiral model." Communication Research 30(6): 713-736.

Objective: To examine if violent media and aggression mutually reinforce each other over time.

Design: 2-year longitudinal survey study using multilevel modeling to determine relationships between aggression over time, use of violent media over time, and related covariates. Analyses applied latent growth curve models to a random coefficients framework. Measured covariates included gender, sensation seeking, Internet use, and age.

Subjects and Setting: 6th and 7th grade students (n = 2550) attending 20 schools across the U.S. Mean age = 12.34; 46% male.

Intervention(s): N/A

Outcome Measure(s): Use of violent media defined measured as frequency of watching action movies, playing video games involving firing a weapon, and visiting Internet sites with violent content. Aggression assessed by six items related to aggressive thoughts, values, and behaviors.

Results: Over time, students became more aggressive (ß = 0.071, $p < 0.0001$) and used violent media more frequently (ß = 0.104, $p < 0.0001$). Those more aggressive at the study's midpoint had aggression scores that increased at a much faster rate than less aggressive students (ß = 0.023, $p < 0.01$). Aggressive behavior was more likely to have been exhibited by males (ß = 0.127, $p < 0.0001$), high sensation seekers (ß = 0.303, $p < 0.01$), and older participants (ß = 0.042, $p < 0.01$). General Internet use was negatively associated with aggressive behavior (ß = -0.032, $p = 0.001$). Greater use of violent media was found among males (ß = 0.600, $p < 0.0001$), high sensation seekers (ß = 0.395, $p < 0.0001$), and frequent Internet users (ß = 0.148, $p < 0.0001$). Age did not significantly predict violent media use. During periods of higher violent media use, students were also more aggressive (ß = 0.093, $p < 0.0001$). Controlling for current violent media use, frequent violent media use predicted future aggression (ß = 0.033, $p < 0.05$).

Conclusions: Cross-sectional and lagged effects of violent media use on aggression support the downward spiral model. Aggressiveness and violent media use are mutually reinforcing. Violent media use increases the likelihood of present and future aggression, even when controlling for current media use. Aggressiveness should be considered a characteristic of the individual rather than as a time varying predictor. © Center on Media and Child Health

77. Ng, S. M., R. M. Khurana, et al. (2003). "Is prolonged use of computer games a risk factor for deep venous thrombosis in children? Case study.[see comment]." Clin Med: 593-4.

78. Colwell, J. and M. Kato (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.
Objective: To determine the relationship between computer game playing and certain negative factors, including social isolation, self-esteem, and aggression, among Japanese adolescents.

Design: Survey study. Participants completed 2-part questionnaire. Part 1 completed by computer game players alone, evaluating game play measures, companionship, leisure activities of choice, and parental attitudes regarding play. Part 2 evaluated certain demographic characteristics, including self-esteem, aggression, and friendship.

Subjects and Setting: 305 (159 boys, 146 girls) Japanese adolescents, ages 12-13, enrolled in 4 mixed junior high schools in Tokyo. Opportunity sample.

Intervention(s): N/A

Outcome Measure(s): Self-esteem, aggression, and social isolation.

Results: Exposure to and frequency of game playing were both significantly related to preference for games over the companionship of friends (p<.001). Self-esteem was not related to any game playing measures. Controlling for sex, the frequency of game play was significantly related to aggression (p<.05), but further analysis indicates that this relationship may be correlational and not causal.

Conclusion: Among Japanese adolescents, game playing was significantly related to expressed preference for games over the companionship of friends, suggesting that computer games may be acting as "electronic friends." © Center on Media and Child Health

79. Feldman, D. E., T. Barnett, et al. (2003). "Is physical activity differentially associated with different types of sedentary pursuits?" Archives of Pediatrics & Adolescent Medicine 157(8): 797-802.

Objective: To determine the relationship between the time adolescents spend in physical activity and the time they spend in specific sedentary pursuits, such as watching television or reading.

Design: Cross-sectional study. Subjects completed questionnaire regarding physical activity, sedentary pursuits, health, and psychosocial issues. Subjects measured for height, weight.

Subjects and Setting: 743 7th-10th graders (mean age = 15.1 years, 48.3% female) from 1 private, 2 public high schools in Montreal, Quebec. Subjects, parents of subjects under 14 signed informed consent form prior to study.

Intervention(s): N/A

Outcome Measure(s): Physical activity (type, duration), sedentary pursuits (productive or leisure, duration), time spent working, musculoskeletal pain, mental health status, type of school (public or private).

Results: Time spent in all sedentary pursuits increased slightly as activity level increased. Working was associated with increased physical activity for both girls and boys (odds ratios = 1.4, 1.5 respectively). Productive sedentary behavior was associated with increased physical activity (odds ratio = 1.7, 95% confidence interval = 1.2-2.4), while leisure behavior was not (odds ratio = 1.1, 95% confidence interval = 0.8-1.5).

Conclusion: Physically active adolescents spent more time on productive sedentary pursuits, such as reading, but not on leisure activities, suggesting that participation in physical activity involves good time management skills. © Center on Media and Child Health

80. Bushman, B. J. and J. Cantor (2003). "Media ratings for violence and sex: Implications for policymakers and parents." American Psychologist 58(2): 130-141.
Objective: To review existing research findings regarding the implementation of media rating systems, parental evaluation of such systems, and the effect of systems on children's television preferences.

Design: Review of existing media ratings systems. Meta-analysis of research on parental use of systems. Meta-analysis of experimental studies assessing effect of systems on children's media preferences.

Subjects and Setting: Relevant research on media rating systems.

Intervention(s): N/A

Outcome Measure(s): Parental evaluations of media rating systems. Effect of systems on children's media preferences.

Results: Media ratings are either evaluative (e.g. age-based) or descriptive (e.g. content-based). Existing systems include the Motion Picture Association of America (MPAA) ratings, TV Parental Guidelines (V-chip), music advisories, Electronic Software Ratings Board ratings, and the Internet Content Ratings Association. While a majority of parents used the systems, there was a poor knowledge of the ratings' meaning. Parents significantly preferred content-based systems over age-based systems. Ratings and advisories significantly increased attraction to media, compared with control conditions (95% CI: .06-.17), with a greater effect on males than females ($p<.05$). This attraction effect existed from age 11 to age 22.

Conclusion: Although media rating systems are widespread and used frequently, many parents have poor knowledge of the meaning of various ratings, and ratings often make programs more attractive to children and adolescents (the "forbidden fruit" effect).

81. Anderson, C. A. and C. R. Murphy (2003). "Violent video games and aggressive behavior in young women." Aggressive Behavior 29(5): 423-429.
Objective: To determine the short-term impact of violent video games on young women.

Design: Randomized control trial. Gender matching between video game player and character included as a factor. Subjects assigned to three groups: violent video game (Street Fighter II) with female protagonist, violent game with male protagonist; or nonviolent game (Oh No! More Lemmings). Video games played for 20 minutes.

Subjects and Setting: Female undergraduate psychology students (n = 91) at Iowa State University.

Intervention(s): N/A

Outcome Measure(s): Aggressive behavior assessed by two-phase Taylor Competitive Reaction Time (TCRT) task. Wins/losses during the phase trials evenly split. Participants set noise levels for the punishment during Phase 2 during which they were not subjected to hear the noise. Instrumental aggressive motivation, including revenge, assessed by a TCRT follow-up questionnaire.

Results: Subjects playing the violent game had higher levels of aggressive motivation than those playing the nonviolent game [$F(1,87) = 6.05$, $p < 0.02$]. Gender of the video game character had no significant impact on aggressive motivation. Violent game players also expressed more aggressive behavior than nonviolent game players by delivering more loud noise blasts in the TCRT task [$F(1,87) = 6.83$, $p < 0.02$]. No significant evidence that aggressive motivation mediated the effect of violent video games on aggressive behavior, however revenge motivation partially mediated this relationship [$F(1,86) = 24.44$, $p < 0.001$].

Conclusions: Brief exposure to a violent video game increase aggressive behavior in young women. Suggest future studies to identify specific features of violent video games that impact aggressive thoughts, feelings, and behaviors. Also recommend studies exploring the long-term effects of repeated exposure to violent video games. © Center on Media and Child Health

82. VanDeventer, S. S. and J. A. White (2002). "Expert Behavior in Children's Video Game Play." Simulation & Gaming 33(1): 28.
This study investigated the display of "expert" behavior by outstanding video game–playing children. Seven highly proficient, video game–playing, 10 and 11-year-old children were observed in the act of teaching adult "foils" how to play one of two popular home video games. The children were also debriefed after the teaching sessions. Observation and debriefing transcripts were then analyzed for evidence of expert behaviors such as self-monitoring, pattern recognition, principled decision making, qualitative thinking, and superior memory. The findings indicate that outstanding video game–playing children frequently display the characteristics of experts as they are displayed in other domains. Differences in levels of expertise also appear to be present along a continuum from novice to expert. Further study of video game processes may inform educators about the development of expert proficiencies in children.ABSTRACT FROM AUTHOR

83. Bushman, B. J. and C. A. Anderson (2002). "Violent video games and hostile expectations: A test of the general aggression model." Personality & Social Psychology Bulletin 28(12): 1679-1686.
Objective: To examine whether violent video games produce a "hostile expectation bias"-the tendency to expect others to react to potential conflicts with aggression.

Design: Experimental study

Subjects and Setting: 224 undergraduate students (112 men, 112 women) enrolled in introductory psychology courses-course credit received in exchange for study participation. Participants played either a violent (experimental) or nonviolent (control) video game. Following, ambiguous stories on potential interpersonal conflicts were read. Participants were then asked what the main character will do, say, think, and feel as the story continues.

Interventions: N/A

Outcome Measures: Number of aggressive responses for character do/say, think, feel

Results: Experimental group expected more aggressive responses from story characters than controls; F(1,220) 7.40, p<.007. Experimental group were more likely to expect main characters to do or say something aggressive; F(1,22) = 8.14, p<.005. Experimental group was more likely to expect the main character to have aggressive thoughts and ides, though not quite significant effect F(1,22) = 3.69, p<.06. Experimental group more likely to expect the main characters to feel angry and aggressive; F(1,220) =6.17, P<.02.

Conclusion: Playing a violent video game for just 20 minutes produced significant increases in expectations that potential conflict situations would be handled aggressively, as predicted by the General Aggression Model. This model organizes the relevant research in a simple way and can serve as a guide for future research designed to answer critical questions pertaining to mediation and interventions. © Center on Media and Child Health

84. Gordon-Larsen, P., L. S. Adair, et al. (2002). "Ethnic differences in physical activity and inactivity patterns and overweight status." Obesity Research 10(3): 141-149.
Objective: To determine the relationship between physical activity and inactivity and overweight status in U.S. adolescents, with respect to ethnicity.

Design: Longitudinal study, using data from adolescent health surveys. Subjects completed questionnaire regarding physical activity, media use, and body measures at 2 times (Apr-Dec 1995 and Apr-Aug 1996)

Subjects and Setting: 12,759 adolescents (6997 non-Hispanic whites, 2676 non-Hispanic blacks, 2185 Hispanics, and 901 Asians). 11-19 years old, 49.3% male. Nationally representative data from National Longitudinal Study of Adolescent Health (1995, 1996). Survey completed at home.

Intervention(s): N/A

Outcome Measure(s): Overweight status, as determined by body mass index at 2nd measurement.

Results: Overweight prevalence was positively associated with high level TV/video viewing among white boys (odds ratio = 1.53, 95% confidence interval: 1.08-2.14) and girls (2.45, 1.51-3.97). The odds of overweight decreased with high levels of moderate to vigorous physical activity among white boys (0.81, 0.76-0.87), non-Hispanic black boys (0.86, 0.76-0.98), and girls (0.88, 0.78-0.99), and Hispanic boys (0.90, 0.83-0.97) and girls (0.91, 0.84-0.99).

Conclusion: Adolescents who watched less TV and engaged in frequent physical activity had a lower overweight prevalence, suggesting that reducing TV and video viewing and increasing

physical activity could reduce overall overweight prevalence. © Center on Media and Child Health

85. Walsh, D. A., D. A. Gentile, et al. (2002). "Parents rate the ratings: a test of the validity of the American movie, television, and video game ratings." Minerva Pediatrica 54(1): 1-11.
Objective: To test the validity of the current movie, television, and video game rating systems.

Design: Panel study

Subjects and Setting: 55 adult raters recruited through advertisements in local newspapers (parents or grandparents-n=48; child development professionals-n=7). Both single and married parents were included. Ages: 22-66, mean =40. 13 males, 42 females. Diverse range of SES and ethnic backgrounds. 276 films, 253 television programs, 166 computer games were selected for rating based on: release b/w 1997-9, popularity, marketing to children, likely to be seen by children. Once ratings were assigned, data were presented using a 3-point scale: Green light-considered by parent raters to be child appropriate; Yellow light-parents use caution to allow children; Red light-product not recommended for children.

Outcome Measure: Mean ratings using point system

Intervention: N/A

Results: Half or fewer of movies and TV shows labeled "G" were considered appropriate for 3-7 year old by parents. Of PG-rated movies, 63% received green lights, 57% of TV Y7-rated shows received green lights. G received red lights only 8% of the time, TV-PG received red lights 38% of the time. 60% of PG-13 rated films were considered to be appropriate for teenagers. Less than 50% of T-rated games given green light by parents. 15% tv-14 programs considered appropriate for teenagers. Amount of violence content and portrayals of violence are primary markers for disagreement b/w parent and industry ratings.

Conclusion: Ratings of media products can play a critical role in preserving artistic and economic freedom while protecting public health. However, results demonstrate lack of system in these "systems". Physicians have the opportunity to affect parents and children through their roles as educators, clinicians, and concerned citizens. Nothing short of a universal overhauls of current industry ratings will safeguard public health. © Center on Media and Child Health

86. Beasley, B. and T. C. Standley (2002). "Shirts vs. skins: clothing as an indicator of gender role stereotyping in video games." Mass Communication & Society 5(3): 279-293.
Objective: To examine female gender role stereotyping in video games.

Design: Content analysis of gender role stereotyping based on the types of clothing worn by female characters. Random sampling of all Nintendo 64 and Playstation games available for purchase. Video game characters observed for the first 20 minutes of game play. Games coded by game system, game rating, and game type (sport, fighter, game show, etc.). Character gender and species also coded.

Subjects and Setting: 32 PlayStation and 16 Nintendo 64 games. Adult-only titles excluded. Games rented from area video game stores. Titles unavailable for rent replaced by a random selection from original list. Overall, 597 characters were analyzed.

Interventions: N/A

Outcome Measure(s): Clothing assessed by sleeve length (long/ ¾, short, or no sleeve), neckline (high, mid, or low collar), lower body clothing (length and skirt/pants), and cleavage size.

Results: Of the characters analyzed, 13.74% were women compared to 71.52% men and 14.74% of an undeterminable gender. Bare arms were more frequently observed on female characters than males (?2 (3) = 34.15, p < 0.05) most frequently wearing halter tops, tank tops, and bathing suits. The vast majority (85.71%) of characters shown with a low neckline with visible cleavage were women (?2 (2) = 95.35, p < 0.05). Mixed results with lower body clothing due to traditional expectations of skirts being worn only by women. Female characters in games with a mature rating had larger breasts than in games rated for everyone (?2 (4) = 9.90, p < 0.05).

Conclusions: Considerable gender role stereotyping in video games. Women were underrepresented and those present were less clothed than male characters. Video game designers should be reminded that gender role discrimination in any media is unacceptable. Future studies should focus on characters' behavior and male stereotyping. © Center on Media and Child Health

87. Cultrara, A. and G. Har-El (2002). "Hyperactivity-induced suprahyoid muscular hypertrophy secondary to excessive video game play: a case report." Journal of Oral & Maxillofacial Surgery 60(3): 326-7.

88. De Lisi, R. and J. L. Wolford (2002). "Improving children's mental rotation accuracy with computer game playing." Journal of Genetic Psychology 163(3): 272-282.
Objective: To determine the relationship between mental rotation (MR) and computer game playing among 8 - 9 year olds.

Design: Randomized control study. Subjects played "Tetris" (MR experience) or "Where in the USA is Carmen Sandiego?" Mental rotation test (MRT) administered to groups of 15 - 16 in classroom settings. Subjects matched on baseline MR ability.

Subjects and Setting: 47 third-grade students attending a small public school in central New Jersey. 24 boys, 23 girls.

Intervention(s): "Tetris" was played allowing students to practice MR as they rotate game blocks. The game was played during 11 class sessions within a month

Outcome Measure(s): Mental rotation accuracy measured by a revised French Kit Card Rotation Test in which subjects labeled figure pairs as "same" or "different."

Results: The experimental group's mean score on the MRT increased significantly at post-test while the control group's did not due to improvement after playing "Tetris." Boys outperformed girls on the MRT at baseline, but not after playing the video games. The greatest gains in MR scores were among the girls that played "Tetris." Although students with high MR abilities outperformed students of lower ability at baseline and post-test, the difference between mean scores was much lower after playing the games, predominantly due to the gains made by the low ability students that played "Tetris."

Conclusions: Gender differences in MR accuracy are present in children as young as third grade. Children use similar solution strategies when playing "Tetris" and MR tasks. Playing "Tetris" enhanced MR performance. Suggest future research consider how much practice is needed to reach asymptotic performance levels, the minimum hours needed to demonstrate positive effects, and the extent positive effects are maintained. © Center on Media and Child Health

89. Bartholow, B. D. and C. A. Anderson (2002). "Effects of violent video games on aggressive behavior: Potential sex differences." Journal of Experimental Social Psychology 38(3): 283-290.

Objective: To examine if level of aggression in male and female college students is increased after playing a violent video game and a non-violent video game.

Design: Randomized control trial testing aggression and retaliation reaction time effects of 2 video games: 1 violent, Mortal Kombat, and 1 non-violent, PGA Tournament. A female experimenter served as decoy opponent for each subject, but a computer determined 12 of the 25 trial wins. Subjects were led to separate rooms before the trials and then provided with written and verbal instructions by an experimenter. Phase trials were 10 minutes. Phase 1: 25 trials, observation of subject's response to noise levels and reaction time; duration and intensity of punishment set by opponent. Phase 2: same as phase 1, but duration and intensity set by subject and examined retaliation reaction time.

Subjects and Settings: Undergraduates (n= 43, 22 male, ages 18 - 23) recruited by telephone. Subjects were selected if they had played the two games in the last 6 months, but exclude if they played more than once a week. Experiment completed in a lab setting.

Intervention(s): N/A

Outcome Measure(s): Level of aggressive behavior observed in retaliation phase-2 measured by severity of punishment.

Results: Generally, males and subjects completing the Mortal Kombat game trials set higher levels of noise punishment (M = 5.61 & M = 5.97) than females (M = 4.80) and PGA Tournament (M = 4.60) game players. Mortal Kombat intensity levels were set higher and more often (M = 8.29). Violent video game effects were stronger for males than females.

Conclusions: Aggressive behavior for males playing Mortal Kombat was greater than females and PGA tournament players. © Center on Media and Child Health

90. Panee, C. D. and M. E. Ballard (2002). "High versus low aggressive priming during video-game training: Effects on violent action during game play, hostility, heart rate, and blood pressure." Journal of Applied Social Psychology 32(12): 2458.
Objective: To quantify amount of violent action, cardiovascular activity, and hostile feelings varied depending on whether players of violent video games were trained aggressively before playing.

Design: Half the participants were exposed to training conditions that were highly aggressive and half exposed to low aggression training. Participants played "Metal Gear Solid" video game 1 hour. Cardiovascular activity was recorded by attaching a blood pressure cuff to their arm during video game play. Game performance recorded on a videotape. Bell Adjustment Inventory subscale questionnaire used to assess levels of hostility.

Subjects and Setting: U.S. male undergraduates (N=36). Mean age 20.1 years.

Intervention: exposure to high or low aggression training prior to video game play

Outcome Measure(s): frequency of violent action, blood pressure (diastolic & systolic), heart rate, and level of hostile feeling.

Results: Participants in the high aggression training engaged in more violent action than those in low aggression training $F(1, 34)=59.17$, $p<0.001$. Participants in the high aggression training had higher hostility levels as compared to those in low aggression training $F(1, 34)=20.69$, $p<0.001$. Heart rate and blood pressure did not seem to vary depending on aggression training.

Conclusions: Violent action was more frequent among those who were trained to be more aggressive. Heart rate and blood pressure were not different depending on whether participants were trained in high or low aggression prior to play. Designers of video games may want to create more games that offer alternatives to violent action. © Center on Media and Child Health

91. Durkin, K. and B. Barber (2002). "Not so doomed: Computer game play and positive adolescent development." Journal of Applied Developmental Psychology 23(4): 373-392.
Objective: To assess the relationship between playing videogames and measures of positive and negative adjustment and risk taking among high school students.

Design: 90-minute survey study administered in schools plus school record data

Subjects and setting: Participants in the Michigan Study of Adolescent Life Transitions recruited from 10, largely White, middle- and lower-middle class school districts in Southeastern Michigan (6th-graders in 1983). Current study used Wave 5 data collected from 1,304 10th-graders (approx. age 16) in 1988

Intervention(s): N/A

Outcome measure(s): Measures of adjustment (depressed mood, self esteem), self-concept (intelligence, leadership, interpersonal skills, mechanical ability, computer skills), risk behavior

(aggression, disobedience, substance use, truancy), school records (attendance, GPA), family closeness (Family Environment Scale - Moos & Moos, 1981), school attachment, friend characteristics (academic, risky), participation (sports, activities and clubs); related to computer games use (none, low, high).

Results: Computer game use was significantly related to measures of adjustment ($F(4,2026)=3.39$, $p<0.01$), self-concept ($F(10,2016)=11.31$, $p<0.001$), risk behavior ($F(8,2002)=3.65$, $p<0.001$), school records ($F(4,1740)=7.15$, $p<0.001$), family closeness ($F(2,1034)=7.40$, $p<0.01$), school attachment ($F(2,1032)=5.61$, $p<0.01$), friendship characteristics ($F(4,1822)=3.77$, $p<0.01$), and activity participation ($F(4,2042)=2.52$, $p<0.05$).

Conclusions: Those with low use reported significantly less depressed mood than high or never users and had higher self esteem than never users. Never players reported lower intelligence than low or high players, and less mechanical ability than high players. Computer ability increased from never to low to high players. Never players reported the highest levels of disobedience, substance use and truancy, while high players reported the most aggression. Compared with computer game players (either low or high use), never players had the most absences, lowest GPA, less family closeness and less school attachment. They also had fewer "academic" friends and more "risky" friends, and participated in fewer sports and activities. © Center on Media and Child Health

92. Kasteleijn-Nolst Trenite, D. G., A. Martins da Silva, et al. (2002). "Video games are exciting: a European study of video game-induced seizures and epilepsy." Epileptic Disorders. 4(2): 121-8.

BACKGROUND: Video game seizures have been reported in photosensitive and non-photosensitive patients with epilepsy. The game Super Mario World, has led to many cases of first seizures. We examined whether this game was indeed more provocative than other programs and whether playing the game added to this effect. METHODS: We prospectively investigated 352 patients in four European cities, using a standard protocol including testing of a variety of visual stimuli. We correlated historical data on provocative factors in daily life with electroencephalographic laboratory findings. RESULTS: The video game, Super Mario World proved more epileptogenic than standard TV programs and as provocative as programs with flashing lights and patterns. Most striking was the fact that video game-viewing and-playing on the 50 and 100 Hz TV was significantly more provocative than viewing the standard program ($P < 0.001$, $P < 0.05$ respectively). Playing the video game Mario World on a 50 Hz TV, appeared to be significantly more provocative than playing this game on the 100 Hz TV ($P < 0.001$). Of 163 patients with a history of TV-, VG- or CG-seizures, 85% of them showed epileptiform discharges in response to photic stimulation, 44% to patterns, 59% to 50 Hz TV and 29% to 100 Hz TV. CONCLUSIONS: Children and adolescents with a history of video game seizures are, in the vast majority, photosensitive and should be investigated with standardised photic stimulation. Games and programs with bright background or flashing images are specifically provocative. Playing a video game on a 100 Hz TV is less provocative [published with videosequences].

93. Surette, R. (2002). "Self-reported copycat crime among a population of serious and violent juvenile offenders." Crime & Delinquency 48(1): 46-69.
Objective: To measure the prevalence and examine correlates of copycat crimes (emulating exampled from media) among serious and violent juvenile offenders.

Design: Self-report, retrospective cohort study. Survey administered in classrooms and adjusted to low education levels.

Subjects and Setting: Juvenile offenders (n = 68) transferred to adult criminal court and incarcerated in the Orange County Corrections facility (Florida). Subjects with unavailable correctional jail data files were excluded. Mean age 16.5. Predominantly black, low academic scores, and extensive and violent criminal histories. Higher than average media exposure to music and films and lower exposure to books.

Intervention(s): N/A

Outcome Measure(s): Copycat crime measured by an index of five forced-choice questions. Criminogenic influences measured by questions assessing the most influential factors on their criminal behavior and those considered the most helpful.

Results: One-third of juveniles considered a copycat crime and 25% attempted one. Media induced 20% to seek out fights. Music and visual media encouraged 25% and 33% respectively to seek out guns. Copycat juveniles were more likely to credit ideas from friends (B = -0.616, p = 0.009) and the media (B = -756, p = 0.009) as highly influential factors in committing crimes. Copycat juveniles were more likely to consider media, friends, adults, and other inmates as helpful sources of crime information than their counterparts. Gun-related criminal offenses were correlated with copycat attempts and crimes. Non-significant correlates include gang membership, jail adjustment, prior arrests, violent offences and media exposure.

Conclusions: Consideration of and attempted copycat crimes are related to media and peer-related perceptions. Media may be sources of crime information for at-risk juveniles. Need additional theoretical conceptualization to explain the juvenile copycat crime model. Future research should pursue in-depth interviews and direct viewing behavior of offenders. Interactive media such as video games should be explored further. © Center on Media and Child Health

94. Williams, R. B. and C. A. Clippinger (2002). "Aggression, competition and computer games: Computer and human opponents." Computers in Human Behavior 18(5): 495-506.
Objective: To examine the feelings of aggression and hostility generated by computer game play with the computer or person as opponent.

Design: Experimental study. College students' frustration and aggression was examined as they played against a computer or person as opponent. State Hostility Scale (developed by Andeson et al. (1995) was used).

Subjects and Setting: 54 undergraduate students from the Pennsylvania State University (26 women, 28men) who received credit for study participation. Study took place in a small

university computer lab over 2 week span. Week 1-aggression levels of playing against the computer were tested. Week 2-aggression levels while playing against person opponents were tested.

Outcome Measure: Aggression and hotility.

Intervention: N/A

Results: Participants playing against the computer reported more aggression (mean aggression score 49.11,) then playing aginst each other (42.35 mean aggression score), p<.05. Female mean aggression/hostility scores for the computer-51.12; playing against another woman-42.58 (p<.05). Male computer mean aggression/hostility-47.25, playing against each other-42.14; nonsignificant (p<.10).

Conclusion: The study inidicates there was a significant decrease in mean aggression shown by the partipcipants in the two different game scenarios. Playing against the computer generated more aggression than playing against each other. This study should be replicated to ensure vllidity. The impact of a human opponent at a distance should be included. Computer games of differing levels of aggression and violence should also be used to measure the extent ot whiche these factors interact with the identity and proximity to the opponent. © Center on Media and Child Health

95. Funk, J. B., J. Hagan, et al. (2002). "Aggression and psychopathology in adolescents with a preference for violent electronic games." Aggressive Behavior 28(2): 134 - 144.
Objective: To determine if a preference for violent video games is associated with aggressive emotions and behaviors.

Design: Cross-sectional study. Study questionnaire assessed names of favorite electronic games, playing time per week. Students were classified into two groups "high preference for violent games" or "low preference for violent games". Students also filled out the Problem Items of the Youth Self-Report (YSR) questionnaire regarding perceptions of their own behavior.

Subjects and Setting: Adolescents ages 11 to 15 years (n=32). Midwestern middle school in a suburban area (n=20 students) and an urban alternative middle school for students with behavioral problems (n=12 students).

Intervention: N/A

Outcome Measure(s): Self-assessed perceptions of behavior in eight problem areas (YSR score).

Results: Adolescents who had a high preference for violent games scored higher on the YSR (total score p<0.05), specifically for internalizing (p>0.06) and anxious-depressed subscales of the survey. No relationship was found between a preference for violent games and aggressive behavior.

Conclusions: Adolescents with a high preference for violent video games reported more problems with emotions and behaviors. © Center on Media and Child Health

96. Salguero, R. A. T. and R. M. B. Moran (2002). "Measuring problem video game playing in adolescents." Addiction 97(12): 1601-1606.
Objective: To design and assess a scale that evaluates adolescent problems associated with the potentially addictive use of video game systems.

Design: Design, administration of problem video game playing (PVP) scale. Researchers used DSM-IV criteria for substance dependency, pathological gambling, and existing literature to develop PVP scale. Subjects completed PVP scale, demographic questionnaire, and Severity of Dependence Scale (SDS).

Subjects and Setting: 223 Spanish adolescents (ages 13-18) attending school in Granada and Algeciras, Spain. Subjects completed survey anonymously during classroom hours. All present in classroom at time of survey administration were invited to participate; all consented.

Intervention(s): N/A

Outcome Measure(s): Problems associated with addictive use of video games (preoccupation, tolerance, loss of control, withdrawal, escape, lies/deception, disregard for consequences, disruption).

Results: The 9-item PVP scale had factorial validity, with one factor explaining 39.1% of variance, and an acceptable internal consistency coefficient of 0.69. PVP scores correlated with SDS scores ($r = 0.47$, $p<.0001$). Total PVP score was significantly correlated ($p<.0001$) with play frequency ($r = 0.64$), mean duration of play ($r = 0.52$), and longest time per session ($r = 0.56$). Subjects who believed they played too much, perceived themselves having a problem associated with playing, or thought that their parents worried about their playing all had significantly higher PVP scores ($p<.0001$).

Conclusion: The PVP scale demonstrated unidimensionality, acceptable internal consistency, and construct validity; study results indicate that behavior associated with video game playing does resemble dependence for some adolescents. © Center on Media and Child Health

97. Anderson, C. A. and B. J. Bushman (2001). "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 12(5): 353-359.
Objective: To use meta-analysis to determine the effects of playing violent video games on aggression
Data Sources: Computerized search of PsychINFO through 2000 using the following terms: (video* or computer or arcade) and (game*) and (attack* or fight* or aggress* or violen* or hostil* or ang* or arous* or prosocial or help*).

Study Selection: 35 studies (4262 participants) found. Study included if it involved effects of actually playing violent video games on aggression (cognition, affect, or behavior), physiological arousal, and/or prosocial behavior.

Data Extraction: The correlation coefficients (r) and 95% confidence intervals of the relationships between playing violent video games and aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior were calculated.

Data Synthesis: The average effect size of 33 tests (3,033 participants) of the relationship between violent video game playing and aggressive behavior was positive and significant (r = .19), with no significant moderator effects. The average effect size of 20 tests (1495 participants) of the relationship between violent video game playing and aggressive cognition was positive and significant (r = .27), with no significant moderator effects. The average effect size of 17 tests (1151 participants) of the relationship between violent video game playing and aggressive affect was positive and significant (r = .18), with no significant moderator effects. Seven tests (395 participants) showed that playing violent video games increased physiological arousal (r = .22). The average effect size of 8 tests (676 participants) of the relationship between playing violent video games and prosocial behavior was negative and significant (r = -.16).

Conclusions: Playing violent video games is related to increased aggressive behavior, aggressive cognition, aggressive affect, physiological arousal and to decreased prosocial behavior. © Center on Media and Child Health

98. Tazawa, Y. and K. Okada (2001). "Physical signs associated with excessive television-game playing and sleep deprivation." Pediatrics International 43(6): 647-650.
Objective: To determine the relationship between excessive television-game (TVG) playing and specific physical signs.

Design: Cross-sectional cohort study. Parents reported child's TV viewing, TVG playing, and sleep per night in mailed questionnaire. Children examined separately by researcher for three physical signs: black rings under eyes (BR), muscle stiffness in shoulders (MS), and scapula displacement associated with MS (DS/MS).

Subjects and Setting: 1143 children (6-11 years old, 585 males, 558 females), in two elementary schools in Akita City, Japan. Questionnaire sent on school day, informed parental consent obtained.

Intervention(s): N/A

Outcome Measure(s): Number of hours spent watching TV, playing TVG, and sleeping. Presence of BR, MS, and DS/MS.

Results: Excessive TVG players, or those who played more than 60 min. per day, had greater frequencies of BR and MS than non-TVG players (18.9% vs. 13.0%, p<.05, and 25.6% vs. 14.4%, p<.01). Sleep deprivation correlated with all three signs (BR, p<.0078; MS, p<.0001; DS/MS, p = .029).

Conclusion: Excessive TVG playing is associated with the occurrence of black rings under the eyes and muscle stiffness, suggesting that TVG playing time should be regulated and better sleep habits encouraged. © Center on Media and Child Health

99. Walsh, D. A. and D. A. Gentile (2001). "A validity test of movie, television, and video-game ratings." Pediatrics 107(6): 1302-1308.
Objective: To test the validity of movie, TV, and video game rating systems.

Design: Panel study comparing parent media evaluations with industry designated ratings. Subjects used the KidScore media evaluation system to evaluate 276 films, 253 TV programs, and 166 computer games.

Subjects and Setting: 55 adult volunteers that were parents, grandparents, or child development professionals. 35 were educated in child development or worked with children professionally. Mean age = 40; 13 male, 42 female.

Intervention(s): N/A

Outcome Measure(s): Evaluations for appropriate content considered violence, induction of fear, illegal/harmful behavior, offensive language, nudity, sexual content, and appropriate age group for the content. Ratings collapsed to thee categories: green light (appropriate for children), yellow light (suggest parental caution), red light (not recommended for children).

Results: Parent evaluations of materials unsuitable for children (red lights) generally matched industry ratings (R-, TV-MA, and M-ratings). In consideration of child audiences ages 3 - 7, although parents generally agreed with TV-Y, E- and G- ratings, they considered less than one half them appropriate for this age group. For audiences ages 8 - 12, parents gave green lights to 63% of PG-rated movies, and 57% of TV-Y7 rated TV shows. While they only have red lights to 8% of the PG rated films, 38% of TV-PG shows received red light ratings. For older audiences (ages 13-17) parents believed that only 60% of PG-13 films and 50% of T-rated video games were appropriate.

Conclusions: Parents do not consistently agree that media considered appropriate for children contains safe content. Inconsistencies vary by media type (films, TV, video games). Recommend parents and physicians play a larger role in understanding children's media

exposure and habits. Suggest a universal media ratings system including standardized ratings across media types, a range of raters, explicit guidelines, and mandatory implementation to ensure confidence in the system. © Center on Media and Child Health

100. American Academy of Pediatrics (2001). "Media violence." Pediatrics 108(5): 1222-1226.
Objective: To show that media violence leads to harmful outcomes, to ask pediatricians to learn about the media use of their patients, and to entice pediatricians to promote more age-appropriate children's media

Authors: American Academy of Pediatrics Committee on Public Education, 2000-2001: Drs. Miriam E. Bar-on, Daniel D. Broughton, Susan Buttross, Suzanne Corrigan, Alberto Gedissman, M. Rosario González de Rivas, Michael O. Rich, Donald L. Shifrin

Evidence: Data sources were literature on violent media's effects on children. Children are exposed to a lot of violence in the media (including television, videos, movies, video games, print, radio, music, computers, and the internet). Further, this violence influences children in harmful ways. They may imitate aggression, they may become desensitized to violence, they may experience fear, depression, nightmares, or sleep disturbances by being exposed to media violence. In order to moderate these negative outcomes, the AAP recommends that pediatricians do the following: 1. Learn about their patients' media use. 2. Encourage parents to limit media viewing and make use of the V-chip. 3. Make sure only non-violent media is available in their office waiting rooms, etc. 4. Encourage local communities, educators, and parents to raise media literate children. 5. Nationally, advocate for keeping media violence on the public health agenda. 6. Advocate for more age-appropriate children's media (but not censorship). 7. Advocate for easily understood content-based ratings that are similar across different types of media. 8. Remind parents that if violent media is not consumed, it will not be produced.

Consensus Process: Not stated

Conclusions: Since children are exposed to violent media, pediatricians need to help moderate the possible harmful effects of this exposure by following the recommended guidelines. © Center on Media and Child Health

101. Ridley, K. and T. Odds (2001). "Video center games: Energy cost and children's behaviors." Pediatric Exercise Science 13(4): 413-421.
Investigates the effect of video games in childhood obesity and sedentary behavior. Decline of physical fitness; Indication of gender differences; Estimation of gross energy expenditure.

Objective: To describe children's behavior and energy expenditure at video game centers

Design: 2 studies. 1st study was convenience sample to observe children over six sessions - five with regular center use and one 2-hour 'lock-in' session with unlimited access to games for fixed price. 2nd study was to measure energy expenditures on 10 children fitted with heart monitors and accelerometers at rest and playing video games of varying intensity in five-minute intervals with 15 minutes recovery time between conditions.

Subjects & setting: 1st study: 134 randomly-chosen children (approx 10-12 years old) observed for 1770 total minutes over 6 sessions at center; 2nd study: 10 students recruited from elementary school in Australia (5 males, mean age 12.5 years)

Intervention: N/A

Outcome Measure(s): recorded observations; heart rate, respiratory measures, energy expenditure

Results: Observation study: 78% of patrons were boys; they stayed longer and spent more time playing games than girls. Game choice distribution during open versus lock-in sessions were 'twitch' (forearm/hand movements only) games (46%vs 61%); driving simulation (18% vs 20%); upper body (basketball, iar hockey) games (35% vs 13%); lower body (horse or bike riding) games (1% vs 6%).

Measurement study: Highest energy costs associated with games using lower body moves, followed by upper body games, then 'twitch' games. Significant differences found between game types in mean oxygen consumption ($p<0.0001$).
No consistent gender differences in heart rate or respiratory measures.

Conclusions: New-generation videogames, especially those involving lower body movements, can elicit moderate-to-high energy expenditure, similar to walking/jogging 3 to 7.5 km/hr. However energy is briefly expended in short bursts. Most popular games have low energy expenditures.

102. O'Connor, T. J., S. G. Fitzgerald, et al. (2001). "Does computer game play aid in motivation of exercise and increase metabolic activity during wheelchair ergometry?" Medical Engineering & Physics [print] 23(4): 267-273.
GAMEWheels is an interface between a portable roller system and a computer that enables a wheelchair user to play commercially available computer video games. The subject controls the game play with the propulsion of their wheelchair's wheels on the rollers. The purpose of this study was to investigate whether using the GAMEWheels System during wheelchair propulsion exercise can help increase the individual's physiological response and aid in the motivation to exercise. Fifteen subjects participated in this study. The subjects propelled their wheelchairs on a portable roller that was equipped with the GAMEWheels System. There were two exercise trials consisting of 2 min of warm-up, 16 min of exercise and 2 min of cool-down. Physiological data (ventilation rate, oxygen consumption, heart rate) were collected. A significant difference ($P<0.05$) was found between exercise with GAMEWheels versus without GAMEWheels for average ventilation rate and average oxygen consumption. The differences were found during time periods of transition from warm-up to exercise, and before and after the midpoint of exercise. Written questionnaires showed that 87% of the individuals tested reported the system would help them work out on a regular basis. Playing the video game helped these individuals to reach their exercise training zone faster and maintain it for the entire exercise trial.

103. Villani, S. (2001). "Impact of media on children and adolescents: A 10-year review of the research." Journal of the American Academy of Child & Adolescent Psychiatry 40(4): 392-401.
Objective: To review and synthesize research on the media's effect on children and adolescents

Data Sources: Computer search for literature on the effects of television, movies, rock music, rap music, music videos, advertising, video games, computers, and the Internet on children, using literature from the previous ten years

Study Selection: N/A

Data Extraction (for meta-analysis): N/A

Data Synthesis: Research on television, movies, music, and advertising show that exposure to certain types of content can change children's behavior and attitudes. Specifically, television and movie violence is positively correlated with aggressive behavior for all ages. Further, children who watch violent television report more trauma symptoms than those who do not. Also, young children have increased fear responses after watching frightening movies. For adolescents, television watching in general is related to participating in high-risk behaviors, including substance abuse and sexual promiscuity. Risky behavior is also associated with listening to rock music and watching music videos. Tobacco and alcohol advertising also adversely affects children. Although there's not a lot of research on computers, the Internet, and video games, the little that there is suggests possible similar negative outcomes. More research needs to be done in these areas.

Conclusions: More studies are necessary to see if the deleterious effects of media can be prevented. The author suggests testing media literacy programs in schools. She also suggests that healthcare professionals who deal with children and adolescents (especially psychiatrists) need to include media information in their standard evaluations. © Center on Media and Child Health

104. Robinson, T. N., M. N. Saphir, et al. (2001). "Effects of reducing television viewing on children's requests for toys: A randomized controlled trial." Journal of Developmental & Behavioral Pediatrics 22(3): 179-184.
Objective: To examine how children's toy purchase requests are modified by reductions in television, videotape, and video game viewing.

Design: Randomized controlled trial. Children and parents reported demographics, media use, and toy purchase requests for the previous week. Intervention school assigned to implement a program to reduce TV, videotape, and video game use. Baseline and posttest surveys completed during 40-minute class periods over the same 2-day period by both schools.

Subjects and Setting: 3rd and 4th grade children (n control school = 120, n intervention school = 105). Mean age 8.9 years. Two public elementary schools in the same school district of San Jose, CA. Matched by scholastics and SES. Response rate of 78.3% for control school (47.1 %

female), 85.4% for intervention school (45.5% female). Parents completed baseline (62.8%) and posttest (61.7%) phone interviews. Baseline survey administered September 1996. Posttest survey conducted April 1997.

Intervention(s): Based on Bandura's social cognitive theory. Six-month classroom curriculum consisted of 18 lessons lasting 30-50 minutes each. Taught by regular 3rd and 4th grade teachers trained by research staff. TV turnoff challenge for 10 days followed by 7 hr/wk TV-viewing budget segment.

Outcome Measure: Children's toy purchase requests

Results: Baseline: Similar toy purchase requests for intervention and control groups: children's self-reports (30.7% vs. 25.3%, p = .43), parents' self-reports (22.7% vs. 21.6%, p = .88). Posttest: Children in the intervention school were significantly less likely to report toy purchase requests than children in the control school, after adjusting for baseline purchase requests, gender, and age [O.R. = 0.29, 95% CI, 0.12 - 0.69, p< .005]. No significant effect of intervention on gender or age.

Conclusions: Decreased television viewing was associated with reductions in children's toy purchase requests. No significant differences by age or gender.

105. Fleming, M. J. and D. J. Rickwood (2001). "Effects of violent versus nonviolent video games on children's arousal, aggressive mood, and positive mood." Journal of Applied Social Psychology 31(10): 2047-2071.
Objective: To examine the relationship between violent video games and children's arousal, aggressive mood, and positive mood.

Design: Cross-over study. Children each played a paper-and-pencil game, nonviolent video game, and violent video game. Outcome measurement questionnaire completed after each game. Demographics and frequency of video game play, and video game content reported by parents.

Subjects and Setting: 71 Australian children ages 8 - 12 attending a public junior school in Canberra. Mean age = 10.5; 49.3% female. Those without parental consent were excluded. 80.3% played video games at least weekly.

Intervention(s): N/A

Outcome Measure(s): Heart rate measured every 4 minutes throughout game play. Survey assessed post-game self-reported arousal, aggressive mood (based on State-Trait Anger Expression Inventory), positive affect, and general mood (Smiley Faces scale).

Results: Boys were generally more experienced with video games than girls (t = - 2.93, p < 0.01). No correlation between children's experience with video games and arousal or heart rate. The violent game was associated with a higher heart rate and self-reported arousal than the paper-and-pencil game and the nonviolent game[F = 4.85, p < 0.05 and F = 5.28, p < 0.05

respectively]. No correlation with game type for aggressive mood and positive affect. General mood was more positive after playing the violent game than after the paper-and-pencil game (p = 0.034)

Conclusions: Playing a violent versus nonviolent video game increased arousal; however it did not result in a more aggressive mood. Results do not support catharsis theory. Suggest future studies examine the extent players identify with certain characters and how they interpret game scripts. © Center on Media and Child Health

106. Calvert, S. L. and A. B. Jordan (2001). "Children in the digital age." Journal of Applied Developmental Psychology 22(1): 3-5.
This piece gives an introduction to a special journal issue on children and media. It details the topics covered by various articles in the issue. The first study by Subrahmanyam explores children's comfort with computers and the internet and explores the effect of their use on cognitive development and social relationships. Wright investigates usage patterns in families from a range of socioeconomic levels. Borzekowski emphasizes the importance of school and public library internet access for lower-income children searching out health information. Valkenburg puts forth a consumer socialization model focused on the cognitive development of children and their understanding of advertising goals and motivations. In an article on privacy, Turow examines the phenomenon of children revealing consumer patterns and family information to researchers online. Jordan analyzes the positive effects of mandated informational programming for television. In the last article, Calvert investigates what children actually learned from those programs. © Center on Media and Child Health

107. Lieberman, D. A. (2001). "Management of chronic pediatric diseases with interactive health games: theory and research findings." Journal of Ambulatory Care Management 24(1): 26-38.
In randomized clinical trials, children and adolescents improved their self care and reduced their emergency clinical utilization after playing health education and disease management video games. A diabetes game reduced diabetes-related urgent and emergency visits by 77 percent after diabetic youngsters had the game at home for six months, compared to no reduction in clinical utilization in a control group of diabetic youngsters who took home an entertainment video game that had no health content. Positive impacts were also found in clinical trials of games for asthma self-management and smoking prevention.

108. Bensley, L. and J. Van Eenwyk (2001). "Video games and real-life aggression: Review of the literature." Journal of Adolescent Health 29(4): 244-257.
Objective: To review the literature on video games and real-life aggression.

Data Sources: Literature on video games and real-life aggression.

Study Selection: PsychInfo, ERIC, Medline search w/ following search terms: video games, computer games, human machine systems, audiovisual games, communications media, violence, aggressiveness, antisocial behavior, hostility, emotional responses. Studies examining association b/w video-game playing and aggressive/antisocial behavior responses. Excluded: behaviors other than aggression, psychological traits, non-gender controlled studies.

Data Extraction: N/A

Outcome Measures: Self-reported aggression, behavioral observations, association between video-game playing and aggression.

Data Synthesis: Preschool/Elementary Children-3 out of 4 studies using behavior observations of aggression during free-play found violent video game play causes increased aggression immediately after video game. Studies of toy choices yielded inconsistent findings. Middle/High-School Students-6 correlational and one descriptive study provided mixed results of link b/w self-reported video game play and aggression. Four other studies found associations with varied patterns. College Students/Young Adults-Studies examining possible effects of video games on hostile mood yielded mixed Results: of 6 studies examining hostile mood, 2 showed increased hostility after video game play, 4 did not. Gender: gender differences were not found to cause subsequent aggression in experimental studies, no gender differences were reported in experimental studies.

Conclusion: Current research evidence is not supportive of a major concern that violent video games lead to real-life violence. However, well-controlled studies of adolescents are lacking. Also, this conclusion might change as more research is conducted on more recent and increasingly realistic games.

109. Thompson, K. M. and K. Haninger (2001). "Violence in E-rated video games." JAMA 286(5): 591-598.
Objective: To quantify and characterize the depiction of violence, alcohol, tobacco, drugs, and sex in E-rated video games.

Design: Quantitative content analysis of a convenience sample of E-rated video games. Games played for 90 minutes or to their conclusion.

Subjects and Setting: 55 E-rated video games available for rent/sale by April 1, 2001 including all of the games from The Legend of Zelda and Super Mario Bros. series.

Interventions: N/A

Outcome Measure(s): Game genre (action, adventure, casino, fighting, puzzle, racing, role-playing, shooting, simulation, sports, and strategy); duration of violence; number of fatalities; types of weapons used; rewarding violence/destruction; depiction of alcohol/tobacco/drugs; and sexual content. Violence defined as intended physical harm excluding normal sports play.

Results: 64% of the games featured intentional violence, with an average of 30.7% of playing time featuring an act of violence. Awards were given in 60% of the games for injuring other characters and in 53% of the games for destruction. Those with violent content descriptors contained significantly more violence than those without (t = 2.59), however, 44% of those with no content descriptors contained violence. Almost half (49%) of the games played depicted deaths from violence. Within The Legend of Zelda series, each progressive game in the series

features less violence. The most common weapons used were the body and projectiles (in 55% and 49% of games, respectively). Use of alcohol/tobacco/sexual content was limited in the sample, but mention was rarely given in content descriptors.

Conclusions: Many E-rated games involve violence, killing, and the use of weapons in the course of normal play and content descriptors provide limited information about violent content. Suggest development of a violence scale in content descriptions and that ESRB raters play the finished game prior to assigning a rating. Recommend greater parental awareness of game ratings and content and greater participation in game selection. © Center on Media and Child Health

110. Sherry, J. L. (2001). "The effects of violent video games on aggression: A meta-analysis." Human Communication Research 27(3): 409-431.
Objective: To determine the effects of violent video games on aggression among children and adolescents, through examination of existing empirical research.

Design: Meta-analysis of existing studies on effects of video games with violent content on aggression, to estimate a cumulative measure of effect size.

Subjects and Setting: 25 studies, published Jan 1975-July 2000, addressing the effects of video games on aggression, available in online databases and bound indexes. All studies had violent video game play as independent variable, measure of aggression as dependent variable.

Intervention(s): N/A

Outcome Measure(s): Aggression, as assessed in individual studies.

Results: Through meta-analysis, the overall estimate of the correlation between video game play and aggression was r = .15 (p<.0001). There were greater effect sizes for video games with fantasy or human characters engaging in violence than for games with sports-related violence. There were greater effect sizes for studies with paper-and-pencil measures of aggression than for studies with behavioral measures. The year of the study, age of subject, and length of playing time all significantly predicted aggression (? = .33, .25, and -.19 respectively).

Conclusion: Results of existing research on violent video game playing and aggression among youth indicate a small but significant relationship between playing and aggression levels; this relationship increases with age and year and decreases with playing time. © Center on Media and Child Health

111. Blumberg, F. C., B. Hollander, et al. (2001). "Goals, attention, and video game performance among gifted children." Gifted Child Quarterly 45(3): 216-222.
Objective: To determine the effects of goal-setting and patterns of attention in the video game playing of gifted 2nd and 5th grade students.

Design: Randomized control trial. Subject was asked about prior experience with video game Sonic the Hedgehog 2, playing frequency. Subject was instructed to focus on 1 of 4 things while

playing: "how much you like the game" (evaluative goal), "how well you are playing the game" (outcome goal), "what you are doing while playing" (process goal), or nothing (control). Subject then played game for 10 min. continuously, asked questions regarding play.

Subjects and Setting: 47 2nd graders (22 boys, 25 girls, mean age = 8.01) and 47 5th graders (24 boys, 23 girls, mean age = 11.10) attending selective, ethnically diverse New York City elementary school.

Intervention(s): N/A

Outcome Measure(s): Goal-oriented comments (evaluative, outcome, and process goal references); strategy-based comments (attention, game strategy references); game-oriented comments (game mechanics, cue references); and uninformative or definitive (yes or no) comments. Subject's overall and specific game experience, level reached while playing.

Results: 5th graders performed best and 2nd graders worst in the evaluative condition [grade by goal condition interaction: $F(3, 86) = -2.75$, $p<.05$]. 5th graders performed worst and 2nd graders best in the outcome condition [grade by goal condition interaction: $F(1, 45) = 8.02$, $p = -.007$]. 60% of all participants made references to process goals in their post-game responses, yet 2nd graders made more references to their attitude about the game, and 5th graders made more to strategy-oriented comments and game cues. References to their goals for learning were not significantly related to their performance.

Conclusion: An evaluative focus aided the performance of older students and hindered that of younger, while outcome goals aided the performance of younger students and hindered that of older. © Center on Media and Child Health

112. Funatsuka, M., M. Fujita, et al. (2001). "Study on photo-pattern sensitivity in patients with electronic screen game-induced seizures (ESGS): effects of spatial resolution, brightness, and pattern movement." Epilepsia 42(9): 1185-97.
PURPOSE: With the ever-increasing popularity of computers, electronic screen game-induced seizure (ESGS) is beginning to pose a serious social problem. To elucidate the pathophysiology of ESGS, with the ultimate goal of prevention, we have been studying photo-pattern sensitivity in detail with a pattern-stimulation test using a CRT (cathode ray tube) display. This method is referred to as the "CRT-pattern test." METHODS: We studied 17 patients brought to our department for evaluation of ESGS. EEG responses were recorded during exposure to various patterns consisting of three elements: spatial resolution, brightness perception, and pattern-movement recognition displayed on a CRT monitor. Photo-paroxysmal response (PPR) frequencies were compiled for each stimulation. RESULTS: PPR was induced by the CRT-pattern test in nine of the 17 cases. In four cases, PPR induction was obtained only after introducing CRT-pattern tests in addition to standard intermittent photic stimulation (IPS). The rate of PPR induction differed according to the type of pattern, spatial frequency, and pattern-reversal frequency. However, neither the clarity of the edges of a pattern nor changes in the brightness of a pattern element had any effect on the rate of PPR induction. With the exception of a few subjects, the stimulation caused by pattern movement was not effective in eliciting PPR. Six cases in whom spatial resolution was involved showed occipital dominance in PPR

provocation, and three in whom brightness perception and pattern movement recognition was involved showed frontal dominance. CONCLUSIONS: The CRT-pattern test is useful for identifying patients with photosensitivity among patients considered to have incidental or nonphotosensitive seizures unresponsive to standard IPS. Patients with ESGS caused by photosensitivity can be divided into two groups: those with occipital dominance for PPR provocation, in whom spatial resolution is involved; and another group with frontal dominance, in whom brightness perception and pattern-movement recognition (or possibly perception of colors) are involved.

113. Din, F. S. and J. Calao (2001). "The effects of playing educational video games on kindergarten achievement." Child Study Journal 31(2): 95-102.
Objective: To examine if playing educational video games aids children's learning.

Design: Pretest-posttest with control group study. Assignment to experimental or control group by flipped coin. Experimental group given a Lightspan PlayStation and CDs for 11 weeks and instructed to play a minimum of 30-minutes per day at home in addition to classroom sessions in pairs (40-min/day).

Subjects and Setting: 47 kindergarten students attending an urban public school in the Northeast. All African American and from low SES families.

Intervention(s): N/A

Outcome Measure(s): The Wide Range Achievement Test-R3 (WRAT-R3) assessed learning at pretest and posttest.

Results: Both groups performed better in spelling, reading, and math at posttest than pretest ($F = 51.4$, $p = 0.000$; $F = 45.3$, $p = 0.001$; and $F = 29.29$, $p = 0.000$ respectively). No significant gains in math at posttest. The experimental group made more significant gains in spelling and reading than the control group ($F = 4.17$, $p = 0.05$ and $F = 11.84$, $p = 0.001$ respectively). No significant differences between the two group in the gains made in math.

Conclusions: Light-span related educational video games helped kindergarten students with learning spelling and reading, but not math. Recommend larger sample sizes for future research.

114. Robinson, T. N., M. L. Wilde, et al. (2001). "Effects of reducing children's television and video game use on aggressive behavior: A randomized controlled trial." Archives of Pediatrics & Adolescent Medicine 155(1): 17-23.
Objective: To assess the effects of reducing television, videotape, and video game use on aggressive behavior and perceptions of a mean and scary world.

Design: Randomized, controlled, school-based trial

Subjects and Setting: Third and fourth grade students, and their parents/guardians in 2 sociodemographically and scholastically matched public elementary schools in a single school

district in San Jose, California. One school was randomly assigned to implement a program to reduce television, videotape, and video game use. The other school was assigned to an assessments-only control.

Outcome Measures: Peer rating of aggressive behavior

Intervention: 18, 30-50 minute classroom lessons taught by trained 3rd and 4th grade teachers. Lessons comprised of: TV, video, and video game self-reporting and monitoring and reduction, TV turnoff, TV and video game budget, peer advocacy skills in media use reduction. Parent-oriented interventions: newsletters.

Results: Compared with controls, children in the intervention group had statistically significant decreases in peer ratings of aggression (adjusted mean difference, -2.4%; 9% CI -4.6 to -0.2; p = .03) and observed verbal aggression (adjusted mean difference, -0.10 act/minute/child; 95% CI, -0.18 to -0.03; p = .01). Differences in observed physical aggression parent reports of aggressive behavior, and perceptions of a mean and scary world were not statistically significant, but favored the intervention group.

Conclusion: Study findings support the causal influences of media on aggression and the potential benefits of reducing children's media use. Further research is needed on sub-groups and results from longer follow-up. © Center on Media and Child Health

115. Wiecha, J., A. M. Sobol, et al. (2001). "Household television access: Associations with screen time, reading, and homework among youth." Ambulatory Pediatrics 1(5): 244-251.
Objective: To examine how household factors mediating access to television is associated with screen time, reading, and homework.

Design: Cross sectional in-school survey assessing household environment including number of TVs, TVs in bedroom, parental limits on watching TV, and frequency of family dinners. Subject characteristics measured include perception of neighborhood safety, school performance, physical activity, obesity (BMI/TSFs measured by trained staff), and health conditions limiting activity.

Subjects and Setting: 6th and 7th graders (n = 1197) from 10 middle schools in Boston-area communities. Participation rate was 70%; exclusions based on absence and nonparental consent. Excluded students tended to have more screen time than participants.

Outcome Measure(s): Weekday and weekend screen time based on self-reports of daily time spent watching TV, videos, movies, and computer/video games. Similar daily averages calculated from self-report time spent reading and doing homework.

Results: Households had an average 3.4 TVs and adolescents spent 3.4 hours a day in front of a TV or computer. About 1 hour and 40 minutes of additional time watching TV or playing video games was attributed to having a TVs in the bedroom, parents not setting limits on TV watching, and seldom had family dinners ($p < 0.001$). Each TV outside of the bedroom added about 7 minutes of additional screen time per day. Adolescents with TVs in the bedroom or whose

parents did not set limits on watching TV spent about 20 minutes less reading and doing homework each day ($p < 0.01$).

Conclusions: Interventions can focus on limiting access to TV and constructing family time away from screen media. Encourage community action on reducing television watching. Potential clinical implications for reducing obesity. Recommend further research to test household strategies for reducing watching TV through access limitations. © Center on Media and Child Health

116. Arriaga-Ferreira, P. and J. L. Pais-Ribeiro (2001). "The relationship between playing violent electronic games and aggression in adolescents." Aggressive Behavior 27(3): 167-168.

Objective: To determine the relationship between violent video game exposure and aggression among adolescents.

Design: Survey study. Participants completed 4 questionnaires assessing their video game habits, opinions regarding game playing, aggression, and certain personality and demographic characteristics. Researchers evaluated the violent content in video games played by participants.

Subjects and Setting: 666 Portuguese adolescents (239 males and 327 females) enrolled in grades 8-10, ages 12-17.

Intervention(s): N/A

Outcome Measure(s): Aggression, both physical and verbal.

Results: Males spent more time playing video games and held fewer negative opinions regarding video games than females. Playing video games with violent content was associated with total and physical aggression among females. For males, the frequency of video game playing in arcades was associated with total, physical, and verbal aggression.

Conclusion: Female adolescents who played video games with violent content and male adolescents who played video games in arcades reported higher levels of aggression than those who did not. © Center on Media and Child Health

117. Glaubke, C. R., P. Miller, et al. (2001). Fair play? Violence, gender and race in video games. Oakland, CA, Children Now: 36.

The goal of this study was to examine and compare the composition of video games with regard to violence, gender, and race. For each of the six video game consoles and for personal computers the ten most popular games were critiqued. First a macro-level analysis looked at general trends in content. Then a micro-level analysis was used to examine the intersection of individual characters' gender, race, role, and level of aggression and victimization.

Each of the games was also rated for its girl-friendliness based on a point system developed in a previous study. Points were given for elements like female player-controlled characters, cooperative play, and the ability to create something. Violence featured prominently in almost

every game and there was never punishment for killing. In fact, when players killed this was nearly always justified and encouraged through rewards.

Among the choices of player-controlled characters, 73% were male people. However, it was more likely for a child to end up with an animal character than with a female human. Half of the women characters in the games were simply props or bystanders. Meanwhile, the men were competing. Male characters were overly muscular and were the ones to display physical aggression more often while showing few effects when on the receiving end of violence. Female characters tended to use verbal aggression, scream, share, help, and nurture or do nothing. Women heroes contented with the extra challenge of looking sexy while doing their brave deed. There were very few girl-friendly video games, but PC games did much better than console games. In games for younger children only white characters existed.

Among games for older kids racial representation was poor and stereotypes were only reinforced. Out of 1,716 characters, not a single Latina woman existed. Black women (for the most part) were not active participants. There were only three Native Americans and one of them had an active role while the other two were props. Meanwhile, Asian, Pacific Islander, and African American men were portrayed mainly in sports as vicious or superhuman competitors. In terms of victimization, Latinos were shown exhibiting the most pain even though they were portrayed almost exclusively in sports where injuries should not be as devastating as in more violent games. While 43% of white characters showed pain and physical harm when injured, only 15% of African Americans did. Black women were much more likely than anyone else to be the victims of violence. © Center on Media and Child Health

118. Robinson, T. N. (2000). "Can a school-based intervention to reduce television use decrease adiposity in children in grades 3 and 4?" Western Journal of Medicine 173(1): 40.
Objective: Reduce television use to decrease adiposity in elementary school children.

Design: Randomized blinded, controlled trial.

Subjects and Setting: 227 children in grades 3 and 4 in 2 public elementary schools in San Jose, California. Mean age: 9 years.

Intervention: Limiting access to television sets, budgeting watching or playing time, more selective use of play. 18 lessons (30-50 minutes each) incorporated in regular curriculum taught by classroom teachers who received special training.

Outcome Measure(s): adiposity (BMI), skinfold thickness, waist circumference, hip circumference, television viewing, meals in front of television, watching videos, playing video games, consumption of high-fat foods, snack eating during media use, cardio-respiratory fitness.

Results: Children in treatment group had decreases in BMI (P=0.002), triceps skinfold thickness (P=0.002), waist-to-hip ratio (P<0.001), television viewing (P<0.001), video game use (P=0.01) and frequency of eating meals in front of television (P=0.01) compared to control group. No differences in physical activity levels, cardio-respiratory fitness, video tape viewing, consumption of high-fat foods.

Conclusion: School-based intervention for 3rd and 4th graders was successful in decreasing children's adiposity. © Center on Media and Child Health

119. Anderson, C. A. and K. E. Dill (2000). "Video games and aggressive thoughts, feelings, and behavior in the laboratory and in life." Journal of Personality & Social Psychology 78(4): 772-790.
Objective: To determine how violent video games impact on aggression-related variables

Design: Study 1 - Correlational study measuring relationship between long-term exposure to violent video games and several outcome variables (aggressive behavior, delinquency, academic achievement, and world view). Data collected via self-report questionnaire. Individual difference data from Caprara Irritability Scale (CIS) and Buss-Perry Aggression Questionnaire (AQ). Outcome variable data from Delinquency Scale, video game exposure questions, and World View Scale. Study 2 - Experimental study (2x2x2 between-subjects factorial design) examining effects of video game play on aggressive thought, affect, and behavior, and on world view. Independent variables included video game type (violent/nonviolent), irritability level (high/low), and sex (male/female). Completed CIS (irritability measure), State Hostility Scale (affect measure), World View Scale, video game rating, reading reaction time task (cognitive measure), and competitive reaction time task (aggressive behavior measure). Each video game played 3 times. Pilot study determined video games used in main experiment.

Subjects and Setting: Study 1 - 227 undergraduates (78 male, 149 female); mean age 18.5 years; from introductory psychology class at large university in Midwest; received credit for participation; small-group participation; one male dropped from all analyses (failed to complete AQ) Study 2 - 210 undergraduates (104 female, 106 male) with same background as in Study 1.

Intervention(s): N/A

Outcome Measure(s): Study 1 - Strength of relationship between exposure to violent video games and several variables (aggressive behavior, delinquency, academic achievement, and world view) Predictive ability of violent video game exposure on outcome variables Study 2 - Differences on several measures of aggression and world view between subjects

Results: Study 1 - Significant positive correlation between both types of delinquent behavior (aggressive/nonaggressive), and both trait aggressiveness and video game violence exposure ($r = .31$ to $.46$, $p < .05$). Stronger correlation between video game violence exposure and aggressive delinquent behavior, $t(223)=2.64$, $p < .05$. Positive relationship between violent video game exposure and aggressive personality ($r = .22$, $p < .05$). Gender strongly related to a number of variables (perceived safety, video game violence, time spent playing games), $r = .35$-$.68$, $p < .05$ - greater male scores. Violent video game exposure is strong predictor of both aggressive and nonaggressive delinquent behavior (ps < .001). Study 2 - Significant effect of video game type on aggressive behavior after "lose" trial, $F(1,187)=4.82$, $p < .05$, $MSE=.27$ - violent video game players more aggressive toward opponent after provocation. Signficant effect of irritability on aggressive behavior after "lose" trial, $F(1,187)=4.43$, $p < .05$, $MSE=.27$. - high irritability subjects more aggressive.

Conclusions: Violent video games provide a model for aggressive conflict resolution. Frequent video game playing may put the player at risk for increased aggressive behavior and thoughts. © Center on Media and Child Health

120. Roberts, D. F. (2000). "Media and youth: Access, exposure, and privatization." Journal of Adolescent Health 27(2 Supplement: Special Issue on Youth and Media): 8-14.
Objective: To examine the access and exposure of American youth to a spectrum of media, as well as the social contexts in which exposure takes place.

Design: Cross-sectional national random survey of adolescents. Subjects completed media behavior questionnaire regarding type and context of media exposure. Types of media included print, TV, videos, motion pictures, audio, computers, and video games. 487 of the original subjects completed week-long media diaries.

Subjects and Setting: 2065 3rd-12th graders (8-18 years old). Questionnaires completed at school, diaries at home.

Intervention(s): N/A

Outcome Measure(s): Access to media, amount of exposure, type of content consumed, physical and social context of media use. Background and demographic information, self-reports of social/psychological well-being.

Results: The households of most subjects contained most media, with the exception of computers, whose presences was related to both race/ethnicity and SES. 59% of boys' homes contained video game systems, compared with 32% of girls' homes. Over 60% of the youth sampled, and more African Americans and Hispanics than Whites, have TVs in their bedrooms. Average media exposure was always greater than 7 hours per day; younger children reported more exposure than older children. Media exposure time is inversely related to family SES. Solitary TV viewing was relatively high and co-viewing with parents relatively low.

Conclusion: The adolescents sampled devoted as much as one-third of their day to media, and their exposure was frequently solitary, suggesting that parents need to be more attentive to media content and consumption. © Center on Media and Child Health

121. Borzekowski, D. L. G., T. N. Robinson, et al. (2000). "Does the camera add 10 pounds? Media use, perceived importance of appearance, and weight concerns among teenage girls." Journal of Adolescent Health 26(1): 36-41.
Objective: To examine the relationship between the use of electronic media and perceived importance of appearance and weight concerns among adolescent girls.

Design: School-based survey.

Subjects and Setting: Ninth-grade girls from four public high schools in San Jose, California, (excluding students not in mainstream classes or limited English proficiency). Physical

measures and self-report surveys were obtained from 837 girls. Mean age =14.9; 36% Latino, 24% White, 22% Asian, 8% Black, 19% Other.

Intervention: N/A

Outcome Measure: Demographics, anthropomorphic data, media use, perceived importance of appearance, weight concerns.

Results: Television was the medium of choice (20.4%). Total media use was not significantly related to perceived importance of appearance or weight concerns. When media use was separated into distinct media genres, only hours of watching music videos was related to perceived importance of appearance and weight concerns (r=0.12, p<.001, and r=.08, <.05, respectively). In multivariate analyses, after controlling for BMI and ethnicity, no media use variables were significantly associated with either perceived importance of appearance or weight concerns.

Conclusion: Frequent music video use may be a risk factor for increased perceived importance of appearance and increased weight concerns among adolescent girls. Future research should examine exposure to print media and other environmental cues, measure a range of additional attitudes and behaviors relevant to media use, appearance and weight. Studies should design and include questions about attributes and characteristics that potentially interact with and confound the set of variables measures in this research. © Center on Media and Child Health

122. Zifkin, B. G. and D. Kasteleijn-Nolst Trenite (2000). "Reflex epilepsy and reflex seizures of the visual system: a clinical review." Epileptic Disorders 2(3): 129-36.
Reflex epilepsy of the visual system is charecterised by seizures precipitated by visual stimuli. EEG responses to intermittent photic stimulation depend on the age and sex of the subject and on how stimulation is performed: abnormalities are commonest in children and adolescents, especially girls. Only generalised paroxysmal epileptiform discharges are clearly linked to epilepsy. Abnormal responses may occur in asymptomatic subjects, especially children. Photosensitivity has an important genetic component. Some patients are sensitive to patterns, suggesting an occipital trigger for these events. Myoclonus and generalised convulsive and nonconvulsive seizures may be triggered by visual stimuli. Partial seizures occur less often and can be confused with migraine. Although usually idiopathic, photosensitive epilepsy may occur in degenerative diseases and some patients with photosensitive partial seizures have brain lesions. Sunlight and video screens, including television, video games, and computer displays, are the commonest environmental triggers of photosensitive seizures. Outbreaks of triggered seizures have occurred when certain flashing or patterned images have been broadcast. There are regulations to prevent this in some countries only. Pure photosensitive epilepsy has a good prognosis. There is a role for treatment with and without antiepileptic drugs, but photosensitivity usually does not disappear spontaneously, and then typically in the third decade. [References: 40]

123. Colwell, J. and J. Payne (2000). "Negative correlates of computer game play in adolescents." British Journal of Psychology 91(3): 295-310.
Objective: Investigate the relationship between home computer game play and friendship, social isolation, self-esteem and aggression.

Design: Survey. Subjects filled out questionnaires on computer game play, aggression, self-esteem, and friendship. Questionnaire administered by form tutor at school.

Subjects and Setting: 204 children (91 boys and 113 girls) from comprehensive school in North London. Ages 12-14 (M =12.7 years).

Intervention: N/A

Outcome Measure(s): aggression, friendship, social isolation, self-esteem.

Results: Some support for 'electronic friendship' for boys. Game play did not lead to social isolation. Negative relationship between self-esteem and frequency for boys ($r=-.21$, $p<.05$). Aggression not related to number of games with aggressive content ($r=.27$, $p<.01$) but with total exposure to game play ($r=.30$, $p<.001$). Child's sex and total game play explained small amount of variance in aggression scores ($R2=.10.5$).

Conclusion: Some evidence that there is relationship between exposure to game play and aggression, however, this study does not inform us about causal relationship between the 2. More analyses necessary (e.g. structural equation analyses) on longitudinal data to examine causal relationship between aggression and game play. © Center on Media and Child Health

124. Kaune, W. T., M. C. Miller, et al. (2000). "Children's exposure to magnetic fields produced by U.S. television sets used for viewing programs and playing video games." Bioelectromagnetics 21(3): 214-27.
Two epidemiologic studies have reported increased risk of childhood leukemia associated with the length of time children watched television (TV) programs or played video games connected to TV sets. To evaluate magnetic field exposures resulting from these activities, the static, ELF, and VLF magnetic fields produced by 72 TV sets used by children to watch TV programs and 34 TV sets used to play video games were characterized in a field study conducted in Washington DC and its Maryland suburbs. The resulting TV-specific magnetic field data were combined with information collected through questionnaires to estimate the magnetic field exposure levels associated with TV watching and video game playing. The geometric means of the ELF and VLF exposure levels so calculated were 0.0091 and 0.0016 microT, respectively, for children watching TV programs and 0.023 and 0.0038 microT, respectively, for children playing video games. Geometric means of ambient ELF and VLF levels with TV sets turned off were 0.10 and 0.0027 microT, respectively. Summed over the ELF frequency range (6-3066 Hz), the exposure levels were small compared to ambient levels. However, in restricted ELF frequency ranges (120 Hz and 606-3066 Hz) and in the VLF band, TV exposure levels were comparable to or larger than normal ambient levels. Even so, the strengths of the 120 Hz or 606-3066 Hz components of TV fields were small relative to the overall ambient levels. Consequently, our results provide little support for a linkage between childhood leukemia and exposure to the ELF magnetic fields

produced by TV sets. Our results do suggest that any future research on possible health effects of magnetic fields from television sets might focus on the VLF electric and magnetic fields produced by TV sets because of their enhanced ability relative to ELF fields to induce electric currents.

125. Funk, J. B., D. D. Buchman, et al. (2000). "Preference for violent electronic games, self-concept, and gender differences in young children." American Journal of Orthopsychiatry 70(2): 233-241.
Objective: To examine the relationship among time commitment, gender, preference for violent games, and self-concept.

Design: School-based self-administered survey

Subjects and Setting: 364 4th and 5th graders (203 girls, 160 boys) in four schools in a midwestern suburban school district completed the survey in school. Maternal education clustered around the high end of high school to college graduate. All students completed the Harter Self-Perception Profile for Children.

Outcome Measure: preference for violent games, effect on self-perception

Intervention: N/A

Results: MANOVA showed significant main effects for gender and for preference for violent games on the Harter subscale scores ($p<.05$). Univariate analysis showed the girls' mean subscale score was significantly higher than that of the boys' on behavioral conduct, and the boys' mean subscale scores were significantly higher than the girls' on athletic competence and physical appearance (p,.05). The mean subscale for behavioral conduct decreased for both boys and girls with high preference for violent game ($p<.01$).

Conclusion: Consistent with past research, significant gender differences were found in time commitment and aspects of game preference. More detailed study of individuals including information about academic performance, as well as parent and teacher reports, is needed to confirm the present findings. The results of this study may not be completely generalizable to other socioeconomic or religious groups. © Center on Media and Child Health

126. Funk, J. B., G. Flores, et al. (1999). "Rating electronic games: Violence is in the eye of the beholder." Youth & Society 30(3): 283-312.
Objective: To determine if commercial ratings reflect consumer perceptions of violent video game content.

Design: Descriptive study comparing commercial ratings to consumer perceptions.

Subjects and Setting: 49 favorite video/computer games listed by 201 fourth graders in1995. Raters consisted of 145 college students in introductory Developmental Psychology classes, adult parents whole children attended a Catholic elementary school, and 52 sixth graders.

Intervention(s): N/A

Outcome Measure(s): Video game list was categorized as general entertainment (GE), educational (ED), fantasy violence (FV), human violence (HV), nonviolent sports (SP), or sports violence (SV).

Results: Between rater categorizations of games was more consistent than comparisons of study and commercial ratings. There was greater alignment between study and commercial ratings when games featured very little or extreme levels of violence. For example, Doom and Mortal Kombat were consistently rated as Human Violence with commercial ratings recognizing inappropriate material for young consumers. Street Fighter was categorized by raters in one of the violence categories, but commercial ratings varied ranging from K-A (6 years old - adult) to Teen (13 years and older) to Mature (17 years and older). Greater inconsistencies between consumer and commercial ratings were found for games with cartoon characters as the perpetrators of violence. Commercial ratings did not recommend any restrictions. In contrast, a large percentage of consumers categorized these games as violent. Children and nonparents were more likely to categorize these games as violent compared to parents.

Conclusions: Commercial ratings of video games did not consistently reflect the perceptions of consumers for violent content. Suggest current rating systems make refinements with respect to cartoon- or fantasy-type violence. Recommend a comprehensive rating system across all media and public education about the rating systems and media literacy. Future research should continue to use consumer content perceptions and identify groups at high risk for adverse consequences.

127. Ballard, M. E. and R. Lineberger (1999). "Video game violence and confederate gender: Effects on reward and punishment given by college males." Sex Roles 41(7-8): 541-558.
Objective: To determine whether level of videogame violence, as well as an interaction between violence level and gender of opponent, affected reward and punishment administered by player following the game.

Design: Laboratory experiment; Participants were assigned to play either a violent video game at 1 of 3 levels of increasing violence or a non-violent game. After play, participant tested the opponent (male or female research assistant with scripted instructions but unaware of study hypotheses) on a memory test and gave reward or punishment for correct responses. Amount of reward or punishment independently determined by the participant.

Subjects and Setting: 119 upper-to-middle-class male college students (mean age 21 years; 96 White, 23 African American) receiving $5 or course extra credit; convenience sample

Intervention(s): N/A

Outcome measure(s): Amount of reward (number of jellybeans) and punishment (time submersing opponents hand in cold water)

Results: Reward of male ($p<0.01$), but not female, opponents was higher after non-violent game; level of violence of the violent game did not additionally influence reward. Punishment of male opponents was greater after violent versus non-violent games, while there was a linear trend of increasing punishment with increasing level of violence for female opponents (3.3 seconds vs. 4.5 vs. 4.5 vs. 5.8; p trend <0.01)

Conclusions: Video game violence may decrease reward behavior, particularly for male opponents, and increase punishment behavior, particularly for female opponents. How this directly translates into interpersonal behavior is unclear, with the authors expecting negative behaviors to be minor, and media exposure to violence to be one of many influences. © Center on Media and Child Health

128. Funk, J. B., J. Hagan, et al. (1999). "Children and electronic games: A comparison of parents' and children's perceptions of children's habits and preferences in a United States sample." Psychological Reports 85(3, Pt 1): 883-888.
Objective: To examine parental knowledge of children's electronic game-playing habits.

Design: Elementary school children and one parent of each child completed a background questionnaire and played either a violent or nonviolent 9control) electronic game.

Subjects and Setting: 35 children in grades 3-5 (10 girls) and 24 of their mothers participated; recruited through advertisements in the community of a middle-size midwestern city. Ages of children: 8-12 years, parents'age:31-52 years. Ethnicity-primarily European-American. Highly educated sample, all children were current game-players.

Outcome Measure: Congruence between children's and parents' perceptions of child's playing time, parental supervision, game preference, reaction to actual game-playing.

Intervention: N/A

Results: Paired comparisons did not yield statistically significant differences between playing time reported by children and parent's reports of children's playing time. Parents reported significantly higher estimates of supervision frequency than children ($p<.001$). 8 of the parents couldn't name any electronic games as a possible favorite. 15 named a different favorite than reported by the child. Of 23 incorrect matches, 16 perceived their favorite game as being violent. Statistically significant differences in frustration reported by parents and by children after playing same violent or nonviolent video game ($p=.004$).

Conclusion: Present results confirm anecdotal reports suggesting there are some significant differences between parents' and children's perceptions of some aspects of children's electronic game-playing. © Center on Media and Child Health

129. Gordon-Larsen, P., R. G. McMurray, et al. (1999). "Adolescent physical activity and inactivity vary by ethnicity: The National Longitudinal Study of Adolescent Health." Journal of Pediatrics 135(3): 301-306.
Objective: To determine the extent to which patterns of physical activity and inactivity among U.S. adolescents vary by ethnicity.

Design: Nationally representative survey. Data gathered through National Longitudinal Study of Adolescent Health (NLSAH).

Subjects and Setting: 14,438 adolescents (3135 non-Hispanic blacks, 2446 Hispanics, 976 Asians) attending grades 7-12 in U.S. schools. Data taken in 1996 from Wave 2 of NLSAH. Final analysis (n = 13,157) excluded pregnant females, disabled adolescents, and American Indians (small sample size).

Intervention(s): N/A

Outcome Measure(s): Hrs/wk of inactivity (TV watching, playing video or computer games, etc.). Times/wk of moderate to vigorous physical activity.

Results: Non-Hispanic black males and females had both the highest composite inactivity hrs. and the highest mean hrs. of TV viewing per week; non-Hispanic white males and females had the lowest. Ethnic differences in physical activity were small among males, but larger for females, with non-Hispanic white females reporting much higher levels of moderate to vigorous physical activity than minority females. 49.5% of black females reporting engaging in physical activity 2 times or less per week.

Conclusion: Patterns of physical activity and inactivity do differ by ethnicity, as minority adolescents and female minorities in particular are less likely to engage in physical activity and more likely to be inactive than non-Hispanic white adolescents; with rising rates of obesity, these results highlight important public health concerns. © Center on Media and Child Health

130. Hernandez, B., S. L. Gortmaker, et al. (1999). "Association of obesity with physical activity, television programs and other forms of video viewing among children in Mexico City." International Journal of Obesity 23(8): 845-854.
Objective: To assess the association of physical activity, television program viewing and other forms of video viewing with the prevalence of obesity among school children.

Design: Cross-sectional study conducted between April and June 1997.

Subjects and Setting: 712 children 9-16 years old attending school in low and middle- income towns in Mexico City (3 public and 4 private schools randomly selected from 33 schools). All children completed a self-administered questionnaire in class.

Intervention: N/A

Outcome Measure: Obesity.

Results: 24% of 461 children (with complete information) were classified as obese. Children reported an average of 4.1 + 2.2h/d watching television (2.4 + 1.5 h/d for TV programs and 1.7 + 1.5 h/d for video cassette recorder, and 1.8 + 1.3 h/d in moderate and vigorous physical activities. Watching television increased the odds that a child in the sample was obese (OR.1.12, 95% confidence interval (CI) 1.02, ± 1.22); odds ratios (OR) of obesity were 10% lower for each hour of moderate/vigorous physical activity per day (OR = 1.12, 95% CI 1.02-1.22 for age, gender, town, and perception of mother's weight status. Adjusted OR of obesity (2.588, 95% CI 1.47-4.54) higher for middle-income town.

Conclusion: Study results underscore the importance of obesity in children as a public health problem in Mexico, and the need to develop preventive interventions. Reducing TV program viewing and increasing time dedicated to physical activity were identified as strategies to prevent obesity in this population. More research is necessary to identify factors related to TV viewing and physical activity, and how to increase physical activity in children. © Center on Media and Child Health

131. Pellouchoud, E., M. E. Smith, et al. (1999). "Mental effort-related EEG modulation during video-game play: comparison between juvenile subjects with epilepsy and normal control subjects." Epilepsia. 40(Suppl 4): 38-43.
PURPOSE: This study investigated the effects of mental effort exerted during video-game play on features of the EEG in juvenile subjects diagnosed with seizure disorders and in age-matched clinically healthy subjects. METHODS: EEG was recorded from 14 children (9-15 years old) as they played a video game, watched another person playing a video-game, and sat quietly with their eyes open. Seven of the subjects had been clinically diagnosed with seizure disorders, three of whom had also exhibited photosensitivity. RESULTS: Three spectral components of the EEG showed cognitive load-related modulation. The amplitude of a frontal midline theta (6-7 Hz) signal increased with video-game play relative to the watching and eyes open resting conditions. A posterior alpha band (9-12 Hz) signal was attenuated during the playing and the watching conditions relative to the resting condition. A central mu (10-13 Hz) rhythm was attenuated during the game-playing condition. No significant differences were found between the patient and control groups for any of these features. Incidence of epileptiform events did not discriminate test conditions in the children with epilepsy. CONCLUSIONS: The results from this small sample suggest that video-game play tends to produce similar responses from children with epilepsy and in healthy control subjects. These responses in the juvenile population are similar to responses elicited by increased mental load in normal adult populations.

132. Fylan, F., G. F. Harding, et al. (1999). "Mechanisms of video-game epilepsy." Epilepsia. 40(Suppl 4): 28-30.
PURPOSE: We aimed to elucidate the mechanisms underlying video-game epilepsy by comparing the flicker- and spatial-frequency ranges over which photic and pattern stimulation elicited photoparoxysmal responses in two different populations: (a) 25 patients with a history of seizures experienced while playing video games; and (b) 25 age- and medication-matched controls with a history of photosensitive epilepsy, but no history of video-game seizures. METHODS: Abnormality ranges were determined by measuring photoparoxysmal EEG abnormalities as a function of the flicker frequency of patterned and diffuse intermittent photic

stimulation (IPS) and the spatial frequency of patterns on a raster display. RESULTS: There was no significant difference between the groups in respect of the abnormality ranges elicited by patterned or diffuse IPS or by spatial patterns. When the groups were compared at one specific IPS frequency (-50 Hz), however, the flicker frequency of European television displays, the video-game patients were significantly more likely to be sensitive. CONCLUSIONS: The results suggest that video-game seizures are a manifestation of photosensitive epilepsy. The increased sensitivity of video-game patients to IPS at 50 Hz indicates that display flicker may underlie video-game seizures. The similarity in photic- and pattern-stimulation ranges over which abnormalities are elicited in video-game patients and controls suggests that all patients with photosensitive epilepsy may be predisposed toward video-game-induced seizures. Photosensitivity screening should therefore include assessment by using both IPS at 50 Hz and patterns displayed on a television or monitor with a 50-Hz frame rate.

133. Huston, A. C., J. C. Wright, et al. (1999). "How young children spend their time: Television and other activities." Developmental Psychology 35(4): 912-925.
Objective: To determine how young children spend their time and to identify characteristics of development and home environments that mediate these behaviors.

Design: Longitudinal cohort study spanning 3 years. Inclusion criteria: 1) residence in a census tract/community with > 10% of families with children below the federal poverty line and 2) participation in a government program with low-income eligibility requirements. Families discontinuing participation replaced by recruits from initial sample population. Time-use measured during annual face-to-face office and home visits and bimonthly phone interviews.

Subjects and Setting: Two - and four-year olds (n = 236) in Kansas City, MO, Kansas City, KS, and Lawrence, KS. 38% African American; 40% Caucasian; 18% Hispanic; 16% Spanish was primary language; 33% single-parent families; average parent education 13 years; average parental occupation level blue-collar.

Interventions: N/A

Outcome Measure(s): Time use based on diary of activities during 24-hour period prior to interviews. TV behaviors assessed time spent and types of programs viewed. Home Observation Measure of the Environment (HOME) assessed parents' emotional support/discipline, cognitive stimulation, and quality of physical environment.

Results: Older children spent less time sleeping and watching informative and animated programs while spending more time reading/in educational activities, playing video games, and in religious activities. There were no sex differences in TV viewing, but girls spent more time socializing, completing chores, and engaged in personal care while boys spent more time playing video games. Time spent watching entertaining programs seemed to displace time reading and in educational activities. Watching more TV decreased video game play, but increased general playtime. Better maternal education and stimulating home environments increased time spent watching informative TV and decreased watching entertaining TV. Maternal education level mediated the inverse relationship between watching TV and reading/educational activities.

Conclusions: The relationships between TV viewing and other activities are complex and dependent upon TV program types, structural/social environmental factors, and the compatibility and functional equivalent of other activities with TV viewing. © Center on Media and Child Health

134. Rich, M. (1999). "It's your shot! Immunization by basketball." Annals of Epidemiology 9(7): 394-396.
Objective: To examine the public health risks and implications of rising physical inactivity among youth.

Design: Editorial, in response to 1999 study of physical inactivity among urban schoolchildren, ages 9-13, by O'Loughlin et al.

Subjects and Setting: N/A

Intervention(s): N/A

Outcome Measure(s): N/A

Results: Risks posed by infectious diseases in previous years have now been replaced by new morbidities arising from issues of inactivity. Recent studies indicate that inactivity among youth leads to increases in obesity and depression. Obesity is a disease that has lifetime medical and psychosocial effects. Public health efforts need to focus on changing lifestyles and behaviors of youth in order to prevent these problems and should promote regular exercise, parental involvement in and support of physical activity, and increased access to sporting opportunities for all youth.

Conclusion: Public health efforts need to promote active youth lifestyles and behaviors in order to prevent against obesity, depression, and poor self-esteem, all conditions that accompany physical inactivity. © Center on Media and Child Health

135. Greenberg, J. L., S. E. Lewis, et al. (1999). "Overlapping addictions and self-esteem among college men and women." Addictive Behaviors 24(4): 565-571.
Objective: To examine the prevalence of multiple addictions to common substances and activities among college students, with consideration of gender and self-esteem differences.

Design: Survey. Subjects completed questionnaire regarding self-esteem, personal involvement with addictive substances and activities.

Subjects and Setting: 64 male and 65 female students (mean age = 20.5 years), enrolled in private, highly selective, urban university in Midwest. Student body 69% Caucasian, 45% Jewish. Subjects non-systematically sampled from campus locations, asked to complete anonymous questionnaire.

Intervention(s): N/A

Outcome Measure(s): Addiction to 4 substances (alcohol, caffeine, chocolate, cigarettes) and 5 activities (exercise, gambling, Internet use, television, video games), assessed using Rozin and Stoess' addiction definition.

Results: There was a positive and significant correlation among the 4 addictive substances ($r = .36$, $p<.001$), as well as among the 5 addictive activities ($r = .44$, $p<.001$). Subjects who reported greater addictive tendencies towards substances also reported greater addictive tendencies toward activities ($r = .50$, $p<.001$). Self-esteem was only significantly related to exercise ($r = .25$, $p = .004$). Men reported significantly greater scores for addictive activities [$t(127) = 4.04$, $r = .34$, $p<.001$]. Men reported greater levels of addiction to video games ($r = .45$, $p<.001$), gambling ($r = .40$, $p<.001$), and Internet use ($r = .31$, $p<.001$), while women reported greater levels of addiction to chocolate ($r = .35$, $p<.001$) and caffeine ($r = .18$, $p = .04$).

Conclusion: College students tended to become addicted to more than one common substance or activity, with several important gender differences; self-esteem levels were generally unrelated to addictive tendencies.

136. Dietz, T. L. (1998). "An examination of violence and gender role portrayals in video games: Implications for gender socialization and aggressive behavior." Sex Roles 38(5-6): 425-442.

Objective: To examine the portrayal of women and use of violent themes in video games and their possible impact on children's identity

Design: Content analysis of popular video games examining the portrayal of women and use of violent themes. Each game played and instruction book read. Videos coded for female character involvement (no female characters, female characters portrayed as sex objects or prizes, females as victims, females as hero, females in feminine roles) and role of violence as part of game theme or strategy (no violence or aggression, socially acceptable aggression, violence directed at women, violence directed at others).

Subjects and Setting: Nonrandom selection of 33 Nintendo and Sega Genesis games. Game selection occurred in Dallas-Fort Worth Metroplex.

Intervention(s): N/A

Outcome Measure(s): Frequency of types of female character involvement and use of violence as game theme or strategy

Results: 15% of videos portrayed women as heroes or action characters. 30% had no female characters at all. Women portrayed as victim or "damsel in distress" 21% of time. 21% rated as non-violent. 79% rated as including some type of violence or aggression with 27% including aggression in a sporting event and 21% with some form of aggression/violence directed at women. 16 of 33 games had violence or aggression directed at other characters.

Conclusions: In general, popular video games minimized the role of females and when included, portrayal was highly stereotypical. Majority of games also had some type of violent theme.

Authors argue that video games play a role in identity development in children and that negative portrayals of women and frequent violence may adversely affect gender attitudes and potentially harm children who play them. Studies of long-term exposure effects of video game play by children recommended. © Center on Media and Child Health

137. Kirsh, S. J. (1998). "Seeing the world through Mortal Kombat-colored glasses: Violent video games and the development of a short-term hostile attribution bias." Childhood 5(2): 177-184.
Objective: To investigate whether playing violent video games would lead children to interpret provocative situations by peers to have hostile intent.

Design: Intervention study. Random assignment to play violent video game (Mortal Kombat II) or non-violent video game (NBA Jam:TE) for 13 minutes. Children were then read five stories that involved a same-sex peer to cause something negative to happen. Children then answered a series of questions about the intent, retaliation and punishment, and emotional state of the harmdoer.

Subjects and Setting: 3rd and 4th grade children in a middle-class community in Kansas. 44% female.(N=52)

Intervention: Random assignment to play violent video game (Mortal Kombat II) or non-violent video game (NBA Jam:TE) for 13 minutes.

Outcome Measure(s): Intent, retaliation and punishment, and emotional state of the harmdoer.

Results: Children who played the violent video game responded more negatively to half of the questions. hildren who played the violent game responded negatively to one of the intent questions as compared to those who played the nonviolent game ($F_{1,51}=8.85$, $p<0.01$). Children who played the violent game responded that they would retaliate and expect more punishment ($F_{1,51}=8.34$, $p<0.01$). Children playing the violent game were more likely to say the harmdoer did not like them ($F_{1,51}=4.54$, $p<0.04$).

Conclusions: Children who played the violent video game responded more negatively to some questions about intent of the harmdoer, retaliation and punishment, and emotional questions. © Center on Media and Child Health

138. Wiegman, O. and E. G. M. van Schie (1998). "Video game playing and its relations with aggressive and prosocial behavior." British Journal of Social Psychology 37(3): 367-378.
Objective: Examine the relationship between amount of time spent on playing video games and aggressive and prosocial behavior.

Design: Survey. Children kept diary on video game use for 1 week. Filled out questionnaires on aggressive and prosocial behavior, preference for aggressive video games and Intelligence test.

Subjects and Setting: 144 girls and 134 boys in 7th and 8th grade from 5 elementary schools in the Netherlands. Average age: 11.5 years. Range: 10-14 years. Measures administered in June 1994. Peer-nomination technique used to measure aggressive and prosocial behavior.

Intervention: N.A.

Outcome Measure(s): preference for aggressive video games, time spent on video games, aggressive and prosocial behavior.

Results: No significant differences in aggressive behavior between heavy players, moderate players and non-players. Heavy players behaved less prosocially than moderate (t (275) =2.73, p <.01) and non-players (t (275) =2.41, p =.02). Boys had higher preference for aggressive videos than girls (?2 (2) =50.73, p <.001). Children with preference for aggressive video games tended to have lower intelligence (r = -.15, N=238, p=.02). Boys with preference for aggressive video games tended to behave more aggressively (t (123) =1.92, p=.05). Children with no preference for aggressive video games behaved more prosocially than children with high preference for aggressive video games (t (245) =3.28, p<.01). Children with preference for aggressive video games, spent more time playing those games (r =.20, N=246, p<.01).

Conclusion: No relationship between video game use in general and aggressive behavior. However, negative relationship between video game use and prosocial behavior found. More research necessary to examine long-term effects of playing different types of violent video games on children's behaviors. © Center on Media and Child Health

139. Armstrong, C. A., J. F. Sallis, et al. (1998). "Children's television viewing, body fat, and physical fitness." American Journal of Health Promotion 12(6): 363-368.
Objective: To determine the relationship between children's television viewing and physical fitness.

Design: Cross-sectional data from questionnaires were examined. Dependent variables included objective measures of cardiovascular fitness, body fat, muscular strength/endurance, and muscular flexibility. The independent variables included parental and child reports of the child's amount of TV viewing.

Subjects and Setting: The children were 4th graders from 7 schools within a school district of a suburban California city. 98% of eligible students participated. Due to missing data, 10% of these were dropped. Final sample size was 284 girls and 304 boys. Average age was 9.28 years (SD= .49). 83% Caucasian, 12% Asian-American, 3% Latino, 2% African-American.

Interventions: N/A

Outcome Measures: Self-report and parent report of TV viewing, video game playing; cardiovascular fitness; body fat; abdominal muscle strength/endurance; upper body strength/endurance; and muscle flexibility.

Results: 3 chi-square analyses were conducted. The first examined the relationship between the 2 TV viewing variables. The second and third chi-square analyses examined gender differences in the 2 measures of TV viewing. One-way analyses of variance (ANOVAs) with Tukey post hoc tests were used to examine the relationship between each TV viewing variable and the 6 fitness variables. Both parental (n2=.051 and .031 for boys and girls, respectively) and child reports (n2= .020 and .028) of the child's amount of TV viewing were associated with the 1 mile run/walk times. Only parental reports of the child's TV viewing time were associated with BMI (n2=.041 and .058) and skinfolds (n2=.050 and .029). Muscular strength/endurance and flexibility were not associated with either measure of the child's viewing time.

Conclusions: The amount of time spent watching television was related to one test of cardiovascular fitness. Further studies are needed to look at more definitive cause-effect relationships between children's physical fitness and the amount of television they watch. © Center on Media and Child Health

140. Griffiths, M. D. (1997). "Computer game playing in early adolescence." Youth & Society 29(2): 223-37.
Objective: To examine demographic characteristics of computer game playing, acquisition, development, and maintenance.

Design: Cross-sectional cohort study.

Subjects and Setting: 11-year old children (n = 147) attending a summer camp. 49% female; predominantly from working class families; 56.6% played both handheld computer games and TV games.

Intervention(s): N/A

Outcome Measure(s): Questionnaire assessed frequency of computer game play, types of computer games played, perceived good/bad game characteristics, negative consequences of the computer game playing, and addiction. Addiction scale adapted from DSM-III-R criteria for pathological gambling. Extraversion/introversion assessed by the Eysenck Personality Questionnaire.

Results: 25.8% of the children played computer games everyday and another 47.6% played most days. Most computer game sessions lasted for an hour or less (55.7%) or between 1 to 3 hours (26.5%). Boys played computer games more frequently than girls (?2 = 6.52, p < 0.001). Initiation of computer game play occurred on average around age 7.5, although males tended to start earlier than girls. Although most played games for fun, for a challenge, or because there was nothing else to do, 15.6% played because they could not stop. The most popular games were platformers, followed by adventure, beat 'em ups, and sport simulations. Boys mentioned more violent games as being their favorites than girls (?2 = 14.55, p < 0.0001). Although 19.7% of children noted potential general health detriments and 10.2% thought games could be addictive or frustrating, 44.8% claimed there was nothing bad about computer games. 37.5% of the children were addicted to computer games. Although none had faced serious consequences, 25.1% had skipped homework or gotten in trouble at school due to computer game playing.

Conclusions: Stress the importance of measuring incidence and prevalence of computer game-related problems as well as establish better measures of addictiveness.

141. Dorman, S. M. (1997). "Video and computer games: Effect on children and implications for health education." Journal of School Health 67(4): 133-138.
Objective: To examine the health effects of video games on children, suggest criteria for parental and teacher evaluation, note implications for health education.

Data Sources: Literature on video games and children's health.

Study Selection: N/A

Data Extraction: N/A

Data Synthesis: Studies suggest video games have the following health impacts on children: a) cardiovascular-while playing video games have been found to increase heart rate, systolic and diastolic blood pressure, and oxygen consumption in males and females, similar to mild intensity exercise, playing video games in not sufficient to improve cardiorespiratory fitness, b) video game induced seizures-have been noted in some 50 children worldwide, c) aggression and antisocial behavior-studies examining this relationship have been inconclusive and inconsistent in their findings. Video games can be used in a positive way to promote health to children and adolescents, as well as therapeutic regimens. Several elements should be considered when choosing a health promoting video game: (i.e. educational objective, information and roles, difficulty, participant age and characteristics, facilitator's role, setting, hardware).

Conclusion: Attention should be given to the potential detrimental effects of video games on children's health, especially children's behavior. Health promoters should understand how to use video game technology to improve health, which may function to improve the health of many children and adults of an increasing technologically-based society.

142. Barnett, M. A., G. D. Vitaglione, et al. (1997). "Late adolescents' experiences with and attitudes toward videogames." Journal of Applied Social Psychology 27(15): 1316-1334.
Objectives: To assess individual differences in experiences with, preferences for, and attitudes about videogames

Design: Cross-sectional, descriptive survey study; facilitator-administered questionnaires

Subjects and Setting: 229 students in a small Midwestern city (102 high school, 127 college; 51% male; 81% White; mean age 18.1 years); Questionnaire administered in high school classrooms and small groups for college students receiving Psychology course credit for participating; convenience sample

Intervention(s): N/A

Outcome Measure(s): Frequency of playing videogames, motivation for playing, characteristics of preferred videogames, general attitudes toward videogames and players; correlates include demographics, personality characteristics (self-esteem, conscientiousness, fantasy empathy, introversion)

Results: 80% of males and 56% of females were frequent players (at least 1 to 2 hours/week). There were significant gender differences in the favorite types of games (?2 (3, N=206) = 73.5; p<0.0001), with males preferring sports and violent games and females preferring action/fantasy and intellectual/creative games. Males desired to spend more time playing videogames than other activities, while females would like to spend the most time reading or socializing. Only females reported concerns about potential negative consequences of playing videogames. Self-esteem measure was inversely correlated with a tendency to perceive videogames as companionship (r= -0.26) and conscientiousness measure was inversely correlated with importance/compulsion of playing (r= -0.24). Those favoring violent games had lower trait fantasy empathy scores compared to those preferring other types (p<0.001)

Conclusions: There were significant gender differences in frequency of play and types of games preferred. Levels of some personality characteristics differed based on perceptions of the role/purpose of videogames.

143. Funk, J. B. and D. D. Buchman (1996). "Children's perceptions of gender differences in social approval for playing electronic games." Sex Roles 35(3-4): 219-231.
Objective: To determine children's views of gender differences in social approval for electronic game playing.

Design: Written exploratory survey. Subjects instructed to indicate "agree," disagree," or "don't know," in response to 14 statements regarding video games.

Subjects and Setting: 364 4th, 5th graders (majority African-American, 203 females) in Midwestern suburban school district, 10% receiving Aid to Dependent Children. Survey administered in school.

Intervention(s): N/A

Outcome Measure(s): Social acceptability of aspects of playing electronic games, with respect to gender. Time commitment to playing, violent content of games.

Results: More boys than girls agreed that playing electronic games is his/her favorite activity [significant result for 5th graders: ?2 (2, 162) = 10.01, p<.07]. More girls than boys indicated that girls can be popular and play electronic games [4th: ?2 (2, 198) = 14.33, p = .001, and 5th: ?2 (2, 162) = 10.17, p = .006]. Boys were more likely than girls to agree that fighting games are mainly for boys [4th: ?2 (2, 200) = 18.53, p<.000, and 5th: V (2, 161) = 20.02, p<.000].

Conclusion: Boys were more likely to engage in gender stereotyping, while girls perceived themselves to have social approval for moderate amounts of game playing, including the playing of fighting games. © Center on Media and Child Health

144. Yuji, H. (1996). "Computer games and information-processing skills." Perceptual & Motor Skills 83(2): 643-7.
To assess the association of past use of computer games and parallel-processing skills as measured by tests of discrimination perception using computers 46 boys and girls in kindergarten, aged 4 to 6 years, were classified into 17 player and 17 nonplayer groups by their enthusiasm for computer games. There were no significant differences between the two groups in correct responses; however, RTs of players were significantly faster than those of nonplayers. RTs were different to color and shape. Experiences with computer games might develop information-processing skills.

145. Funk, J. B. and D. D. Buchman (1996). "Playing violent video and computer games and adolescent self-concept." Journal of Communication 46(2): 19-32.
Objective: To determine the impact of violent video game play (frequency and location) on adolescent self-concept.

Design: Cross-sectional, in-class survey. Questionnaire assessed gender, mother's education, hours per week spent playing video/computer games at home and at arcades, and three favorite video games. Game preferences were categorized as general entertainment, educational, sports, fantasy violence, and human violence.

Subjects and Setting: 7th and 8th graders (n = 357) from a suburban public school in a mid-sized Midwestern city. 51.3% female; 12% minority students.

Intervention(s): N/A

Outcome Measure(s): Self-concept measured using the Harter Self-Perception Profile for Adolescents across the domains of scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth.

Results: Boys spent more time playing video games at home (?2 = 45.85, $p < 0.01$) and in arcades (?2 = 35.63, $p < 0.01$) than girls. Girls were more likely to list violent fantasy games as their favorites (?2 = 27.83, $p < 0.01$), while boys were more likely to list preferences for violent human games (?2 = 24.68, $p < 0.01$). Among girls, more time spent playing arcade games was correlated with lower perceptions of scholastic competence ($t = -2.97$, $p < 0.01$), social acceptance ($t = -2.69$, $p < 0.01$), and athletic competence ($t = -3.80$, $p < 0.01$). Girl's time spent playing video games at home predicted lower scores for behavioral conduct ($t = -2.40$, $p < 0.02$). No other significant correlation between playing video games or preference for violent fantasy or human video games and self-concept.

Conclusions: Future studies should further explore extreme game-playing groups and correlate teacher and parent assessments with adolescent self-reports. Suggest the development of

collaborative studies to explore the implications of violent video game preferences. © Center on Media and Child Health

146. Ballard, M. E. and J. R. West (1996). "Mortal Kombat (tm): The effects of violent videogame play on males' hostility and cardiovascular responding." Journal of Applied Social Psychology 26(8): 717-730.
Objective: To assess the impact of videogame violence on cardiovascular reactivity and hostility among male college students.

Design: Double-blind, randomized control trial. Subjects randomly assigned to play a nonviolent billiards game or Mortal Kombat™ at either the low or high violence level for 10 minutes. Higher violence level adds blood and gore effects to the violent actions of the lower level. Baseline cardiovascular measures prior to the experiment and several days afterwards.

Subjects and Setting: Male undergraduates (n = 30) attending Appalachian State University - a moderately sized liberal arts school. Mean age 19.53; 29 Caucasian, 1 African American. 80% played videogames on a regular basis with preferences for combat and sport games.

Interventions: N/A

Outcome Measure(s): Cardiovascular reactivity defined as changes in heart rate and/or systolic (SBP)/diastolic blood pressure (DBP). Hostility measured by a questionnaire based on the Adjective Checklist, Bell Adjustment Inventory, and Buss-Durkee Hostility Inventory.

Results: Those playing the most violent level of Mortal Kombat had a higher postgame SBP than the group playing at a low violence level [$t(26) = 2.89$, $p < 0.01$] or playing billiards [$t(26) = 2.70$, $p < 0.02$]. Those playing either level of Mortal Kombat had a higher change in heart rate than those playing billiards [high: $t(26) = 3.19$, $p < 0.01$; low: $t(26) = 2.80$, $p < 0.01$]. The violence level of the videogame played was also significantly associated with each measure of hostility [$F(6, 48) = 43.24$, $p < 0.001$].

Conclusions: The more violence a videogame contains the greater the potential for negative outcomes. Suggest alerting videogame makers and parents to possible detrimental effects and making adjustments to game designs and limits on game play. Future studies should examine differential effects on habitual vs. occasional game players, males vs. females, and players' developmental stage. Also suggest future studies to measure overt hostile behavior. © Center on Media and Child Health

147. Anyanwu, E. and N. A. Watson (1996). "Visually-evoked pattern and photomyoclonic responses in video game and television epilepsy: case reports." Acta Physiologica, Pharmacologica et Therapeutica Latinoamericana 46(3): 177-84.
This research paper reports a case study of two male photosensitive epileptic patients, aged 14 and 16 years old respectively, whose epileptic seizures were often triggered by the flickers from television and video games respectively. The 14-year old patient had no family history of epilepsy, while the 16 year old had a family history of epilepsy. A comprehensive electroencephalogram (EEG), including hyperventilation, intermittent photic stimulation (IPS)

and pattern stimulation were carried out on them and EEG abnormalities including photoparoxysmal responses (PPR) and generalized myoclonic responses were evoked. A thorough analysis of the EEG morphology of the myclonic responses and the clinical manifestations showed evidence of two separate entitles of seizures namely: visually evoked pattern-myoclonic responses (PTMR) and visually evoked photomyoclonic responses (PMR). PTMR was independent of flash rate and occurred before a PPR and at the same time as the flash rate, while PMR occurred after the PPR and was dependent on flash rate. These findings suggest that "Video Game" epilepsy is probably a pattern sensitive epilepsy, electronic screen being the source of the triggering patterns; hence, the morphology and the family histories and the myoclonic phenomena differ from those of pure photosensitive epilepsy.

148. Scott, D. (1995). "The effect of video games on feelings of aggression." Journal of Psychology 129(2): 121-132.
Objective: To determine whether playing aggressive video games increases aggressive feelings in adults.

Design: Experimental: Undergraduates were assigned to play 10 minutes of a non-aggressive, moderately aggressive, or highly aggressive video game. Aggressive feelings and personality type were assessed before and after playing with the Buss-Durkee Inventory and the Eysenck Personality Questionnaire.

Subjects and Setting: 117 undergraduates from Strathclyde University in Scotland. 42 men/75 women. 14 men/25 women in each condition. 3 participants dropped because of a high score on the social desirability scale of the personality questionnaire were replaced with 3 others.

Interventions: N/A

Outcome Measures: Change in aggressiveness (subscales included assault, indirect hostility, irritability, negativism, resentment, suspicion, and verbal hostility)

Results: A three-way ANOVA with gender and game type as between-subject variables and subscale of the aggression inventory as a within subject factor revealed only a significant effect of game type ($F [2, 111] = 4.39$, $p < .05$). Participants who played the moderately aggressive game decreased in aggressive feelings, but those who played the non-aggressive and highly aggressive games equally increased in aggressive feelings. The results were not significantly affected by personality type or gender.

Conclusions: This study does not support the notion that playing aggressive videogames increases feelings of aggressiveness. © Center on Media and Child Health

149. Abbott, M., B. Palmisano, et al. (1995). "Video Game Playing, Dependency and Delinquency: A Question of Methodology?" Journal of Gambling Studies 11(3): 287-301.
A methodological challenge to Sue Fisher's (1992) study of adolescent fruit machine gamblers was carried out with questionnaire data from video game players, ages 11-16, recruited from 4 amusement arcades. Fisher described an association between frequency fruit machine playing, dependency, & delinquency. Using a similar analysis, her results were confirmed. However, a

separation of key variables & the use of multiple regression analysis shows that of money spent, time spent, & impaired choice, only the first was a significant predictor of delinquency. It is suggested that delinquents have higher disposable incomes to spend on their leisure activities. Video game playing & possible fruit machine gambling appear to be independently associated with delinquency; in video game playing, this association is not mediated by dependency. 6 Tables, 22 References. Adapted from the source document

150. Irwin, A. R. and A. M. Gross (1995). "Cognitive tempo, violent video games, and aggressive behavior in young boys." Journal of Family Violence 10(3): 337-350.
Objective: To examine the impact of violent video games on the behavior of impulsive and reflective children. To determine whether a) exposure to violent video games results in increased aggression from the children in free-play and frustrating situations, b) impulsive youngsters exhibit more aggressive responding than reflective children.

Design: Factorial design used to assess interpersonal aggression and aggression toward inanimate objects in a free-play setting; and interpersonal aggression during a frustrating situation. Second grade boys (15 per cell) were assigned to: 2x2 (aggressive video game versus nonaggressive video game x impulsive versus reflective). Subjects' heart rates were recorded twice per minute for 5 minutes. A confederate was used for both free-play and frustration manipulation sessions. Free-play was videotaped continuously for 15 minutes.

Subjects and Setting: 60 2nd grade boys (14 African American, 46 Caucasian), aged 7-8, recruited from two local elementary schools. Recruitment: letters being sent to parents of 150 boys. Signed forms expressing interest were returned by 70 children (46%). Logistical problems prevented 10 families from participating.

Intervention: N/A

Outcome Measures: heart rate, toy preference, aggressive behavior

Results: ANOVA failed to show a significant difference in heart rate for the two video game conditions. Subjects who played the aggressive video game displayed significant more verbal aggression toward objects and confederates during free-play than nonaggressive video game subjects ($F(1, 156) = 6.23$, $p = .016$); ($F(1,156) = 4.94$, $p = .03$). Subjects who played aggressive video games showed significantly more physical aggression during the frustrating situation than nonaggressive video game subjects ($F(1,156) = 4.96$, $p = .03$). Toy preference was not significantly affected by video game condition or response style.

Conclusion: Children playing violent video games exhibited more object aggression during free-play and more interpersonal aggression during frustrating situation than nonaggressive subjects. Further research is needed on the impact of violent video games on children's behavior. Parents may consider the type video game content type (object versus person-person). © Center on Media and Child Health

151. Lawry, J., R. Upitis, et al. (1995). "Exploring common conceptions about boys and electronic games." Journal of Computers in Mathematics and Science Teaching 14(4): 439-459.
Objective: Explore common conceptions about boys and electronic games in order to learn more about whether and how electronic games could be used for science and math teaching.

Design: Observational. Field notes taken during observations of and interviews with children and adults at electronic games exhibit in interactive science museum.

Subjects and Setting: boys and their parents attending the Electronic Games Research Lab at Science World BC in Vancouver, Canada during months of July and August 1993.
Boys and parents talked about preference for video or computer games, game knowledge, social and gender issues etc.

Intervention: N/A

Outcome Measure(s): preference for violent video games, anti-social behavior, lack of interest in other activities besides electronic games.

Results: Violent games are popular among boys but many boys prefer games that challenge them mentally. No evidence that electronic game-playing leads to anti-social behavior. Many boys who play electronic games have also other interests such as sports, music etc.

Conclusions: More research necessary to examine whether electronic games can be used to increase number of children who interact positively with math and science within context of existing classroom educational methods.

152. Griffiths, M. D. and N. Hunt (1995). "Computer game playing in adolescence: Prevalence and demographic indicators." Journal of Community & Applied Social Psychology 5(3): 189-193.
Objective: To determine the demographic indicators, prevalence, and effects of adolescent computer game playing in the United Kingdom.

Design: Survey. Subjects completed questionnaire regarding playing frequency and context.

Subjects and Setting: 387 adolescents (12-16 years old), attending comprehensive school in Exeter, U.K. 58% male, 98.7% deemed players.

Intervention(s): N/A

Outcome Measure(s): Time spent playing games, acquisition and maintenance of game playing, favorite game and reasons for playing it, gender differences in playing, and negative consequences of playing.

Results: 31% of subjects played every day, and 68% of those playing over 4 hrs/session played every day. The mean starting age was 8.4 years, and 75% played for fun, 27% for a challenge,

25% because their friends did, and/or because there was nothing else to do (23%). Males were significantly more likely than females to play most days [?2 = 14.18, p<.001] and to start playing to impress their friends [?2 = 5.72, p<.02]. 2.7% of subjects reported truancy to play, 1.6% stole money to buy games, and 20.5% admitted to aggressive behavior as a result of playing.

Conclusion: Male adolescents played computer games with much greater frequency than females, with many initiating play to impress friends and reporting aggressive behavior as a result. © Center on Media and Child Health

153. Fisher, S. (1995). "The amusement arcade as a social space for adolescents: An empirical study." Journal of Adolescence 18(1): 71-86.
Objective: To explore why adolescents visit amusement arcades and to quantify their use of arcades relative to other social settings.

Design: Cross-sectional survey. Students completed a survey that assessed addiction to amusement machines, parental attitudes, demographics, use of arcades relative to other venues, motivations to visit amusement arcades, other experiences in amusement arcades.

Subjects and Setting: Adolescents aged 11 to 16 years in secondary schools in south-west Britain (N=460). 52% female, 48% male. Mean age 14 years.

Intervention: N/A

Outcome Measure(s): arcade use relative to other venues, motivations to visit arcades, bad experiences in arcades, views on amusement arcades

Results: 66% of adolescents in the town had visited the amusement arcade in the last year. 25% visited arcades once a week. Regular users visited the arcade once or more a week (n=117), casual users visited the arcade less often (n=197). After free public spaces, amusement arcades were the most popular leisure venue. Primary motivation to visit arcades to "hang around and/or meet friends" for the regular users (81%). Regular visitors were more likely to be addicted to amusement machines 16% vs. 2% among casual users. Regular visitors of amusement arcades had more bad experiences such as being involved in a fight (18%). Adolescents viewed amusement arcades as good places to meet friends, but indicated that they also had "nowhere else to go".

Conclusions: Adolescents visit amusement arcades primarily to meet other adolescents. Adolescents go to the arcade more than any other leisure venue. Regular arcade visitors differ from the casual arcade visitor in terms of addiction to games. There are positive and negative consequences for young people. © Center on Media and Child Health

154. Phillips, C. A., S. Rolls, et al. (1995). "Home video game playing in schoolchildren: A study of incidence and patterns of play." Journal of Adolescence 18(6): 687-691.
Objective: To identify normal children behavior in terms of home video game playing and determine possibility of identifying excessive home video game playing.

Design: Questionnaire designed to broadly capture subjects' game playing habits.

Subjects & Settings: Participants ages 11 to 16 (n= 868) attending two attachment schools in U.K. Mean age 13.66, 429 male and 387 female.

Intervention: N/A

Outcome Measures: Time spent and frequency during week subjects play video games.

Results: Largest contingency of players (24.2%) reported play seven days a week. Most frequent time period reported was between half and one hour at a time. More than 75% of sample played longer than half hour. Over 14% played longer than 2 hours at a time. Males significantly more likely to admit to playing video games than females, ($x2= 78.9$, $p<0.001$). Males spend significantly more time playing continuously than females ($x2 = 20.4$ $p<0.001$) and more males played six days or more per week ($x2= 59.1$, $p< 0.001$). A subgroup, 7.5% of sample, identified and found to: play six or more days per week; play for more than one hour in a single session; feel they play longer than intended; and, report neglecting homework by playing. Majority of these are male (37/50).

Conclusion: Normal pattern of playing video games is at least six days a week and duration and frequency is high. Boys play video games significantly more often and for longer periods of time. © Center on Media and Child Health

155. Fitzgerald, M., A. P. Joseph, et al. (1995). "Leisure activities of adolescent schoolchildren." Journal of Adolescence 18(3): 349-358.
Objective: To investigate Irish adolescents' level of interest and participation in leisure activities and to determine if they vary by gender.

Design: Cross-sectional, in-class survey.

Subjects and Setting: 211 adolescents from an urban disadvantaged area of Dublin. Mean age = 16; 43% female.

Intervention(s): N/A

Outcome Measure(s): Participants rated interest (3-point scale) and frequency of participation (4-point scale) in 62 leisure time activities ranging from sports and outdoor activities to social events and cultural/educational hobbies.

Results: The most popular leisure activity was listening to music (76%). Most participants spent a lot of time with their families, close friends, and groups of peers and little time alone with friends of the opposite sex. Interest levels were highly correlated with participation in activities and vice versa. Girls were more interested in entertainment activities like parties, discos, and talking/visiting with friends ($t = 5.6$, $p < 0.001$), while boys were more interested in sports ($t = 3.78$, $p < 0.001$), social activities ($t = 4.43$, $p < 0.001$), and hobbies ($t = 2.24$, $p = 0.026$). Girls tended to participate more in physical activities like aerobics and yoga ($t = 4.49$, $p < 0.001$),

while boys participated in more sports ($t = 6.51$, $p < 0.001$) and outdoor activities ($t = 3.22$, $p < 0.001$) like camping, and fishing.

Conclusions: Preferred activities were passive, but sociable. Future studies should investigate other subpopulations of adolescents. Potential exists for better tailoring facilities to adolescent and interests and leisure activities. © Center on Media and Child Health

156. Clark, C. S. (1995). "Sex, violence, and the media." CQ Researcher 1995(November 17): 1019-1039.
Provides a wide overview of the entertainment industry's treatment of violence and sex in advertisements, movies, television, and music, discussing both the industry's reasons for including this content and consumer and critic responses to items that 'push the envelope'. The article also provides a chronology of Hollywood's major 'firsts' on television and video in regard to sexual behavior, a look at how the TV ratings system would work, and a short response on either side to the question "is Hollywood largely to blame for the nation's social problems?" © Center on Media and Child Health

157. Griffiths, M. D. and I. Dancaster (1995). "The effect of type A personality on physiological arousal while playing computer games." Addictive Behaviors 20(4): 543-548.
Objective: To determine the effect of personality type on physiological arousal during computer-game playing.

Design: 2-way, partial within-subjects study. Subjects were tested for 30 min. individually in lab setting. Each subject was acquainted with game, given incentive to win, and played game for 15-min. period. Heart speedometer attached to subject to measure physiological responses before, during, and after play. Subjects completed post-game questionnaire.

Subjects and Setting: 12 Type A (5 males, 7 females, mean age = 24.3) and 12 Type B (5 males, 7 females, mean age = 24.1) students attending University of Plymouth, enrolled in 1st-year psychology lecture. Personality type determined by Jenkins Activity Survey; participants selected based on scores.

Intervention(s): N/A

Outcome Measure(s): Physiological responses to game playing, as measured by heart rate. Presence of playing addiction.

Results: All subjects experienced significantly higher heart rates during the playing period in comparison to baseline measures [main effect of playing: $F(2, 44) = 26.42$, $p<.001$]. Type A subjects experienced significantly greater increases in arousal than Type B subjects [main effect of personality: $F(1, 22) = 4.63$, $p = .043$]. There were no significant differences between the groups on age, playing frequency, and playing duration.

Conclusion: While both Type A and Type B subjects experienced increased heart rates while playing, Type A subjects experienced significantly higher increases in heart rate than Type B

subjects, suggesting that they may be more susceptible to addiction. © Center on Media and Child Health

158. Graf, W. D., G.-E. Chatrian, et al. (1994). "Video game-related seizures: A report on 10 patients and a review of the literature." Pediatrics 93(4): 551.
A study to further describe the features, postulated pathophysiology, treatment and outcome of seizures ocurring while playing or watching video games is presented. Ten patients are evaluated retrospectively.

159. Sakamoto, A. (1994). "Video game use and the development of sociocognitive abilities in children: Three surveys of elementary school students." Journal of Applied Social Psychology 24(1): 21-42.
Objective: To determine the relationship between video game use and sociocognitive abilities in elementary school children.

Design: 3 surveys (cross-lagged model for Survey 3).

Subjects and Setting: Survey 1: 307 (165 boys, 142 girls) 4th-6th graders attending 2 Tokyo elementary schools. Survey 2: 537 (287 boys, 250 girls) 4th-6th graders attending 2 suburban Tokyo elementary schools. Survey 3: 103 boys, subset of Survey 2 male subjects.

Intervention(s): N/A

Outcome Measure(s): Survey 1: Frequency of video game use, measures of sociocognitive abilities (empathy, cognitive complexity and abstractness), social desirability, sociometric status (popularity), video game skill. Survey 2: Measures of sociocognitive abilities. Frequency of computer use: days of use at school and home, hours of use in 4 applications (video game playing, word processing, programming, learning with computer-assisted instruction). Survey 3: Same measures as 1 and 2.

Results: Survey 1: For boys, video game use was significantly negatively correlated with cognitive complexity; all other results were insignificant when the effect of social desirability was included. Survey 2: For boys, there were significant negative correlations between computer use at school and abstractness (-.17, $p<.05$) and video game playing at home and empathy (-.20, $p<.001$). For girls, computer use at school was significantly positively correlated with complexity (.23, $p<.05$). Survey 3: No effects for the "use leads to ability" path were shown when comparing the results of Survey 3 with Survey 2.

Conclusion: The frequency of video game use had no significant effects on social adjustment or sociocognitive abilities. © Center on Media and Child Health

160. Greenfield, P. M., P. de Winstanley, et al. (1994). "Action video games and informal education: Effects on strategies for dividing visual attention." Journal of Applied Developmental Psychology 15(1: Special Issue on Effects of Interactive Entertainment Technologies on Development): 105-123.
Objective: To examine the relationship between expertise in playing video games and divided visual attention.

Design: Cost-benefit analysis. Experiment 1) video game ability (expert or novice) was assessed in participants by having them playing the game Robotron five times. They then completed an attention task trial on a computer where they pressed buttons in response to various lights appearing on a screen. Reaction times (RT's) were recorded by the computer. The subjects were also told information about the probability (80%, 45%, 10%) of the light appearing on certain areas of the screen. Experiment 2) an experimental group spent 5 hours playing video games between a pre- and posttest game assessment (5 games) conducted as in experiment 1. The experimental group was compared to a control group that only played the pre- and posttest games.

Subjects and Setting: Male subjects (mean age 19) enrolled in an undergraduate psychology class at UCLA, were right handed and had good vision Experiment 1) (N=16). Experiment 2) (N=40)

Intervention: Experiment 1) Subjects completed eight blocks of 50 trials each. Experiment 2) Subjects completed an initial pretest to assess their video game ability and then returned 1 week later to complete a posttest, experimental subjects spent 5 hours playing a video game in between the pre- and posttest.

Outcome Measure(s): Experiment 1) RT's, Experiment 2) improvement in attentional skills

Results: Experiment 1) Video game experts had a significantly faster RT's as compared to novices for the 80% location ($p<0.025$) and the 10% location ($p<0.025$). Experiment 2) video game experts RT's were superior to novices on the 80% and 45% probability targets ($p<0.005$). The experiemental group showed improved attention in monitoring the low probability (10%) target ($p<0.05$).

Conclusions: People are able to use information about target probability to focus their attention regardless of any specific abilities. The mass medium of video games seem to have educational value for occupations that require skills in divided attention.

161. Greenfield, P. M., L. Camaioni, et al. (1994). "Cognitive socialization by computer games in two cultures: Inductive discovery or mastery of an iconic code?" Journal of Applied Developmental Psychology 15(1: Special Issue on Effects of Interactive Entertainment Technologies on Development): 59-85.
Objective: To determine if knowledge of a video game is acquired as a result of the experience of playing the game in Italians and Americans.

Design: Pretest-posttest measured scientific technical discovery. In between pre- and posttest participants played the video game "Evolution" for 2.5 hours with one of six conditions: play only, game demonstration and instructions followed by play, play plus a questionnaire, no-treatment control group. Two additional conditions included computer memory game and mechanical memory game for the Rome subjects.

Subjects and Setting: Psychology students in Los Angeles and Rome (N=206).
Subjects were considered experienced video game players if they scored 5,500 or higher on Pac-Man or reported playing more than 100 video games

Intervention: Subjects viewed screen displays and answered 17 questions about it afterward for the pre- and posttest. Subjects played "Evolution" for 2.5 hours under one of 6 conditions.

Outcome Measure(s): score on pre- and posttest scientific/technical discovery exercise, change in score between pre- and posttest.

Results: Experienced players ($p<0.025$), males ($p<0.005$), and Americans ($p<0.005$) had higher pretest scores in simulated scientific/technical discovery. Americans preferred to use diagrams and Italians preferred to use words in answering questions to the test ($p<0.001$). For experienced players, the change in score from the pretest to posttest was significant for all experimental conditions ($p<0.05$). The change for novice players was not significant for any of the experimental conditions.

Conclusions: Computer games provide informal education for the scientific or technical use of computers. © Center on Media and Child Health

162. Greenfield, P. M., C. Brannon, et al. (1994). "Two-dimensional representation of movement through three-dimensional space: The role of video game expertise." Journal of Applied Developmental Psychology 15(1: Special Issue on Effects of Interactive Entertainment Technologies on Development): 87-103.
Objective: To determine if video games contribute to the development of spatial representational skills.

Design: Cross-sectional and randomized control study. Study 1) Subjects scores on "The Empire Strikes Back" machine were recorded then subjects took a paper folding test to assess spatial skills. Study 2) subjects were randomized to an experimental and control group, both completed pre and posttest mental paper folding. Experimental subjects played "The Empire Strikes Back" until they reached a score of 265,000 three times. Both groups completed a questionnaire at the end of the study which assessed prior video game use.

Subjects and Setting: Study 1) male UCLA grads who played "The Empire Strikes Back" machine in the UCLA video arcade (N=24). Study 2) male and female UCLA undergraduates recruited from introductory psychology class(N=58).

Intervention: Study 2) experimental and control group completed pre- and posttest mental paper folding. Experimental group played "The Empire Strikes Back" over the course 10 weeks

Outcome Measure(s): Study 1) spatial ability as tested by ability answer problems on an 8 item-multiple-choice-test of mental paper folding. Study 2) spatial ability as measured by a 16 item-multiple-choice-test of mental paper folding.

Results: Study 1) 77% of the high video game scorers were also high scorers on the spatial skills test. 89% of low video game scorers also scored poorly on the spatial skills test. The association between video game scores and spatial scores was highly significant ($p<0.0001$). Study 2) 24% of women and 75% of men reached the goal score of 265,000 playing "The Empire Strikes Back". Practice playing "The Empire Strikes Back" did not improve mental paper-folding scores in the short-term.

Conclusions: Video games may help to develop spatial skills. © Center on Media and Child Health

163. Calvert, S. L. and S.-L. Tan (1994). "Impact of virtual reality on young adults' physiological arousal and aggressive thoughts: Interaction versus observation." Journal of Applied Developmental Psychology 15(1): 125-139.
Objective: To determine how playing or observing a violent virtual reality game differentially effects young adults' arousal levels, feelings of hostility, and aggressive thoughts

Design: Experimental manipulation, 3 (condition) by 2 (gender) between-subjects factorial design. Three stages of study - Pretest (3 subtests, Buss and Durkee personality trait measure assessing hostility; psychological measure of pulse rate taken), Treatment conditions (virtual reality immersion, virtual reality observation, no exposure control), Posttest (3 measures - pulse rate, Multiple Affective Adjective Check List, thought-listing questionnaire). Random assignment to treatment condition.

Subjects and Setting: 36 private metropolitan university students (M age = 20yrs, 6mos), middle class; equal numbers male and female; few had played, seen, or knew about virtual reality games

Interventions: N/A

Outcome Measures: Pretest - Dependent variables include arousal scores and hostile personality scores; independent variables include condition and gender. Posttest - Dependent variables included pulse rate, hostile feelings, and arousal and aggressive thoughts. Pretest scores were covariates. Post-hoc comparisons conducted when significant F ratio found.

Results: Pretest scores - No effects for condition or gender on arousal and hostile personality scores. 2-factor ANOVA on subtests resulted in significant effect of gender for assaultive personality, $F(1,30)=4.30$, $p < .05$ - men reported more assaultive personalities. Posttest scores - Significant effect of condition on pulse rate, $F(1,29)=3.35$, $p < .05$; pretest pulse scores significant covariate, $F(1,29)=10.23$, $p < .01$ - virtual reality subjects increased in arousal more than other groups. Virtual reality subjects reported dizziness and nausea more often than subjects in other conditions, $X2(2, N=36)=16.89$, $p < .001$. Significant effect of gender on hostility scores, $F(1,29)=7.80$, $p < .01$ - men reported more hostile feelings during posttest. Significant effect of condition on aggressive thoughts, $F(1,29)=6.18$, $p < .01$ - virtual reality subjects more often to report hostility. No significant differences between conditions in total number of thoughts.

Conclusions: College students playing aggressive virtual reality game displayed greater increase in physiological arousal and aggressive thoughts than those students just observing the game or who simulated virtual reality movements.

164. Fisher, S. (1994). "Identifying video game addiction in children and adolescents." Addictive Behaviors 19(5): 545-553.
Objective: To describe development and initial psychometric properties of a scale developed to identify video game addiction in children and adolescents.

Design: Development of scale. Scale (DSM-IV-JV) developed to measure 9 dimensions of addiction. Survey of amusement machine use carried out in small town in England in one state secondary school.

Subjects and Setting: 460 children aged 11-16 years. 52% female, 48% male. Modal age: 14 years. 63% Protestant, 4% Catholic, remainder agnostic/atheist (1 Jehovah's Witness). Background: 33% professional/managerial, 12% skilled non-manual, 41% skilled manual, 14% partly skilled/unskilled. Questionnaire administered simultaneously to all classes by 32 adults unknown to children.

Intervention: N/A

Outcome Measure(s): video game addiction.

Results: Scale's internal consistency reliability acceptable (9 items at .71). Principal component factor analyses revealed 2 factors: 1) subjectively experienced overwhelming and ever-present need to play video machines 2) restlessness or irritability when trying to cut down or stop playing. Construct validity supported by relationship between pathological video game playing with alternative measures of problem play. In some adolescents, arcade video game playing is behavior resembling pathological gambling.

Conclusion: Initial psychometric properties of scales promising. Further fine-tuning necessary. Arcade video game playing in some adolescents might develop into behavior resembling gambling addiction. Further research necessary to examine social and psychological impact of use of arcade video machines and also home computer games.

165. Michaels, J. W. (1993). "Patterns of Video Game Play in Parlors as a Function of Endogenous and Exogenous Factors." Youth & Society 25(2): 272-289.
Addresses commercial video game parlors & the effects of their physical & social environments on youth, using interview data from 3 parlor managers in VA & informal parlor observation. It is concluded that the environment varies considerably across parlors. Parlor traffic was largely a function of temporal & ecological variables, including season of year, day of week, time of day, & location of parlor. 1 Table, 2 Figures, 17 References. Adapted from the source document

166. Clark, C. S. (1993). "TV violence." CQ Researcher 3(12): 267-287.
In this 1993 review of issues related to television violence, including all-time high rates of violence in children's programming, the proliferation of formats -such as cable, videos, pay-per-view -- and growing trends toward reality TV, the author asks does television violence lead to real violence? While many researchers express the view that consensus evidence is strong enough to show a relationship between television and violence, many industry representatives do not agree. Several governmental actions, such as ratings and warning labels, the Surgeon General's report, and FCC policy, are discussed as well as calls for freedom of speech. A chronology from the congressional hearings on crime and juvenile delinquency and the television link in the 1950s to the release of a joint network violence policy in December, 1992, charts policy and public moves. Brief overviews of violence in music videos, video games, and TV news highlight the prevalence of aggression in media formats. Alternatives for parents, including those outlined in the American Academy of Pediatrics statement, reinforce the need for adult involvement in childhood media use and viewing. © Center on Media and Child Health

167. Funk, J. B. (1993). "Reevaluating the impact of video games." Clinical Pediatrics 32(2): 86-90.
Objective: To determine the frequency of videogame play, as well as location of play and game preference by middle school students.

Design: Survey assessed amount of time playing and location of videogame play by middle school age students. Students asked to name three favorite videogames. 211 games assigned to one of five categories - sports, general entertainment, educational, fantasy violence, human violence. Demographic information also collected.

Subjects and Setting: 7th- and 8th-grade students from large Midwestern city participated. Middle-class population. 357 of 448 distributed surveys analyzed (84%) - 14 not included because of completion by special education students and 77 completed incorrectly.

Intervention(s): N/A

Outcome Measure(s): Frequency and percentage of students playing videogames each week, time spent playing, game preference, and location where played.

Results: 80% with maternal education at high school/college level. Two thirds of girls and 90% boys spent time each week playing videogames at home. Estimated average time played per

week - 2 hours for girls, 4.2 hours for boys. 20% girls and 50% boys played in arcades during the week. Approximately 50% of favorite games were either fantasy or human violence games, 2% were educational.

Conclusions: Adolescents frequently play videogames and seem to be aware of primary game themes. Authors recommend parents monitor game playing and game selection. © Center on Media and Child Health

168. Fling, S., L. Smith, et al. (1992). "Videogames, aggression, and self-esteem: A survey." Social Behavior & Personality 20(1): 39-45.
Objective: To examine if: 1) boys play videogames more than girls, 2) boys are more aggressive than girls, 3) among to videogame lay correlates positively with aggression, 4) amount of play and self-esteem may be related, 5) self-esteem and aggression correlate negatively.

Design: survey administered to high school students.

Subjects and Setting: 153 (104 male, 49 female) 6th-12th graders. The middle school and junior high were public schools and the high school was a private one for disturbed young people. 84% were 11-14 years old, 56% white, 29% Hispanic.

Outcome Measure: video game play, aggression ratings, self-esteem ratings.

Intervention: N/A

Results: Boys reported playing videogames more than girls on the frequency rating ($p<.0001$). Boys were rated as more aggressive than girls in self-ratings ($p<.0001$), as well as in teacher ratings ($p<.001$). The summed measure of amount of videogame play correlate with both teachers' rating of aggression and self-report of aggression ($p<.01$).

Conclusion: More research is needed on both possible positive and negative effects of video game play. © Center on Media and Child Health

169. Sneed, C. and M. A. Runco (1992). "The beliefs adults and children hold about television and video games." Journal of Psychology 126(3): 273-84.
Objective: To compare the influence of television and video games on children and adults.

Design: Survey Phase 1 Questionnaire regarding effects of TV and video games on children. Same survey for children and adults. Phase 2 Questionnaire administered to different groups of parents and children and to control group of adults without children.

Subjects and Setting: Adults recruited from California State University, Fullerton. Parents asked children to participate. Phase 1 Parents aged 30-52 yrs (n=23, 17 females). Children aged 10-19 yrs (n=26, 14 females); 6 recruited from winter church camp. Phase 2 Parents, children, and adults without children (n total =204). 96 parents (66 females), 55 non-parents (51 females), and 53 children (24 females).

Intervention(s): N/A

Outcome Measures: Self-reported beliefs about influences of TV and video games.

Results: 4 TV and 2 video-game clusters. Desirable and undesirable TV clusters Significant main effect of group: MANOVA [F (4, 350) = 3.73, p < .01], ANOVA undesirable [F (2, 176) = 6.40, p < .01], desirable [F (2, 176) = 3.74, p < .05]. Differences between parents and children for undesirable and desirable TV clusters [F (2,175) = 8.19, p < .001]. Children gave higher "TV as desirable" (M 3.13 vs. 2.90) and lower "TV as undesirable" (3.15 vs. 3.54) ratings than parents. Activity and creativity TV clusters Significant main effect of group: MANOVA [F (4, 370) = 3.28, p < .05], ANOVA activity [F (2,186) = 4.05, p < .05], creativity [F (2,186) = 3.83, p < .05]. Significant differences between parents and children [F (2,185) = 7.00, p < .01]. Children ranked "TV as stimulating creativity" (3.18 vs. 2.86) and "not interfering with other activities" (3.35 vs. 3.69) higher than parents. Desirable and undesirable Video Game clusters MANOVA and ANOVA main effect of group not significant. Significant main effect of questionnaire type: MANOVA [F (2, 185) = 4.03, p < .05], ANOVA undesirable cluster [F (1, 186) = 6.16, p < .05]. Ratings for TV differed from video games [7, 178) = 4.09, p < .001]: significant univariate tests of aggression [F (1, 184) = 3.93, p < .05], originality [F (1, 184) = 4.18, p < .05], attention span [F (1, 184) = 4.46, p < .05], and confusing reality with fantasy [F (1, 185) = 13.01, p < .001].

Conclusions: Parents and children had contrasting views regarding television's influence but similar views about video games. © Center on Media and Child Health

170. Funk, J. B. (1992). "Video games: Benign or malignant?" Journal of Developmental & Behavioral Pediatrics 13(1): 53-54.

171. Adler, P. A., P. Adler, et al. (1992). "Playing with power in movies, television, and video games: From Muppet Babies to Teenage Mutant Ninja Turtles." American Journal of Sociology 98(1): 175-176.

172. Segal, K. R. and W. H. Dietz (1991). "Physiologic responses to playing a video game." American Journal of Diseases of Children 145(9): 1034-1036.
Objective: To quantify the metabolic and cardiovascular responses to playing a video game.

Design: Baseline resting measurements were taken while the subjects simply stood in front of the video machine, without playing, for 30 minutes. 3 measures of 5 minutes duration each at 5, 15, and 25 minutes within the 30 minute baseline period were taken. The subjects then played the game for 30 minutes, during which the same number of 5 minute measurements were made.

Subjects and Setting: 20 males and 12 females, age range 16-25 years (mean +/- SEM age, 20 +/- 1 yrs). The arcade version of Ms. Pac-Man was the video game played.

Intervention(s): N/A

Outcome measures: Oxygen consumption, carbon dioxide production, minute ventilation, respiratory quotient, blood pressure and heart rate were measured. Energy expenditure was estimated using a derivation of the Weir equation.

Results: Oxygen consumption, systolic and diastolic blood pressure, and heart rate were all significantly higher while playing the video game than while standing quietly. Energy expenditure (kJ/min) increased from 6.08 +/- 0.24 at rest to 10.94+/- 0.49 while playing the video game. The increase in energy expenditure correlated with the increase in systolic blood pressure (r=.64, p<.001). This was thought to be due to the isometric activity involved in using the hand grip.

Conclusions: Playing a video game was shown to not be a completely passive activity. The energy expenditure is similar to mild-intensity exercise. This is not sufficient, however, to have any beneficial effect on cardiorespiratory fitness. © Center on Media and Child Health

173. Turner, J. R. (1989). "Individual differences in heart rate response during behavioral challenge." Psychophysiology 26(5): 497-505.
This program of experiments examined heart rate responses to mental arithmetic and a video game. Attention first focused on their metabolic relevance. Comparison with heart rate/oxygen consumption regression equations generated from isotonic exercise data revealed that the heart rate increases of certain individuals were considerably in excess of those necessitated by contemporary metabolic demand. Both temporal and intertask consistency of reaction were explored, and supportive evidence was obtained. The relationship between laboratory and real-world reactions was investigated, and preliminary evidence found suggesting that in-laboratory responses are indicative of responses to more naturalistic stressors. Finally, twin studies examining the genetic and environmental determinants of individual differences in heart rate change during the tasks revealed a substantial genetic component for these responses.

174. Braun, C. M. J. and J. Giroux (1989). "Arcade video games: Proxemic, cognitive and content analyses." Journal of Leisure Research 21(2): 92-105.
A study was designed to determine psychological complexity and reinforcement characteristics of popular arcade video games, including sex differences in game content, clientele social structure, human-to-human interaction contingencies, and value content. Results suggest a need for public control of children's access to the games and the video industry. (SM)

175. Schutte, N. S., J. M. Malouff, et al. (1988). "Effects of playing video games on children's aggressive and other behaviors." Journal of Applied Social Psychology 18(5): 454-460.
Objective: To determine the behavioral effects of playing video games.

Design: Randomized control trial. Subjects were matched on sex, assigned to violent (Karateka) or nonviolent (Jungle Hunt) video game condition, and arranged into pairs. Each subject played game for 5 min., then watched partner play for 5 min. Paired subjects then engaged in free play in different room for 5 min., under observation; room contained 3-ft. doll dressed in karate robe, 4-ft. jungle swing, stuffed animals, and 2 children's books.

Subjects and Setting: 31 children (15 boys, 16 girls), 5-7 years old (mean age = 5.52) attending day-care center. Study conducted at center. Games played on computer, with keyboard and joystick as controls.

Intervention(s): N/A

Outcome Measure(s): Aggressive behavior and behavior similar to that in Jungle Hunt.

Results: Older children tended to exhibit more aggressive behavior; there was no effect for gender. Children who played Jungle Hunt were significantly more likely to play with the jungle toy, while children who played the violent video game were significantly more likely to show more aggression [condition effect strength: $F(2, 28) = 3.43$, $p<.046$].

Conclusion: After playing video games, children were likely to exhibit behaviors that are similar to those portrayed in the games, including aggressive behaviors.

176. Carroll, D., J. R. Turner, et al. (1987). "Heart rate and oxygen consumption during mental arithmetic, a video game, and graded static exercise." Psychophysiology 24(1): 112-8.

177. Axelrod, S. and et al. (1987). "Effects of Video Games as Reinforcers for Computerized Addition Performance." Journal of Special Education Technology 9(1): 1-8.
Four 2nd-grade students completed addition problems on a computer, using video games as reinforcers. Two variable ratio schedules of reinforcement failed to increase student accuracy or the rate of correct responses. In a no-games reinforcement condition, students had more opportunities to respond and had a greater number of correct answers. (Author/JDD)

178. Chambers, J. H. and F. R. Ascione (1987). "The effects of prosocial and aggressive videogames on children's donating and helping." Journal of Genetic Psychology 148(4): 499-505.
Objective: To investigate the effects of a prosocial and aggressive themes in video games on children's prosocial behavior.

Design: Children and early adolescents randomly assigned to either a control condition or one of four treatment conditions. 2 of 4 treatment conditions-children played a videogame with prosocial content either singly or cooperatively with another child. Other 2 treatment conditions-children played an aggressive videogame either singly or competitively. Factorial design across the five conditions with blocking by age and sex.

Subjects and Setting: 160 children recruited from public school district in Logan, Utah. 50% of children recruited from 3rd and 4th grade (ages 8-11), 50% from 7th and 8th (ages 12-15). 50% in both age groups boys. 16 elementary age and 16 junior high age boys and girls randomly assigned to each of 5 conditions.

Outcome Measures: donation, helping

Interventions: N/A

Results: 3-way ANOVA showed older students donated significantly more than did younger students (M = 10.19, SD = 6.84; M = 4.45, SD = 5.36). Children who played either of the aggressive videogames donated significantly less than did those who played prosocial games themselves (p<.05). Playing prosocial videogame didn't increase prosocial responding, but playing the aggressive videogame suppressed this behavior (p<.10).

Conclusions: Results demonstrate a reliable difference between the effects of solo play of a prosocial videogame and the effects of both solo and competitive play of an aggressive videogame on children's donating behavior. Failure of the prosocial game to accelerate prosocial responding might be due to the relatively brief treatments used I the study and/or to the particular prosocial game utilized. © Center on Media and Child Health

179. Silvern, S. B. and P. A. Williamson (1987). "The effects of video game play on young children's aggression, fantasy, and prosocial behavior." Journal of Applied Developmental Psychology 8(4): 453-462.
Objective: To determine the effects of video game play on children's behavior

Design: Experiment. In pairs, children participated in three experimental sessions. The first was a baseline session where they played with toys for 10 minutes. In the second session, the pair came back and either played a violent video game or watched a violent television program. Only one child in the pair played the video game, and the other child watched. The children then played for 10 minutes in the same setting where they played in the first session. In the third session, the pair came back and played the video game if they had watched television the day before, or vice versa. Each play session was coded in 10-second intervals for aggression and positive social interactions.

Subjects and Setting: 28 children (14 male/14 female). Average age was 65.09 months (range: 4 to 6 years). Pairs were same sex, similar in age, and in the same class. Setting was a room in the school.

Interventions: N/A

Outcome Measures: Aggression: frequency of physical, verbal, and object aggression. Positive social interaction: frequency of positive verbal interactions

Results: Significant treatment effect ($F[2,56] = 3.28$, $p < .05$) for aggression where the children were more aggressive following television viewing and computer game playing than they were at baseline, but there was no difference between the television and computer sessions. Significant treatment effect ($F[2,56] = 4.59$, $p < .05$) for positive social interaction where the children displayed less prosocial behavior following television viewing and computer game playing than they did at baseline, but there was no difference between the television and computer sessions.

Conclusions: Playing violent video games is similar to viewing violent television in that they both lead to increases in aggressive behavior and decreases in prosocial behavior. © Center on Media and Child Health

180. Anderson, C. A. and C. M. Ford (1986). "Affect of the game player: Short-term effects of highly and mildly aggressive video games." Personality & Social Psychology Bulletin 12(4): 390-402.
Objective: To determine the short-term effects of aggressive video game play on players' affective states

Design: Two studies. Study 1 - Evaluative study choosing 2 video games used in Study 2. Played and rated 2 of 11 games. Games and order played randomly assigned. Study 2 - Experimental manipulation, 3 (highly aggressive, mildly aggressive, control) x 2 (male, female) factors. Random assignment to 1 of 3 experimental conditions (highly aggressive game, mildly aggressive game, no video game). Affect measured through completion of Multiple Affect Adjective Checklist. Subjects unaware of purpose until post-study debriefing.

Subjects and Setting: Study 1 - 55 Rice University undergraduates, participating for extra credit. Study 2 - 60 Rice University undergraduates, participating for extra credit. 20 subjects per condition.

Interventions: N/A

Outcome Measures: Study 1 - 7-point scale ratings on 7 dimensions (violent content and graphics, action, lack of pauses, difficulty, enjoyment, frustration) Study 2 - Differences in affect scores between experimental conditions.

Results: Study 1 - Zaxxon (used for highly aggressive game) perceived as having more violent graphics and content than Centipede (used as the mildly aggressive game), Fs(1,99)>12, ps < .001. Study 2 - Highly significant effect of game type on hostility score, $F(2,54)=8.45$, $p < .001$ - playing mildly and highly aggressive video games increased hostility. Significant effect of game type on anxiety score, $F(2,54)=4.13$, $p < .05$ - playing mildly and highly aggressive video games increased anxiety. Highly aggressive game increased anxiety significantly more than mildly aggressive and no-game, $ts(54) > 2.4$, ps < .02. Significant sex by game interaction for depression, $F(2,54)=3.59$, $p < .05$ - males more depressed playing mildly aggressive game, females more depressed than males in other 2 conditions.

Conclusions: Playing aggressive video games can have short-term negative effects on emotional state of players. Type of game affected degree of affective change. © Center on Media and Child Health

181. Cooper, J. and D. Mackie (1986). "Video games and aggression in children." Journal of Applied Social Psychology 16(8): 726-744.
Objective: To examine the effect of playing or watching others play aggressive and nonaggressive video games on fifth-grade boys and girls' free play.

Design: Randomized control trial with three groups: aggressive video game, nonaggressive video game, control pen-and-paper game. Pairs matched on sex and grade. Random assignment within pairs to game player/observer roles. Students for whom parental consent could not be obtained were excluded.

Subjects and Setting: 4th and 5th graders (n = 84) from a suburban school system in Trenton, NJ. 52% male, 48% female.

Interventions: N/A

Outcome Measure(s): Effect on free play measured through observation by an experimenter who recorded toys played with, order of play, length of play for 8 minutes. Interpersonal aggression in children measured by selecting a punishment (grounding, restricted TV, sent to room) and degree of severity for a "bad" child and a reward (surprise, fewer chores, later bedtime) including degree for a "good" child. Perception of games played measured by a 5-point scale survey.

Results: The video games had more effect on girls' free play than boys'. Girls that played the aggressive video game spent more time playing with aggressive toys [$F(1,288) = 9.98$, $p < 0.002$] and less time with the quiet toys [$F(1,288) = 5.51$, $p < 0.02$) than girls in the other groups. The type of video game played/watched did not affect boys' play with aggressive toys. Video game types had no impact on interpersonal aggression in boys or girls.

Conclusions: Since a greater impact of aggressive video game play was found among girls, it may lend evidence that increased aggression is mediated by arousal from playing video games and that this effect is greater among those relatively inexperienced with violence. Suggest further studies considering perceived success of video game play, social expectations between sexes, and watchers' attention to the games.

182. McCutcheon, L. E. and J. D. Campbell (1986). "The Impact of Video Game Playing on Academic Performance at a Community College." Community-Junior College Quarterly of Research & Practice 10(1): 59-63.
Studies the relationship between video game playing and academic achievement. Compares matched groups of community college psychology students, differing in the amount of their game playing. There were no differences between frequent and infrequent players on measures of psychology class attendance, locus of control, or grade point average. (Author/AYC)

183. Ng, D. and L. June (1985). "Electronic Leisure and Youth: Kitchener Arcade Video Game Players." Society & Leisure 8(2): 537-548.
Selected characteristics of arcade video game players were examined for a random sample of 218 youth in grades 7-12 in Kitchener, Ontario, based on data collected by a 39-item questionnaire & were analyzed using descriptive & inferential statistical techniques. Focus was on: (1) sociodemographic characteristics of the players, (2) changes in their other leisure pursuits, (3) major factors associated with their initial attraction to video-game playing, & (4) salient motives for playing video games. It appears that young people's increased exposure to computer technology has whet their appetites for electronically oriented leisure pursuits. 28 References. Modified HA

184. Gagnon, D. (1985). "Videogames and Spatial Skills: An Exploratory Study." Educational Communication & Technology 33(4): 263-75.
This study of undergraduate and graduate students examined the potential relationship between spatial aptitude and videogame use to: (1) determine relationship between scoring ability on videogames and spatial aptitude as defined by standardized tests; (2) explore potential gender differences; and (3) examine effects of videogames practice on spatial aptitude scores. (MBR)

185. Ellis, D. (1984). "Video arcades, touth, and trouble." Youth & Society 16(1): 47-65.
Objective: Do video arcade involvement positively or negatively contribute to deviant/delinquent or conforming behavior in young persons?

Design: Mixed method; Self-reported information of deviation and delinquency behaviors collected via questionnaire & interviews. Participant observation was done in more than 40 video arcades.

Subjects and Settings: Probability sample chosen from two schools in metropolitan Toronto. Sixth, seventh and eighth-graders, n=258, 57% boys, primarily from working class families.

Intervention(s): N/A

Outcome Measure(s): More or less troublesome - defined by answers provided to questions about behaviors, events, attitudes or attitudes of past school year. Deviation scale consisted of two subscales, one measuring level of drinking, smoking and stealing (criminal code offenses) and one measuring truancy, aggression, and vandalism (juvenile status offenses). Video arcade involvement and academic performance measured by parent/teacher model and family social control assessed by the Family Control Index.

Results: A substantial amount of time was not spent in video arcades, only 9.3% of subjects reported spending more time doing so than any other activity. On average, 2/3 of sample was involved in activities approving of adults, while 1/3 of sample reported involvement in deviant activities, but each type of activity was not exclusive. In other words, some subjects reported involvement in both approving and deviant activities. Academic performance and video arcade involvement were positively associated ($p < .05$). Subjects visiting arcades after 10 pm were mostly male and accounted for almost half of self-reported deviant behaviors. Family social control had a positive association between gender and deviant activities. Firm parental control was reported more by females.

Conclusions: Generally, a positive association between video arcade involvement and deviant behavior was found mostly in a few subjects visiting video arcades after 10 pm.

186. Dominick, J. R. (1984). "Videogames, television violence, and aggression in teenagers." Journal of Communication 34(2): 136-147.
Objective: To examine the relationship between playing videogames and watching violent television programs, and their impact on aggression and self-esteem.

Design: Cross-sectional study of convenience sample. Questionnaire distributed in class used self-report measures of time spent playing videogames at home and at the arcade as well as frequency of watching pre-determined violent TV programs. General TV viewing, school performance and social class also assessed.

Subjects and Setting: Sophomores and Juniors (n = 250) from three high schools in northeast Georgia. Excluded students unwilling to give up a free period to participate. 44% male. Sample reflected lower percentage of videogame players than expected from Gallup poll of 13 to 18 year olds (76% compared to 93%).

Interventions: N/A

Outcome Measure(s): Aggression index based on hypothetical aggressive reactions to situations, manifest physical aggression (point at which one resorts to physical aggression), and aggressive behavioral delinquency (frequency of fighting). Self-esteem index based on Rosenberg study.

Results: Adolescents who watched more violent TV shows also spent more time at the arcades playing videogames ($r = 0.26$, $p < 0.01$). Home videogame playing not significantly correlated with viewing violent TV programs. Manifest physical aggression was strongly related to arcade videogame playing among girls ($r = 0.19$, $p < 0.05$) and to watching violent TV programs among boys and girls ($r = 0.22$, $p < 0.01$). Arcade videogame playing was associated with how frequently boys got in a fight with school performance and TV violent viewing taken into account ($r = 0.20$, $p = 0.005$). Relationship between self-esteem and videogame playing was varied and needs further study.

Conclusions: Videogame playing time does not seem to have cut into time spent watching TV. Social interactions while playing videogames may be a factor in their overall effects. Recommend additional studies of the effect of videogames on self-esteem and similar studies in other geographic settings.

187. Egli, E. A. and L. S. Meyers (1984). "The Role of Video Game Playing in Adolescent Life: Is There Reason to Be Concerned?" Bulletin of the Psychonomic Society 22(4): 309-312.
Adolescents (N = 10 Fs & 141 Ms) in a Davis, Calif, video arcade were surveyed to determine their attitudes toward video game playing (VGP) & its role in their lives. Concerns have been expressed in the public media that VGP is addictive for youngsters & leads to excessive expenditures of time & money, poorer school performance, reduced involvement in sports, & less opportunity to develop social skills. The data gathered do not support these contentions. Although approximately 10% of the Ss appeared to show some compulsive behavior in their play, no identifiable problems were correlated with the amount of time spent playing. For the

great majority, VGP was an enjoyable activity kept in perspective with other aspects of their lives. 2 Tables, 7 References. Modified HA

188. Gibb, G. D., J. R. Bailey, et al. (1983). "Personality Differences between High and Low Electronic Video Game Users." Journal of Psychology 114(2): 159-165.
A controversy has recently emerged in the US over the possible effects of video game usage on the individual personality. To assess personality differences among video game players, high & low users of video games (N = 280) were compared by sex on the personality dimensions of: (1) self-esteem/self-degradation, (2) social deviance-conformity, (3) hostility-kindness, (4) social withdrawal-gregariousness, (5) obsessive-compulsive, & (6) achievement motivation. Correlations between the six personality variables & the weekly amount of time spent playing video games yielded no significant relationships for either sex. Correlations between the variables & length of experience with video games indicated that Fs with longer experience were more achievement-motivated than Fs with lesser experience. 2 Tables, 8 References. HA

189. Malec, J. F., R. M. Jones, et al. (1982). "Video Game Practice Effects on Sustained Attention in Patients with Cranio Cerebral Trauma." Archives of Physical Medicine & Rehabilitation 63(10): 542.

190. Kaplan, S. and S. Kaplan (1981). "Video Games, Sex, and Sex Differences." Social Science 56(4): 208-212.
A comparison of M & F video game players to determine differences in their responses to video games, with respect not only to sexuality, but also to several other emotional responses associated with video game playing - anger, excitement, frustration, joy, & exhilaration. Conclusions are based on examination of the pertinent literature, approximately 20 hours of observation at 2 mall arcades, interviews with the owner of 2 arcades & 4 arcade attendants, & statistical analysis of 430 questionnaires responded to by Coll freshmen. Contrary to what has been alleged about pinball games, analysis revealed no evidence of a sexual component to video game playing. As far as other emotional responses were concerned, there were minimal differences between Ms & Fs. In all instances - with the exception of intensity of frustration & excitement - Ms were slightly higher than Fs in their positive responses. Modified AA

3234/001/X77100.v1
1:44 PM