



The logs of Eliza and other media stories: Behavioral and Developmental Effects of a School Based Media Education Program—Berlin Longitudinal Study Media

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The implementation of electronic media platforms by teachers and tutors is considered as state-of-the-art education. In the last decade, teachers at all levels of schooling had to take up the challenge of acquiring the needed knowledge, both to handle and to teach the appropriate use of multimedia computers as well as internet-based communication and learning tools. Beyond educational use of modern media technologies, leisure time media usage by children has developed even more rapidly. Modern childhood is undeniably a media childhood. Most children's everyday life activities are characterized, if not dominated, by the usage of several electronic media formats and contents. German nine-year-old schoolchildren, for example, spend an average of 1.5 hours daily watching television, and an average of 0.5 hours playing video and computer games. About 14 percent spend more than 3 hours daily total in both activities (see Feierabend & Klingler, 2003a; Mößle, Kleimann, & Rehbein, 2007). In 2002, about 25 percent of all German first graders already had their own TV in their bedroom (Feierabend & Klingler, 2003b). Internet communities like *facebook.com* or its German equivalent *schueleroz.net* empower young children to live an independent, digital life apart from "offliners" like parents, teachers and tutors. Compared with the enormous difficulties in establishing media use and teaching skills in a constantly overstrained teaching staff, children's abilities to integrate new media technologies into their everyday life seem to be nearly unlimited. Depending on one's point of view, the consequences of these trends can be described as either promising or depressing. Optimists refer to the complex and creative media use patterns many children were able to develop without any adult guidance in recent years. Pessimists rather point to the long-term consequences.

Alarming Media Effects

While parents and teachers slowly begin to explore the benefits and risks of the new media age, their children and students are right in the middle of it. The possible effects of children's often excessive media habits are still hotly debated in public forums as well as among researchers. Besides the debate regarding possible influences of media use on children's and adolescents' social and cognitive development, the relationship of violent media content and violent behavior has been intensely discussed for a long time. In the last years, elaborated studies and meta-

analyses show rather clear results supporting the pessimists' point of view. Today "there is little doubt that viewing television violence has a causal effect on aggressive behavior" as Huston and Wright (1998, p. 1043) recapitulated in their chapter on the effects of media violence in the *Handbook of Child Psychology* after a thorough review of several experimental, longitudinal and meta-analytical studies. "Overall", they conclude, "the longitudinal studies support theories predicting that violence contributes to children's learned patterns of behavior or scripts in ways that can be manifested in behavior well beyond childhood" (Huston & Wright, 1998, p. 1031). Regarding computer and video games, Möller (2006) for the first time analyzed the relationship between violent video game content and aggression among primary school children in a longitudinal design. Her findings show a causal link between the playing of violent computer games and physical aggression, a result which is consistently reported in the literature (see Anderson & Bushman, 2001; Anderson & Dill, 2000; Anderson, Gentile, & Buckley, 2007; Bushman & Anderson, 2002; Bushman & Huesmann, 2006; Gentile, Lynch, Linder, & Walsh, 2004). Recent studies also point to a causal relation between media violence and a desensitization to real-life violence as well as a loss of empathy of heavy users of media violence (see Bartholow, Bushman, & Sestir, 2006; Funk, Baldacci, Pasold, & Baumgardner, 2004). Carnagey et al. summarize the current research as follows: "Children consume increasingly threatening and realistic violence, but the increases are gradual and always in a way that is fun. In short, the modern entertainment medial landscape could accurately be described as an effective systematic violence desensitization tool" (Carnagey, Anderson, & Bushman, 2007, p. 7).

Violence, desensitization, loss of empathy: these relatively well-explored effects can only serve as examples for an entire bouquet of possible negative effects associated with modern electronic media usage by children. So-called computer game addiction and poor academic performance (for a literature review see Mößle, Kleimann, & Rehbein, 2007), to name but two more examples from our current research on children's media usage, are both urgent media related topics. In addition, our research shows the disturbing result that parents seem to be too vastly overextended to successfully guide their children to use appropriate media content, for an appropriate purpose, for an appropriate time. In a study with 5,529 fourth grade primary school students conducted in Germany in 2005, 24 percent of all interviewed children reported a complete absence of any computer-related media education by their parents. Only 39 percent reported appropriate parental guidance. Unsurprisingly, we also found a remarkable effect of family status on parents' media education efforts: The lower the parents' educational level and household income, the lesser children's electronic media use was attended by their parents (see Möle, Kleimann, & Rehbein, 2007).



School-Based Media Education

Since a) electronic screen media are widely available in children's bedrooms, since b) several problematic media usage effects are considered by international research, and since c) parental guidance and monitoring of children's media usage tend to be unsatisfactory, increasing emphasis has to be placed on the role of schools in imparting media skills. To date, however, children's everyday media use is rarely touched upon in the classroom. Furthermore, German teachers' and school authorities' difficulties in not only promoting modern media as effective educational tools, but also choosing children's media usage as a central educational topic, essentially dash the hope set on the beneficial role of schools. Looking abroad, however, a couple of promising, empirically evaluated approaches can be observed, using school-based media literacy programs and media education programs for a whole set of different purposes. Teaching units on tobacco and alcohol abuse (see Gonzales, Glik, Davoudi, & Ang, 2004; Pinkleton, Weintraub Austin, Cohen, Miller, & Fitzgerald, 2007), on obesity or prevention of anorexia (see Austin, Field, Wiecha, Peterson, & Gortmaker, 2005; Gortmaker, 2008; Robinson, 1999) as well as on violence reduction (see Botvin, Griffin, & Nichols, 2006; Robinson, Wilde, Navracruz, Haydel, & Varady, 2001), all more or less primarily focus on children's and adolescents' media usage. Depending on the specific aim of the program and the age of the participants targeted, either reflection-based media literacy strategies or reduction-based media education programs have been implemented. Teaching units focused on alcohol and tobacco, for example, mainly aim to sensitize students to hidden or obvious advertising messages as well as to certain "cool" role stereotypes associated with tobacco or alcohol use as portrayed in the media. Some obesity prevention programs, on the other hand, mainly focus on the sheer reduction of media usage times, for the reason that extensive media use, regardless of the perceived content, is causally linked with a more sedentary and therefore unhealthy lifestyle. Beyond the particular theme of a program, a student's age is of exceptional importance, as exercises in reflecting certain media messages do not make any sense for first graders, for example. Researchers widely agree, however, that media education programs are only likely to succeed if two conditions apply: Firstly, children must be reached at an age where questionable behavior and attitude patterns have not yet become ingrained and, secondly, it seems that

intensive work with parents is necessary in addition to the media education at school. It is therefore unsurprising that the effective media curriculum published by Stanford University, which mainly focused on a reduction approach, is targeted at nine-year-olds and emphasizes work with parents (Robinson, 1999; Robinson, Wilde, Navracruz, Haydel, & Varady, 2001). Crucial effects reported after a school-based media usage intervention program (18 lessons within about 2 months) were a reduction of average TV and computer game times, a reduction of school violence, an improvement in class climate and a decrease in body mass index.

The media education program—implementation and measure

Taking the promising effects of the Stanford study, we worked with primary school teachers in a pilot project, part of the *Berlin Longitudinal Study Media*, to develop and systematically evaluate school-based media education lessons for the third and fourth grades. Our main goal, however, was not to impact children's body mass index or class climate, but to enable children (and their parents) to establish an age appropriate, moderate media use without undesirable side effects.

The *Berlin Longitudinal Study Media* is a five-year longitudinal control group study (see Figure 1) with 1,059 elementary school children (third to sixth grades; baseline, $n = 113$; treatment, $n = 492$; control, $n = 454$).

492 children in 20 primary school classes across Berlin took part in the pilot lessons. The two pilot teaching units were based on two reading booklets in which schoolchildren learned about various aspects of media use and media effects in a set of stories and tasks that build on each other. Within the third-grade unit (approx. 12 lessons) entitled "Media Pilot Training Program", conducted in late spring 2006, students in all participating classes read a story that deals with several third grade students and their experiences with TV and computer games. After a controversy between the students and their teacher about inappropriate media use on a school trip, the class and the teacher enter a media usage contract. Core instruments of this first unit were a media and leisure time log, a TV-planning tool and the media usage contract. In the fourth grade unit (approx. 12 lessons) "The Logs of Eliza", which followed one year later in 2007, the story of Bela, a thirteen-year-old boy, is told. School problems and the critical illness of his

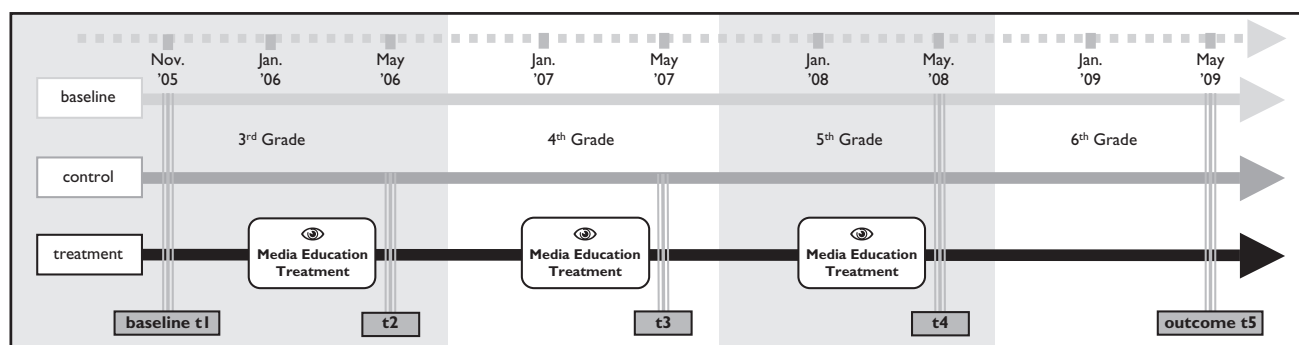


Figure 1. Design.

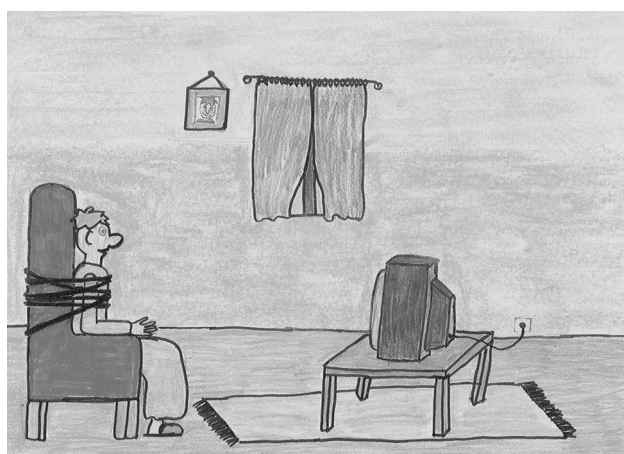
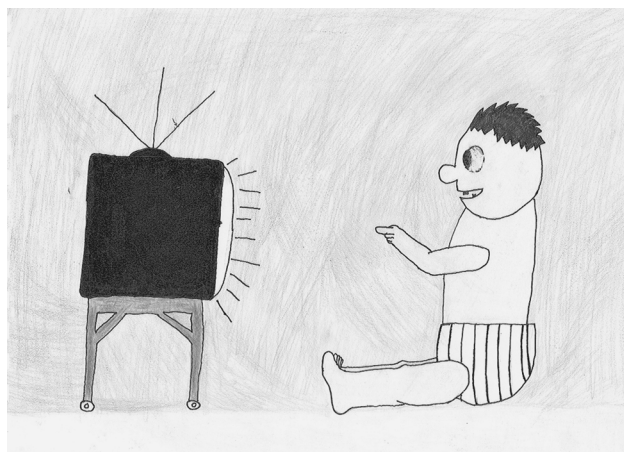


Figure 2. An essential part of the media education lessons was the creative reflection of children's media usage and its possible effects.

mother impel him to escape from everyday life into the virtual world of an online role-play computer game. After a chat with Eliza, an old-fashioned internet *chatbot* with some strange new abilities, Eliza mails Bela a couple of logs: journal files of Eliza's former chats with kids like him. Every log file describes another media-related problem such as media violence use, social isolation or media addiction. Reading these logs, Bela realizes that Eliza is not an ordinary computer *chatbot*, but a kind of media usage advisor. Unfortunately, it turns out that the chat computer's advice to solve its chat partner's problems is not very helpful, but may be rather extremely harmful. Finally, he realizes, it is up to him to develop a reasonable approach to media usage.

Both teaching units were supplemented by several exercises, role-plays, peer interviews and behavioral trainings. Within the units, teachers were advised to give clear instructions to reduce electronic media usage to a reasonable time slot not exceeding 60 minutes per school day and to discuss possible harmful effects of an age-inappropriate media usage. On the other side, we instructed the teachers to organize their lessons as a process of two-way-learning: Teachers were explicitly encouraged to give students the chance to talk about their favorite media devices and contents, to illustrate the fascinating aspects of electronic

media usage and to explain the positive facets of electronic media. It is our firm conviction that only after teachers really understand their students' media world can they be serious pilots and broadly accepted advisors in this world. Furthermore, both teaching units were accompanied by trilingual leaflets for parents, parent-teacher-conferences and letters to parents. As the cooperation of parents is an essential part of a teaching unit on leisure time media behavior, we advised the teachers to arrange parent-teacher-conferences where the "media topic" was linked with other important (e.g. monetary) decisions, to get a real chance to get through to almost all parents and not only the committed ones.

On three occasions—before the first lesson in autumn 2005, after the first lesson in spring 2006, and after the second lesson in spring 2007—a survey was conducted with the children in the classes receiving the lessons and with a further 454 schoolchildren from 20 control classes. On all measurement occasions, a paper-pencil interview was completed within the classroom setting concerning media availability and exposure, leisure time and social behavior, perceived parental education and guidance (general/media), as well as socio-demographic parameters. Standardized psychological tests served to assess students' IQ (CFT 20), academic self-image, classroom climate and social integration (FEES 3-4). Additionally, all students' body weight and height were taken. The children's parents were questioned at t1, t3 and t4 regarding socio-demographic parameters, educational achievement, media equipment and exposure (self/child) as well as their children's leisure time behavior. A teacher questionnaire was used to evaluate class characteristics, school performance and work habits at all measurement occasions.

Findings

Due to our primary research focus on media usage effects on academic achievement of primary school students, data on students' violent behavior was not collected until t3. Therefore, at this point we can neither present longitudinal data on the correlation between media violence and violent behavior, nor can we interpret group differences between control and treatment group as causal effects of the intervention. Nevertheless, we considered it appropriate to calculate a structural equation model for t3 to test the hypothesis of an independent effect of media usage on violent behavior. Our model (see Figure 3) shows significant correlations between gender (male), personality variables (lower empathy and higher impulsiveness), a high degree of daily media exposure (content and time), and problematic social behavior (measured by school violence).

In this analysis, we especially focused on the role of empathy and its moderating influence on the relationship between media violence and violent behavior. On the one hand, as expected, we observed a direct, independent effect of violent media content use on violent behavior, although we could not verify, as our literature review would suggest, a significant direct effect of violent media content use on empathy. On the other hand, we could confirm a direct effect of temporal daily media exposure on empathy. From our point of view, this result can be interpreted as indicating a necessary change in our perspective on media

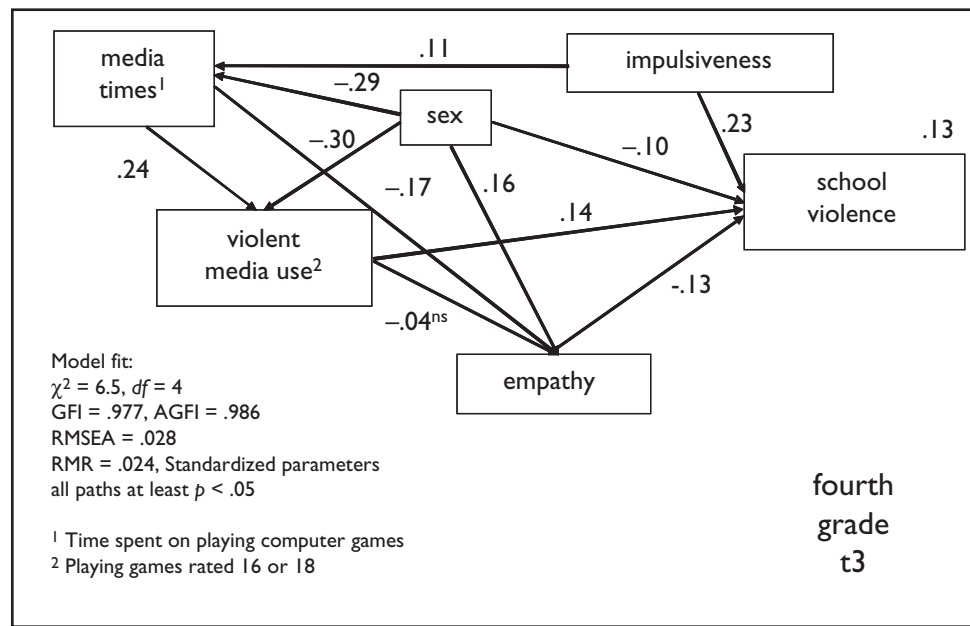


Figure 3. Structural equation analysis of school violence.

violence research. Sheer media exposure times are of importance for the development of violent behavior, an influence that should not be underestimated. Children who spend several hours a day in digital virtual worlds, interacting only with media characters or avatars of other users, seem to have a deficient development of empathy, independent of the consumed content. Our interpretation: Para-social relations to media characters and avatars cannot substitute the role of real-world social interactions in developing empathic abilities.

In this context, the results regarding our media teaching units were encouraging (included in the analyses were only those students who participated in all three measurement occasions; treatment: $n = 401$, control: $n = 363$): Firstly, after three measurement occasions, the percentage of primary school children with a television or a games console in their bedroom was significantly smaller in the intervention than in the control group (see Figure 4).

Although there were already minor differences between the groups at the time of the first survey (t1), the media education lessons succeeded in widening them. We also observed effects on media exposure (time and content) for children in the 20 intervention schools at the third measurement occasion (t3), compared to children in the control schools. Regarding school achievement, further measurements have to be obtained before we can assess true effects of our media education program. First analyses, however, show a higher percentage of children improving their marks in the intervention group (56 percent) than in the control group (48 percent). Besides students' media behavior, first analyses of t1 to t3 longitudinal data focused on parental media education and guidance. In our understanding, parental media education consists of an attendance-part and a regulation-part. Parental attendance implies an interest in children's media habits and an active engagement in helping children to reflect on those habits. The regulation-part consists of clear parental rules regarding tolerable media times and media content on the one

hand, and monitoring of these rules on the other hand. In our questionnaire, we focused on parental media education regarding TV usage and video game playing. Figure 4 d) shows an intervention effect on parental media education relating to TV usage. Parents' educational engagement in the video game playing habits of their children increased in both groups, whereas we cannot detect an additional intervention effect. Even though control group parents and group parents show intensified efforts in video game related education (which is probably related to the intensive current debate on video game usage in Germany), the work with parents has to be intensified in the subsequent years of our program.

What is to be Done?

Fortunately, our program is far from being finished yet. In early summer 2008, students in the treatment group took part in a third step of our media education program, and a fourth measurement (5th grade) was instituted in all three study groups (data regarding this third year of our program are currently being analyzed). An additional media education unit and measurement occasion is scheduled for the end of sixth grade in summer 2009 and we will probably be able to follow students of all groups, treatment, both control and baseline, up to the ninth grade. Thus, long-term effects of our primary school media education program can be tracked into adolescence. So much for the good news. The bad news is that due to crammed curricula, it is hard to convince treatment group teachers to take part in a last, fourth teaching unit. As long as school-based media education is not made compulsory in German curricula and is focused only on new electronic learning and teaching tools, this very important task will tend to be sidelined for sure. It is necessary, on this account, to illustrate the chances and advantages of media education programs based on viable, well-evaluated examples, which can easily be integrated into current school curricula.

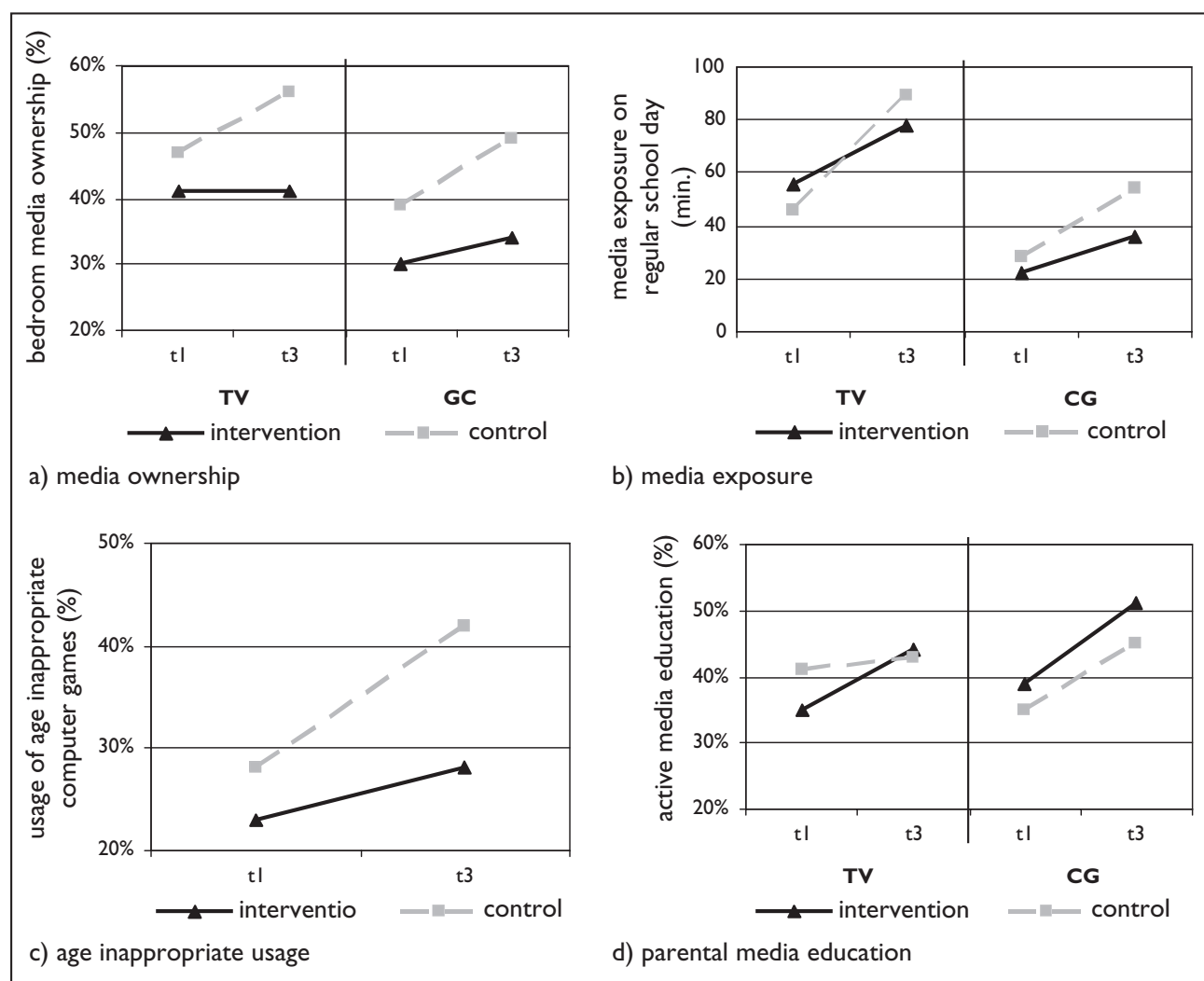


Figure 4. **A)** Bedroom media equipment¹ (TV, Games Console in %) by group and measurement occasion. **B)** Media exposure on an average school day² (TV, Computer Games in minutes) by group and measurement occasion. **C)** Usage of age-inappropriate computer games (rated age 12, 16 or 18)³ by group and measurement occasion. **D)** Active parental media education⁴ (TV, Computer Games) by group and measurement occasion.

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¹ Multivariate (TV/GC/PC) Analysis: Media Equipment (Repeated) × Group, $F(3/605) = 4.61, p < .01, \eta^2 = .02$; Group $p < .05, \eta^2 = .02$; Media Equipment, $p < .001, \eta^2 = .04$.

² Multivariate (TV/CG) Analysis: Media Exposure (Repeated) × Group, $F(2/706) = 4.26, p < .05, \eta^2 = .01$; Group $p < .01, \eta^2 = .02$; Media Exposure, $p < .001, \eta^2 = .11$.

³ Univariate Analysis: Inappropriate Usage (Repeated) × Group, $F(1/371) = 1.87, p < .17$; Group $p < .01, \eta^2 = .02$; Inappropriate Usage, $p < .001, \eta^2 = .04$.

⁴ Multivariate (TV/CG) Analysis: Parental Media Education(Repeated) × Group, $F(2/540) = 5.86, p < .01, \eta^2 = .02$; Group $p = .20$; Parental Media Education, $p < .001, \eta^2 = .04$. Univariate (TV): Parental Media Education(Repeated) × Group, $F(1/541) = 5.39, p < .05, \eta^2 = .01$. Univariate (CG): Parental Media Education(Repeated) × Group, $F(1/541) = .989, p < .282$.

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Adolescents' Video Game Playing and Aggression

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Now that computers are widespread, more and more people are playing games on them for daily recreation. Game designers have become a highly-paid elite due to the demand in this market, and the number of game players has been increasing rapidly. Moreover, gamers are no longer satisfied with the initial mild games played just for fun, and have begun to actively seek game partners online. Violence is playing a larger part in games. According to the "2007 annual report of online gaming in China", 19% of students were keen on online-games; nearly 60% of players were 19–30 years old; 31% of players preferred RPG (Role Play Games); and 24% preferred ACT and FPS (Action Game & First Personal Shooting Game). Young people 19 years of age and below have been investigated less; to explore the nature of adolescents' game playing and its consequences, a research group in the Center for Child Development and Family Studies at the Shanghai Normal University conducted a research project focusing on the video game playing of adolescents. The participants were students in grades 6, 8, and 10 in middle schools in Shanghai, China. We collected comprehensive data on various violence levels of video game playing, game play time, level of game skill, behavior problems, personality traits, parenting styles, family earnings, etc. Our aim was to use multi-methods such as questionnaires and experiments to investigate the access of Chinese children and youth to violent video games, analyze possible causes of aggression, and test the relations between violent video game playing and aggression.

Why Do Adolescents Love to Play Video Games?

In our project, we were first interested in reasons for adolescents' involvement in video games. Our results suggested that middle- and high-school students like to play video games (with violence or not) for the following main reasons:

First, games are designed elaborately and beautifully. For example, some RPGs (Role Play Games) have an intricate plot and funny dialogue, and some have delicate CG (Character Graph) designing and dramatic audio effects, which can have a magnificent audio and visual impact.

Second, the system of levels in game design can provide players with an experience of success. Video games usually have a character level and a game level. Players can get access to higher levels after gaining enough points through their own efforts, and have a chance to experience success thereby.

Third, games can enhance players' judgment and other abilities and enable them to practice using strategies. Many games require players to make quick judgments, and some