ORIGINAL ARTICLE

# The relationship between violent video games, acculturation, and aggression among Latino adolescents

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Multiple factors are involved in the occurrence of aggressive behavior. The purpose of this study was to evaluate the hypotheses that Latino middle school children exposed to higher levels of video game playing will exhibit a higher level of aggression and fighting compared to children exposed to lower levels and that the more acculturated middle school Latino children will play more video games and will prefer more violent video games compared to less acculturated middle school Latino children. This study involved 5,831 students attending eight public schools in Texas. A linear relationship was observed between the time spent playing video games and aggression scores. Higher aggression scores were significantly associated with heavier video playing for boys and girls (p<0.0001). The more students played video games, the more they fought at school (p<0.0001). As Latino middle school students were more acculturated, their preference for violent video game playing increased, as well as the amount of time they played video games. Students who reported speaking more Spanish at home and with their friends were less likely to spend large amounts of time playing video games and less likely to prefer violent video games (p<0.05).

**Key words:** adolescent, video games, latinos, violence, aggression, acculturation.

**La relación entre los juegos de viodeo violentos, la aculturación y la agresión entre adolescentes latinos**

Múltiples factores están relacionados con el comportamiento agresivo. El propósito de este estudio fue evaluar dos hipótesis: 1) estudiantes latinos de sexto a octavo grado expuestos a numerosas horas de juegos de video mostraran altos niveles de agresión y pelearan mas comparados con los estudiantes expuestos a menos horas de juego de video y, 2) mientras más aculturados sean los estudiantes latinos de sexto a octavo grado, mas tiempo pasarán jugando juegos de video y preferirán más los juegos de video violentos en comparación con los estudiantes menos aculturados. Este estudio incluye 5.831 estudiantes de ocho escuelas públicas de Houston, Texas. Se observó una relación lineal entre la cantidad de tiempo invertido en juegos de videos y los puntajes en la escala de agresión. Se encontró una asociación positiva y estadísticamente significativa entre los puntajes más altos en la escala de agresión y la cantidad de tiempo que los estudiantes indicaron jugar juegos de video. Esta asociación fue positiva tanto para ambos sexos (p<0,0001). Los estudiantes que reportaron jugar más juegos de video, reportaron también haber peleado más en el colegio (p<0,0001). Los estudiantes de sexto a octavo grado más aculturados a Estados Unidos (medido por el uso del lenguaje inglés) mostraron mayor preferencia por juegos de video violentos y pasaron más tiempo jugando juegos de video. Los estudiantes que reportaron hablar más español en casa y con sus amigos pasaban menos tiempo jugando videos y preferían juegos de video no violentos (p<0,05).

**Palabras clave:** adolescentes, juegos de video, Latinos, violencia, agresión, aculturación.

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Violence is all around us. As it continues to increase and affect more segments of society, the need to determine the roots of this major public health problem becomes more pressing. Violence,

as defined by the Centers for Disease Control and Prevention (CDC) of the Public Health Service, is the threat or actual use of physical force or power against another person, against oneself, or against a group or community that either results in or has a high likelihood of resulting in injury, death, or deprivation (1).

Despite the decrease in juvenile crime and murder rates in the United States during the period of 1994 and 1998 (2), the recent wave of school shootings (Littleton, CO, Springfield, OR, Paducah, KY, Jonesboro, AR), as well as several population-based indicators, suggest that youth violence is still a major area of concern for the health and well-being of this age group in the United States.

Between 1989 and 1995, the percentage of students aged 12 to 19 years who reported avoiding one or more places at school for their own safety nearly doubled from 15% to 28% (2). While slightly decreasing since 1991, 33% of youth surveyed in 2001 reported to have been involved in a physical fight during the previous year.

Latino communities endure a disproportionate share of violence-related death and injury compared with the general population (3). Various environmental influences such as social, economic, and political factors contribute to violent behavior among Latino youth. Results from the United States' census conducted in 2000 (U.S. Census Bureau, http://www.census.gov) indicated that one in every four Latino families and one of every three Latino children live in poverty. Latino families are about three times more likely to be living below the poverty level than non-Hispanic whites. Latino youth have the highest high school dropout rate of all ethnic groups (4).

It is clear that multiple factors are involved in the occurrence of aggressive behavior. Mass media have been identified as one possible cause of violent behavior (5) and several hypothesis and theories have been developed to explain media's influence on human behavior (6-9).

In 1992, the American Psychological Association Task Force on Television and Social Behavior (10) concluded that 30 years of research confirms the harmful effects of television violence. These conclusions were reaffirmed by the American Psychological Association Commission on Violence and Youth in 1993 (11-13).

The typical American child spends an average of more than 38 hours a week - nearly 5 1/2 hours a day consuming media outside of school, according to a major national study conducted by the Kaiser Family Foundation. That amount is even higher - nearly 6 3/4 hours a day for kids eight and older (14). In regards to the hypothesis that active engagement in the playing of violent video games leads to increased aggression, findings are mixed and suggest the need for further research. Studies with children suggest a positive association between violent video game playing and aggression (15-18). Studies on violent video game playing and aggression among adolescents and young adults have indicated less consistent results (19-22).

Acculturation is the process of change occurring as a result of contact between cultural groups (23). The concept of acculturation has actually assumed great importance in studies of Latinos in general during the 1980s. The measurement of acculturation is important, for it is useful in identifying individual and personality differences (24) and has also been correlated to important health-related variables. For example, research conducted among legal and undocumented Mexican immigrant women in San Diego, California, indicated that the underutilization of preventive services by a significant proportion of these women was attributable to lack of acculturation (25). Amaro and colleagues examined the relation between acculturation and illicit drug use among Hispanics in the United States employing data from the 1982-84 HHANES. They found that acculturation into U.S. society, as reflected in English language use, was associated with higher rates of illicit drug use (26). Weitz conducted a study among females and males from five populations in the Solomon Islands to examine how acculturation affects the fitness of different age and sex groups. Men and women in the least acculturated group showed the highest fitness levels, reflecting strenuous work patterns (27). Data from the Southwestern sample of the Hispanic HANES were employed to evaluate the

relationship of acculturation into the larger society with alcohol consumption. Acculturation was not found to be related to alcohol consumption in Mexican American men, but was positively related to alcohol consumption in younger Mexican American women (28). On the other hand, Caetano found that Hispanics who were more acculturated go to bars more frequently and drink more frequently than less acculturated Hispanics in a number of social settings (29). In a study to evaluate the relationship between acculturative stress, depressive symptoms, and suicidal ideation among immigrant and second-generation Latino-American adolescents, Hovey and King found that some Latino adolescents experience high levels of stress in relation to acculturation due to perceived family dysfunction and negative "expectations for the future" (30).

The purpose of this study was to evaluate the association of video game playing with aggressive behavior and the effects of acculturation on preference for violent video games and amount of video game playing among a large sample of Latino middle school students. Based on a cross-sectional survey of sixth, seventh, and eighth graders, conducted as a part of the Student for Peace project, we evaluated the hypotheses that Latino children exposed to higher levels of video game playing will exhibit a higher level of aggression and fighting compared to children exposed to lower levels and that the more acculturated Latino children will play more video games and will prefer more violent video games compared to less acculturated Latino children.

## Methods

### Sample

In the spring of 1994, a cross-sectional survey was conducted as part of a baseline evaluation of Students for Peace, a study designed to evaluate a comprehensive, school-wide violence prevention intervention (31). Students for Peace was funded by the Centers for Disease Control and Prevention. The survey was administered to all sixth, seventh, and eighth graders of eight public middle schools in Texas who were present on the day of the survey and who consented to participate. The total sample consisted of 8,863 students (88% response rate)

and the analysis for this study was done from the majority of the sample composed of 5,831 students who identified themselves as Latinos (66% of the total sample).

### Measurement instrument

The self-administered survey included questions related to demographic characteristics, predictors of violence (video game playing, preference for violent video games, and acculturation), aggression, and fighting. The survey was approved by the Committee for the Protection of Human Subjects of the University of Texas Health Science Center at Houston.

### Demographic characteristics

Participants were asked questions to obtain basic demographic information. They were asked about grade, age, gender, parent's education, parents' origin, and family structure.

Parent's education level was measured by two items that asked students to mark the highest level their mother/stepmother and father/stepfather completed in school with response categories: "did not finish high school", "graduated from high school", "some college", "graduated from college", and "not sure or don't know her/him".

Family structure was measured by the item, "The parents or guardians you live with most of the time are: a) my mother and father; b) my mother and stepfather; c) my father and stepmother; d) only my mother; e) only my father; f) one or more of my grandparents; g) other adult (aunts, uncles, or other)" to which students were asked to check only one answer. Parents' origin was measured by the item: "your parents (father, mother) are from: a) Mexico; b); Central America (El Salvador, Guatemala, Honduras, Nicaragua, Panama, or Costa Rica); c) Puerto Rico; d) Cuba; e) South America; f) The United States (Texas, New Mexico, Arizona, California, Florida, or other state in the United States).

### Predictors of violence

Two items from Marín's acculturation scale measured acculturation. Marín *et al.* published an acculturation scale of four items, all of which are related to language, that has shown good

psychometric characteristics. The scale has correlated highly with usual validity criteria such as respondents' generation (r=0.69), length of residence in the United States for foreign-born respondents (r=0.76), and age at arrival in the United States (r =-0.72). To score, the respondents' answers can be averaged across the four items and the score is used as an interval scale, where the scores closer to five indicate high level of acculturation while those closer to one indicate little acculturation (32).

Students were asked: "When you are with your family, how often do you speak English?" and "When you are with your friends, how often do you speak English?". Students were asked to respond: "all of the time," "most of the time," "sometimes," "hardly ever," or "not at all." For analytical purposes, the variable was collapsed into three discrete categories: "all the time", "sometimes", and "not at all."

Frequency of video game playing was assessed by asking students how many hours per day during the weekday and weekend they play video games. Potential responses ranged from "I don't play video games" to "four or more hours a day." In addition, one item assessed preference for video games that portray violence. Students were asked to respond "very true," "true," "false," or "very false" to the following statement: "I like to play violent video games". This question was later dichotomized: "like violent video games" (very true and true) and "don't like violent video games" (very false and false).

### Main outcome variables

Indicators of students' aggressive behaviors were scores on the aggression scale and frequency of fights at school. The aggression scale measured aggressive behavior during the week prior to the survey. Eleven items comprise the scale, with responses ranging from "0 times" to "6 or more times." Each point on the scale represents one aggressive behavior performed during the previous week for a total possible score of 66 points. The scale measured behaviors such as teasing, pushing, name-calling, hitting, encouraging students to fight, kicking, threatening to hurt or hit, and getting angry easily. The internal

consistency of the scale was high (Cronbach's alpha =0.88), and it did not vary significantly by gender, race, or Hispanic ethnicity (33). The scale has been translated to Spanish and Portuguese and has been used in El Salvador, Mexico, Chile, and Brazil.

Frequency of fights during the 30 days prior to the survey ranged from 0 to 12 or more times. This question was taken from the Centers for Disease Control and Prevention's Youth Risk Behavior Survey (YRBS). Brener and colleagues conducted a test-retest reliability study of the YRBS questionnaire with resulting kappa statistics for this item of 0.68 (34). Students were asked: "During the past 30 days, how many times were you in a physical fight (fist fight, pull hair, bite, or so) on school property?"

### Data collection

Before the administration of the questionnaire, a "Parent Consent Form" was sent to parents explaining the importance and content of the survey. Parents, who did not wish their child to participate in the survey, could sign the form and return it to the school. A group of researchers, who followed written instructions, administered the survey in classrooms with booklets and scannable answer sheets to all students. The importance of the study and the proceeding to certify confidentiality were explained. Students who did not wish to answer the questionnaire or whose parent signed the "Parent Consent Form" were given another activity. Professional data entry students at the University of Texas School of Public Health checked every answer sheet for patterned responses.

### Statistical analyses

Statistical analyses included both descriptive and analytical/inferential statistics. Descriptive statistics such as frequencies, mean, standard deviation, and range were calculated. Chi-square analysis was used to test the independence between the row and column variables for cross-tabulation analyses. Analytical statistics was done using both univariate and multivariate tests. Odds ratios and corresponding 95% confidence intervals were calculated to describe the association

between dependent (e.g., aggression and fight) and independent variables (e.g., gender, acculturation, hours of weekday and weekend video game playing, and preference for violent video games). Language is considered the best indicator of level of acculturation. Logistic regression models were developed to identify the relationship between acculturation and preference for violent video games, and acculturation and frequency of video game playing. Analysis of variance (ANOVA) and t-test were used to test the hypothesis of no significant differences between the means for aggression and frequency of video game playing. The level of significance for acceptance of the hypotheses was set at 0.05. All analyses were performed using the Statistical Package of Social Science (SPSS) for Windows version 10.0 and Stata 7 for Windows.

## Results

The sample for this study consisted of 5,831 Latino students (49.9% males and 50.1% females). Students ranged in age from 11 to 16 years with a mean age of 13.2. All the study population was Latino but most parents (62%) were Mexican, second in order were from the United States, followed by Central American. Nearly a third of parents had not completed high school. Thirty percent of students reported being unsure of their parent's education. Sixty-five percent of students lived with both biologic parents; that number increased to -78% if stepparents were included.

Of the 5,831 students interviewed, 80% spoke English all the time or sometimes when they were with their families, and 93% spoke English all the time or sometimes when they were with their friends. There was a slight difference among boys and girls when speaking English while with their families. Girls spoke more English with their families than boys (82.4 versus 77.8%, respectively). No gender differences were found in relation to English spoken with friends.

Frequency of video game playing and video game preference was subdivided by categories of gender. Table 1 shows a statistical significant difference between boys and girls in their preference for violent video game playing (79 versus 39%, respectively). Overall, more than a half of the total

**Table 1.** Preference for violent video game playing and frequency of video game playing, by gender.

|  | Boys (%) | Girls (%) |
|---|---|---|
| **Preference for violent video games** |  |  |
|  | (n=2596) | (n=2708) |
| Yes | 79.3 | 39.1 |
| Statistics | χ² (1) 884.4, p<0.0001 | |
| **Weekday video playing/day** |  |  |
|  | (n=2491) | (n=2658) |
| None | 32.7 | 61.7 |
| <1 hour | 29.6 | 22.5 |
| 1 to 2 hours | 15.9 | 8.7 |
| >2 to 4 hours | 13.2 | 5.0 |
| >4 hours | 8.6 | 2.1 |
| Statistics | χ² (4) 507.9, p<0.0001 | |
| **Weekend video playing/day** |  |  |
|  | (n=2482) | (n=2642) |
| None | 27.3 | 57.9 |
| <1 hour | 25.2 | 23.2 |
| 1 to 2 hours | 16.6 | 9.2 |
| >2 to 4 hours | 16.6 | 6.8 |
| >4 hours | 14.3 | 3.0 |
| Statistics | χ² (4) 634.0, p<0.0001 | |

sample liked to play violent video games (59%). Only 5% of the students played video games four or more hours during the week, and 9% played four or more hours during the weekend. Both during the weekdays and the weekends, boys were four times more likely than girls to play four or more hours of video games.

Figure 1 shows a linear relationship observed between amount of time spent playing video games and the mean aggression scores measured by the aggression scale for weekdays and weekends. Higher aggression scores were significantly associated with heavier weekday video game playing ($F_{(4, 5103)} = 73.6$, $p<0.0001$) as well as with heavier weekend video game playing ($F_{(4, 5083)} = 48.5$, $p<0.0001$).

Overall, 23% of the students reported being involved in a physical fight at school within the past 30 days. There was a statistically significant gender difference ($c^2=112.5$ (2), $p<0.0001$). The mean self-reported aggressive behavior for the sample was 15.4 (SD=14.0); that is, on average, students reported 15.4 aggressive acts during the
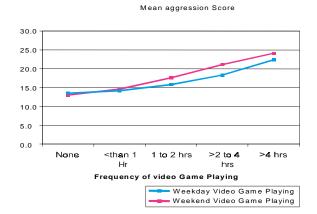
Mean aggression Score



**Figure 1.** Mean aggression score by video game playing among Latino adolescents.

**Table 2.** Percentage of students involved in a physical fight at school within the past 30 days by video game playing, preference for violent video games, and gender.

| | Boys | | Girls | |
|---|---|---|---|---|
| | n | (%) | n | (%) |
| **Weekday video playing/day** | | | | |
| None | 808 | 23.6 | 1636 | 14.4 |
| <1 hour | 735 | 25.2 | 597 | 16.9 |
| 1 to 2 hours | 395 | 32.7 | 230 | 20.0 |
| >2 to 4 hours | 326 | 37.4 | 132 | 32.6 |
| >4 hours | 215 | 43.5 | 56 | 33.9 |
| Statistics | $\chi^2$ (4) 51.5, p<0.0001 | | $\chi^2$ (4) 43.6, p<0.0001 | |
| **Weekend video playing/day** | | | | |
| None | 672 | 27.7 | 1526 | 16.4 |
| <1 hour | 626 | 23.0 | 611 | 14.6 |
| 1 to 2 hours | 409 | 32.5 | 242 | 17.8 |
| >2 to 4 hours | 409 | 29.1 | 178 | 24.2 |
| >4 hours | 354 | 39.3 | 79 | 21.5 |
| Statistics | $\chi^2$ (4) 31.9, p<.0001 | | $\chi^2$ (4) 10.6, p=.031 | |
| **Preference for violent video games** | | | | |
| Yes | 2048 | 29.8 | 1055 | 21.8 |
| No | 533 | 27.0 | 1647 | 13.3 |
| Statistics | $\chi^2$ (1) 1.6, p=0.211 | | $\chi^2$ (1) 33.6, p<0.001 | |

**Note:** Row percentages by gender are reported (e.g., 23.6% of the boys who never played video games during a weekday [n=808] fought at least once during the month prior to the survey).

week prior to the survey. Table 2 presents the analysis of percentage of students involved in a physical fight at school within the 30 days prior to the survey in relation to amount of video game playing during weekdays and weekends, and

preference for violent video games. The more students played violent video games during the weekdays and weekends, the more they fought. Boys were more likely to prefer violent video games and to be involved in a physical fight than girls were. On the other hand, there was a significant association between preference for violent video games and fighting only among girls.

Table 3 describes the association between acculturation and preference for violent video game playing. Those who sometimes spoke English with the family were about 40% less likely to prefer violent video games than those who spoke English with the family all the time. In addition, those who did not speak English with the family at all were 30% less likely to play violent video games than those who spoke English with the family all the time (p<0.0001). With respect to the relationship between preference for violent videogame playing and amount of English spoken with their friends, a higher level of acculturation was positively associated with preference for violent video games (p<0.0001).

Table 4 presents results of the relationship between amount of English students speak at home and with their friends and the frequency of video game playing. A logistic regression was conducted with all of the results being statistically significant. As compared to students who reported always speaking English with the family, students who reported sometimes speaking English with the family were 19% less likely to play video games during weekdays and 14% less likely to

**Table 3.** Preference for violent video game playing in relation to amount of English spoken with family and friends (n=5,831).

| | | Preference for violent video games | |
|---|---|---|---|
| | OR | CI | p-value |
| **English spoken with the family** | | | |
| Sometimes | 0.62 | 0.55, 0.70 | <0.001 |
| Not at all | 0.68 | 0.58, 0.79 | <0.001 |
| **English spoken with friends** | | | |
| Sometimes | 0.61 | 0.53, 0.70 | <0.001 |
| Not at all | 0.56 | 0.45, 0.70 | <0.001 |

Referent group: students who speak English "all the time"

**Table 4.** Frequency of video game playing during weekdays and weekends in relation to amount of English spoken with family and friends (n=5,381).

| | Weekday video playing | | Weekend video playing | |
|---|---|---|---|---|
| | OR | 95% CI | OR | 95% CI |
| **English spoken with the family** | | | | |
| Sometimes | 0.81* | 0.71, 0.91 | 0.86* | 0.76, 0.98 |
| Not at all | 0.73* | 0.62, 0.85 | 0.77* | 0.66, 0.90 |
| | | | | |
| **English spoken with friends** | | | | |
| Sometimes | 0.81* | 0.70, 0.94 | 0.79* | 0.69, 0.92 |
| Not at all | 0.68* | 0.54, 0.86 | 0.69* | 0.55, 0.87 |

Referent group: students who spoke English "all the time"
*p<0.05

play videos during the weekends than students who spoke English all the time. Students who always spoke Spanish at home which is a sign of less acculturation, were less likely to play video games during weekdays and weekends than students who spoke English all the time (27 and 23%, respectively).

There were statistically significant results in regard to the frequency of video game playing and the language students used with friends. For example, those who sometimes spoke English with their friends were 19% less likely to play video games during the week and 21% less likely to play videos during the weekend than students who spoke English with their friends all the time. Those who reported never speaking English with their friends were 32% less likely to play video games during the week and 31% less likely to play video during weekends than students who always spoke English with their friends.

## Discussion

This study is a secondary data analysis of students participating in the Students for Peace project. The primary purpose of the project was to evaluate the effects of a violence prevention program. While some studies have reported an association between video game playing and violent behavior, few studies have examined this relationship among the Latino population (35).

Based on this study, we conclude that video consumption was strongly associated with aggressive behavior. The frequency of students' aggressive behavior significantly increased as the number of hours they played video games daily also increased. Kestenbaum and colleagues mentioned that heavy video game use does not result in and is not correlated with increased aggressive feelings. He defines "high video players" as persons who reported spending at least 5 hours a week on video games (36). However, in this study the frequency of video game use was much higher: 20% of the sample (over 1,000 students) played video games 2 hours or more per day during the weekend and 14% reported playing 2 or more hours daily during weekdays.

As middle school students become more acculturated, their preference for violent video game playing increased, as well as the amount of time they play video games. Specifically, students who reported speaking more Spanish at home and with their friends were less likely to spend large amounts of time playing video games.

The reasons for aggressive behavior are varied, and this study does not attempt to demonstrate all causes associated with aggressive behavior. There are others components of a student's life that may influence or affect his or her behavior. Things like the relationship between parents and children (lack of communication), socioeconomic status (poverty), and the environment, not only at home, but also in the neighborhood and at school; any of these can be a risk factor for violent behaviors. It is possible that high video game playing is associated with low parental supervision and possibly with some other family problem behaviors that might also be associated with violence. It could be that the association with video game playing and violence is only because those who frequently play video games are also those who have the least parental supervision. For future research, we would recommend more longitudinal studies that evaluate precise causes and effects in regard to violent behavior and video game playing.

There were some limitations with the current study. It used a cross-sectional design with its particular problems, such as temporal ambiguity of cause and effect and measurement error, which may lead

to information bias. The error in measuring could be differential misclassification or correlated errors. In this specific case, the temporal ambiguity of cause and effect is present because we cannot determine whether violent video game playing influenced aggression or vice versa. Recall bias is another limitation. For example, it is possible that those who are more aggressive remember their aggressive behavior more clearly than those who are not, or those who are more aggressive may remember more clearly the number of hours they play video games. In the same way, the non-aggressive students perhaps did not report all the hours of video game playing. This study, however, does have a particular strength. There have been neither many studies with this sample size nor studies on this subject among Latino populations.

Recognizing that video game playing influences violent behavior among this particular population of middle school students, the following are recommendations for interventions. First, parents should know and be alarmed of the possible influence of video game playing in their children's life. Second, content of video games need to be carefully evaluated and studied on a regular basis to gain knowledge on the real potential physical and psychological effects that may exist within them. Third, parents should limit playing time and monitor game selection. Finally, parents should encourage and provide alternative activities for their children.

## Acknowledgements

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