

Connections Between Violent Television Exposure and Adolescent Risk Taking

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This study utilized a survey to assess television viewing and risk-taking behavior in 717 adolescents (age 11–22). Results indicated that, among adolescents, there is a link between exposure to violent television in the form of violent drama, realistic crime shows and contact sports and participation in various forms of risk taking: problem drinking, drinking and driving, delinquency (vandalizing, trespassing, truancy), reckless driving, and drug use. However, the relationship between exposure to various forms of violent television content and risk-taking behavior varies somewhat. Specifically, exposure to realistic crime shows and exposure to contact sports is positively related to risk taking; whereas, exposure to violent drama is negatively related to risk-taking behavior. Predictions are made and findings discussed in terms of problem behavior theory. Implications for health messages targeting adolescents are discussed.

Viewing of violent television and interest in television violence has been linked to a host of antisocial behaviors such as increased aggression (Eron & Huesmann, 1984; Tan, 1986), decreased sensitivity to violence and the suffering experienced by the victims of violence (Rabinovitch, McLean, Markham, & Talbott, 1972), and an increased sense of fear and helplessness (Gerbner, Gross, Morgan, & Signorielli, 1986). In fact, longitudinal studies have indicated a

causal link between exposure to television violence and increases in aggressive behavior among children and adolescents even after controlling for other correlates (Eron & Huesmann, 1984). In short, viewing violent television has been identified as a causal factor in increases in violent behavior and increases in callousness toward violence. Yet little research has looked at the potential link between exposure to violent TV and other antisocial and risky behaviors. Specifically, little research has examined whether exposure to risk-taking behavior in the form of television violence might be linked to viewers' participation in other forms of risk-taking behavior, thereby creating a general pattern of risk taking.

Adolescents are typically overrepresented in terms of risk taking (Arnett, 1992). They are more likely than their younger and older counterparts to drink and drive, to shoplift, and to vandalize property (Arnett, 1991), and research has established adolescence as the period of initiation of and experimentation with much sexual activity, smoking, delinquency, and drug and alcohol use. Therefore, adolescents are a particularly interesting group to consider when examining the link between watching violent television and engaging in risk-taking behaviors. This study will test the link between adolescent exposure to violent television and their practice of various risk-taking behaviors.

THE DEVELOPMENT OF RISK-TAKING BEHAVIORS

Risk taking is the tendency to engage in behaviors that threaten or harm an individual's physical and/or mental health. Risk taking can be distinguished from antisocial behaviors in that risk-taking poses an actual threat to the individual engaging in the activity; whereas, antisocial behaviors may be considered inappropriate by some societal standard, but the behavior may not be harmful to the actor. In this article, we use the term *risk taking* to refer specifically to behaviors that pose physical risks (e.g., drinking and driving).

Risk taking has been viewed as a personality characteristic, a developmental phenomenon, and a learned behavior. As a personality characteristic, risk taking can be conceptualized as an individual difference factor or varying according to personality traits (Ball, 1995; Greene, Krmar, Rubin, Walters, & Hale, 1998; Zuckerman, 1994). As a developmental phenomenon, willingness to take risks has been considered a negative by-product of cognitive development, specifically, egocentrism (see Elkind, 1967, 1978). Greene, Rubin, Walters, and Hale (1996) demonstrated that egocentrism was indeed related to higher instances of risk taking among adolescents.

The learned behavior approach suggests that risk taking is, in part, a modeled phenomenon. From this perspective, risky behaviors or groups of risky behaviors

can be learned through environmental modeling. Several theories (e.g., social learning theory and problem behavior theory) have attempted to link individuals' exposure to modeled behaviors in the environment with subsequent learning or performance of those behaviors. Problem behavior theory (Jessor & Jessor, 1984) is one theory that relies, in part, on environmental modeling to explain risk-taking behavior. However, the theory suggests that the meaning an individual makes of some symbolic event (e.g., another's cigarette smoking, watching a violent video) is as important as the objective content of that symbolic event in determining whether or not the individual imitates the behavior. In this study, we utilized problem behavior theory to make predictions concerning a possible link between exposure to violent behavior on television and adolescent risk taking.

Problem Behavior Perspective

Problem behavior theory rests on the notion that all behaviors carry some meaning for an adolescent (e.g., truancy demonstrates independence). In addition, all risk-taking behaviors tend to carry similar meanings for a given individual. Therefore, when an adolescent is exposed to an instance of deviance, he or she believes that the risk-taking behavior carries a certain meaning. Any behavior, then, that carries the same meaning for that adolescent as the behavior that was witnessed will have an increased likelihood of occurrence (Jessor & Jessor, 1984). In this way, if the adolescent interprets both shoplifting and truancy as an expression of independence, exposure to shoplifting behavior can result in increases in truancy for that individual. Behaviors are learned, therefore, not only by exposure to identical behaviors but by exposure to behaviors that carry the same meaning as the behavior to be performed. In sum, behaviors can be grouped not only by their form but also by the meanings they carry for an individual.

From the perspective of problem behavior theory, social deviance is represented by a collection of problem behaviors that constitute a pattern. Among those behaviors are deviance (e.g., vandalizing or shoplifting), underage drinking, drug use (e.g., smoking cigarettes and marijuana), and physical aggression (e.g., fighting; Fraser, 1996; Jessor & Jessor, 1984). These behaviors are affected by three systems of psychosocial influence: the personality system (e.g., sensation seeking or self esteem); the perceived environment system (e.g., family life, peer influence); and the behavior system (e.g., school performance, communication behavior). In consort, these systems, and the antecedents of demographics and social structures, work to create adolescent proneness;

proneness specifies the likelihood of occurrence of transgressions or risk-taking behavior. In total, then, the model includes antecedent and background variables and social-psychological variables that lead to behavioral proneness. The theory further contends that “because proneness to engage in problem behavior is seen as a system-level property, it is theoretically meaningful to speak of personality proneness, environmental proneness and behavioral proneness” (Jessor, 1987, p. 332).

Problem behavior theory, then, states that negative behaviors are learned because they fit into an entire system of behaviors; the behaviors need share nothing in common in terms of form. For example, according to the problem behavior model, media influence is construed as an antecedent variable but can also be included in the environmental system. Media, like parents and friends, are seen to provide modeled behaviors and to act as a normative comparison for adolescents. Therefore, a violent media image may fit into an environmental system that leaves an adolescent prone or open to problem behavior. This study will include television within the environmental system. Furthermore, because this investigation examines the relative contribution of modeled aggressive behavior on adolescent problem behavior, we focus only on environmental proneness within problem behavior theory. Although the psychosocial component and behavioral component should also be considered, this study attempts to take a first step in examining only the contribution of media to the environmental system within problem behavior theory.

Environmental Proneness. To date, many media effects studies have looked at the effects of specific media portrayals on similar behavioral outcomes: that is, they have followed a modeling-imitation framework (see Tan, 1986, for a review). Little work has been done testing the effects that result from exposure to one kind of televised risk-taking behavior on risk taking, in general. In other words, little empirical work has considered television as a system-level variable. Consider the perceived environmental system within problem behavior theory. Within this model, environment refers to characteristics—supports, influence, controls, and models—that carry meaning for the adolescent that result in problem behavior. Typically, “problem behaviors” such as vandalism and truancy mean, for the adolescent, that they are refuting conventional norms and affirming their independence (Jessor, 1987). When risk-taking behaviors of any kind are modeled, the adolescent perceives this behavior as refuting norms and demonstrating independence. Therefore, because underage drinking and fighting, for example, both carry the same meaning for the adolescent, modeling of one behavior can decrease the likelihood of censoring the other.

For example, Chassin et al. (1981) found that perceived environment, which included peer-, adult-, and media-modeled behavior, accounted for 10% of the variance in adolescent cigarette smoking behavior. Rooney and Wright (1982) found that modeled behaviors within the perceived environmental system could predict marijuana use. Donovan and Jessor (1985) found vandalizing property could be predicted by modeled behavior within the perceived environment (specifically, the adolescent's peers), and Rachal et al. (1975) found that drinking behavior could be predicted by modeled use of drugs in general. In addition, Roe's (1995) work on "delinquent" media use has also found that various forms of delinquent behaviors tend to group together in an individual. For example, adolescents who perform poorly in school also tend to listen to heavy metal music, watch violent television, and associate with deviant peer groups. Interestingly, Roe suggested that exposure to heavy metal music is simply another form of delinquency—an idea that fits in well with the approach of problem behavior theory. In this case, an adolescent perceives his/her use of heavy metal music to be a form of, for example, rebellion, similar to poor school performance and perhaps similar to other forms of risk taking.

What is crucial here is not only that modeled negative behaviors were imitated, but that a system of modeled behaviors resulted in a system of behavioral outcomes. Therefore, we argue that the portrayal of a specific problem behavior on television, violence, will result in a system of problem behaviors identified within problem behavior theory.

H1: Risk-taking behaviors will correlate into a grouping of behaviors including smoking, problem drinking, drinking and driving, risky sex, drug use, gambling, trespassing, and vandalism (i.e., delinquency).

Because it is expected that these risk-taking behaviors will constitute a grouping of behaviors that are performed by adolescents, it is likely that exposure to one of these behaviors will result in increases in other related behaviors. In short, if the problem behavior is part of a system of behaviors, there is little need to distinguish between vandalism (for example) and problem drinking, insofar as these behaviors carry similar meaning for the adolescent.

Media Violence As Problem Behavior. Although a variety of content analyses have examined potentially problematic behaviors on television, more content analyses have been conducted concerning the portrayal of violence on television than for any other type of content (see, e.g., Gerbner et al., 1986; Wilson et al., 1997). Not only have many content analyses been conducted, but

the most recent figures suggest that as many as 57% of the programs on television contain some violence (Wilson et al., 1997).

In addition to its frequent occurrence, exposure to these depictions has been associated with direct imitation of violence, as well as increased aggression among viewers (Eron & Huesmann, 1984). Therefore, when deciding to examine the link between one problem behavior as portrayed on television, with other problem behaviors potentially enacted by adolescents, violent television is the most probable selection. Therefore, we predicted the following:

H2: Exposure to violent drama (e.g., *NYPD Blue*, *Walker, Texas Ranger*), realistic crime shows, and contact sports will predict risk-taking behavior in adolescents.

METHOD

Participants

To enable cross-sectional comparisons across adolescence, junior high school and high school students ($n = 381$) and college students ($n = 343$) were sampled. The junior high and high school students ranged in age from 11–18 ($M = 15.1$, $SD = 1.7$), and the college students ranged from 18–25 ($M = 20.7$, $SD = 1.6$). The sample included 414 women (57%) and 303 men (42%) (7 or 1% did not report gender). The sample included a majority of White individuals (93%), and the sample reported just above “some college education” for mothers’ education and slightly below “college degree” for fathers’ education. The resulting sample included 721 adolescents.

College students were recruited from introductory communication courses at two southeastern universities.¹ College students completed the survey outside of class time and received credit for their participation. Junior high and high school students were recruited by students trained in research methods courses who selected adolescents aged 11–17. Students in the research methods course were instructed to select adolescents between the ages of 11 and 17. Each student was required to select an approximately equal number of males and females. Participants then received a survey with a set of instructions and filled out the survey in their homes. Parental consent was required prior to participation. The questionnaire took approximately 45 minutes to complete and was anonymous (participants sealed it in an envelope separate from the consent form to increase their confidence in its anonymity). After completing the questionnaire, participants were debriefed and thanked for their participation. Random

callbacks (20% contact) by a research assistant occurred 2 weeks later to ensure that junior high and high school students had filled out the survey. Of those called back, information from two of the surveys was found to be inaccurate or questionable. Subsequently all of the surveys conducted by those two undergraduates were eliminated from the analyses. The resulting sample of younger adolescents included 381 junior high and high school students.

Procedure

This study contained two parts: first, a questionnaire assessed adolescents' (a) exposure to various television programs, (b) personality and developmental factors, and (c) practice of risk-taking behaviors. The questionnaire took approximately 45 minutes to complete, and, although it contained a variety of measures, only those used here will be discussed because the questionnaire was part of a larger project examining adolescent risk taking and health messages. The second part of the study was a content analysis. A sample of prime-time programs was recorded and subsequently content analyzed by trained coders for the amount of violence the programs contained. Both the questionnaire and the content analysis will be discussed in detail in the next section.

Measurement Instruments

Television Viewing. Participants were first presented with a list of seven program genres. These included sit-coms, evening soap dramas such as *Melrose Place*, realistic news-type programs such as *COPS*, sports such as football and hockey, sports such as golf and tennis, local news, and national news. They were asked to rate how often they watched each kind of program on a 5-point scale ranging from *never* to *always*. Second, participants were presented a list of all the 1-hour fictional programs available during that viewing season (e.g., *Melrose Place*, *ER*). They were asked to rate on the same scale how frequently they watched each of these programs. Among the seven categories of programs, "contact sports such as football and hockey" and "realistic crime programs such as *COPS*" were considered to be aggressive programs.

Risk-Taking Behavior Measures

Seven kinds of risk-taking behaviors were measured, including smoking, risky sexual behavior, drug use, risky driving, delinquency, problem drinking, and drinking and driving.

Smoking. Smoking was measured by two items developed by the authors. The first item asked, "How many cigarettes do you smoke a day?" and the five responses ranged from 0 (*none*) to 4 (*a pack or more*). The second item asked, "How long have you been smoking at your current level?" The response was number of years, coded 0 for non smokers. These two items were summed ($M = 2.59$, $SD = 3.08$, range 1–22), with a higher score indicating more smoking for a longer period.

Risky Sexual Behavior. Risky sexual behavior was measured by three items developed by the authors. The first two items asked, "How many different sexual partners have you had in the past 2 years?" and "How many sexual partners have you had in the last 6 months?" Those who were not sexually active were scored 0. The next item asked, "How often do you (does your partner) use a condom when you have sexual intercourse?" The 5-point Likert responses ranged from 1 (*always*) to 5 (*never*). These items were summed to form a risky sex score ($M = 4.74$, $SD = 6.34$, range 0–46), with a higher score indicating more past sexual partners and less protective or more risky sexual behavior.

Drug Use. Illegal drug use was measured by seven items developed by the authors. The prompt asked, "In the past 90 days, how many times have you used each of the following?" The target drugs included marijuana, uppers, downers, LSD, tranquilizers, opiates, and cocaine/crack. The 6-point Likert responses ranged from 1 (*never*) to 6 (*more than 10*). These items were summed and averaged to form a drug use score ($M = 1.31$, $SD = .53$, range 1–5.86), with a higher score indicating more past drug use. The reliability was moderate ($\alpha = .71$) but increased when the marijuana item was deleted ($\alpha = .80$).

Risky Driving Behavior. Risky driving was measured by three Likert-type items developed by the authors. The items included the following: "How often have you driven over 80 mph?"; "How often have you driven more than 20 mph over the speed limit?"; and "How often have you passed in a no passing zone while driving?" The responses ranged from 1 (*never*) to 5 (*very often*). These items were summed and averaged to form a risky driving score ($M = 2.16$, $SD = 1.04$, range 1–5), with a higher score indicating more risky driving. The reliability was good ($\alpha = .92$).

Delinquent Behavior. Delinquent behavior was measured by six Likert-type items developed by the authors. The items included the following: "How often have you cheated on a test in school?"; "How often have you shoplifted from a

store?"; and "How often have you trespassed on restricted property?"; "How many times have you participated in vandalism (damage to or destruction of property)"; "How often do you gamble?"; and "How often have you gambled more than \$25 on an event?" The responses ranged from 1 (*never*) to 5 (*very often*). These items were summed and averaged to form a delinquency score ($M = 1.74$, $SD = .61$, range 1–5), with a higher score indicating more delinquent behavior. The reliability was moderate ($\alpha = .79$).

Problem Drinking. Alcohol consumption was measured by three Likert type items developed by the authors. The items included the following: "How often do you drink alcoholic beverages?"; "How often do you become drunk?"; and "On a typical occasion, how much alcohol do you consume?" The responses for the first two items ranged from 1 (*never*) to 5 (*every day*), and responses for the quantity item ranged from *less than one drink* to *6 or more drinks*. These items were summed and averaged to form a drinking score ($M = 2.27$, $SD = 1.24$, range 1–4.67), with a higher score indicating more alcohol consumption. The reliability was high ($\alpha = .90$).

Drinking and Driving. Drinking and driving was measured by two Likert type items developed by the authors. The items included: "In the past year, how often have you driven a car while under the influence of alcohol?" and "In the past year, how often have you ridden with a driver who was under the influence of alcohol?" The responses ranged from 1 (*never*) to 5 (*6 or more times*). These items were summed and averaged to form a drinking and driving score ($M = 1.97$, $SD = 1.24$, range 1–5), with a higher score indicating more drinking and driving. The reliability was adequate ($\alpha = .83$).

Content Analysis. The content analysis was conducted during the Fall and Spring of 1995 and 1996, respectively. Each of 26 one-hour dramas that aired during prime time on the four major networks were considered for inclusion in the sample. During October 1995, each of the 26 programs was videotaped one time. Approximately five programs were randomly selected to be recorded during the first week of October; five more were chosen to be recorded during the second week in October, and so on until all programs had been recorded once. If for some reason the chosen program had been preempted (for a football game, for example), then the program was automatically chosen to be recorded the following week. The same procedure was duplicated in March. An episode from each of the 26 programs was again randomly selected and recorded. Due to cancellations, only 24 one-hour dramas were recorded during the Spring.

Two graduate students coded the recorded sample. During the hour-long program, the program was first divided into scenes. There was 100% agreement between the two coders about the number of scenes in each program. Second, the coder timed the length of the scene and recorded that time in seconds. Third, the coder recorded the duration of time devoted to violence within each scene. Violence was defined as “any physical action performed by a perpetrator, with or without a weapon, in which injury is intentionally directed at the perpetrator or at others in the scene.” Timing began at the onset of the action and concluded when the violent act itself was over. Therefore, if an act of aggression was performed by person A, who then left the scene, the timing was concluded, even if the victim was still shown in the scene. Finally, we computed the average seconds devoted to violence for each program.

Exposure to Violence Measurement. To test the hypotheses, several new variables were created by combining the variables from the content analysis with those from the questionnaire. For each participant, an overall attraction-to-violence score was created. First, the four most violent shows were selected. These programs were selected because the mean length of violence for those shows fell more than 2 standard deviations above the overall mean, and, only four programs met that criteria. Those programs included *JAG* (282 seconds/hour), *Walker Texas Ranger* (280 seconds/hour) and *NYPD Blue* (146 seconds/hour) and *Space: Above and Beyond* (152 seconds/hour). Second, for each participant, the amount of time devoted to violence for each of the top four shows (e.g., 282 seconds) was multiplied by the frequency with which the participant watched that show. Each participant then had a score for attraction to violence for each of the four violent programs (e.g., *sometimes* = 1). So, if they watched the most violent show infrequently they might get a similar score to someone who watched a less violent show frequently. Lastly, the violence variable for each participant was created by summing the resulting multiplicative scores of the top four violent programs. Ultimately, each participant had an overall attraction-to-violence score, based on the amount of time they watched violent shows multiplied by the amount of time those shows depicted violence.

In addition to this violence viewing variable, reported viewing of sports such as football and hockey ($M = 3.02$, $SD = 1.02$) and reported viewing of realistic crime shows such as *COPS* ($M = 2.71$, $SD = 1.07$) was measured using two single item measures. That is, participants were asked to report on a 0 (*never*) to 4 (*always*) scale how frequently they watched each program type. Oliver (1994) has found that a majority of real crime programs contain violence, and contact sports were identified as violent due to the arousing and aggressive nature of the content of football and hockey (Krcmar & Greene, 1999).

Analyses. Principal components factor analysis, canonical correlation, and stepwise multiple regression were used to analyze the data. A zero-order correlation matrix is presented in Table 1.

TABLE 1

Zero-Order Correlation Matrix of Violent Television Exposure and Risk-Taking Behavior

	1	2	3	4	5	6	7	8
1. Problem Drink		.69**	.48**	.56**	.52**	.19**	.13*	-.14*
2. Drink & Drive			.43**	.50**	.45**	.15**	.09	.16**
3. Delinquency				.49**	.58**	.34**	.17**	-.04
4. Reckless Drive					.38**	.15**	.13*	.04
5. Drug Use						.13*	.04	-.08
6. (TV) Contact Sports							.27**	.17**
7. (TV) Real Crime								.28**
8. Violent Drama								

* $p < .01$, ** $p < .001$

RESULTS

Because demographic variables may account for some variance in both television viewing and risk taking, those relationships were assessed prior to hypothesis testing. Biological sex accounted for a significant proportion of variance in risk taking and will be considered in the analyses reported.² A second demographic variable, parents' education, was also considered. However, parents' education was unrelated to the dependent variables with the exception of exposure to real crime shows.³ Therefore, parents' education was not considered in subsequent analyses. Next, a factor analysis was conducted with all seven risky behavior items entered into the equation. As predicted, one factor emerged, with an Eigenvalue of 3.63. The factor captured 49% of the variance. Loading on this factor were the following risky behaviors: alcohol use (loading = .84), drinking and driving (loading = .78); delinquency, which included vandalizing, trespassing, and truancy (loading = .69); reckless driving (loading = .74); and drug use (loading = .75). Because risky sex (loading = .59) and smoking (loading = .59) were considered to have factor loadings below what is considered typically acceptable, they were not included in subsequent analysis, although they did not, in fact, load on a separate or distinct factor. Therefore, behaviors

with factor loadings above .65 were considered to form a class, or system, of interrelated behaviors. This provides support for hypothesis 1.

TABLE 2

Canonical Correlation: Exposure to Violent Television and Risk-Taking Behavior

	Root 1	
	Canonical Weight	Structure Coefficient
Set 1: Risk-taking Behavior		
Problem Drink	-.54	-.79*
Drinking and Driving	-.14	-.66*
Risky Sex	.08	-.23
Smoking	-.13	-.39
Delinquency	-.75	-.85*
Reckless Driving	.10	-.53*
Drug Use	.31	-.46*
Set 2: Violent Television		
Contact Sports	-.83	-.84*
Realistic Crime	-.33	-.46*
Violent Drama	.51*	.30*

* $p < .01$

Hypothesis 2 predicted a relationship between exposure to TV violence and risk-taking behavior.⁴ To test this, a canonical correlation was computed. The overall canonical correlation was significant, $F(21) = 8.24$, $p < .001$, and the first three roots were significant. The first canonical root yielded a canonical correlation of .41, $F(21) = 8.02$; $p < .001$, with an eigenvalue of .19, capturing 72% of the variance. The second root yielded a canonical correlation of .21, $F(12) = 4.02$, $p < .001$, capturing 17% of the variance. The third canonical root yielded a correlation of .17, $F(5) = 3.91$, $p < .05$, capturing 11% of the variance in risky behaviors. Because of the small canonical correlations of the second and third roots ($< .30$), only the first root was interpreted. Table 2 contains the standardized and structure coefficients for the dependent variables and covariates for the first function. This latent factor was labeled *delinquent behavior*. Therefore, exposure to contact sports and realistic crime is positively related, and exposure to violent drama is negatively related to the root that includes risk-taking behavior. That is, the television viewing factors and the risk-taking factors constitute a set of interrelated variables.

An examination of the structure coefficients reveals that exposure to contact sports was the strongest predictor of the set of risk-taking behaviors ($-.84$). To a lesser extent, exposure to realistic crime shows was also related to these behaviors ($-.46$). Surprisingly, violent drama showed an inverse relationship with the set ($.30$), indicating that less viewing of violent drama was actually related to risk taking. Examination of the structure coefficients in set one suggests that problem drinking ($-.79$), drinking and driving ($-.66$), delinquency ($-.85$), reckless driving ($-.53$), and drug use ($-.46$) are all related to the violence viewing measures, but contact sports viewing and viewing of realistic crime shows are positively related, whereas exposure to violent drama is inversely related to each of the risk-taking behaviors.

In addition to the analysis reported above, we wanted to take a more detailed look at the data in terms of the breakdown for males versus females. In general, biological sex is typically related to risk-taking behavior (e.g., Newcomb & McGee, 1989), with adolescent boys engaging in greater amounts of drinking, risky driving, and drug use than adolescent girls. For this reason, it might be interesting to see if the relationship among the variables held up for the two subgroups. To do this, two canonical correlations were computed, one for males and one for females; however, the risky behaviors of smoking and risky sex were eliminated from this analysis because they were nonsignificant in the canonical correlation for the entire population.

For males, the results were similar to those for the entire data set. Specifically, the overall canonical correlation was significant, $F(15) = 4.52$, $p < .001$, and the first root was significant. The first canonical root yielded a canonical correlation of $.44$, $F(15) = 4.74$, $p < .001$, with an eigenvalue of $.24$, capturing 85% of the variance. Perhaps because of the large amount of variance accounted for by the first root (unlike the results from the entire sample), only that first root was interpretable.

An examination of the structure coefficients reveals that exposure to contact sports was the strongest predictor of the set of risk-taking behaviors ($-.80$). Exposure to realistic crime shows was also related to these behaviors ($-.55$) and, once again, violent drama showed an inverse relationship with the set ($.36$), indicating that less viewing of violent drama was actually related to greater risk taking. Examination of the structure coefficients in set one suggests that problem drinking ($-.81$), drinking and driving ($-.69$), delinquency ($-.72$), reckless driving ($-.56$), and drug use ($-.68$) are all related to the violence viewing measures. Therefore, exposure to contact sports and realistic crime is positively related, and exposure to violent drama is negatively related to the root that includes risk-taking behavior. That is, the television viewing factors and the risk-taking factors

constitute a set of interrelated variables for males. However, it is noteworthy that in every case, the structure coefficient of each variable was larger for the male subgroup than it was for the entire sample.

Next, the canonical correlation was computed for females. For this subgroup, the overall canonical correlation was significant, $F(15) = 2.24$, $p < .05$; however, none of the roots exhibited a coefficient high enough to be interpreted ($R_c < .30$). Therefore, for females, there was no significantly consistent pattern of relationships among risk taking and exposure to violent television.

These hypotheses were further tested through multiple regression. Five individual regression equations were computed with the five risk-taking behaviors as the dependent variables (leaving out smoking and risky sex because factor analysis revealed that they were unrelated to risk taking in the data). In each of the equations, participant sex and overall television viewing were entered in step one. This was done because (a) sex was found to be related to the variables of interest, as can be seen in the previous analyses, and (b) overall viewing is frequently used as a control variable, leaving only the effect of exposure to specific content. Next, the three violence viewing variables were entered as a set in step two. Degrees of freedom vary somewhat due to differences in missing data on each of the dependent measures.⁵ In the first equation, problem drinking was the dependent variable. On the first step, sex and overall viewing were entered. These were significant, $R = .24$, $F(2, 583) = 17.35$, $p < .001$. On the second step, the viewing variables were entered and these were also significant, R^2 change = .08, $F(5, 580) = 17.43$, $p < .001$. Specifically, realistic crime and contact sports were positively related and violent drama negatively related to problem drinking. Table 3 provides the beta weights for the individual predictor variables at the final step of the equation.

In the second equation, drinking and driving was the dependent variable. On the first step, sex and overall viewing were entered. These were significant, $R = .21$, $F(2, 614) = 13.75$, $p < .001$. On the second step, the viewing variables were entered and these were also significant, R^2 change = .06, $F(5, 611) = 15.14$, $p < .001$. Again, exposure to real crime shows and contact sports was positively related and exposure to violent drama was negatively related to drinking and driving (See Table 3 for beta weights at the final step). In the third equation, drug use was the dependent variable. On the first step, sex and overall viewing were entered. These were significant, $R = .28$, $F(2, 615) = 26.85$, $p < .001$. On the second step, the viewing variables were entered and these were significant, R^2 change = .02, $F(5, 612) = 4.90$, $p < .01$. Exposure to real crime shows was positively related, and exposure to violent drama was negatively related to drug use (See Table 3 for beta weights at the final step). In the fourth equation, risky

TABLE 3
Regression Equations: Television Use as a Predictor of Risk-taking Behavior

Dependent Variables	Problem Drinking	Drinking and Driving	Drug Use	Risky Driving	Delinquency
Predictor Variables	<i>Beta</i>	<i>Beta</i>	<i>Beta</i>	<i>Beta</i>	<i>Beta</i>
Step One					
Bio. Sex	-0.22***	-0.21***	-0.25***	-0.32*	-0.32***
Tot TV	0.15**	0.14**	0.07	0.09*	0.11*
Step Two					
Real Crime	0.12**	0.11**	0.17**	0.12**	0.05*
Sports	0.14**	0.08*	-0.03	0.02	0.00
Violent Drama	-0.32***	-0.31***	-0.10*	-0.16**	-0.17***

Note. Beta weights derived from the last step in each regression equation

* $p < .05$

** $p < .01$

*** $p < .001$

driving was the dependent variable. On the first step, sex and overall viewing were entered. These were significant, $R = .30$, $F(2, 614) = 31.45$, $p < .001$. On the second step, the viewing variables were entered and these were significant, R^2 change = .02, $F(5, 611) = 5.67$, $p < .001$. Exposure to real crime shows was positively related, and exposure to violent drama was negatively related to risky driving. In the fifth and last equation, delinquency was the dependent variable. On the first step, sex and overall viewing were entered. These were significant, $R = .50$, $F(2, 614) = 104.10$, $p < .001$. On the second step, the viewing variables were entered, and these were significant, R^2 change = .05, $F(5, 611) = 14.04$, $p < .001$. Again, exposure to real crime shows was positively related and exposure to violent drama was negatively related to delinquency (See Table 3 for individual beta weights).

DISCUSSION

This study suggests that there may be a link between exposure to violent television in the form of violent television drama, realistic crime shows, and contact sports and participation in various forms of risk taking, especially for adolescent males. Specifically, alcohol use, drinking and driving, delinquency (vandalizing, trespassing, truancy), reckless driving and drug use were related to violence viewing. However, the relationship between various forms of violent television content and risk-taking behavior varies somewhat. Specifically, exposure to realistic crime shows and contact sports is positively related to risk taking; whereas, exposure to violent drama is negatively related to risk-taking behavior, even when controlling for sex.

Why does this interesting pattern of results occur? First, it is important to distinguish between risk taking, as we have defined it here, and antisocial behavior. Because risk taking is clearly defined as behaviors that threaten the health of an individual, it is simpler to determine which behaviors constitute risk taking. Interestingly, however, antisocial behaviors are context dependent. For example, body piercing may have been considered antisocial a decade ago, but due to its widespread occurrence among adolescents, it has ironically lost the very antisocial statement it was attempting to make. It has entered mainstream acceptance. What does this mean for the current study? Perhaps the link that we see between realistic crime shows and contact sports, on one hand, and reckless driving, drug use, alcohol use, and delinquency on the other, might more accurately be seen as a link between violent programming and male adolescents' current definition of antisocial behaviors. Consider the behaviors identified in Root 1. These include problem drinking, drinking and driving, reckless driving, drug use, and delinquency. Smoking and sex are not included. On further consideration, it seems that although all of the behaviors in the list are indeed risky, the final two may be seen as socially acceptable among adolescents and, therefore, are not antisocial. It is possible that the link we see among the behavior variables and the media variables can more accurately be referred to as a link between TV violence and antisocial risk taking.

This interpretation is supported at least in part from the fact that smoking and unsafe sex, which are clearly risky, are not statistically related to the other risk-taking behaviors. Similarly, exposure to violent drama has a negative—not positive—relationship with the root that includes, for example, risky driving and problem drinking, perhaps because it is neither violent enough nor visually vivid enough to provide the same meaning for adolescents as do the other violent programs. In short, problem behavior predicts that behaviors that carry the same

meaning for an individual will co-occur. It is possible that smoking, unsafe sex, and violent drama are not antisocial or thrill provoking as are, for example, risky driving, real crime shows, and contact sports. Therefore, the findings may be interpreted to indicate a link between exposure to antisocial and arousing television (which does not include violent drama) and adolescent antisocial (albeit risky) behavior. Therefore, for the remainder of the article, we will discuss the findings in terms of antisocial risk taking.

This study also found strong support for the fact that sex, as well as overall television viewing, is related to adolescent antisocial risk taking. Specifically, males are more likely than females to engage in alcohol use, drinking and driving, reckless driving, drug use, and delinquency. These findings are consistent with previous research that has found that adolescent males engage in relatively more antisocial risk-taking behavior than their female counterparts (e.g., Donohew, 1990; Newcomb & McGee, 1989). In addition, those adolescents who reported watching more television, in general, were likely to engage in more antisocial risk-taking behavior. This finding additionally suggests that television viewing, as a system-level variable, can account for variance in adolescent behavior that has potentially harmful effects for adolescents. However, it is important to note that, even when sex and overall television viewing were entered as control variables, there still remained a relationship between exposure to violent content and adolescents' enactment of risk-taking behavior.

Problem Behavior Theory and Television Exposure

Problem behavior theory suggests that all elements of the subsystems (the environmental, the psychosocial, and the behavioral) are system-level properties. This study, therefore, in support of problem behavior theory, suggests that television viewing, particularly exposure to some forms of TV violence, is an activity, a part of an adolescent's environment that is a subset of a larger system (see Fraser, 1996). Within the model of problem behavior, exposure to TV violence does not result only in simple imitation. Rather, an adolescent chooses to watch TV violence because this type of media content fulfills some need, carries some meaning for the adolescent; media violence is sought out for the meaning it carries for the adolescent. In turn, exposure to media violence can then encourage performance of other antisocial risk-taking behaviors. As a system-level variable, then, exposure to media violence, especially programs considered arousing or antisocial, can increase the occurrence of risk-taking behaviors in adolescents in a way that is more complex than initially thought.

In addition, it is possible that at-risk adolescents watch more television violence, are more attentive to violent cues, and therefore place more emphasis on the violence. Because of this increased emphasis, exposure to television violence may increase their tendency to attach importance and relevance to the violence they see. As suggested by problem behavior theory, this increased relevance, or increased meaning, can then serve to make violent television a model for other risky behaviors. This increase in risky behaviors in turn may result in increased attention to violent television, thus furthering the pattern.

Implications

There are several implications for these findings. First, because this study suggests that there is a grouping of interrelated television programs (i.e., environmental variables) that is related to a grouping of problem behavior variables, there are implications for messages targeting various types of adolescent antisocial risk taking. At present, many programs (e.g., Just Say "No") have focused mainly on one type of problem behavior, such as drug use or sexual behavior. Even those programs that focus on the adolescent decision-making process (the Just Say "No" program claims to teach general refusal skills) do so in the context of only one behavior, such as drugs, smoking, or violence. Even federal funding available for risk-type interventions often specify one behavior (for example, National Institute for Drug Abuse, NIDA, funds research on one type of problem behavior). Results of the present study would indicate that programs should be developed that target overall risk-taking decision making. In teaching adolescents to make positive decisions regarding risk taking in general, more might be accomplished than is currently done in single behavior targeted campaigns. And, if a grouping of behaviors carry similar meaning for adolescents in general, teaching overall decision-making may prove to be more advantageous than teaching them to avoid individual risky behaviors. It would be impossible to teach someone about every risk that they might encounter, thus more can be accomplished by encouraging adolescents to reach their own healthy life decisions. Fraser (1996, p. 349) elaborates on a ecodevelopmental view where "inadequate training in critical and social cognitive skills" (combined with other factors such as impoverished opportunity structure) are viewed as responsible for much problem behavior.

A second implication is that media effects theory should begin to consider various stimuli as interrelated, with a potential for interrelated effects. The present study suggests that models might be developed that also consider patterns in outcome behaviors. For example, it may be interesting to examine

how adolescents' exposure to alcohol advertising may result in increases in risky driving, or perhaps delinquency behaviors.

Limitations

Although the present study found that exposure to violent television is related to increased occurrence of other antisocial risk-taking behaviors in adolescents, several limitations exist. First, problem behavior theory posits that the psychosocial and environmental systems are causally related to problem behaviors. Because these data are survey data, it is impossible to make causal claims. Although it is intriguing that such diverse behaviors as exposure to violence on television and delinquency are related, longitudinal research should examine this link more thoroughly.

Second, problem behavior theory posits that behaviors that carry the same meaning for an adolescent are likely to be linked with one another. Previous research by Jessor and Jessor (1984) has found that delinquency, drug use, violence, and vandalism are related to one another in that they tend to occur simultaneously or not at all in a given individual. The present study, however, did not measure the perceived meaning of the violent television that the adolescent watched or the meaning of their problem behavior. Therefore, although the data suggest support of problem behavior theory, it is equally plausible that a third, unmeasured variable is responsible for both exposure to television violence and an adolescent's tendency to perform antisocial risk-taking behavior. For example, adolescents may both watch media violence and perform antisocial risk-taking behaviors to demonstrate their independence. It is possible, too, that both variables are caused by, for example, lack of financial resources to engage in more productive leisure activity or association with peers who hold favorable attitudes toward media violence and risk behaviors.

Third, this study suggests that exposure to violent television might predict antisocial risk taking, in general. This possibility might better be supported with information about adolescents' violent behavior, for example fighting. In this way, we could additionally argue that one portrayal (e.g., reckless driving) could predict an array of antisocial risk-taking behaviors, among which the depicted behavior (i.e., reckless driving) was one. It might also be interesting, from a systems perspective, to look at other related mediated forms of aggression, for example violent video games. Last, as is often the case with self-report data, lack of information about actual behavior, rather than simply self-reported behavior, may inflate or otherwise affect findings. Future research on this topic should attempt to assess behaviors in a less obtrusive manner.

Future Research

Future research should attempt to assess the various meanings these environmental and behavioral factors have for an individual. It is possible, for example, that the adolescent who watches *COPS* because his or her parents object to the program may respond to it very differently than the adolescent who watches the program because it airs at a convenient hour or because peers talk about it at school. In this way, understanding the meaning that the program carries for the adolescent may provide a crucial link between exposure to the program and performance of various problem behaviors. Future research should explore this link between the meaning of the program and the meaning of the problem behavior rather than the link between simple television exposure and problem behavior.

Because the present study did not measure adolescents' reports of aggressive behavior, such as fighting, it would also be important to replicate the present study measuring adolescents' exposure to televised aggression and their reports of various antisocial risk-taking behaviors, including aggressive behaviors such as fighting. Therefore, future research should examine the interplay between adolescent exposure to media violence, adolescent aggressive behavior, and other forms of adolescent antisocial risk taking.

To date, previous research has convincingly linked exposure to television violence with increases in aggressive behavior. The present findings suggest that media violence may in fact be more insidious than previously thought. Although adolescent aggressive behavior is certainly worthy of concern, if exposure to media violence can in fact increase adolescent antisocial risk taking in general, even more emphasis is needed to decrease the amount of violence depicted on television.

NOTES

¹ Although media effects were covered in the introductory courses, that topic was covered at the end of the semester after surveys had been collected.

² In this paper, biological sex (i.e., male vs. female) will be referred to as sex. Sexual activity will be referred to as sexual intercourse or as risky sex, where appropriate.

³ Significant relationships were found between mother's education and exposure to real crime shows ($r = -.09, p < .05$), and between father's education and exposure to real crime programs ($r = -.11, p < .01$).

⁴Questions pertaining to driving were asked of all adolescents, including those below the legal driving age. Because even those 13 and younger reported some risky driving (78% in this group reported *never*) and some drinking and driving (84% reported *never*), we chose to include all adolescents in the analyses. Furthermore, for those under 16, the correlations between risky driving and other risk-taking behavior and the correlations between drinking and driving and other risk-taking behavior, were all significant at $p < .05$. These data suggest that this group of young adolescents are high risk takers across categories.

⁵Smoking and risky sex were found to be unrelated to exposure to violent television in any of the previous statistical analyses; therefore, they were omitted from further analyses.

REFERENCES

- Arnett, J. (1991). Heavy metal music and reckless behavior among adolescents. *Journal of Youth and Adolescence, 20*, 573–592.
- Arnett, J. (1992). Reckless behavior in adolescence: A developmental review. *Developmental Review, 12*, 339–373.
- Ball, S. A. (1995). The validity of an alternative five-factor measure of personality in cocaine abusers. *Psychological Assessment, 2*, 148–154.
- Bandura, A., Ross, D., & Ross, S. A. (1963). Imitation of film-mediated aggressive models. *Journal of Abnormal and Social Psychology, 66*, 3–11.
- Chassin, L., Presson, C. C., Bensenberg, M., Corty, E., Olshavsky, R. W., & Sherman, S. J. (1981). Predicting adolescents' intentions to smoke cigarettes. *Journal of Health and Social Behavior, 22*, 445–455.
- Donohew, L. (1990). Public health campaigns: Individual message strategies and a model. In E. B. Ray & L. Donohew (Eds.), *Communication and health: Systems and applications* (pp. 136–152). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Donovan, J. E., & Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology, 53*, 890–904.
- Elkind, D. (1967). Egocentrism in adolescence. *Child Development, 38*, 1025–1034.
- Elkind, D. (1978). Understanding the young adolescent. *Adolescence, 13*, 127–134.

- Eron, L. D., & Heusmann, L. R. (1984). The control of aggressive behavior by changes in attitudes, values and the conditions of learning. In R. J. Blanchard & D. C. Blanchard (Eds.), *Advances in the study of aggression* (pp. 139–171). Orlando, FL: Academic.
- Fraser, M. W. (1996). Aggressive behavior in childhood and early adolescence: An ecological–developmental perspective on youth violence. *Social Work, 41*, 347–361.
- Gerbner, G., Gross, L., Morgan, M., & Signorielli, N. (1986). Living with television: The dynamics of the cultivation process. In J. Bryant & D. Zillmann (Eds.), *Perspectives on media effects* (pp.17–40). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Greene, K., Krcmar, M., Rubin, D. L., Walters, L. H., & Hale, J. L. (1998, November). *Elaboration in processing adolescent health messages: The relative contributions of egocentrism and sensation seeking*. Paper presented at the annual meeting of the National Communication Association, New York, NY.
- Greene, K., Rubin, D. L., Walters, L. H., & Hale, J. L. (1996). The utility of understanding adolescent egocentrism in designing health promotion messages. *Health Communication, 8*, 131–152.
- Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. *Journal of Addiction, 82*, 331–342.
- Jessor, R., & Jessor, S. L. (1984). Adolescence to young adulthood: A twelve-year prospective study of problem behavior and psychosocial development. In S.A. Mednick, M. Harway, & K. M. Finello (Eds.), *Handbook of longitudinal research: Teenage and adult cohorts* (Vol. 2, pp. 34–61). New York: Praeger.
- Krcmar, M., & Greene, K. (1999). Predicting exposure to and uses of television violence. *Journal of Communication, 49*(3), 24–45.
- Newcomb, M. D., & McGee, L. (1989). Adolescent alcohol use and other delinquent behaviors: A one year longitudinal analysis controlling for sensation seeking. *Criminal Justice and Behavior, 16*, 345–369.
- Oliver, M. B. (1994). Portrayals of crime, race and aggression in “reality-based” police shows: A content analysis. *Journal of Broadcasting and Electronic Media, 38*, 179–192.
- Rabinovitch, M. S., McLean, M., Markham, J. W., & Talbott, A. D. (1972). Children’s violence perceptions as a function of television violence. In G. A. Comstock, E. A. Rubinstein, & J. P. Murray (Eds.), *Television and social behavior: Vol. 5. Television effects: Further explorations* (pp. 32–51). Washington, DC: U. S. Government Printing Office.

- Rachal, J. V., Williams, J. R., Brehm, M. L., Cavanaugh, B., Moore, R. P., & Eckerman, W. C. (1975). *A national study of adolescent drinking behavior, Vol. I: The extent and nature of adolescent alcohol and drug use: The 1974 and 1978 national sample studies*. Research Triangle Park, NC: Research Triangle Institute.
- Roe, K. (1995). Adolescents' use of socially devalued music: Towards a theory of media delinquency. *Journal of Youth and Adolescence, 24*(5), 617–631.
- Rooney, J. F., & Wright, T. L. (1982). An extension of Jessor and Jessor's problem-behavior theory from marijuana to cigarette use. *The International Journal of the Addictions, 17*, 1273–1287.
- Tan, A. S. (1986). Social learning of aggression from television. In J. Bryant & D. Zillmann (Eds.), *Perspectives on media effects* (pp. 41-55). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Wilson, B. J., Kunkel, D., Linz, D., Donnerstein, E., Smith, S., Blumenthal, E., & Gray, T. (1997). Television violence and its context. In Mediascope (Ed.), *National Television Violence Study, Volume 1* (pp. 5–266). Newbury Park, CA: Sage.
- Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensations seeking*. New York: Cambridge University Press.

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