# Exposure to Media Violence and Other Correlates of Aggressive Behavior in Preschool Children

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## Abstract

This article examines the play behavior of 70 preschool children and its relationship to television violence and regulatory status. Linear regression analysis showed that violent program content and poor self-regulation were independently and significantly associated with overall and physical aggression. Advanced maternal age and child age and better self-regulation were independently and significantly associated with prosocial behavior. According to *t*-test analysis, two other statistically significant factors associated with overall aggression were gender and the lack of a father figure in the home. Analysis of *t*-tests showed a statistically significant relationship between children who watched violent content alone and verbal aggression. Multiple regression analysis established that poor self-regulation was the biggest predictor of overall aggression and that overall aggression was significantly related to gender. Results suggest limiting the amount of violent programming that preschool children see. Results also indicate that children benefit from interactive regulatory support.

## Introduction

Children between the ages of 2 and 18 years view all forms of media—including online and other electronic games—an average of 38 to 45 hours weekly (Roberts, Foehr, Rideout, & Brodie, 1999; Woodard & Gridina, 2000). At least 26 of these hours are spent watching television (National Center for Children Exposed to Violence, 2003). Of particular concern is that more than 60% of all television programs show violence (Seawell, 1998). Typically, children are likely to see 8,000 murders and at least 100,000 other acts of violence prior to leaving elementary school at age 12 years (Huston et al., 1992). Many people who are interested in children's well-being are concerned about possible detrimental effects of these violent images. It is of interest that Robinson, Wilde, Navracruz, Haydel, and Varady (2001) showed that a reduction in television, videotape, and video game use decreased aggressive behavior in elementary school children.

Empirical findings confirm that children who are exposed to media violence have increased probability of aggression (Anderson et al., 2003; Anderson & Bushman, 2002; Bushman & Huesmann, 2001; Frost, Wortham, & Reifel, 2001; Huesmann, Moise-Titus, Podolski, & Eron, 2003; Johnson, Cohen, Smailes, Kasen, & Brook, 2002). Some research indicates that this is especially true of boys (Fabes & Eisenberg, 1992; Goldstein, 1995; Scales & Cook-Gumperz, 1993). In one longitudinal study of boys, for example, researchers found a relationship between having viewed television violence during early childhood and aggressive and antisocial behavior 10 years later (Eron, Huesmann, Lefkowitz, & Walder, 1972).

The mounting evidence that media violence and aggressive behavior are related suggests a complex association. There is speculation that children who view aggressive behaviors are likely to imitate the aggression (Anderson et al., 2003; Anderson & Bushman, 2002; Bushman & Huesmann, 2001; Levin, 1998), that repeated exposure to violent images desensitizes children to violence and inclines them to behave in an aggressive manner (Dodge, Petit, Bates, & Valente, 1995; Huesmann et al., 2003), that children who are aggressive enjoy watching violence more than other children (Atkin, Greenberg, Korzenny, & McDermott, 1979; Goldstein, 1998), and that the relationship is attributable to a combination of factors (Huesmann et al., 2003).

Most research on the effects of media violence in children has investigated single-effect relationships in laboratory settings (Tobin, 2000). But test performance in the laboratory does not represent typical behavior, and the complexity of factors involved in children's aggressive interactions warrants examination of multiple variables. In the present study, we examine multiple simultaneously occurring factors, including exposure to media violence, to determine which ones most influence preschool children's spontaneous play behaviors in the classroom. The use of naturalistic observations of children's play themes to study their cognitive structures is well documented (Frost et al., 2001; Levin, 1998; Nourot, 1998; Piaget, 1962; Smilansky, 1968, 1990; Van Hoorn, Nourot, Scales, & Alward, 1999; Vygotsky, 1966).

Separation of internal thought from external perception marks the emergence of symbolic capacity and directly

facilitates cognitive growth and abstract thinking. Until these capacities are developed, children cannot reflect upon or understand the consequences of violent behavior (Levin, 1998, 2003; Van Hoorn, Nourot, Scales, & Alward, 2003). As such, children who are developing internal symbolic systems are vulnerable to the images of media (Csikszentmihalyi, 1990; Levin, 2003), especially when the images are violent (Huesmann et al., 2003; Anderson et al., 2003).

The present study contributes meaningful information about children and media to the field of early childhood education. Very little research on media violence has involved collecting naturalistic observations of preschool children's spontaneous play in the classroom. For example, Christakis, Zimmerman, DiGiuseppe, and McCarty (2004) analyzed data collected by the National Longitudinal Study of Youth. They reviewed data for 1,275 children at age 1 year and another 1,345 children at age 3 years and found that the number of hours that the children viewed television was later associated with attention problems at age 7.

Similarly, little research on media violence has examined the specific contribution of self-regulation to a child's level of aggressive behavior. Self-regulation is a complex capacity that develops in early childhood and is highly contingent upon the quality of caregiver/child interactions (Schore, 2003, 2005; Schuder & Lyons-Rutter, 2004). Children progress toward self-regulation proceeding from the early control of arousal in infancy to the mature regulation of internal states and behavior in response to social expectations in later childhood (Kopp, 1982).

The primary purpose of the present study was to examine whether viewing television violence is associated with aggression in preschool children during spontaneous play. We define aggression as the intent to injure or harm another, and we distinguish it from playful aggression such as chasing or pretending to harm another. Our expectation was that the images that the children saw while watching television influenced their cognitive structures and would be apparent in their play.

The secondary purpose was to evaluate simultaneous multiple variables that influence children's behavior. Based on what we know about the role of self-regulation in managing internal states and behavior, we hypothesized that the children's regulatory status would be associated with their play behaviors independent of watching media violence.

## Method

### Participants

Seventeen preschools in Lake County, California, were recruited for the present study. Seven preschools participated, and 40% of the families consented to be part of the study. The sample size was 70 children, 32 females and 38 males, ranging in age from 36 to 60 months, with a mean age of 53.2 months. The children spent an average of 24.5 hours per week in school and an average of 19.3 hours weekly viewing television. Most of the children were Caucasian (69%), followed by Hispanic (20%), African American (8%), Native American (1%), and Asian (2%).

The mean age of the fathers was 34.5 years and of the mothers was 32.6 years. Most of the children were from two-parent families (63%), followed by families of single mothers (36%), and one family of a single father (1%). The parents' average education was high school or less (70.5%), 2 years of college or vocational training (12.5%), college degrees (12%), and graduate degrees (5%). The parents' average annual income varied—less than $30,000 (45%), $30,000-$60,000 (27%), and more than $60,000 (28%).

Thirty out of 35 teachers (86%) consented to participate in the study. Of the 30 teachers, 29 were female and 1 was male. Their ages ranged from 19 to 60 years, with a mean of 37 years. They had at least 12 units of early childhood education, with a mean of 1.5 years of college. Their teaching experience ranged from 5 to 20 years, with a mean of 8 years, and they earned an average of $22,500 annually.

### Instruments and Materials

*Temperament and Atypical Behavior Scale (TABS).* The TABS regulation subtest score was used to determine children's self-regulation (Neisworth, Bagnato, Salvia, & Hunt, 1999). This score was derived from 24 yes-or-no questions that yielded a numerical rating for behavioral difficulties in the combined areas of dysregulation and hypersensitive/overactive. The overall internal consistency reliability of .88 is expected to be lower for the subtests. A low score represented children's robust ability to self-regulate—the capability to monitor their own internal states and behavior. A high score represented children's poor self-regulation—difficulty managing their own emotions and behavior. Test items included "easily frustrated," "frequently irritable," "demands attention," "impulsive," "hit others," and "cannot comfort self when upset" (Neisworth et al., 1999).

The principal researcher trained each participating teacher to administer the TABS instrument. The test was administered and scored according to the TABS manual. Each teacher filled out the instrument for every child in her care at the end of the study.

*Early Childhood Environment Rating Scale-Revised (ECERS-R)*. The ECERS-R was used to rate the quality of each preschool classroom (Harms, Clifford, & Cryer, 1998). One overall score from seven areas—space and furniture, personal care routines, language and reasoning, activities, interaction, program structure, and parents and staff—was calculated on a scale of 1 to 7 (1 = inadequate to 7 = excellent). The inter-rater reliability was .88. The principal researcher administered the ECERS-R on the last day of data collection at each location and individually scored them according to the manual.

*Parent Survey*. This survey was a modified version of Eron (1982). It had 46 questions about the parents' education, age, annual income, and who lived in the home. The parents were asked what television programs their children regularly watched, how frequently they watched them, and whether the children watched the program alone or with family members. The parents listed three of the children's favorite videotapes and three of their favorite morning, afternoon, and evening weekday programs. They scored 1 to 5 to show how often the children watched each program. The parents also named three of the children's preferred weekend programs and marked whether each one was watched every time it was on, often, once in a while, or hardly ever.

*Teacher Survey.* This survey had 15 questions about the teacher's age, number of years of formal education, years of teaching experience, and annual income. Each of these categories was averaged into one score per preschool classroom. The principal researcher administered the survey at the beginning of the study to all of the teachers who participated in the study.

*Children's Play Behavior.* Observations of the children's interactive play were categorized into "episodes" as defined by Corsaro (1985):

> Interactive episodes are those sequences of behavior that begin with the acknowledged presence of two or more interactants in an ecological area and the overt attempt(s) to arrive at a shared meaning of ongoing or emerging activity. Episodes end with the physical movement of interactants from the area, which results in the termination of the originally initiated activity. (p. 24)

Corsaro's (1985) definition was modified for the purposes of the present study because the children tended to travel from area to area continuing their play with their original intention still intact, particularly during outdoor play. Thus, episodes were defined as ending when the original intention of the activity was changed *or* the children left the area to play in separate or different areas.

The children's play behaviors were first coded as prosocial, assertive, and verbal and physical aggressive according to Smith's (1998) system (see Table 1). The aggressive behaviors were assigned a violence/aggression rating based on the degree to which these behaviors intentionally caused distress or harm to another child or to an object (see Table 2). It is of interest that Smith's system does not have a passive behavior category. This omission may be of concern in that children's passivity may be mistaken as prosocial behavior but may not necessarily be positive behavior.

**Table 1**
Child Behavior Coding Categories

| Abbr. | Behavior | Examples |
|---|---|---|
| ***PR*** | *Prosocial Behavior* (behavior that is seen as a positive exchange between children) | • Cooperative activities (task or play cooperation)<br>• Object-related activities (giving and sharing objects)<br>• Helping activities (help in task or play)<br>• Empathic activities (looking at, approaching, or comforting an upset peer)<br>• Encouraging activities (inviting another to participate)<br>• Enforcing rules (reminding another of the school rule)<br>• Reciprocal activities or relationships (allowing another to have a turn or initiate a play activity without protest) |
| ***AS*** | *Assertive Behavior* (behavior that is seen as a motivation to elevate one's position or push one's self forward in the peer group) | • Showing off ("Check me out." or "Look at me.")<br>• Competitive behavior ("Bet I can beat you." or "You can't catch me.") |

| | | |
|---|---|---|
| | | • Bragging behavior ("I am better than you are.")<br>• Challenging behavior ("No, you didn't.")<br>• Objecting behavior ("I'll tell." or "Stop it.")<br>• Taking lead in play (assigning roles or/and reassigning roles)<br>• Standing up for self ("You can't tell me what to do." or "Yes, I can.")<br>• Questioning behavior ("Why did you do that?" or "What were you thinking?")<br>• Requesting help from the teacher ("Teacher, she won't give me a turn.") |
| ***VA*** | *Verbal Aggression* (use of words to inflict harm) | • Property or territory disputes<br>• Exclusion of another child from group or game<br>• Ordering about, demanding<br>• Judgment<br>• Laughing at others when they are sad or hurt<br>• Teasing<br>• Threats<br>• Withholding verbal communication by purposefully ignoring |
| ***PVA*** | *Provoked Verbal Aggression* (verbal aggression used when provoked by others) | |
| ***PV*** | *Physical Violence* (use of physical force) | • Hitting, pushing, kicking, biting, scratching, pinching, and spitting<br>• Bullying with physical force<br>• Grabbing toy or object away with force |
| ***GA*** | *Group Aggression:* more than one child uses physical violence against another | |
| ***D*** | *Physical Violence* (physical violence that results in the death of an insect) | |
| ***ProV*** | *Provoked Physical Violence* (physical violence used when provoked by others) | • Taking objects from a child |
| ***OPV*** | *Ongoing Physical Violence* (physical violence that continues for more than three exchanges in an episode)<br>Coder notes the duration of time. | • Ongoing fight scene |
| ***GV*** | *Games Violence* | • Extra rough play<br>• Rough-and-tumble play<br>• Imprisoning, holding someone against his or her will in a game |
| ***TV*** | *Toy Violence* (aggression against a toy or object) | |
| ***IV*** | *Implied Violence* (violence that occurs off screen but can be heard) | • Character being injured by unknown perpetrator off screen |
| ***FA*** | *Failed Attempt at Violence* (violence that was intended but failed to occur due to outside circumstances) | • A bullet that missed<br>• A punch that did not connect because the puncher fell<br>• A bomb intended to kill, accidentally doesn't work |
| ***NSV*** | *Nonspecific Violence* (clear violence, but the intent is vague or difficult to determine and place the blame on)<br>Coder notes the nature of the violence. | • Two characters are fighting over an object, which causes bodily harm by knocking over tables and chairs on top of themselves |

**Table 2**

Violence/Aggression Rating Scale

| Abbr. | Behavior | Points |
|---|---|---|

| | | |
|---|---|---|
| VA | Verbal Aggression | 2 |
| PVA | Provoked Verbal Aggression | 1 |
| PV | Physical Violence | 5 |
| GA | Group Aggression | 8 |
| D | Death of Insect | 10 |
| ProV | Provoked Violence | 2 |
| OPV | Ongoing Physical Violence | 10 |
| GV | Games Violence | 1 |
| TV | Toy Violence | 4 |
| IV | Implied Violence | 5 |
| FA | Failed Attempt at Violence | 5 |
| NSV | Nonspecific Violence | 5 |

## Procedure

After gaining consent and collecting completed surveys, the principal researcher videotaped the children's play behaviors from December 2005 to March 2006. Each preschool classroom was visited 3 hours each morning for 5 days. Play observations were made during free play. The duration of these play observations depended on the classroom's schedule. For example, one classroom had 5 hours of free play per week—one hour each morning. The remaining classrooms had between 12 and 15 hours of free play during the week that they were observed. Each child's play behavior was divided by the amount of time he or she was observed. This calculation accounted for the different amount of time that the children played in the various classrooms.

Indoor play was recorded in the block corner and in the dress-up corner for equal periods of time. Observations of outdoor play began at the sandbox or at the playground equipment and moved with the children from one area to another. More observations were made indoors than outdoors because of the weather.

The principal researcher rated each classroom on the ECERS-R (Harms et al., 1998), and the teacher participants administered the TABS (Neisworth et al., 1999) to the children participating in the study. The researcher conducted inservice training sessions for the teachers at each school to teach them how to administer the TABS assessment tool. These training sessions took 45 minutes to 2 hours, depending on the number of participants in each group, and included detailed explanations of the test. The teachers also received brief one-on-one training to answer follow-up questions.

## Rating Procedures

*Children's Play Behaviors.* Play behaviors were coded as prosocial, assertive, or verbally or physically aggressive. Verbal aggression and physical violence were categorized separately, and they were coded differently because these two categories were not mutually exclusive. There were 14 child behavior coding categories: 1 within prosocial behavior, 1 within assertive behavior, 2 within verbal aggression, and 10 within physical aggression (see Table 1). These codes were derived by following the coding system established by Smith (1998), although slight revisions were made for the present study.

Prosocial behavior was seen as positive, altruistic, and cooperative exchanges between children. Assertive behavior was seen as the motivation to elevate one's position in the peer group and to affirm or maintain one's position as an equal in the peer group without causing distress or harm to others. This behavior was displayed when a child told another child, "You are the baby and I am the mommy." It was also displayed when a child was proud of his or her actions and brought it to the attention of the group—for example, "Hey everyone! Look at me. Look at what I did." Verbal aggression was seen as children's use of words to inflict distress or harm on another child and included teasing, ordering about, or using threatening words. Physical aggression was based on 10 categories of violence that included a specific category for game violence.

According to Smith (1998), there are many types of aggressive behavior. He states, "A distinctive advantage of an observational approach is that it enables valid distinctions to be made between different types of aggression" (p. 98). As such, the code for each of the behaviors measured for the present study was determined by the children's apparent intentions and actions. If the intention was to destroy or harm a toy, it was coded toy violence. If the apparent intention was to harm another child, it was coded physical violence. But if its purpose was to "get into" a play character's role, the action was seen as dramatic play rather than aggression. For example, if two children were playing superhero characters and one character tried to "fly" across the playground and accidentally knocked over another child, it was not coded as game violence and therefore did not get physical aggression points. But if children were play wrestling and one child requested the action to stop and the request was repeatedly ignored, it

was coded for game violence and assigned an aggression point. This type of behavior was displayed when the rough-and-tumble play was especially aggressive or when a child was holding others against their will during play.

Children's play was coded for game violence when it seemed to get out of control, when a child got into a character's role and distressed or hurt another child, or when a child wanted to be released from a previously assigned role and was ignored. We observed game violence in the following example. Two children were having fun acting as pirates until one child pretended to tie the other one up and commanded her to walk a plank. The child refused to do so, and a physical struggle occurred. When the "captive" repeatedly tried to stop the play, the struggle escalated until she finally ran away. This behavior was coded as game violence, and the pirate was assigned one aggression point.

One point was received for every prosocial and assertive behavior displayed and 1 to 10 points for every verbal and/or physical aggressive behavior displayed. Scores for each child were independently totaled for the four behaviors, and the verbal and physical aggression scores were combined for an overall violence/aggression rating (see Table 2). Three early childhood education graduate students reached 100% agreement on this rating scale in previous research (Daly, 2002).

A child's ultimate score for each behavior is expressed as the ratio of minutes of observation to raw rating. This integer value was used in the data analysis. For example, a child who was observed for 10 minutes and whose aggression score was 5 would be assigned the same integer value as a child who was observed for 60 minutes and had a score of 30.

*Television Violence*. The same verbal and physical aggression categories were used to code television violence. A rating was assigned to each television program, movie, and videotape that the parents listed by a team of three early childhood undergraduate students. The team coded these media according to the television violence coding categories presented in Table 2. Points from 1 to 10 were assigned to each verbal and physical aggressive act and combined for an overall violence/aggression rating for every program. These ratings were totaled for each child.

*Hours of Television Watched.* The researcher added up the number of hours that each child watched television in one week according to the information provided by the parents in the parent survey.

## Reliability

*Inter-rater Reliability.* The researcher trained a team of three child development students how to view and code every television program, movie, and videotape for violence using a Random Rater Viewing Schedule. For example, each member watched approximately 30% of any one program by fast-forwarding for 5 minutes, then watching for 5 minutes, fast forwarding for 10 minutes, and then watching for an additional 5 minutes (see Table 3).

**Table 3**
Random Rater Viewing Schedule

| 30-Minute Program | | 60-Minute Program | | 90-Minute Program & Over | |
|---|---|---|---|---|---|
| 5-10 mins. | (5) | 5-10 mins. | (5) | 5-10 mins. | (5) |
| 20-25 mins. | (5) | 20-25 mins. | (5) | 20-25 mins. | (5) |
| | 10 viewed | | (5) | | (5) |
| | | | (5) | | (5) |
| | | | 20 viewed | | (5) |
| | | | | | (5) |
| | | | | | (5) |
| | | | | | (5) |
| | | | | | 40 viewed |

Every team member coded one-third of each of the 173 programs that the parents named on the surveys. A different team member recoded 10% of the 173 programs. Because they did not necessarily fast-forward to the identical temporal point to recode each program, the team reached an overall inter-rater reliability of only 78% for the violent content.

*Inter-observer Reliability.* The principal researcher watched and coded all 29.5 hours of the children's play behaviors. One member from the inter-rater reliability team randomly coded 5 hours (17%) of overall footage (29.5 hours) of the children's play behavior from three of the preschools. Their inter-observer reliability was 89%.

### Data Analysis

A series of linear regression analyses were used to estimate whether 16 independent variables were independently and significantly associated with the children's prosocial, assertive, and aggressive play behaviors:

1. children's gender
2. children's age
3. children's ethnicity
4. hours in school
5. self-regulation
6. number of hours that children watched television in one week
7. parents' age
8. parents' education
9. presence of father figure in the home
10. family's annual income
11. teachers' age
12. teachers' years of education
13. teaching experience
14. teachers' annual income
15. quality of the classroom
16. violence rating for every program watched

Multiple regression analysis (ANOVA) was used on all 16 variables simultaneously to assess which ones were significantly associated with the children's play behaviors. Multiple regression analysis is more robust than linear regression at identifying independent variables that significantly predict dependent variables.

Analyses of *t*-tests were used to determine significant behavioral differences between boys and girls, among the children who watched programming alone or with their parents, and between the children who lived with a father figure and those who did not.

## Results

### Linear Regression Analyses

Violent content and poor self-regulation were independently and significantly associated with overall aggression (physical and verbal combined) ($r$ = .25, $p$ = .05) and ($r$ = .71, $p$ = .0000) and physical aggression ($r$ = .25, $p$ = .05) and ($r$ = .69, $p$ = .0000). The higher the program violence rating and the higher the self-regulation score, the more aggressive the children were. Poor self-regulation was significantly associated with verbal aggression ($r$ = .67, $p$ = .0000). The children who were seen has having the least self-regulation expressed the most verbal aggression.

The children's self-regulation and age and the mother's age were independently and significantly associated with prosocial behavior ($r$ = -.24, $p$ = .04), ($r$ = .27, $p$ = .03), and ($r$ = .27, $p$ = .03). These findings showed that the children who were rated as having good self-regulation were engaged in more prosocial behaviors. They also showed that prosocial behavior was associated with the mother's age. The older the mother, the more prosocial the children were. The greater number of hours the children were at school, the greater the association with assertive behavior ($r$ =.34, $p$ = .005).

### Multiple Regression and Analysis of Variance (ANOVA)

Poor self-regulation influences aggressive behavior in preschool children. The results showed that it was the biggest predictor of overall aggression, reaching significance at $p$ = .0000 (*coefficient value* = 0.0957, $t$ = 8.2996, *RSq(adj)* = 55.7961%, and $df$ = 69). The coefficient tells us that, on average, each point of the regulation score added 0.0957 points to the children's overall aggressive behavior per hour in school. Gender significantly

influenced overall aggressive behavior, reaching significance at $p$ = .0038 (*coefficient value* = -0.2853, $t$ = -2.9961, *RSq(adj)* = 55.7961%, and $df$ = 69). On average, girls were 0.2853 points less aggressive per hour in school than boys (see Tables 4a and 4b).

**Table 4a**
Multiple Regression (ANOVA) for Overall Aggressive Behavior with Respect to Gender and TABS Regulation Subscore
ANOVA (Dependent Variable—Overall Aggressive Behavior) ($N$= 70)

| Source | *SS* | *df* | *MS* | *F* | *p*-Value |
|---|---|---|---|---|---|
| Regression | 13.6114 | 2 | 6.8057 | 44.5474 | 0.0000*** |
| Error | 10.2359 | 67 | 0.1528 | | |
| Total | 23.8472 | 69 | | | |

RSq = 57.0774%; RSq(adj) = 55.7961%; std. error = 0.2764; Durbin-Watson: 1.7344.
*$p$ < .05; **$p$ < .01; ***$p$ < .001.

**Table 4b**
Multiple Regression (ANOVA) for Overall Aggressive Behavior with Respect to Gender and TABS Regulation Subscore

| Coefficient | Value | Std. Error | *t* | *p*-Value |
|---|---|---|---|---|
| b0 (Intercept) | 0.3540 | 0.0708 | 4.9983 | 0.0000 |
| b1 (Gender) | -0.2853 | 0.0952 | -2.9961 | 0.0038 ** |
| b2 (Regulation Subscore) | 0.0957 | 0.0115 | 8.2996 | 0.0000 *** |

*$p$ < .05; **$p$ < .01; ***$p$ < .001.

The child's age, self-regulation, and the mother's age significantly predicted prosocial behavior. The child's age was the biggest indicator, yielding an individual statistical significance of $p$ = .0188 (*coefficient value* = 0.0038, $t$ = -2.4132, *RSq(adj)* = 16.4248%, and $df$ = 64). This result was followed by the child's self-regulation and the mother's age, with an individual statistical significance of $p$ =.0382 (*coefficient value* = -0.0071, $t$ = -2.1181, *RSq (adj)* = 16.4248%, and $df$ = 64) and $p$ = .0449 (*coefficient value* = 0.0038, $t$ = 2.0473, *RSq(adj)* = 16.4248%, and $df$ = 64) (see Tables 5a and 5b).

**Table 5a**
Multiple Regression (ANOVA) for Prosocial Behavior with Respect to Child's Age, Mother's Age, and TABS Regulation Subscore
ANOVA (Dependent Variable—Prosocial Behavior) ($N$ = 70)

| Source | *SS* | *df* | *MS* | *F* | *p*-Value |
|---|---|---|---|---|---|
| Regression | 0.1677 | 3 | 0.0559 | 5.1926 | 0.0029** |
| Error | 0.6567 | 61 | 0.0108 | | |
| Total | 0.8244 | 64 | | | |

RSq = 20.3423%; RSq(adj) = 16.4248%; std. error = 0.0599; Durbin-Watson: 1.9204.
*$p$ < .05; **$p$ < .01; ***$p$ < .001.

**Table 5b**
Multiple Regression (ANOVA) for Prosocial Behavior with Respect to Child's Age, Mother's Age, and TABS Regulation Subscore
ANOVA (Dependent Variable—Prosocial Behavior) ($N$ = 70)

| Coefficient | Value | Std. Error | *t* | *p*-Value |
|---|---|---|---|---|
| b0 (Intercept) | -0.1275 | 0.1001 | -1.2744 | .2074 |
| b1 (Child's Age) | 0.0038 | 0.0016 | 2.4132 | .0188* |
| b2 (Mother's Age) | 0.0038 | 0.0018 | 2.0473 | .0449* |
| b3 (Regulation Subscore) | -0.0071 | 0.0034 | -2.1181 | .0382* |

*$p$ < .05; **$p$ < .01; ***$p$ < .001.

## *t*-Test Analysis

The difference between boys and girls was statistically significant for overall aggression ($t$ =3.18, $p$ = .002). Boys were 3 times more aggressive than girls. Children who lived in homes without a father figure exhibited twice as

much overall aggression ($t$ = 2.17, $p$ = .03). Children who watched violent programs alone were significantly twice as verbally aggressive as those who watched violent programs in the company of others ($t$ = 2.35, $p$ = .02).

### Media Viewing

The data showed that the boys more often watched *Batman, Superman, Spiderman,* and *Power Rangers* and the girls more often viewed *Little Mermaid 1, Little Mermaid 2*, *Cinderella,* and *Beauty and the Beast.* Both genders viewed *Shrek, Lion King, Finding Nemo,* and *Aladdin.* It is of interest that the gender preferences were not associated with violent content. For example, *Superman* had 69 points compared to *Little Mermaid 1,* which had 134 points; *Spiderman* had 178 points compared to *Beauty and the Beast,* which had 135 points; and *Power Rangers* had 90 points compared to *Little Mermaid 2,* which had 101 points. The boys and girls equally viewed *Sponge Bob Square Pants,* which had relatively low violent content. More than 72% of the children viewed *Dora the Explorer,* which had no violent content.

## Analysis and Discussion

Watching media violence is associated with aggressive behavior in preschool children. A review of the children's interactions showed that the most common type of aggression was the use of physical force. For example, if a child had an object that a second child wanted, the second child would hit or shove the first child and then take the object. A remarkable observation was of a boy who was identified as having low self-regulation. This child wanted to ride a tricycle that another child was riding. Rather than waiting for his turn, as the teacher had asked, he took the tricycle, waiting until the teacher had turned her back and then intentionally pushing the other child off the tricycle and onto the ground. He then rode off, leaving the other child on the ground protesting.

Of special significance is that aggression is exacerbated relative to the child's gender. The impact of media violence on young children is even greater in the case of boys than of girls (Fabes & Eisenberg, 1992; Goldstein, 1995; Scales & Cook-Gumperz, 1993). Though boys and girls in the present study saw a similar degree of violent content, the boys were 3-1/2 times more aggressive. It is important for future studies to clarify whether boys are more aggressive or if researchers have different expectations about gender roles and these expectations are reflected in the methods that are used to assess children's behavior.

It is also important to know whether exposure to media violence is a form of traumatic stress that causes fear in young children, who lack the cognitive maturity to reflect upon or to understand such experiences. A perpetuated fearful state may distort sensory perceptions. It seems to trigger activity in parts of the brain associated with interpreting threatening social cues. The regulatory system becomes biased toward arousal and hypervigilant to signs of negativity (Perry, 2002; Perry, Pollard, Blakely, Baker, & Vigilante, 1995; Stien & Kendall, 2004). This theory may explain why the children in this study with low self-regulation scores became highly reactive and had great difficulty managing their own arousal, unable to self-regulate their negative and aggressive behavior in play.

This study directly linked self-regulatory status to children's behavior. Self-regulation is an early developmental task that lays the foundation for inhibiting behavior and managing emotions in later life. Without the capacity to self-regulate, it is difficult for children to refrain from acting out in situations that trigger negative arousal. The source of the children's aggression and of their prosocial behavior was their own self-regulation. Hence, better regulation was positively related to the children's prosocial behavior and the degree of their cooperation with their peers, while poor self-regulation was significantly associated with aggression. A notable finding was a boy who had very limited self-regulation and received high ratings for overall aggression. He generally wandered the playground aimlessly. At one point in the observation, he hit every child in his path and kicked and yelled at the teacher.

No firm conclusions can be drawn about the cause of the children's poor self-regulation. It is conceivable that when young children are watching television they are not engaging with their caregivers, the main providers of interactive regulatory support (Schore, 2003, 2005; Schuder & Lyons-Rutter, 2004). This lack of engagement may lead to specific deficits in self-regulation. Environmental forces that are germane to mediating interactions encourage the development of autonomous regulation. Perhaps the outcome of young children's prolonged exposure to violent media in the absence of their caregivers hinders the development of self-regulation. This finding may also explain why children who watched violent programming alone were more than twice as verbally aggressive as those who watched it with their parents.

It is also possible that self-regulation becomes more challenging for a child when parents are less actively involved with the child and that leaving a young child to watch violent programming alone is evidence of lower overall involvement. To what extent do children who watch violent programming alone have parents who do not know or do not notice what children are watching or who simply do not think it is important?

## Summary/Conclusion

This investigation is one of the first to study the effects of violent media content on preschool children's play behaviors. The findings contribute valuable information to media violence research. Although linear regression analysis showed that violent content is associated with preschool children's aggressive behavior, no such direct effect was found using multiple regression analysis. It was necessary to examine simultaneous multiple variables. Most research on media violence has investigated single-effect relationships (Tobin, 2000). But the complexity of factors involved in young children's aggressive interactions warrants examination of multiple factors to determine which ones most influence preschool children's behavior.

In examining simultaneous multiple variables using a more robust multiple regression analysis, we found that poor self-regulation and male gender were strong predictors of overall aggressive behavior, independent of watching media violence. Children who watched television alone were more verbally aggressive; children were also more aggressive when they had no father figure who lived in the home, independent of television co-viewing. Substantial evidence indicates that a father's absence is particularly predictive of poor outcomes for children (Horn, 2000).

In contrast, better self-regulation and advanced child and maternal age were strongly related to prosocial behavior independent of media exposure: "What young children learn, how they react to the events and people around them, and what they expect from themselves and others are deeply affected by their relationships with parents, the behavior of parents, and the environment of the homes in which they live" (Shonkoff & Phillips, 2000, p. 226).

This study does have design limitations. For example, multiple regression analyses should limit the number of variables relative to the sample size. The estimate of the regression line can be unstable and unlikely to be replicated unless there are 10 to 20 times as many respondents as there are variables. This sample size of 70 was smaller than anticipated and smaller than the recommended sample size of 150. However, it was larger than the 50 participants required to obviate serious biases (Electronic Textbook StatSoft, 2003). In addition, statistical analysis did not establish whether children who are aggressive enjoy watching violence more than other children or if repeated exposure to violent images inclines them to behave in an aggressive manner. Another limitation is that we still do not know whether the children would behave differently if their media diet were changed, as suggested by Robinson et al. (2001).

Beyond any design limitations, the current findings have immediate implications for parents and teachers. Parents should not undervalue the importance of shared media viewing, nor should they overlook the significance of interacting with their children and explaining violent content to them. This study showed that fathers' presence in the home reduced their children's aggression, and that, while being observed, children of older mothers were more likely to display behaviors that were considered prosocial. Both of these findings point to a need for further investigation of the nature of these contributions. Does a father's presence or the amount of time he spends positively interacting with his child reduce aggression? Is it the mother's age or the quality of her interactions with her child that influence the child's prosocial behavior?

The most important finding—that poor self-regulation is associated with aggression independent of how much violent content the child viewed—argues for professional development to help teachers learn ways to foster children's self-regulation. We advocate more opportunities for children to engage in imaginative play that is adult supervised so that teachers, who are prepared to do so, can mediate disputes and assist children with self-regulation strategies when challenges arise. This type of practice may honor or foster the potential of such play to facilitate children's growth in symbolic and abstract thinking. We conclude that young children's growing ability to regulate their behavior would benefit from adults' interactive regulatory support and that it is necessary to limit the amount of violent programming that children see.

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