
Media Exposure, Aggression and Prosocial Behavior During Early Childhood: A Longitudinal Study

Jamie M. Ostrov, *University at Buffalo, The State University of New York*, Douglas A. Gentile, *Iowa State University and National Institute on Media and the Family*, and Nicki R. Crick, *University of Minnesota, Twin Cities Campus*

Abstract

Preschool children (N = 78) enrolled in multi-informant, multi-method longitudinal study were participants in a study designed to investigate the role of media exposure (i.e., violent and educational) on concurrent and future aggressive and prosocial behavior. Specifically, the amount of media exposure and the nature of the content was used to predict concurrent and future physical, verbal and relational aggression as well as prosocial behavior for girls and boys. This two-year longitudinal study found that media exposure predicted various subtypes of aggression and prosocial behavior. These findings are qualified by the gender of the focal child. That is, parental reports of media exposure were associated with relational aggression for girls and physical aggression for boys at school. Ways in which these findings extend our understanding of the role of media during early childhood are discussed.

Keywords: media; aggression; prosocial behavior; preschool

A proliferation of studies on media violence in young children has occurred in recent years, documenting the negative effects of violent depictions for the lives of young children both concurrently and prospectively (Gentile, 2003; Huesmann, Moise-Titus, Podolski & Eron, 2003). A well-documented finding, regardless of empirical method or culture studied, is that media violence exposure increases subsequent physical aggression across development (Anderson, Huston, Schmitt, Linebarger & Wright, 2001; Boyatzis, Matillo & Nesbitt, 1995; Comstock & Scharrer, 2003; Liebert & Sprafkin, 1988; Wiegman, Kuttschreuter & Baarda, 1992; for reviews, see Anderson, Berkowitz, Donnerstein, Huesmann, Johnson, Linz et al., 2003; Bushman & Anderson, 2001). As recently noted, this specific effect is quite strong (e.g., larger than the association between calcium intake and bone mass, Bushman & Anderson, 2001) and can be associated with other negative outcomes as well (i.e., desensitization to real violence, aggressive cognitions and behavior, and problematic parental and peer relationships;

Correspondence should be addressed to Jamie M. Ostrov, 214 Park Hall, Department of Psychology, University at Buffalo, The State University of New York, Buffalo, NY 14260-4110, USA. Email: jostrov@buffalo.edu

for review, see Gentile, 2003). The current public health concern may only get worse, given that nearly 70 percent of children's television shows contain displays of physical aggression with 14 violent acts displayed per hour, compared with less than four violent acts in non-children's programming (Wilson, Smith, Potter, Kunkel, Linz, Colvin et al., 2002). It is also relevant that media may be used to instill prosocial behavior and to assist children in increasing their academic performance (Anderson et al., 2001; Fisch & Truglio, 2000).

Developmental scholars have documented the long-term negative effects of violent media for children's future aggressive and delinquent behavior (for reviews, see Anderson et al., 2001; Bushman & Anderson, 2001; Huesmann & Miller, 1994). Although these studies are important for addressing the media industry and their supporters' claims that violent television, movies and videogames are not harmful (see Freedman, 2002), they are limited in a few key ways. The first concerns their reliance on forms of aggression that are salient for boys (e.g., physical and verbal aggression) and neglect of the study of relational aggression (i.e., using the relationships as the means of harm via ignoring, direct exclusion or by spreading malicious rumors, gossip or lies; Crick & Grotpeter, 1995; cf. Coyne & Archer, 2005; Huesmann et al., 2003, for studies with older children and the related but conceptually distinct construct of indirect aggression). In fact, recent media theorists have suggested that chronic and frequent exposure to violent media and aggressive depictions may influence the display of not only physical and verbal aggression but also relational aggression among young children (Buchanan, Gentile, Nelson, Walsh & Hensel, 2002; Gentile, Linder & Walsh, 2003). The study of media exposure on concurrent and future relational aggression has, to our knowledge, never been investigated. The second major limitation is a reliance on school-aged or adolescent participants and a neglect of young children (i.e., aged two to five) in understanding the specific developmental effects of media exposure. Much of the current literature is cross-sectional, with the exception of a few notable longitudinal studies conducted during early childhood (Anderson et al., 2001; Huesmann et al., 2003; Johnson, Cohen, Smailes, Kasen & Brook, 2002). Most of the work in the study of media effects on children has been with interviews, teacher and parental reports or quasi-experiments and rarely has naturalistic observation been used to document the real aggressive behavior of young media consumers (cf. Boyatzis et al., 1995). Finally, many studies do not report media effects for positive outcomes, such as prosocial behavior, which are important to demonstrate the influence of media exposure on young children's behavior and adjustment (see Anderson et al., 2001; Fisch, Truglio & Cole, 1999). Therefore, the present study was conducted to address these limitations using a longitudinal and multi-informant (i.e., observations, parent and teacher report) design with preschool children and the study of media exposure on physical, verbal and relational aggression as well as prosocial behavior.

The field generally has agreed on an overall definition of aggression: actions with the intent to hurt or harm another person (see Coie & Dodge, 1998; Crick & Grotpeter, 1995). Physical aggression, which harms others via physical force or the threat of physical force, consists of such behaviors as hitting, kicking, pinching, punching and the forceful taking of objects and so on. (Coie & Dodge, 1998; Crick & Grotpeter, 1995). Relational aggression, in which the relationship serves as the vehicle of harm, is documented when gossip or malicious secrets or lies, are transmitted, as well as by intentionally shunning, ignoring, excluding or ostracizing a peer from an activity, game or interaction (Crick & Grotpeter, 1995). Relational aggression may be

delivered in both direct and covert ways (Crick, Werner, Casas, O'Brien, Nelson, Grotperter et al., 1999), which distinguishes it from other conceptually related overlapping constructs such as indirect aggression (see Bjorkqvist, 1994). By definition, the indirect aggressor does not directly confront the victim to avoid the potential costs of retaliation but may use the established peer network (e.g., spread secrets) or may destroy property to display harm (Bjorkqvist, Lagerspetz & Kaukiainen, 1992). In addition, social aggression is a related subtype of relational and indirect aggression. Social aggression consists of non-confrontational behaviors (see Xie, Swift, Cairns & Cairns, 2002) and has recently been redefined to include verbal disparagement and non-verbal aggression (i.e., rolling eyes, negative body posture, etc.) and is thus a more conceptually diverse construct (Galen & Underwood, 1997). The present study focuses on relational aggression during early childhood because indirect aggression is theorized to rely on sophisticated social-cognitive processes that do not emerge until adolescence (Bjorkqvist et al., 1992).

The gender-linked hypothesis of aggression during early childhood, stating that boys will more often use physical aggression than girls and that girls will more often use relational aggression than boys to fulfill gender-specific social goals (see Crick & Grotperter, 1995), has been supported in recent research. Specifically, researchers using teacher, peer and observational methods have documented that boys are significantly more likely than girls to display and receive frequent levels of physical aggression, especially in the company of male peers. In contrast, girls are significantly more likely than their male peers to be identified as relationally aggressive and victimized especially when in the company of female peers (Bonica, Yeshova, Fisher, Zeljo & Arnold 2003; Crick, Casas & Ku, 1999; Crick, Casas & Mosher, 1997; McNeilly-Choque, Hart, Robinson, Nelson & Olsen, 1996; Hawley, 2003; Ostrov, 2006; Ostrov & Keating, 2004; Ostrov, Woods, Jansen, Casas & Crick, 2004; Russell, Hart, Robinson & Olsen, 2003; Sebanc, 2003; cf. Hart, Nelson, Robinson, Olsen & McNeilly-Choque, 1998). Recent research suggests that higher socioeconomic states (SES) children and those with more developed language capacities, who may have more access to various types of media and are more likely to understand the content, are more relationally aggressive (see Bonica et al., 2003; McNeilly-Choque et al., 1996). Thus, higher functioning and higher SES children may be more likely to be exposed to relational aggression via television, videos, and movies and may be more likely to understand and model these behaviors in the future.

In general, the study of relational aggression has relied primarily on teacher and peer reports (see Crick, Werner et al., 1999) but recent observational work during the early childhood period suggests that observations may offer a great deal of support for the gender-linked hypothesis of aggression and may be quite useful for understanding the development of relational aggression during early childhood (see Ostrov, Crick & Keating, 2005). Specifically, recent observational studies have provided evidence of stability of relational aggression in multiple contexts and across a two-year period, as well as much needed validation for the teacher and peer methods (Burr, Ostrov, Jansen, Cullerton-Sen & Crick, 2005; McNeilly-Choque et al., 1996; Ostrov, 2006; Ostrov & Keating, 2004). In addition, there is now evidence that rather young children are capable of sophisticated forms of relational aggression (e.g., spreading secrets) as captured naturalistically and in structured settings (Ostrov et al., 2004; Stauffacher & DeHart, 2005). Finally, there is emerging evidence to suggest that both physical and relational aggression are associated with concurrent and future social-psychological adjustment problems (e.g., Crick et al., 1997; Crick, Ostrov,

Burr, Cullerton-Sen, Janse-Yen & Ralston, 2005; Ostrov et al., 2004). For these reasons, some investigators have attempted to introduce interventions to diminish the peer exclusion behaviors that occur during early childhood classrooms, with some success (see Harrist & Bradley, 2003). Given these findings, it is clear that future observational study of relational aggression investigating other developmentally associated factors (i.e., the media) is greatly needed and may assist applied scholars in generating effective interventions (Crick, Ostrov, Appleyard, Jansen & Casas, 2004).

Early childhood (i.e., aged between two to five years) may be an especially salient developmental period for understanding how young children begin to attend, store, recall, and reproduce simple and complex behavioral patterns acquired from television, video, and other media sources (Barr & Hayne, 1999; Gentile & Sesma, 2003). Past research has documented media effects on both aggressive and prosocial behaviors of young children (Wiegman et al., 1992). It is also well documented that during the early preschool years, children may have meaningful, stable, interpersonal relationships (e.g., Denham & McKinley, 1993; Denham, McKinley, Couchoud & Holt, 1990). It is likely that young children may acquire coercive and aggressive behaviors (Patterson, 1982) and specifically, relationally aggressive behavior patterns from these significant relationships (e.g., from older siblings and friends; see Johnson & Foster, 2005; Stauffacher & DeHart, 2005). It is also likely that they could learn, model, and be reinforced for using relationally aggressive tactics via media exposure during the early childhood years. The converse is also predicted. That is, young children who are exposed to prosocial models and educational media content will be more likely to model prosocial behaviors during interactions with their peers concurrently and prospectively (Bandura, 1977; Fisch et al., 1999). Recent reconceptualizations of the construct of prosocial behavior are also relevant to this discussion. Specifically, scholars have documented that during early childhood, a common form of prosocial behavior that is especially salient for girls, is defined as relational inclusion (i.e., including others in games, activities, play and interactions; Greener & Crick, 1999). Educational media content may transfer not only the traditional features of prosocial behavior, which include helping, co-operating and sharing, but they may also improve children's relationally inclusive skills by teaching them how to approach groups and individuals to ensure that all children are invited and included in play.

To address these gaps in the current literature, the present study investigates the relation between various media habits and exposure to media and their effects on concurrent and prospective aggressive and prosocial behavior. Specifically, we predict that exposure to violent media (TV, video, movies, etc.) will be associated with the display of all subtypes of aggressive behavior (i.e., physical, relational and verbal) at school, as reported by teachers and observers both concurrently and in the future. Moreover, it is predicted that these associations will hold even when controlling for initial levels of social behavior. Secondly, we predict that exposure to educational media will be associated concurrently and prospectively with reported levels of prosocial behavior, which includes assessments of relational inclusion. Thirdly, we predict that weekly TV watching will be associated both with higher levels of aggressive behavior and prosocial behavior. Finally, we predict that the level of parental monitoring of children's media use will be inversely associated with aggression and positively associated with prosocial behavior. These hypotheses were tested by obtaining parental reports of their child's media exposure, and teacher reports of their social behavior, and by observing male and female preschool children's aggressive and prosocial behavior at four time points.

Method

Participants

The participants of this study included 38 boys and 38 girls, and their parents and head teachers, who were part of an on-going longitudinal study in a large mid-western city. The children had parental consent (rate = 76 percent) and were attending a university-sponsored preschool. The mean age at the start of this phase was 47 months ($SD = 10$ months). The families represented various ethnic backgrounds (62 percent Caucasian, 11 percent African-American, 4 percent Asian, 4 percent other, 19 percent unknown). The parents on average had post-secondary education and a majority had advanced or professional degrees, and their yearly income included low- to upper-middle class with the majority as middle class. The families were primarily married (93 percent) with only a few (7 percent) in divorced, separated, or other living arrangements.

The larger longitudinal project consists of two years separated into four phases of data collection with approximately four months between phases. Phase 1 was collected during the autumn and four months later, during the spring, Phase 2 was initiated (media surveys were collected during this phase). Phase 3 occurred during the following autumn, and Phase 4 was conducted during the subsequent spring.

Measures

The parental monitoring scale of the MediaQuotient questionnaire (Gentile & Walsh, 2002) was given to parents. This scale measures parental involvement in monitoring children's media habits across several media, including placing limits on the amount and content of media. This scale had acceptable reliability ($\alpha = .74$).

A new survey the parental survey of media exposure, was generated to further probe the media habits of the participating families and is available upon request. Specifically, parents were asked to report on the three most recent television shows, movies, video games and computer games that their child (i.e., the focal child) recently used. We further asked the parents to rate their child's three favorite TV shows and movies and assessed how violent and how educational the media product was to which their child was exposed on a seven-point unidimensional scale (e.g., 1 = 'not at all violent'; 7 = 'extremely violent'). Several other questions were collected for the purposes of a different study. Two indices were created from these data, one measuring violent media exposure (VME) and one measuring educational media exposure (EME).

VME. The parents were asked to name their children's three favorite television shows and their three favorite movies or videos. For each named media product, the parents were asked to rate how frequently their child watched or played on a seven-point scale (1 = 'almost never'; 7 = 'often'). The parents were also asked to rate how violent they consider each media product to be on a seven-point scale (1 = 'not at all violent'; 7 = 'extremely violent'). A violence exposure score was computed for each participant by multiplying the frequency of watching or playing each media product by its subjective violence rating and then taking the mean of the three similar products. Cronbach's alpha was computed for the overall media violence exposure scale and found to be satisfactory ($\alpha = .74$). Previous research has used this method and found it to be reliable and to have construct validity (Anderson & Dill, 2000; Buchanan et al., 2002; Gentile et al., 2003). Previous research has also confirmed that the respondents were

likely to assess the violence in media products based on the amount of physical violence rather than its relational aggression. People's ratings were most strongly correlated with the graphicness of the portrayal of physical violence across age, gender, amount of television viewing and other factors (Potter, 1999).

EME. For each named favorite media product, the parents were also asked to rate how educational they consider each media product to be on a seven-point scale (1 = 'not at all educational'; 7 = 'extremely educational'). An EME score was computed for each participant by multiplying the frequency of watching or playing each media product by its subjective educational rating, and then taking the mean of the three similar products. Cronbach's alpha was computed for the overall EME scale and found to be satisfactory ($\alpha = .72$).

Observations of aggression, victimization or prosocial behavior. Observers were trained with videotapes from past observational studies (Ostrov & Keating, 2004; Ostrov et al., 2004) and with live practice coding. The observers reached acceptable levels of reliability prior to the collection of the experimental data. The observations were based on a revised Ostrov and Keating (2004) procedure, using the focal child approach (e.g., Fagot & Hagan, 1985; Laursen & Hartup, 1989) in which each child was observed for 10 minutes and all the behavior that he/she displayed to their peers was recorded. The observers recorded behavior for physical aggression (i.e., hitting, kicking, pinching, threats of force, taking object, etc.); relational aggression (i.e., gossiping, spreading malicious rumors, lies, ignoring, exclusion, etc.); verbal aggression (i.e., mean names or insults); prosocial behavior (i.e., sharing, helping, including in activities or groups, etc.). Additional observations were conducted for victimization subtypes, received prosocial behavior and play style for the purposes of the larger longitudinal study. For each behavior, the observers recorded in full detail what occurred and the gender of all individuals involved. A separate behavior recording was based on a temporal break in the interaction during the observation. Each child was observed for eight separate times during each time point and the observations were summed to yield total scores (e.g., during Phase 2, 6080 minutes of observation were collected). For 10 to 15 percent of total observations, two observers observed the same session for reliability purposes and intra-class correlation coefficients (ICC) suggest acceptable levels of inter-observer reliability (ranges between Year 1 and Year 2 findings are provided): physical aggression, ICC = .78 to .91; relational aggression, ICC = .70 to .85; verbal aggression, ICC = .64 to .82; prosocial behavior, ICC = .73 to .79. This observational method has demonstrated acceptable validity in the past with moderate correlations between teachers and observers ranging from, $r = .42$ to $.50$ for relational aggression; $r = .47$ to $.62$ for physical aggression and so on. (Crick et al., 2006; Ostrov & Keating, 2004). In addition, these observations have been demonstrated to be stable during an academic year (e.g., $r = .44$, $p < .05$ for relational aggression) and across a full calendar year in a new academic context (e.g., $r = .31$, $p < .001$ for relational aggression (Crick et al., 2006).

Teacher reports of aggression or prosocial behavior. The teachers were provided with the widely used teacher report form, preschool social behavior scale (PSBS-TF), a reliable and valid measure designed by Crick et al. (1997) to assess individual differences in physical and relational aggressive behaviors. For each child, the head teacher independently completed 19 five-point scales (ranging from 'never or almost

never' to 'always or almost always') that assessed physical (e.g., hits, kicks, or verbally threatens others) and relational aggression (e.g., 'tells others not to play with or to be a peer's friend'; 'tries to get others to dislike a peer'; Crick et al. 1997). Prosocial items (e.g., shares or helps others) were also assessed. In past research (Ostrov & Keating, 2004), correlations calculated between the ratings produced by primary and assistant teachers for the physical and relational aggression subscales of the PSBS-TF were $r = .49$, $p < .001$, and $r = .55$, $p < .001$, respectively. Scores for physical and relational aggressiveness were determined by averaging the ratings across teachers. This measure has demonstrated acceptable psychometric properties in the past (Bonica et al., 2003) and currently with $\alpha > .70$ for all subscales.

Procedure

Media surveys were sent home to the parents of the children enrolled in the on-going longitudinal study with a letter inviting their participation. The surveys were returned via mail to the laboratory and were coded by trained graduate students. The surveys were sent home during Phase 2 of the larger project and corresponded exactly with Phase 2 data collection.

Observations were conducted by trained graduate and undergraduate students and took place in the classroom during free play or on the playground. The observers randomly selected whom they were to observe each day, and no more than one observation was conducted on each child per day. Prior to the data collection phases, the observers spent a considerable amount of time in the classroom and on the playground to diminish the children's interest in them, which decreased the level of reactivity in this study (Pellegrini, 1996). The observers remained within earshot of the child but were careful not to attract the child's attention. The majority of observations in the classroom were conducted from a visually shielded observation booth attached to the classroom, in order to diminish the children's reactivity. Each child was observed by multiple observers over the course of three months.

Teacher reports were administered in the middle of Phase 2 and were completed on every participating child. The reports took approximately 15 minutes per child and teachers were compensated with a small gift certificate for their participation.

Data Analysis

The results from the on going longitudinal study pertaining to age and gender differences for aggression subtypes, stability of aggressive behavior and associations between aggressive subtypes and adjustment problems are reported elsewhere (see Crick et al., 2006). The data presented here are organized by phase in three main sections: predicting media habits from prior behavior, associations between concurrent media habit and behavior and predicting future behavior from prior media habits. The analyses conducted include (1) repeated measures ANOVAs to test for differences between the media type and gender, (2) simple Pearson correlations between variables, (3) between subjects ANOVAs to test for group differences between low and high aggressors and (4) partial correlations controlling for the initial level of a behavior and therefore testing for change in behavior across time. It should be noted that because of the large number of correlations conducted, the possibility of type 1 error is high. However, because of the small sample size and the resulting lack of power, it was felt that setting a higher alpha level (e.g., .01) was too conservative in an exploratory study such as this.

Results

Descriptive Results

The children watched television for an average of 11.83 hours per week ($SD = 11.11$, range 0 to 85 hours). Boys viewed television for an average of 10.53 hours per week ($SD = 6.92$) and girls watched television for an average of 13.39 hours per week ($SD = 14.36$). There was no gender difference for the amount of weekly television watching, $F(1,69) = 1.12$, NS.

To test for gender differences for VME and EME, a 2 (gender) \times 2 (media type: VME or EME) repeated measures ANOVA was conducted. A significant main effect for media type was revealed, $F(1,67) = 139.70$, $p < .001$, $\eta^2 = .68$. Children in this sample were significantly more likely to be exposed to educational media ($M = 11.25$; $SD = .78$) than violent media ($M = 1.80$; $SD = .26$). A two-way interaction was not revealed, suggesting no significant difference between the boys ($M = 1.69$; $SD = 1.54$) and girls ($M = 1.91$; $SD = 2.60$) for the amount of violent media to which they were exposed. In addition, there was no significant difference between the boys ($M = 11.52$; $SD = 6.95$) and girls ($M = 10.98$; $SD = 6.04$) for the amount of educational media to which they were exposed.

As part of a larger longitudinal study, findings concerning gender differences for observed physical and relational aggression have been reported elsewhere, indicating that the girls are more relationally aggressive than the boys in this sample and that the boys are more physically aggressive than the girls in this sample (see Burr et al., 2005; Crick et al., 2006). In addition, the observations and teacher reports of physical and relational aggression appear to be moderately stable in the sample (Burr et al., 2005; Crick et al., 2006). In the present sample, the boys ($M = .23$; $SD = .30$) were more verbally aggressive than the girls ($M = .08$; $SD = .13$), $F(1,69) = 6.74$, $p < .01$. In the present sample, the girls ($M = .60$; $SD = .41$) were not significantly more prosocial than the boys ($M = .41$; $SD = .38$), $F(1,69) = 2.66$, NS.

Next, the frequency of each child's three favorite television programs was calculated. An inspection of the content of these programs indicates that the majority of television programming to which the participants were exposed was found on PBS, Disney Channel, and Nickelodeon and may be coded as prosocial or educational in nature. This observation is consistent with the parents' empirical ratings of the children's media exposure which, as presented above, indicates that the majority of the TV and other media products that children were exposed to were educational and non-violent in nature. A list of the programs and their frequency of selection are available at <http://www.psychology.iastate.edu/faculty/dgentile>.

Predicting Future Media Habits (Phase 2) from Prior Behavior (Phase 1)

Phase 1 observed prosocial behavior predicted phase 2 EME, $r(61) = .25$, $p < .05$.

Predicting Future Media Habits (Phase 2) from Prior Behavior (Phase 1) by Gender

For the boys, observed physical aggression at phase 1 predicted the hours watching television at time 2, $r(33) = .38$, $p < .05$.¹

For the girls, teacher-reported relational aggression at phase 1 predicted hours watching television per week at time 2, $r(31) = .37$, $p < .05$.

Associations Between Media Habits (Phase 2) and Concurrent Behavior (Phase 2)

Bivariate correlations revealed that the total number of reported hours per week of watching television was associated concurrently with observed prosocial behavior, $r(66) = .25, p < .05$.

Parental monitoring of the children's media use was associated negatively with the focal child's physical aggression as reported by teachers during phase 2, $r(64) = -.34, p < .01$.

Associations Between Media Habits (Phase 2) and Concurrent Behavior (Phase 2) by Gender

For the boys, hours of television viewing per week was correlated with concurrent observations of verbal aggression, $r(35) = .47, p < .01$, and with teacher-reported physical aggression, $r(33) = .36, p < .05$.²

For the girls, hours of television viewing per week was correlated with concurrent teacher-reported relational aggression, $r(31) = .34, p < .05$.

Differences Between High and Low Aggressive and Prosocial Behavior Status and TV Watching

To probe for differences between high and low aggression and prosocial groups and overall TV exposure, we first conducted a median split for phase 2 observed physical, relational, verbal aggression and prosocial behavior. To specifically test for differences between high and low behavior groups, we conducted a series of one-way ANOVAs with concurrent parental report of total hours per week watching TV serving as the dependent variable in each analysis. For physical aggression, no differences emerged for the amount of TV watching between low aggressors ($M = 13.37; SD = 14.89$) and high physical aggressors ($M = 10.85; SD = 7.07$), $F(1,68) = .84, NS$. For relational aggression, low aggressors ($M = 14.90; SD = 14.31$) were significantly less likely to view TV relative to the high relationally aggressive children ($M = 9.35; SD = 5.84$), $F(1,65) = 4.18, p < .05, \eta^2 = .09$. For verbal aggression, children displaying low amounts of aggression ($M = 11.65; SD = 13.40$) were not different from the high verbal aggressors ($M = 12.92; SD = 6.52$), $F(1,68) = .20, NS$. Finally, for observed prosocial behavior, the children displaying low levels of prosocial behavior ($M = 9.42; SD = 4.73$) viewed less TV than high prosocial children ($M = 14.93; 14.92$).

Predicting Future Behavior (Phases 3 & 4) from Media Habits (Phase 2) by Gender

For the boys, the amount of television viewing per week (at phase 2) was correlated with observed relational aggression at phase 3, $r(20) = .44, p < .05$. For the boys, VME was related to phase 3 observed physical aggression, relational aggression, and verbal aggression, $r_s(20) = .51, .49, \text{ and } .48$, respectively, all $p_s < .05$. EME at phase 2 was negatively associated with observed physical aggression for the boys during phase 3, $r(20) = -.47, p < .05$.³

For the girls only, VME was associated with phase 3 observed verbal aggression, $r(23) = .45, p < .05$. For the girls, EME was correlated with phase 4 relational aggression, $r(19) = .61, p < .01$.

For the girls, parental monitoring was negatively associated with teacher-reported physical and verbal aggression at phase 3 and with teacher-reported relational and physical aggression at phase 4, $r_s = -.43, -.50, -.47,$ and $-.54,$ $p_s < .05,$ respectively. In addition, for the girls, parental monitoring was negatively associated with observed verbal aggression at phase 4, $r(19) = -.64,$ $p < .01.$

Predicting Increases in Aggression and Prosocial Behavior

To predict increases in aggressive and prosocial behavior from phase 2 to phases 3 and 4, partial correlations were conducted between VME and EME and aggressive or prosocial behavior, controlling for phase 2 aggressive or prosocial behavior, respectively. VME at phase 2 predicted observed verbal aggression at phase 3, controlling for phase 2 observed verbal aggression, $r(40) = .31,$ $p < .05.$ EME at phase 2 negatively predicted observed physical aggression at phase 3, controlling for phase 2 observed physical aggression, $r(20) = -.32,$ $p < .05.$

Discussion

The present study was the first to test the association between VME and EME and the various subtypes of aggression (i.e., physical, relational and verbal) and prosocial behavior during early childhood. In addition, this multi-method (i.e., observer, parent and teacher report), longitudinal study was designed to test for gender-linked associations for both the concurrent and prospective effects of TV watching as well as VME and EME on positive and negative social behavior.

We found that in this study of relatively high SES and high functioning children, where most of the children were exposed to educational programming (i.e., PBS Kids), the amount of television viewing was associated with concurrent prosocial behavior. In addition, those children that were the most prosocial tended to watch television more than their peers. Despite this fact, we found an interesting and important effect in keeping with the gender-linked hypothesis of aggression. Specifically, hours of watching television was associated with both prior and concurrent relational aggression, but only for the girls. In contrast, hours of watching television was associated with prior and concurrent physical aggression, but only for the boys. This is the first empirical evidence that supports the hypothesis that television exposure is associated with the transmission of both physical and relational aggression in gender-specific ways during early childhood. Children who were observed to be higher on relational aggression at school watched more concurrent television relative to their lower relationally aggressive peers. This finding suggests that children are perhaps being exposed to relational aggression models in the media during early childhood, even in educational programming. In addition, these findings suggest the role of gender socialization processes is occurring via media exposure during early childhood. It is likely that boys and girls are watching similar programming (an inspection of our data suggests that this is the case), and boys and girls are attending to and learning different behavioral tactics and schemas from this early media exposure. It is feasible that identification with same-gender TV and media characters is a key component of this process (Huesmann et al., 2003). Future research must be geared to deciphering the processes by which boys and girls interpret and learn these subtypes of aggression from both violent and educational media. More specifically, further research is needed to explore how media exposure may serve as an important

training ground for learning relationally aggressive behaviors during early childhood, particularly for girls. At a minimum, a reinterpretation of the possible risks associated with educational media for young children is needed.

Parental monitoring of children's media exposure was associated negatively with the children's teacher-reported physical aggression. Specifically for the girls, parental monitoring was negatively associated with all subtypes of teacher-reported aggression and with observed verbal aggression in the future. These findings indicated that parental monitoring of media exposure in the home may have both concurrent and future effects on young children's social behavior at school with their peers. These findings also provide further evidence of the importance of the caregiver in facilitating and controlling the media to which young children are exposed.

Media effects research has begun to differentiate the effects that may be due to the *content* of media from those that may be due to the *amount* of media consumed, and it is clear that these dimensions often provide distinct effects (cf. Anderson et al., 2001; Gentile & Stone, 2006; Gentile, Lynch, Linder & Walsh, 2004). When examining the content of children's media exposure rather than just the amount, the results show content-based effects. For the boys, exposure to violent media was associated with all subtypes of future observed aggression. For the girls, VME was only associated with future verbal aggression. EME was associated with future observed relational aggression, but only for the girls. For the total sample, VME predicted increases in verbal aggression and educational media predicted decreases in observed physical aggression. Thus, whereas violent media is associated with all subtypes of aggression, educational media does not predict physical or verbal aggression. However, there may still be some risks in exposing children to educational media.

It seems that exposure to educational media (the majority of programs in the present study) is not always associated with only positive behaviors (e.g., prosocial behavior). More specifically, EME was correlated with future observed relational aggression. These findings may suggest that too much media consumption regardless of content, in general, can have negative consequences for peer relationships. Johnson et al. (2002) recently showed that high amounts of television in adolescence (they did not measure content) predicts greater aggressive and violent behavior in adulthood. In addition, it is likely that many educational and 'prosocial' media model relationally aggressive behaviors as a component of their programs. Anecdotally, our own viewing of many educational programs such as *Arthur* and ABC's *One Saturday Morning* suggests that relational aggression is modeled at a fairly high rate. For example, children may be shown excluding and ostracizing friends or peers on the playground as part of the TV show and at the end of the program the children reconcile. Research on young children's understanding of television makes it clear that preschoolers have a difficult time understanding plots, including being able to connect information at the end of the show to what happened earlier (Bryant & Anderson, 1983). It is likely that young children do not attend to the overall 'lesson' in the manner an older child or adult can, but instead learn from each of the behaviors shown, including the explicit relationally aggressive behaviors. In addition, it appears that these depictions on TV may be differentially salient for girls during early childhood. Girls may attend to and store relationship-salient story lines which fit with their gender construal (Crick & Grotpeter, 1995). In addition, girls may actively approach, gather information and remember scenes that depict gender relevant relationally aggressive behavior. This notion is based on past gender schema theory and research (Martin & Halverson, 1981) and fits with social information

processing approaches to young children's aggressive behavior (Crick & Dodge, 1994). These acquired schemas may then influence their future social behavior with peers (i.e., relational aggression with peers) in predictable ways. Furthermore, one of the developmental tasks of early childhood is to learn sex roles, and television may play a role in helping to transmit stereotypical sex roles, including girls' higher use of relational aggression and boys' higher use of physical aggression, although this hypothesis has yet to be tested (Gentile & Sesma, 2003). Clearly, further study is needed to replicate and extend these initial and somewhat surprising findings, including content analyses of relationally aggressive behaviors in children's programming.

The present study is limited in several ways and future research is needed to rectify these issues. Firstly, the study is limited by the sample size, making our analyses exploratory in nature. Despite the relatively large sample for a longitudinal and multi-method study, which included time-intensive observational methods, we do have diminished power, and replication with a larger sample is needed. Secondly, the media surveys were administered to parents only once and thus we do not know whether the children's media habits changed from phase to phase. Thirdly, our surveys and indexes of media violence and EME are based on parental report and thus there may have been self-presentation biases and reluctance to indicate the violent nature of programs; thus, our estimates may underestimate the true violent nature of young children's media exposure (although this also only serves to limit the ability to find significant effects). Finally, our findings may not generalize to other populations, given that the current sample is relatively high functioning (high SES, typical children) and the present results might be quite different among a more diverse sample or one that is referred for clinically significant aggressive behavioral problems. Despite these limitations, this study presents the first investigation into the relation between EME and VME for various subtypes of aggression and prosocial behavior during early childhood.

Future work with older children and with semi-structured observational procedures may help us understand how media exposure may have direct and mediated effects on relationally aggressive behavior. In addition, currently, we do not have an appreciation for the amount of relationally aggressive content that is presented during children's viewing times and thus a thorough content analysis is necessary to understand the context within which young children are developing.

This study suggests that both violent and educational media may have important effects on young children. These effects appear to be significant (i.e., increased aggressive behavior problems) and to have both concurrent and future consequences (i.e., both positive and negative, depending on the nature of the media content). Although the findings are unique for girls and boys, in general, they suggest that parents should be highly attentive to the amount, type and appropriateness of media to which young children are exposed. Yet the implications may also include a re-examining of what is 'appropriate' for young children. The list of shows that the children in this sample were dominantly viewing what we would consider age-appropriate media, but the effects were not only positive. If our observation that even educational and prosocial shows designed for young children display high levels of relational aggression is correct, it may be time to reassess both what is appropriate or harmful for children to watch and how children's programming may need to change to maximize the benefits while minimizing the harms. Additionally, interventions and prevention efforts could be designed, tested and implemented during early childhood to begin to improve the

developmental outcomes for these young children. In the meantime, however, based on the findings here, we support the American Academy of Pediatrics' recommendations that children under three watch no television and that it be limited to one hour a day for young children over three (American Academy of Pediatrics, Committee on Public Education, 2001).

References

- American Academy of Pediatrics, Committee on Public Education (2001). Children, adolescents, and television. *Pediatrics*, *107*, 423–426.
- Anderson, C. A. & Dill, K. E. (2000). Video games and aggressive thoughts, feelings, and behavior in the laboratory and in life. *Journal of Personality and Social Psychology*, *78*, 772–790.
- Anderson, C. A., Berkowitz, L., Donnerstein, E., Huesmann, R. L., Johnson, J., Linz, D., et al. (2003). The influence of media violence on youth. *Psychological Science in the Public Interest*, *4*, 81–110.
- Anderson, D. R., Huston, A. C., Schmitt, K. L., Linebarger, D. L. & Wright, J. C. (2001). Early childhood television viewing and adolescent behavior. *Monographs of the Society for Research in Child Development*, *66* (1, Serial No. 264), 1–147.
- Bandura, A. (1977). *Social learning theory*. Oxford: Prentice-Hall.
- Barr, R. & Hayne, H. (1999). Developmental changes in imitation from television during infancy. *Child Development*, *70*, 1067–1081.
- Bjorkqvist, K. (1994). Sex differences in physical, verbal and indirect aggression: a review of recent research. *Sex Roles*, *30*, 177–188.
- Bjorkqvist, K., Lagerspetz, K. M. J. & Kaukiainen, A. (1992). Do girls manipulate and boys fight? Developmental trends in regard to direct and indirect aggression. *Aggressive Behavior*, *18*, 117–127.
- Bonica, C., Arnold, D. H., Fisher, P. H., Zeljo, A., & Yeshova, K. (2003). Relational aggression, relational victimization and language development in preschoolers. *Social Development*, *12*, 551–562.
- Boyatzis, C. J., Matillo, G. M. & Nesbitt, K. M. (1995). Effects of the 'Mighty Morphin Power Rangers' on children's aggression with peers. *Child Study Journal*, *25*, 45–55.
- Bryant, J. & Anderson, D. R. (Eds.) (1983). *Children's understanding of TV: Research on attention and comprehension*. New York: Academic Press.
- Buchanan, A. M., Gentile, D. A., Nelson, D., Walsh, D. A. & Hensel, J. (2002, August). *What goes in must come out: Children's media violence consumption at home and aggressive behaviors at school*. Paper presented at the International Society for the Study of Behavioural Development Conference, Ottawa, Ontario, Canada.
- Burr, J. E., Ostrov, J. M., Jansen, E. A., Cullerton-Sen, C. & Crick, N. R. (2005). Relational aggression and friendship during early childhood: 'I won't be your friend!' *Early Education and Development*, *16*, 161–183.
- Bushman, B. J. & Anderson, C. A. (2001). Is it time to pull the plug on the hostile versus instrumental aggression dichotomy? *Psychology Review*, *108*, 273–279.
- Coie, J. D. & Dodge, K. A. (1998). Aggression and antisocial behavior. In N. Eisenberg (Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (pp. 779–862). New York: John Wiley.
- Coyne, S. M. & Archer, J. (2005). The relationship between indirect and physical aggression on television and in real life. *Social Development*, *14*, 324–338.
- Comstock, G. & Scharrer, E. (2003). The contribution of meta-analysis to the controversy over television violence and aggression. In D. A. Gentile (Ed.), *Media violence and children*. Westport, CT: Ablex.
- Crick, N. R., Casas, J. F. & Ku, H. (1999). Relational and physical forms of peer victimization in preschool. *Developmental Psychology*, *35*, 376–385.
- Crick, N. R., Casas, J. F. & Mosher, M. (1997). Relational and overt aggression in preschool. *Developmental Psychology*, *33*, 579–587.
- Crick, N. R. & Dodge, K. A. (1994). A review and reformulation of social information processing mechanisms in children's social adjustment. *Psychological Bulletin*, *115*, 74–101.

- Crick, N. R. & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development*, 66, 710–722.
- Crick, N. R., Ostrov, J. M., Appleyard, K., Jansen, E. A. & Casas, J. F. (2004). Relational aggression in early childhood: 'You can't come to my birthday party unless . . .'. In M. Putallaz & K. L. Bierman (Eds.), *Aggression, antisocial behavior, and violence among girls: A developmental perspective* (pp. 71–89). New York: Guilford Press.
- Crick, N. R., Ostrov, J. M., Burr, J. E., Cullerton-Sen, C., Jansen-Yen, E. & Ralston, P. (2006). A longitudinal study of relational and physical aggression in preschool. *Journal of Applied Developmental Psychology*, 27, 254–268.
- Crick, N. R., Werner, N. E., Casas, J. F., O'Brien, K. M., Nelson, D. A., Grotpeter, J. K. & Markon, K. (1999). Childhood aggression and gender: A new look at an old problem. In D. Bernstein (Ed.), *Nebraska symposium on motivation* (pp. 71–141). Lincoln: University of Nebraska Press.
- Denham, S. A. & McKinley, M. (1993). Sociometric nominations of preschoolers: A psychometric analysis. *Early Education and Development*, 4, 109–122.
- Denham, S. A., McKinley, M., Couchoud, E. A. & Holt, R. (1990). Emotional and behavioral predictors of preschool peer ratings. *Child Development*, 61, 1145–1152.
- Fagot, B. T. & Hagan, R. (1985). Aggression in toddlers: Responses to the assertive acts of boys and girls. *Sex Roles*, 12, 341–351.
- Fisch, S. M. & Truglio, R. T. (Eds.) (2000). *'G' is for growing: 30 years of research on children and sesame street*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Fisch, S. M., Truglio, R. T. & Cole, C. F. (1999). The impact of Sesame Street on preschool children: A review and synthesis of 30 years' research. *Media Psychology*, 1, 165–190.
- Freedman, J. L. (2002). *Media violence and its effects on aggression: Assessing the scientific evidence*. Toronto, Canada: University of Toronto Press.
- Galen, B. R. & Underwood, M. (1997). A developmental investigation of social aggression among girls. *Developmental Psychology*, 33, 589–599.
- Gentile, D. A. (2003). *Media violence and children*. Westport, CT: Ablex.
- Gentile, D. A., Linder, J. R. & Walsh, D. A. (2003, April). *Looking through time: A longitudinal study of children's media violence consumption at home and aggressive behaviors at school*. Paper presented at the 2003 Society for Research in Child Development Biennial Conference, Tampa, FL.
- Gentile, D. A., Lynch, P. J., Linder, J. R. & Walsh, D. A. (2004). The effects of violent video game habits on adolescent hostility, aggressive behaviors, and school performance. *Journal of Adolescence*, 27, 5–22.
- Gentile, D. A. & Sesma, A. (2003). Developmental approaches to understanding media effects on individuals. In D. A. Gentile (Ed.), *Media violence and children* (pp. 19–37). Westport, CT: Ablex.
- Gentile, D. A. & Stone, W. (2005). Violent video game effects on children and adolescents: A review of the literature. *Minerva Pediatrica*, 57, 337–358.
- Gentile, D. A. & Walsh, D. A. (2002). A normative study of family media habits. *Journal of Applied Developmental Psychology*, 23, 157–178.
- Greener, S. & Crick, N. R. (1999). Children's normative beliefs about prosocial behavior: What does it mean to be nice? *Social Development*, 8, 349–363.
- Harrist, A. W. & Bradley, K. D. (2003). You can't say you can't play: Intervening in the process of social exclusion in the kindergarten classroom. *Early Childhood Research Quarterly*, 18, 185–205.
- Hart, C. H., Nelson, D. A., Robinson, C. C., Olsen, S. F. & McNeilly-Choque, M. K. (1998). Overt and relational aggression in Russian nursery-school-age children: Parenting style and marital linkages. *Developmental Psychology*, 34, 687–697.
- Hawley, P. H. (2003). Strategies of control, aggression, and morality in preschoolers: An evolutionary perspective. *Journal of Experimental Child Psychology*, 85, 213–235.
- Huesmann, L. R., & Miller, L. S. (1994). Long-term effects of repeated exposure to media violence in childhood. In L. R. Huesmann (Ed.), *Aggressive behavior: Current perspectives* (pp. 153–186). New York: Plenum Press.
- Huesmann, L. R., Moise-Titus, J., Podolski, C-L., & Eron, L. D. (2003). Longitudinal relations between children's exposure to TV violence and their aggressive and

- violent behavior in young adulthood: 1977–1992. *Developmental Psychology*, 39, 201–221.
- Johnson, D. R., & Foster, S. L. (2005). The relationship between relational aggression in kindergarten children and friendship stability, mutuality, and peer liking. *Early Education and Development*, 16, 141–160.
- Johnson, J. G., Cohen, P., Smailes, E. M., Kasen, S., & Brook, J. S. (2002). Television viewing and aggressive behavior during adolescence and adulthood. *Science*, 295, 2468.
- Laursen, B., & Hartup, W. W. (1989). The dynamics of preschool children's conflicts. *Merrill-Palmer Quarterly*, 35, 281–297.
- Liebert, R. M., & Sprafkin, J. (1988). *The early window: Effects of television on children and youth* (3rd Ed.). New York: Pergamon Press.
- Martin, C. L., & Halverson, C. F. (1981). A schematic processing model of sex typing and stereotyping in children. *Child Development*, 52, 1119–1134.
- McNeilly-Choque, M. K., Hart, C. H., Robinson, C. C., Nelson, L., & Olsen, S. F. (1996). Overt and relational aggression on the playground: Correspondence among different informants. *Journal of Research in Childhood Education*, 11, 47–67.
- Ostrov, J. M. (2006). Deception and subtypes of aggression in early childhood. *Journal of Experimental Child Psychology*, 93, 322–336.
- Ostrov, J. M., Crick, N. R., & Keating, C. F. (2005). Gender biased perceptions of preschoolers' behavior: How much is aggression and prosocial behavior in the eye of the beholder? *Sex Roles: A Journal of Research*, 52, 393–398.
- Ostrov, J. M., & Keating, C. F. (2004). Gender differences in preschool aggression during free play and structured interactions: An observational study. *Social Development*, 13, 255–277.
- Ostrov, J. M., Woods, K. E., Jansen, E. A., Casas, J. F., & Crick, N. R. (2004). An observational study of delivered and received aggression and social psychological adjustment in preschool: 'This white crayon doesn't work'. *Early Childhood Research Quarterly*, 19, 355–371.
- Patterson, G. R. (1982). *Coercive family processes: A social learning approach* (Vol. 3). Eugene, OR: Castalia Publishing Co.
- Pellegrini, A. D. (1996). *Observing children in their natural worlds: A methodological primer*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Potter, W. J. (1999). *On media violence*. Thousand Oaks, CA: Sage Publications.
- Russell, A., Hart, C. H., Robinson, C., & Olsen, S. F. (2003). Children's sociable and aggressive behavior with peers: A comparison of the U.S. and Australia, and contributions of temperament and parenting styles. *International Journal of Behavioral Development*, 27, 74–86.
- Sebanc, A. M. (2003). The friendship features of preschool children: Links with prosocial behavior and aggression. *Social Development*, 12, 249–268.
- Stauffer, K., & DeHart, G. (2005). Preschoolers' relational aggression with siblings and friends. *Early Education and Development*, 16, 185–206.
- Wiegman, O., Kuttschreuter, M., & Baarda, B. (1992). A longitudinal study of the effects of television viewing on aggressive and prosocial behaviours. *British Journal of Social Psychology*, 31, 147–164.
- Wilson, B. J., Smith, S. L., Potter, W. J., Kunkel, D., Linz, D., Colvin, C. M., & Donnerstein, E. (2002). Violence in children's television programming: Assessing the risks. *Journal of Communication*, 52, 5–35.
- Xie, H., Swift, D., Cairns, B. D., & Cairns, R. B. (2002). Aggressive behaviors in social interaction and developmental adaptation: A narrative analysis of interpersonal conflicts during early adolescence. *Social Development*, 11, 205–224.

Acknowledgments

This research was supported in part by a NIMH Traineeship (MH-15755) to the Institute of Child Development, University of Minnesota in support of Jamie M. Ostrov and by NIMH (MH63684) and NSF (BCS-0126521) grants to the third author. This research was also supported in part by the National Institute of Media and the Family (NIMF), Minneapolis, MN. We wish to thank the director, parents, teachers and children of the participating preschool for their assistance and co-operation.

Notes

1. First regression models were run to test for gender interactions. The presented findings all yielded a significant interaction for gender (β s ranged from -1.29 to $.45$, $ps < .05$ and $.01$). For ease of interpretation, bivariate correlations are presented by gender for these significant associations.

2. Regression models were run to test for gender interactions. The presented findings all yielded a significant interaction for gender (β s ranged from -1.16 to 1.79 , $ps < .01$). For ease of interpretation, bivariate correlations are presented by gender for these significant associations.

3. Regression models were run to test for gender interactions. The presented findings all yielded a significant interaction for gender (β s ranged from $-.43$ to $.31$, $ps < .05$). For ease of interpretation, bivariate correlations are presented by gender for these significant associations.