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From Family Violence to Dating Violence: Testing the Dual Pathway Model

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Abstract

Risk factors for adolescent perpetration of or victimization by dating violence stem from different levels of adolescents' social ecologies, including the family, individual, and peer domains. However, these multiple risk factors have not been fully integrated into a single comprehensive model of dating violence development. The present study examined prospective links between exposure to family violence in pre-adolescence; pro-violent beliefs, aggression, deviant peer affiliation, and aggression toward opposite-sex peers in early adolescence and dating violence in late adolescence. Using a longitudinal study of 461 youth (51% female; 80% African American, 19% Caucasian, 1% other ethnicities), path modeling evaluated a theoretically-developed dual pathway model involving a general violence pathway and an early romantic aggression pathway. Each pathway links exposure to family violence in pre-adolescence with early adolescent pro-violent beliefs and/or aggressive behavior. In both pathways, pro-violent beliefs may reinforce aggressive behaviors between same-sex and opposite-sex peers, as well as strengthen bonds with deviant peers. In the last part of both pathways, aggressive behavior and peer deviance in early adolescence may contribute directly to late adolescent dating violence perpetration and victimization. The findings provided support for both pathways, as well as sex differences in the model.

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Authors' Contributions

AMM conceived of the goals of the study, participated in its design, and drafted the manuscript; SM designed the study, drafted portions of the manuscript, and revised the manuscript; MW designed the study and provided feedback on all revisions. All authors read and approved the final manuscript.

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Conflicts of Interest

The authors report no conflicts of interest.

Keywords

adolescence; dating violence; harsh discipline; interparental violence

Introduction

Dating violence is a serious problem facing today's adolescents, with 10% of high school students reporting victimization by physical dating violence within the past year (Centers for Disease Control [CDC], 2014). Furthermore, 24% of 10th grade students reported being victimized by verbal dating abuse (Haynie et al., 2013). Dating violence has been linked with prior exposure to violence in the family, including harsh parenting (Jouriles, Mueller, Rosenfield, McDonald, & Dodson, 2012) and interparental conflict (Tschann et al., 2009). However, the developmental mechanisms through which family violence leads to dating violence are poorly understood. It is likely that family violence serves as a distal risk factor for later adolescent dating violence, with its effects mediated by more proximal individual and peer factors (Olsen, Parra, & Bennett, 2010). For instance, predictors of dating violence include individual attitudes toward dating violence (Ali, Swahn, & Hamburger, 2011), aggressive behavior (Capaldi, Dishion, Stoolmiller, & Yoerger, 2001), and deviant peer affiliations (Miller, Gorman-Smith, Sullivan, Orpinas, & Simon, 2009).

However, there are still several notable gaps in existing research investigating the development of dating violence. Specifically, few studies have integrated family, individual, and peer-level risk factors into a comprehensive model of dating violence development, nor have they simultaneously accounted for potential sex differences in the development of dating violence (Champion, Foley, Sigmon-Smith, Sutfin, & DuRant, 2008; Feiring, Deblinger, Hoch-Espada, & Haworth, 2002; Williams, Connolly, Pepler, Craig, & Laporte, 2008). Thus, this study tests a developmentally-informed pathway model linking preadolescent family violence with late adolescent dating violence, while examining sex differences in these relationships.

Theoretical Background

Two types of family violence figure prominently in the literature on risk factors for dating violence—harsh discipline, defined as use of physical punishment such as spanking, slapping, hitting, and hitting with an object (Ge, Conger, Lorenz, & Simons, 1994), and witnessing interparental violence. The associations between childhood exposure to family violence and adolescent dating violence perpetration and victimization can be explained by several theoretical perspectives. Consistent with the Social Learning Theory (Bandura, 1977), which posits that individuals imitate the actions of others they observe in their environment, children who received harsh discipline or observed interparental violence may learn to view abusive interactions as a normal feature of relationships, as well as a means of eliciting compliance from others. Thus, adolescents may imitate those interactions in their own relationships, including dating relationships. Likewise, beliefs that violence is a normal part of relationships and previous experiences of victimization by harsh discipline or observations of parents being victimized during interparental violence may increase the likelihood of enduring victimization in later peer and intimate relationships.

Furthermore, similarities in pro-violent beliefs and aggressive behavior are strong determinants of children's and adolescents' friendships. Thus, exposure to harsh discipline and interparental violence early in childhood may contribute to pro-aggressive beliefs and aggressive behavior in peer relationships, which may facilitate the development of friendships with other children who accept and engage in more antisocial behavior. Because adolescence marks a time when youth begin to spend less time with their families and more time with peers (Collins & Steinberg, 2006), peer relationships represent a key domain for the application of learned behaviors and beliefs about relationship interactions (Connelly & Goldberg, 1999). As a result, associations with deviant friends may provide additional modeling and reinforcement of antisocial behavior that may extend to early romantic interactions and later dating relationships. Thus, affiliations with deviant peers are likely to perpetuate patterns of family violence perpetration and victimization experienced earlier in development (Tyler, Brownridge, & Melander, 2011).

Family Violence as a Precursor of Dating Violence

Based on these theoretical underpinnings, it is evident that interactions within the family serve as a powerful influence on adolescent behavior. In fact, the co-occurrence of harsh discipline and interparental violence has been documented in numerous studies (e.g., McDonald, Jouriles, Tart, & Minze, 2009; Renner & Slack, 2006; Zolotor, Theodore, Coyne-Beasley, & Runyan, 2007). Furthermore, adolescents and young adults who perpetrated or were victimized by dating violence are more likely to report being harshly disciplined or maltreated as children (Chiodo et al., 2012; Gover et al., 2011; Jouriles et al., 2012; Wekerle & Wolfe, 1998). However, retrospective reports of harsh parenting may be biased by later involvement in dating violence, given that memories of past events may be distorted or biased by later experiences (Brewin, Andrews, & Gotlib, 1993; Henry, Moffitt, Caspi, Langley, & Silva, 1994; Tajima, Herrenkohl, Huang, & Whitney, 2004; Widom & Shepard, 1996). This potential for bias underscores the need for prospective studies. Longitudinal studies have linked harsh discipline with *perpetration* of dating violence three to five years later (Lavoie et al., 2002; Simons, Lin, & Gordon, 1998), but no prospective studies have evaluated the link between harsh discipline and later dating *victimization*. It is important to note that, although some risk factors predict both dating violence perpetration and victimization, other factors are specific to either perpetration or victimization alone (e.g., positive attitudes toward violence vs. hopelessness; Champion et al., 2008; Sears, Byers, & Price, 2007). Thus, harsh discipline may have different relationships with later dating violence perpetration vs. victimization.

Compared to their peers, adolescents and young adults involved in dating violence perpetration or victimization are more likely to report witnessing interparental violence in childhood than their peers (Arriaga & Foshee, 2004; Gover et al., 2011; Jouriles et al., 2012). Among the few longitudinal studies addressing these links, some have replicated the results of cross-sectional studies (Tschann et al., 2009), while others have not found significant relationships between interparental violence exposure and later dating violence perpetration (Lavoie et al., 2002; Simons, Lin, & Gordon, 1998). The lack of association in the latter studies could be due to longer intervals between assessments of interparental conflict and dating violence (i.e., more than a year) and exclusion of girls, who perpetrate

more dating violence than boys (Champion et al., 2008; Feiring et al., 2002). Thus, it is not clear whether witnessing interparental conflict in childhood prospectively predicts dating violence in adolescent boys and/or girls.

A Dual Pathway Model

To elucidate the relationships between family violence and later dating violence, as well as clarify the roles of individual and peer factors, we proposed a dual pathway model (see Figure 1). The overall dual pathway model is comprised of a “general violence” pathway and an “early romantic aggression” pathway. Each pathway first links exposure to family violence in pre-adolescence with early adolescent pro-violent beliefs and/or aggressive behavior at the level of the individual child. In both pathways, pro-violent beliefs may reinforce aggressive behaviors between same-sex and opposite-sex peers, as well as strengthen bonds with deviant peers (Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1994). In the last part of both pathways, aggressive behavior and peer deviance in early adolescence may contribute directly to late adolescent dating violence perpetration and victimization. Significant associations are also expected between harsh discipline and interparental violence; beliefs about general violence and beliefs about dating violence; and perpetration of general peer aggression and opposite-sex aggression.

Parts of the proposed model have received ample empirical support, particularly those associated with the “general violence” pathway. Exposure to harsh parenting is associated with beliefs condoning violence to resolve conflicts (Pardini, Loeber, & Stouthamer-Loeber, 2005); such beliefs predict physical aggression among adolescents (Poteat, Kimmel, & Wilchins, 2011); physical aggression is related to affiliation with deviant peers (Tyler et al., 2011); and deviant peer affiliations predict later dating violence perpetration and victimization (Capaldi et al., 2001; Gagné, Lavoie, & Hébert, 2005; Miller et al., 2009). Some of the proposed mediating links have also received support in previous work. For instance, antisocial behavior partly mediated the effects of harsh parenting (Tyler et al., 2011) and deviant peer associations (Miller et al., 2009) on dating violence perpetration. Also, consistent with the proposed model, studies comparing family vs. peer risk factors for dating violence have identified deviant peer affiliations as a stronger (and more proximal) risk factor for dating violence than family risk factors (Arriaga & Foshee, 2004; Gagné, Lavoie, & Hébert, 2005). Yet, the impact of some parental behaviors (e.g., monitoring) on adolescent dating aggression continues to persist alongside peer influences (Connolly, Friedlander, Pepler, Craig, & Laporte, 2010; Leadbeater, Banister, Ellis, & Yeung, 2008).

In support of the “early romantic aggression” pathway, beliefs in favor of dating violence have been linked with actual dating violence (Josephson & Proulx, 2008) and have mediated the link between marital violence exposure and dating violence perpetration (Kinsfogel & Grych, 2004; Lichter & McCloskey, 2004). Additionally, beliefs approving dating violence and deviant peer affiliations were related to early adolescents’ perpetration of or victimization by aggression toward opposite-sex peers (Windle & Mrug, 2009). However, no studies have examined whether aggression or victimization in early adolescents’ relationships with opposite sex peers predicts later dating violence.

In summary, parts of the proposed dual pathway model have received extensive support, whereas others have not yet been evaluated (see Figure 2 for a summary of mediational links examined). Thus, more research is needed to clarify the distinction and overlap of the two proposed pathways. Longitudinal examination of the multi-domain risk factors for dating violence can provide more nuanced and targeted approaches to youth dating violence intervention and prevention.

Sex Differences in the Dual Pathway Model

Sex differences have been reported in dating violence perpetration and/or victimization. Overall, more females than males report perpetrating dating violence (Champion et al., 2008; Feiring et al., 2002). Females perpetrate more verbal abuse and less severe physical violence, whereas males perpetrate more severe physical dating violence (Tyler et al., 2011). Although similar proportions of males and females report dating victimization (O’Keefe, 2005), females experience more severe and frequent physical injury from dating violence than males (Arriaga & Foshee, 2004). The salience of family and peer risk factors for dating violence may also vary by sex, especially among youth from urban lower-SES and single parent families where relationship violence is more common (Foshee, Benefield, et al, 2004; Foshee, Benefield, et al., 2009). Female adolescents in these families may be more likely to identify with their mothers and their use of harsh discipline or interparental violence (e.g., Jankowski, Leitenberg, Henning, & Coffey, 1999), leading to stronger links between family violence and dating violence perpetration among girls than boys. Similarly, males growing up in families headed by a single mother may become accustomed to a dominant female presence in the household, relative to missing or transient male partners. Thus, males may carry the notion of female household dominance into their own dating relationships and be more likely to accept victimization by females in their dating relationships.

However, sex differences in cross-sectional studies linking interparental violence with dating violence perpetration have been inconsistent. Several studies found stronger links for females compared to males (e.g., Jouriles et al., 2012; Wolf & Foshee, 2003), but another study found a relationship for males but not for females (Kinsfogel & Grych, 2004). Moreover, Wekerle and Wolfe (1998) found that child maltreatment was predictive of physical and verbal dating abuse perpetration for adolescent males, but less so for females, while maltreatment was predictive of victimization for both males and females. Thus, more research is needed to better understand possible sex differences in the roles of risk factors for the development of dating violence.

Hypotheses

This study proposes and tests a comprehensive theoretical model that explains how family violence translates into dating violence. We hypothesize that higher levels of pre-adolescent exposure to harsh discipline and interparental violence will predict late adolescent dating violence perpetration and victimization. Additionally, we expect that the link between harsh discipline and dating violence will be mediated by the “general violence” pathway, following the developmental sequence of harsh discipline, general violence beliefs, general peer aggression and affiliation with deviant peers, and dating violence perpetration and

victimization. In parallel, we expect that the relationship between interparental violence and dating violence will be mediated by the “early romantic aggression” pathway, from interparental violence to beliefs supporting dating violence, affiliation with deviant peers, involvement in aggression with opposite-sex peers, and dating violence perpetration and victimization. Finally, we expect some parts of the proposed model to vary by sex; however, these differences will be exploratory given insufficient evidence for directional hypotheses.

Method

Participants and Procedures

Participants include 461 adolescents (51% female; 80% African American, 19% Caucasian, 1% other ethnicities) who took part in the Birmingham Youth Violence Study (BYVS). Adolescents were initially recruited from 5th grade classrooms in 17 Birmingham area schools selected through a two-stage probability sampling process. In the first stage, schools were randomly selected based on probabilities designed to achieve a representative sample of all students attending public schools in the Birmingham metropolitan area in terms of racial/ethnic, sex, and SES composition. Adolescents completed individual interviews at average ages 11.8 (Wave 1), 13.2 (Wave 2), and 18.0 (Wave 3) between 2003 and 2012. Primary caregivers also completed individual interviews at Waves 1 and 2 as part of the larger study; however, only child reports were used in the current study. Of the 704 youth participating in Wave 1 (W1; 42% recruitment rate), 603 (86%) returned at Wave 2 (W2) and 480 (68%) were interviewed at Wave 3 (W3). Despite intensive tracking efforts, some participants could not be located after the period between W2 and W3 (9% of W1 sample). Others did not participate because they had moved out of the area (5%), refused to participate or repeatedly did not come to scheduled interviews (18%), were deceased (0.6%), or were incarcerated (0.4%).

At W3, same-sex intimate relationships were reported by 4% of the youth. Because this very small group faces more discrimination (Dank, Lachman, Zweig, & Yahner, 2013) that may contribute to qualitative differences in dating violence experiences, we excluded these adolescents from analyses. Thus, this report includes all youth who participated in W3 and reported on dating violence within heterosexual romantic relationships. Compared to W1 participants not included in this report, the current sample had more females (51% vs. 41%, $\chi^2=6.16$, $p=.013$) and members of racial minority groups (81% vs. 72%, $\chi^2=8.03$, $p=.005$), as well as individuals from families with higher parent education and family income (i.e., higher SES; average $z=.05$ vs. $-.09$, $t=2.02$, $p=.043$).

Prior to participants' enrollment, this study was approved by the Institutional Review Board at the University of Alabama at Birmingham. At each wave, parents and adolescents were given detailed information about the study and provided written informed consent (parents or adult participants) and assent (adolescents). Participants were informed about the voluntary nature of participation, including the option to refuse participation, skip any questions, or stop the interview. Interviews were administered by trained interviewers using Computer-Assisted-Personal-Interviews, with sensitive questions (including those about dating and peer deviance) completed privately by participants through Audio-Computer-

Assisted-Self-Interview (ACASI). Participants received monetary compensation for their time.

At W3, 82% (N=377) of the present study sample were enrolled in high school (72%) or college (10%). Of the remainder, 9% had dropped out of high school and 8% graduated from high school but did not attend college. Two-way ANOVAs (with academic status and gender) revealed no differences among the four groups in dating violence perpetration ($F[3, 429]=1.26, p=.286$) or victimization ($F[3, 429]=2.34, p=.073$). Although group means were not significantly different, youth who dropped out of high school reported the highest levels of both dating violence perpetration and victimization (5.59 and 6.39, respectively, compared to 4.42 – 5.56 and 3.69 – 4.75 for the other groups). These patterns are consistent with higher truancy and drop-out rates among youth victimized by general violence (Banyard & Cross, 2008; Dyregrov, 2004). Because peer group relationships may vary between adolescents in school and those who have graduated or dropped out, school enrollment was included as a covariate in analyses.

Measures

Dating violence perpetration and victimization.—At W3, youth responded to the Conflict in Adolescent Dating Relationships Inventory (CADRI; Wolfe et al., 2001), reporting on whether they had committed violent acts against a dating partner (perpetration) and whether a dating partner had committed violent acts against them (victimization) in the past 12 months. The overall scale consisted of 18 perpetration and 18 identical victimization items coded 1 for “yes” and 0 for “no”. Because emotional abuse often co-occurs with physical dating violence (Sears & Byers, 2010), we included physical, threatening, and emotional/verbal abuse in the composite dating violence variable. The physical abuse scale consisted of 4 items (e.g., “I slapped him/her or pulled his/her hair” for perpetration). The threatening abuse scale consisted of 4 items (e.g., “He/she threatened to hurt me” for victimization). Finally, the emotional/verbal abuse scale consisted of 10 items (e.g., “I blamed him/her for the problem” for perpetration).

Scores for overall dating violence perpetration and victimization scales were derived by summing the responses to the 18 individual items. Reliabilities for *overall* dating violence scales were adequate ($\alpha=.88$) and consistent with reliability estimates from other studies ($\alpha=.77-.82$ for perpetration; $\alpha=.82-.86$ for victimization; Hopper, 2011). Construct validity of both scales was supported by positive correlations between self-reports of dating violence and observer ratings of dating couples’ abusive interactions (Wolfe et al., 2001).

Early romantic aggression.—At W1 and W2 (ages 11 and 13), youth reported on the frequency of perpetrating aggression towards and victimization by opposite-sex peers in the past 12 months (Foshee et al., 1996). Each scale (victimization and perpetration) consisted of 15 items assessing involvement in the same aggressive behaviors toward opposite-sex peers as a victim or perpetrator, from milder behaviors (e.g., “How many times did you push, grab, or shove a boy/girl?”) to more serious behaviors (e.g., “How many times did a boy/girl try to choke you?”). At both waves, items were rated from 0 (Never happened) to 2 (Happened 3 or more times) and summed for each scale. Reliability for each scale was good

($\alpha=.84-.87$ for perpetration, $\alpha=.82-.85$ for victimization). Validity was supported by positive correlations with beliefs about dating violence (Windle & Mrug, 2009).

Family violence.—Two types of family violence were examined in this study: Interparental violence and harsh discipline.

Interparental violence.: At W1, youth completed two items from the Children's Perception of Interparental Conflict Scale (CPIC; Grych, Seid, & Fincham, 1992) and two items from the Conflict Tactics Scale (CTS; Straus, 1979) assessing parent-to-partner violent behaviors they had witnessed in the past 12 months. The four items included pushing and shoving during an argument; throwing or breaking things during an argument; mother hitting father when angry; and father hitting mother when angry. Adolescents could report on violence between parents or between a parent and a partner, so that youth from single-parent homes could still report witnessed violence (92% of participants provided data for this scale). Scores were obtained by summing the responses for the four individual items, which ranged from 0 (False) to 2 (True). This scale demonstrated good reliability in this study ($\alpha=.84$), consistent with previous research ($\alpha=.78-.90$; Grych, Seid, & Fincham, 1992). Convergent and construct validity have been supported by positive correlations of child reports of interparental violence with parental reports of the same construct, parent/teacher reports of child internalizing and externalizing problems, and observer ratings of child reactions to parental conflict (Grych et al., 1992).

Harsh discipline.: Harsh discipline was measured through child report at W1. Youth reported on their experiences of harsh discipline using a three-item scale (Ge, Conger, Lorenz, & Simons, 1994). The items included frequency of yelling, spanking or slapping, and hitting with a belt. Scale scores were obtained by summing the responses for individual items, rated 1 (Never) to 5 (Always). Reliability was .67 in the present study, which is somewhat lower than the range from .78 to .81 reported in previous research (Kim & Ge, 2000). Validity of the scale has been supported by positive correlations with other measures of poor discipline, maternal psychopathology, and adolescents' antisocial behavior (Mrug, Loosier, & Windle, 2008; Murry, Simons, Simons, & Gibbons, 2013).

Parental reports of harsh discipline was also measured using the same scale, but was uncorrelated with the child report ($r=.05$, $p=.270$), consistent with previous studies showing low agreement between parent and child reports of parenting behaviors (Gonzales, Cauce, & Mason, 1996). Given this lack of agreement, only the child report was used in this study because it is more valid and less subject to social desirability than parental reports (Morsbach & Prinz, 2006).

Peer deviance.—Youth reported on affiliations with deviant peers at W1 and W2. At both waves, youth completed six items assessing their close friends' delinquent behaviors from the Denver Youth Survey (Institute of Behavioral Science, 1987). These items asked how many of their friends have purposely damaged public property; used alcohol, marijuana, or other illegal drugs; hit or threatened to hit someone; gotten into a physical fight; or carried a knife or gun. At W1, possible responses ranged from 1 (None of their friends) to 5 (All of their friends); responses were averaged. At W2, the scale score was computed as the average

percentage of close friends who had engaged in each deviant behavior, which was then rescaled to a 1 – 5 scale comparable to the one used at W1, from 1 (No friends) to 5 (All friends). The scale demonstrated adequate reliability ($\alpha=.73-.74$). Previous research demonstrated higher reliability for a scale with a larger number of items ($\alpha=.89$; Institute of Behavioral Science, 1987). Validity was supported by multi-informant reports of child's antisocial behavior (Mrug et al., 2008).

General peer aggression.—At W2, youth reported on aggressive behavior using the Forms and Functions of Aggression measure (Little et al., 2003a; Little et al., 2003b). The scale consists of 18 items and includes pure overt aggression, reactive overt aggression, and instrumental overt aggression. To be consistent with the other measures in the study that primarily focused on physical aggression (i.e., harsh discipline, interparental violence, and beliefs about general and dating violence), only the overt aggression scales was used (e.g., “You are the kind of person who fights with others”). Items were rated from 1 (not at all) to 4 (completely true) and summed. The scale had a good reliability in this study ($\alpha=.88$) and in previous research ($\alpha=.79-.84$; Little et al., 2003b). Validity was demonstrated by positive correlations with other measures of antisocial behavior (Fite et al., 2008; Little et al., 2003a).

Beliefs about general violence.—At W2, youth reported on beliefs about violence by completing 5 items about the acceptability of violence (Bosworth, Espelage, & Simon, 1999). Example items include “You don’t need to fight because there are other ways to deal with being mad” and “It’s okay to hit someone who hits you first.” Items were rated from 1 (Strongly disagree) to 5 (Strongly agree) and summed. Reliability was .61, somewhat lower compared to previous research ($\alpha=.71$; Bosworth et al., 1999). Validity was supported by positive correlations with bullying (Bosworth et al., 1999).

Beliefs about dating violence.—At W2, participants reported on dating violence beliefs by completing 12 items about the acceptability of dating violence and how they anticipate they might act if upset with a romantic partner. This measure was developed specifically for this study and was adapted from the Conflict in Adolescent Dating Relationships Inventory (CADRI; Wolfe et al., 2001), but in contrast to the CADRI, the items assessed responses to *hypothetical* dating conflicts, rather than actual events (e.g., “If you were upset or angry, would you push, shove, or shake [your boyfriend/girlfriend]?”) Possible responses ranged from 1 (Definitely would not) to 5 (Definitely would). Total scores were obtained by summing the scores on individual items. This scale demonstrated good reliability ($\alpha=.88$). Construct validity was supported by positive correlations with early romantic aggression perpetration (Windle & Mrug, 2009).

Sociodemographic characteristics.—These characteristics include adolescent sex and ethnicity, obtained through parental reports at W1. Sex was coded as 0 for males and 1 for females. Given that small number of participants who were not Caucasian or African American, ethnicity was coded 0 for Caucasian and 1 for non-Caucasian. Family SES was assessed using a composite variable created from standardized parental reports of their highest education level (8-point scale) and family income (13-point scale) at W1 ($r=.49$, $p<.001$). Age was computed from participants’ birth dates and dates of interview. Parents

reported on family structure at W1, which was coded into two dummy variables indicating single-parent households and households headed by other relatives, vs. the reference group of two-parent families. Adolescents reported on school status at W3, which was coded as 0 for not in high school and 1 for in high school.

Analyses

All main analyses were performed using path modeling in Mplus (Muthén & Muthén, 2006). First, a direct effects model evaluated whether harsh discipline and interparental violence in pre-adolescence predicted dating violence in late adolescence. Paths were adjusted for covariates (age, sex, ethnicity, family SES, family structure, and school status).

Then, we examined the model fit of the general violence pathway only. The “general violence” pathway linked pre-adolescent (W1) exposure to harsh discipline with early adolescent (W2) beliefs endorsing general violence, which were associated with W2 general peer aggression and deviant peer affiliations, as well as late adolescent (W3) dating violence perpetration and victimization. Next, the “early romantic aggression” pathway was added to the model to determine whether its addition resulted in an improved model fit. This pathway linked pre-adolescent (W1) exposure to interparental violence to early adolescent (W2) beliefs approving of dating violence, which were associated with W2 early romantic aggression victimization and perpetration, and ultimately with W3 dating violence perpetration and victimization. The two pathways were also connected through covariances at the levels of beliefs and perpetration of aggression. All paths were adjusted for covariates. W2 measures for which W1 equivalents were available (deviant peers, early romantic aggression perpetration and victimization) were also adjusted for their W1 levels to provide stronger support for the hypothesized directionality of relationships. Mediation was tested with bootstrapping using the MODEL INDIRECT statement in Mplus (Muthén & Muthén, 2006).

Then, multi-group modeling was conducted to test sex differences. In each case, a constrained model (with all paths fixed to be equal across sex) was compared to an unconstrained model where all paths were freely estimated for each sex. A significant likelihood ratio test indicated that the unconstrained model fit the data better than the constrained model. Overall model differences were followed by tests of invariance in each structural path, using $p < .001$ as the cutoff for significant sex differences given the high number of follow-up tests that were conducted.

Results

Preliminary Analyses

A total of 2.9% of all data points were missing. Youth with any missing data were younger at W2 ($M=13.02$ vs. $M=13.23$; $t=-1.99$, $p=.047$), more likely to be Caucasian (34% vs. 30%; $\chi^2=4.69$, $p=.030$), and from higher-SES backgrounds ($M=.16$ vs. $M=-.05$; $t=2.24$, $p=.026$). These missing data were handled using Full-Information Maximum Likelihood (FIML) in all analyses (Wothke, 2000). Outliers were identified and truncated at 3.5 SD (Iglewicz & Hoaglin, 1993). All mediators and dependent variables in the model that were non-normally

distributed were normalized with logarithmic transformations. Descriptive statistics for all variables, including overall means and sex differences in means, are displayed in Table 1. Pearson and point-biserial correlations among the main variables (log-transformed if non-normal) are displayed in Table 2.

At W3, 88% of adolescents reported having ever been on a date and 80% of adolescents reported having ever been in a romantic relationship, which lasted, on average, for 1.71 years. However, because previous literature has not clearly determined what characteristics constitute a formal adolescent dating “relationship” (e.g. length of time, intensity of relationship, risk involvement; Giordano, Soto, Manning, & Longmore, 2010), and because dating violence may occur outside of what youth would define as dating (e.g., as part of “hooking up”; Bogle, 2007), we did not consider past relationship experience as a prerequisite for reports of dating violence. Those who had ever been in a relationship reported more dating violence perpetration compared to those who had never been in a relationship (5.11 vs. 4.04, independent samples $t=-2.05$, $p=.041$), though the two groups did not differ on dating violence victimization.

Main Analyses

Family violence and dating violence.—The direct effects model predicting W3 dating violence perpetration and victimization from W1 family violence, adjusting for covariates, revealed that W1 harsh discipline predicted W3 dating violence perpetration ($\beta=.09$, $p=.043$), but not victimization ($\beta=.07$, $p=.164$; see Figure 3). W1 interparental violence predicted both W3 dating violence perpetration ($\beta=.12$, $p=.011$) and victimization ($\beta=.12$, $p=.014$). These predictive relationships were somewhat weaker compared to the zero-order correlations, suggesting that the inclusion of demographic covariates attenuated these links.

Dual pathway model.—Model fit indices for the general violence pathway alone revealed borderline adequate model fit ($\chi^2(17)=60.953$, $p<.001$, CFI=.96, TLI=.83, RMSEA of .08, SRMR=.03). However, when the early romantic aggression pathway was added to this model, the fit of the overall mediation model improved substantially ($\chi^2(44)=80.881$, $p<.001$, CFI=.98, TLI=.94, RMSEA of .04, SRMR=.03; see Table 3 for R^2 values for key dependent variables). Notably, the R^2 values for dating violence perpetration and victimization increased when the early romantic aggression pathway was added to the model (from .22 to .24 for perpetration, and from .11 to .13 for victimization). Thus, only the combined model is interpreted further.

The path coefficients (see Tables 3–4 and Figure 4) provided support for most of the links in the general violence pathway. Specifically, W1 harsh discipline predicted more general peer aggression and general violent beliefs at W2; general violent beliefs were concurrently associated with more general peer aggression and deviant peer affiliation; W2 general peer aggression predicted dating violence perpetration at W3; and W2 deviant peer affiliation predicted both dating violence perpetration and victimization at W3. Dating violence perpetration and victimization at W3 were strongly correlated.

In addition to testing individual paths, we also tested the mediational pathways to see if any indirect pathways from family violence to dating violence reached significance. In the

general violence pathway, the sum of all indirect links between W1 harsh discipline and W3 dating violence perpetration reached significance ($\beta=.026$, $p=.018$), although no single indirect pathway from W1 harsh discipline to W3 dating violence was statistically significant. The indirect pathways from harsh discipline to dating violence victimization were not significant (sum: $\beta=.015$, $p=.130$).

The early romantic aggression pathway received only partial support. W1 interparental violence did not predict beliefs in favor of dating violence at W2. However, dating violence beliefs were significantly associated with concurrent deviant peer affiliation and early romantic aggression perpetration and victimization. Deviant peer affiliation predicted both W3 dating violence perpetration and victimization, while neither W2 early romantic aggression perpetration nor victimization predicted W3 dating violence perpetration. However, W2 early romantic aggression victimization significantly predicted subsequent dating violence victimization at W3. In addition, W2 deviant peer affiliation was related to concurrent early romantic aggression perpetration and victimization. However, when we tested the mediational paths of the early romantic aggression pathway, none of the indirect paths (nor their sums) significantly mediated the relationship between W1 interparental violence and W3 dating violence.

The following covariances linking the two pathways (see Table 3) were statistically significant: W1 harsh discipline with W1 interparental violence; W2 beliefs in favor of general violence with W2 beliefs in favor of dating violence; and W2 general peer aggression with W2 perpetration of early romantic aggression. Additionally, W1 harsh discipline predicted W2 beliefs in favor of dating violence, and W2 beliefs in favor of dating violence predicted concurrent general peer aggression.

When the 20% of participants who reported not having been in a relationship in the past year were excluded from analyses, all results remained the same with one exception – the covariance between harsh discipline and interparental violence was no longer significant.

Sex differences in the dual pathway model.—Multigroup modeling indicated significant sex differences in the overall dating violence model ($\chi^2(81)=352.993$, $p<.001$). Follow-up analyses were conducted and their results are shown in Tables 3–4. In general, links in the general violence pathway were stronger for males, whereas links in the early romantic aggression pathway were stronger for females.

Discussion

Violence and abuse in romantic relationships are common experiences for many adolescents (CDC, 2014). Although dating violence has been linked with family, individual, and peer factors, the developmental mechanisms through which family violence leads to dating violence are poorly understood. This study aimed to fill these gaps in the dating violence literature by proposing and testing a dual pathway model of family violence leading to dating violence, accounting for mediating roles of individual and peer factors and moderation by sex. We hypothesized that harsh discipline and interparental violence would lead to dating violence through two distinct yet interrelated pathways: the “general violence”

pathway and the “early romantic aggression” pathway. The results provided strong support for the general violence pathway and partial support for the early romantic aggression pathway. Multiple sex differences emerged, with the general violence pathway being more prominent for males and the early romantic aggression pathway being more notable for females.

The prospective relationship between pre-adolescent reports of harsh discipline and adolescent dating violence perpetration was consistent with previous longitudinal research (Lavoie et al., 2002; Simons et al., 1998) and the Social Learning Theory (Bandura, 1977). While the links between interparental violence and both dating violence perpetration and victimization were consistent with previous findings (Ehrensaft et al., 2003; Jouriles et al., 2012), the lack of prospective relationship between harsh discipline and dating violence victimization contrasts with previous cross-sectional results (Chiodo et al., 2012; Gover et al., 2011; Windle & Mrug, 2009), and may be due to a weaker effect of harsh discipline on future victimization than perpetration of violence. It is also possible that youth who were harshly disciplined as children may have learned to resolve conflicts using the forceful methods characteristic of how they were disciplined; as such, these youth may have been more likely to use similar methods of communication with their later dating partners - hence the link between harsh discipline and dating violence *perpetration* but not necessarily *victimization*.

Links from Family Violence to Dating Violence

The results provided strong support for the “general violence” pathway as a developmental mechanism through which childhood harsh discipline translates into perpetration of dating violence in late adolescence. Specifically, the effect of harsh discipline on dating violence perpetration was mediated by beliefs in favor of violence, general peer aggression, and deviant peer affiliations in early adolescence. These results extend previous work on individual components of the pathway, such as harsh parenting predicting general pro-violent beliefs and general peer aggression (Ehrensaft et al., 2003), general pro-violent beliefs and general peer aggression predicting deviant peer affiliations (Hurd, Zimmerman, & Reischl, 2011), and general peer aggression and deviant peer affiliation predicting dating violence perpetration (Ehrensaft et al., 2003). Notably, the positive relationship between two key constructs in the general violence pathway, general peer aggression and deviant peer affiliations, was consistent with past research documenting the role of deviant peers in escalating general peer aggression (e.g., Benson & Buehler, 2012). These findings are consistent with the peer selection and homophily theories and reports of similarity in pro-violent beliefs and aggressive behavior facilitating friendships with other aggressive peers (Poulin & Boivin, 2000; Poulin et al., 1997).

Furthermore, deviant peer affiliations predicted both dating violence victimization and perpetration five years later, extending prior cross-sectional and short-term longitudinal findings (Vézina et al., 2011; Williams et al., 2008). These results suggest that the peer context is a key contributor to the transmission of violence into dating relationships, as youth with more deviant peers or friends who perpetrate dating violence are more likely to perpetrate dating violence themselves (Foshee et al., 2011; Miller et al., 2009). Deviant

peers also put adolescents in contact with potential dating partners who engage in antisocial behavior (Krueger, Moffitt, Caspi, Bleske, & Silva, 1998), which may foster dating violence perpetration and victimization.

In contrast to the general violence pathway, the present study showed only partial support for the early romantic aggression pathway. Interparental violence did not predict beliefs in favor of dating violence, in contrast to previous research documenting pro-dating violence beliefs as mediators of the link between marital violence exposure and dating violence perpetration (Lichter & McCloskey, 2004). It is possible that the low levels of interparental violence reported by participants in this study were insufficient to elicit effects on dating violence beliefs. Deviant peer affiliations contributed to early adolescent aggression toward opposite-sex peers (both as a perpetrator and a victim), consistent with past research (Windle & Mrug, 2009). However, involvement in early adolescent romantic aggression perpetration did not predict later dating violence perpetration or victimization. Thus, early adolescent romantic aggression *perpetration* may be more a function of situational influences than stable tendencies to aggress against other-sex peers. In contrast, early adolescent romantic *victimization* predicted later dating violence victimization. Thus victimization by opposite-sex peers in early adolescence may put youth at risk for later dating victimization, consistent with broader research on victimization as a risk factor for other types of victimization (Finkelhor, Ormrod, & Turner, 2007).

The strong association between late adolescent dating violence perpetration and victimization likely reflects concurrent involvement in dating violence perpetration and victimization (O’Leary, Slep, Avery-Leaf, & Cascardi, 2008) and suggests that violence in dating relationships is mutual. The greater magnitude of this correlation compared to early romantic aggression perpetration and victimization may be a function of greater stability, intimacy, and length of opposite-sex and romantic relationships in older youth (Collins, 2003). Indeed, youth in longer-term relationships are more likely to report bidirectional violence than those in shorter-term relationships (Palmetto, Davidson, Breitbart, & Rickert, 2013). The high residual correlation between dating violence perpetration and victimization, together with a substantial amount of unexplained variance in each variable, also suggest that some common determinants of both dating violence perpetration and victimization have been omitted from the model. These variables may involve distal contextual predictors (e.g., positive parenting practices, community violence), as well as more proximal predictors (e.g., norms in concurrent social networks).

Sex Differences in the Development of Dating Violence

A number of sex differences emerged in mean levels and relationships among variables. In early adolescence, males reported more victimization by girls, whereas females reported more perpetration of aggression against boys. In late adolescence, females continued to report higher levels of perpetrating dating violence, but males and females reported similar levels of dating violence victimization. These sex differences are consistent with studies reporting greater female perpetration of dating violence in adolescence (Champion et al., 2008; Feiring et al., 2002) and similar levels of victimization among middle adolescent males and females (Arriaga & Foshee, 2004; O’Keefe, 2005). Also, the generally higher use

of physical aggression by male vs. female youth (Lansford et al., 2012) may make it more socially acceptable for girls to use physical aggression against male peers. Consistent with the predictions from harsh discipline, pro-violent beliefs predicted general peer aggression slightly more strongly for males and early romantic aggression (both perpetration and victimization) for females.

Next, affiliating with deviant peers in early adolescence was a stronger predictor of concurrent early romantic aggression perpetration for males than females, consistent with past findings establishing deviant peer affiliation as a prominent influence on adolescent boys' perpetration of dating violence (Arriaga & Foshee, 2004; Ehrensaft et al., 2003). In addition, deviant peer affiliations predicted dating violence perpetration and victimization slightly more strongly among males than females, which contrasts with previous literature (e.g., Arriaga & Foshee, 2004; Miller et al., 2009). These sex differences may reflect greater males' vs. females' involvement in deviant peer groups, which may promote more antisocial behavior (including dating violence) to raise the males' status within the peer group (LaFontana & Cillessen, 2010). By contrast, early adolescent involvement in aggression with opposite-sex peers (as a victim or perpetrator) predicted subsequent dating violence perpetration or victimization more strongly for females than males, perhaps because girls' physical aggression may be more likely to occur in early romantic interactions. In fact, the covariance between perpetration of general peer aggression and early romantic aggression was significant for females, but not males, suggesting that males' aggression in early adolescence may be confined to same-sex peer relationships, whereas females' aggression may manifest across relationships with both boys and girls. However, many of these sex differences were of small magnitude, suggesting that many of the processes operate similarly in boys and girls.

Implications

Given that dating violence arises through processes across several ecological contexts, interventions may take place at multiple points along this dual pathway model. Because harsh discipline was a direct risk factor for later dating violence perpetration, and both harsh discipline and interparental violence contributed to involvement in violence through early adolescent beliefs, efforts should be made to prevent both types of family violence.

In particular, several primary prevention programs have demonstrated success in promoting positive parenting, such as Incredible Years (Webster-Stratton, 2007) and the Nurse Family Partnership (Olds, 2006). Incredible Years is targeted toward parents of children ages 2 to 5 years old. Through a 12-to 14-week course, the program aims to improve parents' knowledge of basic parenting skills, such as giving praise, providing appropriate discipline, and playing with their children. Nurse Family Partnership incorporates nurse home visits for pregnant or postnatal low-income women to improve prenatal health, promote sensitive parenting, and support young mothers in finishing school and finding employment. Given the evidence base for these programs, they should be implemented as methods of primary prevention of poor parenting, which may lower the risk of child aggression, behavior problems, and ultimately dating violence over time.

Interventions should also target the prevention of dating violence more directly. For example, the Safe Dates Project is a primary and secondary dating violence prevention program for adolescents that addresses gender role beliefs, dating violence norms, conflict resolution skills, and help-seeking strategies for those already perpetrating or being victimized by dating violence (Foshee et al., 1996; 1998; Foshee, Bauman, & Greene, 2000; Foshee et al., 2004). Our findings suggest that it may be beneficial to administer dating violence programs earlier (e.g., in 6th or 7th grade when aggression toward the romantic partners increases, rather than in 8th or 9th grade when typically implemented) and to incorporate components targeting general aggressive behavior, deviant peer influences, and victimization by early romantic aggression.

Indeed, several dating violence prevention programs target youth beginning in middle school. One program that has been particularly successful in raising awareness of dating violence among middle-school students is Shifting Boundaries (Taylor, Mumford, & Stein, 2015). Shifting Boundaries includes interventions at the classroom level (facilitated through a six-session structured curriculum on dating violence and associated laws), the building level (facilitated through informational posters hung around the school, monitoring of unsafe areas by faculty and staff), or both. Preliminary findings in testing the effectiveness of the program have shown that the intervention has increased student knowledge about dating violence, reduced the incidence of sexual harassment among students, and lowered perpetration and victimization of sexual and physical dating violence when assessed at six-month follow-up (Taylor, Mumford, & Stein, 2015). Given the success of programs like Shifting Boundaries, which target younger students and incorporate interventions at multiple levels, such programs should serve as models for interventions implemented in middle schools nationwide.

Finally, the investigation of sex differences has illuminated areas of potential focus for males vs. females. To allow for more tailored attention to issues that are more salient for males vs. females, student groups could be split up by gender to allow for separate discussions of issues more salient for boys vs. girls. For example, since pro-violent beliefs were more strongly linked to early romantic aggression for females, discussions among females could focus on the importance of equal respect in relationships regardless of gender, as well as general expectations for behavior in relationships. Because deviant peer affiliations were more strongly linked to dating violence for males than females, discussions in the males-only group could focus on peer pressure and overcoming the need to imitate behaviors of peers that are harmful to others. Including such sex-specific components to dating violence prevention programs may be a valuable addition to targeting specific vulnerabilities for males vs. females.

Limitations and Future Directions

The findings should be interpreted in the context of the study's limitations. First, the measurement of some constructs was limited. For example, harsh discipline was assessed with only three items, and the measure of beliefs about general violence had low reliability. These measurement limitations may have weakened associations between these and other variables. Also, all variables were informed only by adolescent self-report, which may lead

to under- or over-reporting of certain variables (particularly family violence) and shared method bias. Thus, our results should be replicated with additional informants for certain constructs (e.g., peer or teacher reports of aggression and peer deviance; partner reports of dating violence). Also, general aggression and beliefs about general and dating violence were not measured at Wave 1; therefore we could not control for previous levels of these variables in the model. Furthermore, some of the directional paths were cross-sectional rather than lagged (i.e., the links from beliefs about violence to early romantic aggression, peer aggression, and deviant peers). Ideally, we would be able to more strongly test the causality of the directional relationships proposed if all paths were lagged. Thus, it is important to replicate the results of the current study using data spanning a greater number of assessment points.

Moreover, our measure for interparental violence did not incorporate the sex of the parent committing violence. Because the downstream impact of witnessing interparental violence on adolescents' own violence may vary based on the sex of the parents involved as well as the directionality of violence (Temple, Shorey, Tortolero, Wolfe, & Stuart, 2013), lack of accounting for the parents' sex may have contributed to a lack of associations between interparental violence and mediating variables. Furthermore, some of the sex differences obtained for pathways and covariances were quite small and may not have great practical significance. Finally, the results may not generalize to racial/ethnic groups not included or underrepresented in our sample of primarily African American and Caucasian youth.

Conclusion

This is one of the first investigations to integrate risk factors at the family, individual, and peer domains into a cohesive model of dating violence development over a seven-year period from pre-adolescence to late adolescence. The results revealed that the effect of preadolescent exposure to harsh discipline on late adolescent dating violence perpetration can be explained by pro-violent beliefs, aggressive behavior, and affiliation with deviant peers; these paths were generally stronger for males. Other risk factors for dating violence included beliefs in favor of dating violence and victimization by opposite-sex peers in early adolescence, with these risk factors being more prominent for females. The proposed dual pathway model, which links pre-adolescent exposure to family violence with early adolescent violent beliefs and aggression, and ultimately with late adolescent dating violence, provides a comprehensive theoretical framework for the development of adolescent dating violence and can be used to guide future research and intervention development.

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Figure 1.

Conceptual model of the proposed dual pathway model. The “general violence” pathway is outlined in black, while the “early romantic aggression” pathway is outlined in grey. Linkages between the two pathways are shown with dashed paths.

Figure 2.

Conceptual model of dual pathway model. Previously-examined links are shown in black, while links yet to be examined are shown in grey.

Figure 3.

Results of a direct effects model linking family violence with dating violence

Notes: All paths are also adjusted for age, gender, ethnicity, family SES, school enrollment, and family structure. Dashed lines indicate nonsignificant paths.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 4.

Results of a dual pathway model linking family violence with dating violence through individual and peer risk factors.

Notes: ^aAdjusted for the same variable at a previous time point. All paths are also adjusted for age, gender, ethnicity, family SES, school enrollment, and family structure. Dashed lines indicate nonsignificant paths.

* $p < .05$ or lower.

Table 1

Descriptive Statistics for all Variables

Variable	N (%)					
Female gender	235 (51%)					
Ethnic minority	374 (81%)					
Single-parent households	291 (63%)					
Two-parent households	140 (30%)					
“Other”-headed households	30 (7%)					
Enrolled in school (high school or college)	377 (82%)					
	Mean (SD)	Min	Max	Mean - Males	Mean - Females	t-value
Age (W1)	11.79 (.74)	10.43	15.54	11.82	11.77	.67
Age (W2)	13.19 (.89)	11.62	16.62	13.21	13.17	.42
Age (W3)	18.03 (.82)	16.49	22.61	18.04	18.02	.25
Family SES	.01 (.87)	-1.54	1.92	.09	.08	2.14 *
Harsh discipline (W1)	5.74 (2.45)	3	15	5.87	5.62	1.12
Interparental violence (W1)	.62 (1.46)	0	8	.50	.73	-1.68
General violence beliefs (W2)	13.08 (4.20)	5	25	13.20	12.97	.58
Dating violence beliefs (W2)	22.09 (9.57)	12	55.83	20.08	24.07	4.40 ***
General peer aggression (W2)	25.92 (7.14)	18	51.16	26.48	25.36	1.62
Deviant peers (W1)	1.57 (.56)	1	3.59	1.66	1.49	3.17 **
Deviant peers (W2)	1.54 (.64)	1	3.94	1.57	1.50	1.09
Early romantic perpetration (W1)	2.06 (3.07)	0	13.39	1.73	2.38	2.27 *
Early romantic perpetration (W2)	2.71 (3.94)	0	22	1.44	3.97	7.01 ***
Early romantic victimization (W1)	2.62 (3.24)	0	14.50	3.06	2.20	2.85 **
Early romantic victimization (W2)	2.92 (3.65)	0	22	3.44	2.41	2.92 **
Dating violence perpetration (W3)	4.92 (4.26)	0	17	3.67	6.12	-6.34 ***
Dating violence victimization (W3)	4.79 (4.26)	0	18	5.10	4.50	1.47

Notes: W1 – Wave 1; W2 – Wave 2; W3 – Wave 3.

*
p<.05

**
p<.01

p<.001.

Table 2

Correlations between Independent and Dependent Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Harsh discipline (W1)	--											
2. Interparental violence (W1)	.18*	--										
3. General violence beliefs (W2)	.19*	.17*	--									
4. Dating violence beliefs (W2)	.15*	.20*	.35*	--								
5. Peer aggression (W2)	.26*	.23*	.55*	.41*	--							
6. Deviant peers (W1)	.28*	.36*	.30*	.25*	.38*	--						
7. Deviant peers (W2)	.11*	.22*	.39*	.38*	.50*	.22*	--					
8. Early romantic aggression perpetration (W1)	.29*	.26*	.30*	.27*	.39*	.49*	.16*	--				
9. Early romantic aggression victimization (W1)	.34*	.19*	.28*	.19*	.35*	.54*	.14*	.68*	--			
10. Early romantic aggression perpetration (W2)	.20*	.21*	.35*	.49*	.53*	.35*	.53*	.48*	.28*	--		
11. Early romantic aggression victimization (W2)	.25*	.09	.36*	.25*	.40*	.32*	.33*	.40*	.54*	.45*	--	
12. DV perpetration - overall (W3)	.13*	.18*	.29*	.30*	.29*	.21*	.15*	.23*	.16*	.38*	.19*	--
13. DV victimization -- overall (W3)	.11*	.14*	.24*	.21*	.26*	.27*	.07	.19*	.21*	.25*	.27*	.73*

Notes: DV = dating violence.

* $p < .05$ or lower.

Table 3

Covariances from the Proposed Dual Pathway Model and R-Square Values for by Key Variables

Covariances for model parameters	Overall β	Sex differences	
		Males (β)	Females (β)
W1 harsh discipline ↔	.18 **	--	--
W1 interparental violence			
W2 general violence beliefs ↔	.25 ***	--	--
W2 dating violence beliefs			
W2 general peer aggression ↔	.25 ***	--	--
W2 deviant peers			
W2 general peer aggression ↔	.27 ***	--	--
W2 early romantic aggression perpetration			
W2 early romantic aggression perpetration ↔	.34 ***	--	--
W2 early romantic aggression victimization			
W3 dating violence perpetration ↔	.75 ***	--	--
W3 dating violence victimization			
Key variables		R-square values	
W2 General Violence Beliefs		.16 ***	
W2 General Peer Aggression		.41 ***	
W2 Deviant Peers		.35 ***	
W2 Dating Violence Beliefs		.20 ***	
W2 Early Romantic Aggression Perpetration		.52 ***	
W2 Early Romantic Aggression Victimization		.35 ***	
W3 Dating Violence Perpetration		.24 ***	
W3 Dating Violence Victimization		.13 ***	

Notes: -- indicates no significant differences by sex (for covariances). See also Table 4 for path coefficients from the dual pathway model. See Figure 3 for a graphical presentation of the overall dual pathway model. For the overall dual pathway model, fit statistics indicated good fit, $\chi^2(44)=80.881$, $p<.001$, CFI=.98, TLI=.94, RMSEA of .04, SRMR=.03.

*
 $p<.05$

**
 $p<.01$

 $p<.001$.

Table 4

Pathways from the Proposed Dual Pathway Model

Model parameters	Overall β	β for Sex differences	
		Males	Females
W1 harsh discipline $\rightarrow$ W2 general violence beliefs	.11 *	--	--
W1 harsh discipline $\rightarrow$ W2 general peer aggression	.09 *	.15 ***	.02
W1 harsh discipline $\rightarrow$ W2 dating violence beliefs	.10 *	.02	.19 ***
W1 interparental violence $\rightarrow$ W2 general violence beliefs	.04	--	--
W1 interparental violence $\rightarrow$ W2 dating violence beliefs	.06	--	--
W2 general violence beliefs $\rightarrow$ W2 general peer aggression	.39 ***	.40 ***	.38 ***
W2 general violence beliefs $\rightarrow$ W2 deviant peers	.19 ***	--	--
W2 dating violence beliefs $\rightarrow$ W2 general peer aggression	.25 ***	.274 ***	.270 ***
W2 dating violence beliefs $\rightarrow$ W2 deviant peers	.22 ***	--	--
W2 dating violence beliefs $\rightarrow$ W2 early romantic aggression perpetration	.21 ***	.20 ***	.22 ***
W2 dating violence beliefs $\rightarrow$ W2 early romantic aggression victimization	.12 *	.16 ***	.17 **
W2 deviant peers $\rightarrow$ W2 early romantic aggression perpetration	.37 ***	.43 ***	.36 ***
W2 deviant peers $\rightarrow$ W2 early romantic aggression victimization	.16 **	.14 **	.16 **
W2 general peer aggression $\rightarrow$ W3 dating violence perpetration	.16 **	.202 **	.199 ***
W2 general peer aggression $\rightarrow$ W3 dating violence victimization	.07	.04	.01
W2 deviant peers $\rightarrow$ W3 dating violence perpetration	.15 **	.18 **	.16 **
W2 deviant peers $\rightarrow$ W3 dating violence victimization	.16 **	.13 *	.12 *
W2 early romantic aggression perpetration $\rightarrow$ W3 dating violence perpetration	.06	-.04	.04
W2 early romantic aggression perpetration $\rightarrow$ W3 dating violence victimization	.05	.21 ***	.23 **
W2 early romantic aggression victimization $\rightarrow$ W3 dating violence perpetration	.07	.09	.12 **
W2 early romantic aggression victimization $\rightarrow$ W3 dating violence victimization	.15 *	.09	.02

Notes: -- indicates no significant differences by sex.

* $p < .05$ ** $p < .01$

.100>d

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