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EMPIRICAL RESEARCH

Partner Violence During Adolescence and Young Adulthood: Individual and Relationship Level Risk Factors

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Abstract Violence within romantic relationships is a significant public health concern. Previous research largely explores partner violence at one or two time points, and often examines a limited set of risk factors. The present study explored both individual and relationship-level risk factors and their associations with physical victimization and perpetration across more than 10 years using a community sample of 200 participants (50 % female; *M* age Wave 1 = 15.8). Additionally, we explored the effects of previous partner violence on the likelihood of future partner violence. Survival analysis indicated that externalizing symptoms and negative interactions (e.g., relationship conflict) were associated with both perpetration and victimization. Reporting an experience of partner violence did not significantly alter an individual's risk of future partner violence. Overall, men were significantly more likely to report victimization; perpetration rates did not vary by gender. The results highlight the importance of examining multiple levels of risk.

Keywords Dating violence · Partner violence · Romantic relationships · Risk factors · Victimization · Perpetration

Introduction

Partner violence—i.e., physical victimization or perpetration—is extremely common within romantic relationships (Black et al. 2011). Approximately one in four women and one in five men report being victimized by a partner during their lifetimes (Desmarais et al. 2012a). These individuals demonstrate greater risk for depression, anxiety, substance use, suicidality, and overall poorer physical health outcomes (Coker et al. 2002; Lawrence et al. 2012). Perpetration rates of partner violence are similar to those of victimization (Desmarais et al. 2012b). Given the high rates of partner violence and the adverse outcomes associated with its occurrence, additional research into the etiological pathways of partner violence is necessary to inform prevention efforts.

Theories of Risk

Theoretical models guiding partner violence research increasingly examine multiple levels of risk factors (Connolly et al. 2010; O'Leary et al. 2007). Stemming from Bronfenbrenner's ecological framework, these multidimensional models consider risk for partner violence to be the result of a complex network of distinct, yet interacting, variables at the individual, relationship, and social levels (Bronfenbrenner and Morris 1998). Capaldi and colleagues proposed applying one such model, the dynamic developmental systems perspective, to the study of partner violence (Capaldi et al. 2005). This perspective considers the contribution of both individual factors, such as psychopathology, and relationship factors, such as support, while also allowing for change in these factors across time or development. By accounting for variables across multiple levels of influence, this perspective strives to create a more complete picture of an individual's risk for partner violence.

The risk factors implicated in the dynamic developmental systems framework are expected to predict not only an individual's likelihood of initial partner violence but

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also his or her risk for recurrent episodes of partner violence. Some previous research suggests that the experience of partner violence may increase the likelihood that an individual will experience additional partner violence in the future (Smith et al. 2003; Williams et al. 2008). However, much of this work relies on retrospective reporting or two-time point designs. Other studies using longitudinal designs have found less stability in partner violence across relationships (Capaldi et al. 2003). Importantly, recurrent episodes of partner violence have rarely been explored within a longitudinal sample spanning adolescence and adulthood. Research is needed to explore whether risk factors contribute differently to initial versus recurrent episodes of partner violence during middle adolescence to early adulthood.

Extensive research has examined risk factors associated with victimization and perpetration in both adult and, more recently, adolescent samples (Foshee and Reyes 2012; Hickman et al. 2004). However, much of this work is cross-sectional or explores partner violence in only adolescence or only adulthood (Chu et al. 2013). As a consequence, the existing literatures on adolescent and adult partner violence are separate from each other, and we do not know if the findings for one developmental period apply to the other.

Further, following participants across two developmental periods would also allow for a more inclusive and accurate measure of the violence that may be occurring in relationships over time. Repeated experiences of partner violence are particularly likely to be missed if only a short time were examined. Moreover, Further, few studies have examined the ways in which risk factors may contribute differently to first versus repeated events. Certain risk factors may become more salient after the experience of partner violence. For example, negative interactions may become a stronger predictor for repeated violence because individuals have previously established a pattern in which they deteriorate into violence.

The current study aimed to address these gaps in the literature by assessing partner violence using a dynamic developmental systems framework. Seven variables representing risk at the level of the individual and his or her relationship are used to predict partner violence—more specifically, these variables are used to predict an individual's likelihood of being victimized by or perpetrating physical partner violence (e.g., slapping/hitting, shoving, or kicking). The analyses examined eight assessment points over nearly ten years, spanning both adolescence and early adulthood. The extensive data collection provided a more detailed and systematic record of partner violence across two critical developmental periods. Further, we assessed multiple risk factors previously shown to be associated with partner violence and examined whether these risk factors contributed differently to initial versus repeated experiences of partner violence.

Individual Risk Factors for Partner Violence

Four individual-level variables were chosen as markers of individuals' broad psychological adjustment: internalizing and externalizing problems, substance use, and self-worth. These variables have also frequently been associated with partner violence in the literature (Capaldi et al. 2012). Individuals with higher levels of internalizing symptoms such as depression or anxiety may be more vulnerable to entering or remaining in violent relationships, or may experience increased risk due to side effects of their symptoms such as irritability (Brooks-Russell et al. 2013; Halpern et al. 2009). Indeed, internalizing symptoms are frequently linked to partner violence (Holt and Espelage 2005; Foshee et al. 2010). Externalizing behaviors are also associated with partner violence and may place individuals at risk in several ways (Maas et al. 2010). They may increase the likelihood that individuals will encounter violent scenarios or associate with aggressive partners, thus increasing their risk for victimization. Individuals who engage in externalizing behaviors, broadly, may be more likely to perpetrate aggressiveness within their romantic relationships, as well. Similarly, substance use has been linked to partner violence (Margolin et al. 2013; Shorey et al. 2011; Testa et al. 2003). The use of substances may lower individuals' self-control, thus increasing their propensity toward negative interactions and increasing their likelihood of later partner violence (Follingstad et al. 1999). Low self-worth, which has also been identified as a risk factor for partner violence, may affect an individuals' susceptibility to enter or remain in negative partnerships (Whiting et al. 2009).

Relationship Risk Factors for Partner Violence

A dynamic developmental systems framework mandates that risk be explored not only at the level of the individual, but also at the level of the individual's relationship. Previous research has found significant stability in partner violence only when individuals remain in the same relationship over time, suggesting that violence is at least in part influenced by the quality of the relationship (Capaldi et al. 2003). Three variables were chosen as indicators of overall relationship quality: relationship support, negative interactions (e.g., relationship conflict), and relationship satisfaction. Relationships that are lower in supportiveness, higher in negative interactions, and rated as less satisfying may all be more likely to feature partner violence than relationships with more adaptive scores on these variables. Indeed, low support has been linked to partner violence

(Carlson et al. 2002). Relationships characterized by low support may feature less adaptive problem solving and thus may feature more conflict ending in violence. Similarly, negative interactions predict partner violence; these interactions represent the types of situations that may escalate into physical violence (DeMaris et al. 2003). Individuals reporting higher relationship satisfaction are more likely to be in supportive relationships with fewer negative interactions and would seem to be less likely to be at risk for violence, though the literature is somewhat mixed (c.f., Ackerman and Field 2011; Stith et al. 2008 vs. Dixon et al. 2015; Katz et al. 1995). Therefore, continued research in this domain is warranted.

The Present Study

The current study applied a dynamic developmental systems framework to a longitudinal study of risk factors and their links to: (1) initial and repeated episodes of physical violence victimization and (2) initial and repeated episodes of physical violence perpetration. Consistent with the framework, we examined risk factors at both the relationship and individual levels. Risk factors were analyzed using multiple-spell, discrete time survival analysis, which has been used to assess risk for sexual victimization in adolescence (Young and Furman 2008).

The present study makes several contributions to the literature. First, we aim to expand our understanding of risk by exploring both relationship and individual level risk factors. Second, we examine partner violence at eight different times across a ten-year period of adolescence and adulthood. Most longitudinal studies have examined partner violence at two or perhaps three points, limiting the period over which participants' experiences with partner violence are measured. Third, risk factors were analyzed using multiple-spell, discrete time survival analysis. This technique takes into account the fact that individuals may change in the degree to which they are at risk at different time points; such variability is particularly important when examining relationship factors which are likely to vary considerably over the course of a decade. Finally, multiple-spell discrete time survival analysis allows for a direct comparison in risk between initial and repeated experiences of partner violence.

The current study analyzed two separate models, one predicting the likelihood of victimization and another predicting perpetration. With regard to victimization, we made three specific hypotheses. Experiencing physical partner violence victimization will result in higher risk for later victimization. Individuals with poorer individual adjustment (i.e., higher levels of internalizing and externalizing problems, higher levels of substance use, and lower levels of self-worth) will be at higher risk for victimization. Individuals with poorer relationship quality (i.e., higher levels of negative interactions, lower levels of relationship support, and lower levels of relationship satisfaction) will be at increased risk for victimization. The hypotheses regarding perpetration paralleled those for victimization.

Methods

Participants

The current study was part of a larger ongoing study of close relationships and psychosocial adjustment from adolescence through early adulthood. Participants were 100 males and 100 females who were initially recruited in the tenth grade (M age = 15 years, 10.44 months old, SD = .49, range 14–16 years old). We sought to obtain a diverse sample by distributing brochures and sending letters to families residing in a number of different zip codes and to students enrolled in various schools in ethnically diverse, working class to upper middle class neighborhoods in a large Western metropolitan area. We were unable to determine the ascertainment rate because we used brochures, and because letters were sent to many families who did not have a 10th grader.

We contacted interested families with the goal of selecting a quota sample that had an equal number of males and females, and had a distribution of racial/ethnic groups that approximated that of the United States. To insure maximal response, we paid families $25 to hear a description of the project in their home. Of the families that heard the description, 85.5 % carried through with the Wave 1 assessment. Participants were selected to be representative of the ethnic distribution of the United States. The sample consisted of 11.5 % African Americans, 12.5 % Hispanics, 1.5 % Native Americans, 1 % Asian American, 4 % biracial, and 69.5 % White, non-Hispanics. The sample was of average intelligence (WISC-III vocabulary score M = 9.8, SD = 2.44); 55.4 % of their mothers had a college degree, indicating that the sample was predominately middle or upper middle class. With regard to sexual orientation, 90.7 % said they were heterosexual/straight at Wave 8, whereas the others said they were bisexual, gay, lesbian, or questioning. We retained the sexual minorities in the sample to be inclusive.

We compared our sample's scores to comparable national norms of representative samples for trait anxiety scores on the State Trait Anxiety Inventory (Spielberger 1983), maternal report of externalizing symptoms on the Child Behavior Child Checklist (Achenbach 1991), participants' reports of internalizing and externalizing

symptoms on the Youth Self Report, and 8 indices of substance use from the Monitoring the Future survey (Johnston et al. 2002). The present sample was more likely to have tried marijuana, 54 % versus 40 %, $z = 2.23$, $p < .05$; sample scores did not differ significantly from the national scores on the other 11 measures, including frequency of marijuana usage.

Procedure

Participants completed questionnaires at home at their convenience. They then took part in a series of laboratory sessions in which they were interviewed about their romantic relationships. The mother and a close friend nominated by the participant also completed questionnaires about the participant's psychosocial adjustment and risky/problem behaviors (*M* Mothers $N = 169$; *M* Friend $N = 145$). All questionnaires used in the current analyses were administered at each wave of data collection.

For the current study, data were drawn from the first eight waves of the study, beginning when participants were in the 10th grade and ending approximately 7 years post-high school. Data were collected on a yearly basis during Waves 1 through 4 and every eighteen months during Waves 5 through 8. Participant retention was excellent (Wave 1 and 2: $N = 200$; Wave 3: $N = 199$, Wave 4: $N = 195$, Wave 5: $N = 186$, Wave 6: $N = 185$, Wave 7: $N = 179$, Wave 8: $N = 172$). Those who participated in the study in Wave 8 did not differ from those who did not in terms of age, ethnicity, gender, maternal education, or their initial scores on the primary variables.

Participants completed all self-report measures about their most important romantic relationship in the last year that had lasted at least a month. On average, 68.44 % of participants reported having a romantic partner in the last year (range 59.50–74.50 %). Participants reported on an average of 3.9 such partners over the course of our study ($SD = 1.66$, range 1–8).

The study was approved by the local Institutional Review Board. The confidentiality of participants' data was protected by a Certificate of Confidentiality issued by the U.S. Department of Health and Human Services.

Measures

Victimization and Perpetration

For the current study, we chose to examine participants' experiences of physical partner violence. Participants reported on their own use of physical violence (perpetration) as well as their partner's use of physical violence (victimization) using the Conflict Resolution Style Inventory (CRSI; Kurdek 1994). For all relationship variables, participants were instructed to report on their most important romantic relationship during the past year. To insure the participant answered about the same relationship on each questionnaire, the partner's name was written in on each relationship questionnaire.

Using a 7-point scale, adolescents rated how often they and their partner had each engaged in various behaviors in arguments or disagreement. Four items were added to assess victimization and perpetration ("Forcefully pushing or shoving," "Slapping or hitting," "Throwing items that could hurt," and "Kicking, biting or hair pulling;" Victimization *M* $\alpha = .88$; Perpetration *M* $\alpha = .88$). Participants' scores on the CRSI were dichotomized such that any report of physical victimization at a particular wave resulted in a victimization score of '1' for that wave; a victimization score of '0' was assigned if no victimization was reported at a given wave. Perpetration scores were similarly dichotomized.

Internalizing Symptoms

Internalizing symptoms were measured using a composite derived from the trait scale of Spielberger's (1983) State-Trait Anxiety Inventory (STAI; *M* $\alpha = .92$), the Beck Depression Inventory (BDI; Beck et al. 1979; *M* $\alpha = .86$), and the Youth/Adult Self Report (Achenbach 1991, 1997). Participants completed Achenbach's Youth Self-Report in Waves 1–3 and Achenbach's Adult Self-Report in Waves 4–7. Internalizing scores were derived from the 26 items that were comparable on the two versions (*M* $\alpha = .82$). None of the items explicitly referred to behavior in romantic relationships.

Externalizing Symptoms

Externalizing symptoms were measured using a composite derived from participant, mother, and friend report. Participants completed Achenbach's Youth Self-Report in Waves 1–3 and Achenbach's Adult Self-Report in Waves 4–7 (Achenbach 1991, 1997). Externalizing scores were derived from the 20 items that were comparable on the two versions (*M* $\alpha = .87$). None of the items explicitly referred to behavior in romantic relationships.

Friends and mothers reported on the participant's externalizing symptoms by completing the externalizing items of the Child Behavior Checklist in Waves 1–3, and the externalizing items on the Adult Behavior Checklist in Waves 4–7 (Achenbach 1991, 1997). Friend and mother reports of externalizing scores were derived from the 19 items that were comparable on the two versions (*M* $\alpha = .84$ and .88, respectively).

Substance Use

Substance use was assessed using a composite derived from participant and friend report. Participants completed the Drug Involvement Scale for Adolescence (Eggert et al. 1996). This measure assesses the participant's use of beer, wine, liquor, marijuana, and other drugs (cocaine, opiate, depressants, tranquilizers, hallucinogens, inhalants, stimulants, over-the-counter drugs, and club drugs) over the last 30 days. Frequency of each substance use was scored on a 7-point scale ranging from never to every day. Participants also completed a 9 item measure assessing adverse consequences arising from substance use ($M\ \alpha = .92$) and a 16 item measure assessing difficulties in controlling substance use ($M\ \alpha = .90$). The questionnaires on substance use were administered by computer-assisted, self-interviewing techniques to increase the candor of responses.

Friends were asked four questions about the participant's use of alcohol and drugs and problems related to the use of those substances as part of their version of the Adolescent Self-Perception Profile (Harter 1988). The four items were averaged to derive the friend report of the participant's substance use and problems ($M\ \alpha = .82$).

Self-Worth

Global self-worth was measured using a composite derived from participant, mother, and friend report. Participants completed an abbreviated version of Harter's (1988) Self-Perception Profile for Adolescents (SPPA) at Waves 1–3 and an abbreviated version of Messer and Harter's (1986) Adult Self-Perception Profile at Waves 4–7. Participants, friends and mothers rated the participant's global self-worth using an abbreviated form of Messer and Harter's (1986) scale on the Adult Self-Perception Profile. The scale consisted of five items using a 4-point structured alternative format ($M\ \alpha = .85$), (participant-mother $M\ r = .47$; participant-friend $M\ r = .38$; friend-mother $M\ r = .28$, all $ps < .02$.)

Negative Interactions and Support

Participants completed the Network of Relationships Inventory: Behavioral Systems Version (NRI; Furman and Buhrmester 2009), to assess their perceptions of their most important romantic relationship in the last year. The short version of the NRI includes five items on social support ($M\ \alpha = .89$) and six items on negative interactions ($M\ \alpha = .93$). Participants used a 5-point scale to rate how much each description was characteristic of their romantic relationship.

Relationship Satisfaction

Relationship satisfaction was assessed through an adapted version of the Quality of Marriage Index (QMI; Norton 1983), a 6-item self-report measure that assesses an individual's global perception of his or her most important relationship quality (Baxter and Bullis 1986). An example of a question is "My relationship with my boy/girlfriend makes me happy" which the participant then responds to on a 7 point Likert scale (1 = strongly disagree/not at all true to 7 = strongly agree/very true; $M\ \alpha = .96$).

Derivation of Composites

The derivation of composites involved several steps. The various measures used to create the composites had different numbers of points on their scales. Such differences among measures present problems in deriving composite measures, as the scores from the different measures in the composite are not comparable. Therefore, we first standardized scores on each measure *across* all waves to render the scales comparable with one another. In other words, all the data across the seven waves were compiled for each measure, and one set of standardized scores for all waves of each measure was derived. For example, we aggregated the seven waves of data on the Beck Depression Inventory, determined the overall mean and SD, and calculated a single set of standardized scores for all waves.

This procedure of standardizing variables over waves is recommended as it retains differences in means and variance across age, and neither changes the shape of the distribution, nor changes the patterns of associations among the variables (Little 2013).

After each measure was standardized across waves we generated several composites. First, BDI depression scores, STAI anxiety scores, and Achenbach internalizing symptom scores were averaged to derive a composite index of internalizing symptoms. Second, participants', friends', and mothers' reports of externalizing symptoms were averaged to derive a composite index of internalizing symptoms. With regard to substance use we averaged the participants' reports of beer or wine drinking and their reports of drinking liquor to obtain a measure of alcohol use. Similarly, we averaged the participants' reports of marijuana use, and their reports of other drug use to derive a measure of drug use. Participants' reports of intra- and interpersonal problems, control problems and adverse consequences of use were each averaged to derive a measure of problem usage. Finally, participants' alcohol, drug, and problem usage, and friends' reports of substance use were averaged to derive a composite measure of substance use.

Results

Frequency of Partner Violence

Over the course of the study, approximately 46 % of participants reported an episode of physical violence victimization within their most important dating relationship. Of those participants, 47.80 % reported victimization at a single wave, 28.30 % reported victimization at two waves, and 23.90 % reported victimization at three or more waves. Fifty-four percent of male participants reported experiencing victimization compared to 38 % of female participants.

Approximately 51.50 % of participants reported perpetrating physical violence within their most important dating relationship. Of these participants, 50.50 % reported perpetration at a one wave, 24.30 % reported perpetration at two waves, and 25.20 % reported perpetration at three or more waves. Fifty-six percent of females reported perpetration compared to 47 % of males.

Preliminary Analyses

Outliers were identified and corrected by adjusting scores to fall 1.5 times the interquartile range below the 25th percentile or above the 75th percentile. The variables were examined to ensure that they had acceptable levels of skew and kurtosis (Behrens 1997).

Rates of missing data due to omission or attrition were low for the individual-level variables ($M = 5.56$ %). Missing data rates were higher for the relationship-level variables ($M = 33.73$ %), which principally reflected the fact that participants often did not have a relationship during a specific wave. We were interested in participants who had recurrent partner violence across two relationships versus repeated violence in one relationship. Accordingly, participants were assigned missing values for the relationship variables in the waves after the initial violence if they were still in the same relationship. This procedure ensured that we were not measuring repeated episodes of partner violence within a single relationship spanning multiple waves.

Missing data were estimated using multiple imputation (MI) procedures, including relevant auxiliary variables to increase the likelihood that the data would be missing at random (Schafer and Graham 2002). Multiple imputation protects against bias in analyses and yields more accurate estimates than either pairwise or listwise methods. One hundred multiple imputation datasets were generated using the software program Amelia II (Honaker et al. 2011) and combined for analyses using the Zelig package for R (Imai et al. 2007).

Survival Analysis

Hypotheses were tested using multiple spell, discrete time survival analysis (Willett and Singer 1995). Broadly, multiple spell survival analysis examines the occurrence of repeated events and how much time has passed before each occurrence (Singer and Willett 1993). In this case, one set of analyses examined the first and second reported episodes of victimization. Another set of identical analyses examined first and second reported episodes of perpetration.

Survival analysis begins by building a person-spell-period data set, in which participants experiences are described in terms of spells and periods through dummy coding. A participant is considered to be within a particular spell until they experience the event, at which time the next spell begins. Time within a single spell may cross multiple waves of data collection; each wave that occurs within a single spell is represented as a period. As an example, a participant who reported experiencing victimization for the first time at Wave 4 would be considered to be in Spell 1, Period 4 at the time of victimization. Because she reported victimization at this wave of data collection, she would enter Spell 2 Period 1 at the next wave. Participants who reported more than two episodes entered Spell 3; because a sufficient portion of the sample did not experience more than two episodes, Spell 3 was not included in the analyses.

A series of hierarchical logistic regression models were conducted. A baseline hazard model was constructed using the spell, period, and spell by period interaction term dummy variables, which describes the risk for the event across the course of the study without considering predictor variables. We first constructed seven single-predictor models (one for each of the seven predictor variables) to examine whether any one predictor significantly predicted partner violence when it was the only predictor. Because the different predictors were not independent, we then constructed a final all-predictor model, which included all seven variables simultaneously predicting partner violence. Each model was examined for improvement in fit over the baseline hazard model. Each predictor's contribution to risk is presented as an odds ratio (OR).

Baseline Hazard Models of Victimization and Perpetration

Two baseline hazard models were constructed to describe the risk for initial and subsequent victimization and perpetration without regard to predictor variables. Results of these models appear in Tables 2 and 3, respectively. In both models, the estimate for Spell 2 was not significant, indicating that the risk for experiencing a second episode of

victimization or perpetration did not significantly differ from the risk for an initial episode.

Single Predictor Models of Victimization and Perpetration

Results from each of these single-predictors models are presented in Tables 2 and 3 for victimization and perpetration, respectively. These models also included the baseline spell, period, and spell by period interaction terms reported in the first column.

The estimate for gender was significantly associated with victimization (OR = 0.55), indicating that girls were approximately half as likely to be victimized compared to boys. The estimate for gender was not significant in the perpetration model. The interaction term between spell and gender was not significant in either the victimization or perpetration models, indicating that gender's contribution to risk did not differ from initial to recurrent victimization or perpetration.

Of the individual-level risk factors, externalizing symptoms and internalizing symptoms were significantly related to both victimization (ORs = 1.62 and 1.19, respectively) and perpetration (ORs = 1.49 and 1.26, respectively). Self-worth and substance use were significant predictors for perpetration (OR = 0.82 and 1.24, respectively), but neither were associated with victimization. The interactions between these variables and spell were all nonsignificant; thus, these variables were associated with both initial and recurrent instances of partner violence.

Of the relationship-level risk factors, negative interactions was significantly related to victimization and perpetration (ORs = 1.74 and 1.70, respectively). Satisfaction was predictive of victimization (OR = 0.98) but not perpetration. The interactions between these variables and spell were all nonsignificant. Thus, these variables were associated with instances of both initial and recurrent violence.

Prospective Single Predictor Models of Victimization and Perpetration

The single-predictor models presented in Tables 1 and 2 used concurrent predictor variables, where each variable was used to predict either victimization or perpetration *at that same wave*. Additional models were run using prospective predictors, where each risk variable was used to predict outcomes *at the next wave of data*. As no data were available prior to Wave 1, risk variables measured at Wave 1 were used to predict outcomes at both Wave 1 and Wave 2.

Using prospective individual predictors, externalizing symptoms remained significantly predictive of victimization (OR = 1.39), whereas internalizing symptoms were no longer significantly predictive. Externalizing symptoms, internalizing symptoms, and self-worth all remained significant predictors of perpetration (ORs = 1.31, 1.21, and 0.83, respectively), whereas substance use was no longer significantly predictive. The interactions between these variables and spell all remained nonsignificant. Thus, these variables were associated with instances of both initial and recurrent violence.

Analyses using prospective predictors for the relationship variables were not conducted as they would not have yielded meaningful information because they may or may not have been with the same partner in the next wave. Due to the variability in who the subsequent relationship partner was, such analyses would not have been interpretable.

All Predictor Model

Finally, all predictor variables, and their interactions with spell, were entered simultaneously in a single step to predict risk for victimization and perpetration. The all predictor model used exclusively concurrent predictors. Results of the victimization and perpetration models are presented in Tables 2 and 3, respectively. Gender was a significant predictor of victimization (OR = 0.54), as were externalizing symptoms (OR = 1.58) and negative interactions (OR = 1.58). Externalizing symptoms were also significantly predictive of perpetration (OR = 1.38) as were negative interactions (OR = 1.61). Internalizing symptoms, substance use, and self-worth were not significantly associated with victimization or perpetration, nor were relationship satisfaction or relationship support.

Discussion

Previous work has examined risk factors associated with partner violence, but much of this work has relied on retrospective reporting, explored a restricted age range, or analyzed a limited number of data points. Prior research has also largely focused on individual-level risk variables (Capaldi et al. 2003). The present study applied a dynamic developmental systems framework to explore risk factors across multiple levels and their associations with both initial and recurrent episodes of partner violence measured over the course of a decade. Results support the merit of a developmental systems framework as both individual- and relationship-level variables were significantly related to risk for partner violence. These findings support the conceptualization of partner violence as a dyadic phenomenon,

Table 1 Variable means (with SDs in parentheses)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8
Internalizing	0.22 (1.21)	0.22 (1.25)	0.08 (1.18)	−0.04 (1.14)	−0.04 (1.13)	−0.15 (1.10)	−0.23 (1.21)	−0.10 (1.34)
Externalizing	0.34 (1.13)	0.16 (1.07)	0.17 (1.11)	0.05 (1.01)	−0.18 (0.86)	−0.31 (0.88)	−0.41 (0.89)	−0.30 (1.05)
Self-worth	−0.11 (1.03)	−0.07 (1.08)	−0.02 (1.06)	0.02 (1.06)	0.06 (1.03)	−0.01 (1.08)	0.05 (1.10)	0.12 (1.21)
Substance use	−0.38 (0.74)	−0.26 (0.85)	−0.14 (0.88)	0.01 (0.76)	0.14 (0.88)	0.28 (0.79)	0.30 (0.84)	0.22 (0.78)
Support	−0.67 (1.40)	−0.06 (1.44)	−0.05 (1.40)	0.21 (1.34)	0.13 (1.38)	0.37 (1.31)	0.49 (1.28)	0.45 (1.19)
Negative interactions	0.07 (1.51)	−0.14 (1.54)	0.30 (1.86)	−0.08 (1.60)	0.21 (1.63)	0.03 (1.52)	−0.02 (1.32)	−0.09 (1.50)
Relationship satisfaction	−0.43 (1.57)	−0.10 (1.62)	−0.18 (1.71)	−0.39 (1.47)	−0.10 (1.73)	0.20 (1.65)	0.23 (1.59)	0.67 (1.43)
Victimization	1.17 (0.46)	1.17 (0.47)	1.27 (0.61)	1.20 (0.45)	1.16 (0.39)	1.11 (0.34)	1.11 (0.37)	1.16 (0.40)
Perpetration	1.11 (0.32)	1.12 (0.35)	1.23 (0.53)	1.16 (0.36)	1.13 (0.32)	1.14 (0.42)	1.13 (0.36)	1.11 (0.30)

Table 2 Parameter estimates (and standard errors) for survival models of victimization

Predictor	Baseline model	Single predictor model	Full model
Period 1	−1.75 (.22)***		−1.15 (.37)**
Period 2	−1.70 (.24)***		−1.00 (.39)**
Period 3	−1.83 (.27)***		−1.05 (.40)**
Period 4	−2.02 (.32)***		−1.06 (.44)*
Period 5	−1.77 (.37)***		−0.83 (.50)†
Period 6	−2.30 (.44)***		−1.26 (.54)*
Period 7	−2.54 (.54)***		−1.41 (.62)*
Period 8	−1.89 (.40)***		−0.72 (.51)
Spell 2	−0.61 (.41)		0.72 (.44)
Period × Spell 2	−0.02 (.13)		−0.04 (.13)
Gender		0.61 (.18)***	−0.62 (.19)**
Gender × Spell 2		0.35 (.44)	0.42 (.48)
Substance use		0.18 (.11)†	0.01 (.12)
Substance use × Spell 2		0.09 (.25)	0.15 (.26)
Internalizing		0.18 (.07)*	0.08 (.10)
Internalizing × Spell 2		0.09 (.16)	0.06 (.23)
Externalizing		0.48 (.08)***	0.46 (.10)***
Externalizing × Spell 2		0.09 (.20)	0.04 (.23)
Relationship support		−0.05 (.13)	0.07 (.16)
Rel. support × Spell 2		−0.19 (.26)	−0.22 (.32)
Neg. interactions		0.55 (.16)***	0.45 (.17)**
Neg. interactions × Spell 2		0.16 (.35)	0.17 (.38)
Satisfaction		−0.02 (.01)*	−0.01 (.01)
Satisfaction × Spell 2		−0.00 (.02)	0.02 (.02)
Self-worth		−0.14 (.08)†	0.07 (.11)
Self-worth × Spell 2		0.03 (.20)	0.08 (.27)

The single predictor model columns presents the results for each of the seven models in which one predictor variable and its interaction with spell were entered

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 3 Parameter estimates (and standard errors) for survival models of perpetration

Predictor	Baseline model	Single predictor model	Full model
Period 1	−1.48 (.23)***		−1.56 (.39)***
Period 2	−1.40 (.23)***		−1.41 (.38)***
Period 3	−1.71 (.27)***		−1.71 (.40)***
Period 4	−2.11 (.35)***		−2.04 (.47)***
Period 5	−1.59 (.33)***		−1.49 (.44)***
Period 6	−2.36 (.49)***		−2.19 (.58)***
Period 7	−1.84 (.46)***		−1.65 (.56)**
Period 8	−1.56 (.39)***		−1.34 (.50)**
Spell 2	0.44 (.38)		0.45 (.40)
Period × Spell 2	−0.07 (.12)		−0.08 (.12)
Gender		−0.06 (.17)	−0.05 (.19)
Gender × Spell 2		0.20 (.40)	0.18 (.43)
Substance use		0.22 (.11)*	0.10 (.12)
Substance use × Spell 2		−0.08 (.23)	−0.04 (.25)
Internalizing		0.23 (.07)***	0.13 (.10)
Internalizing × Spell 2		−0.06 (.16)	−0.14 (.23)
Externalizing		0.40 (.08)***	0.32 (.10)***
Externalizing × Spell 2		−0.07 (.21)	−0.06 (.24)
Relationship support		0.05 (.12)	0.12 (.15)
Rel. support × Spell 2		−0.06 (.24)	−0.05 (.31)
Neg. interactions		0.53 (.15)***	0.48 (.16)**
Neg. interactions × Spell 2		−0.18 (.31)	−0.16 (.35)
Satisfaction		−0.01 (.01)	−0.00 (.01)
Satisfaction × Spell 2		0.00 (.02)	0.00 (.02)
Self-worth		−0.20 (.08)*	−0.00 (.11)
Self-worth × Spell 2		−0.01 (.19)	−0.12 (.26)

The single predictor model columns presents the results for each of the seven models in which one predictor variable and its interaction with spell were entered

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

and highlight the importance of studying multiple levels of risk.

Individual and Relationship-Level Risk Factors

Externalizing symptoms and negative interactions consistently emerged as predictors of both victimization and perpetration in both single and full models, which is broadly consistent with previous work (DeMaris et al. 2003; Maas et al. 2010). The consistency of these effects suggests that externalizing symptoms and negative interactions may be particularly robust predictors of partner violence. Engaging in the types of risky or delinquent behaviors that characterize externalizing symptoms consistently emerges as a risk factor for partner violence (Maas et al. 2010). Individuals whose externalizing symptoms include impulsivity or oppositional behaviors may experience more frequent negative interactions in their relationships. Indeed, negative interactions and externalizing symptoms were moderately correlated ($r = .30$). Yet, the fact that externalizing symptoms may lead to negative interactions is not fully responsible for the associations with partner violence, as each made a unique contribution to partner violence in the full models. Regardless of an individual's tendency to externalize, negative interactions represent the type of situation that could easily escalate into violence. Further, even in the absence of frequent negative interactions, individuals higher in externalizing may demonstrate more impulsivity resulting in episodes of partner violence.

Internalizing symptoms were also associated with partner violence in the single predictor models, although they were no longer significantly predictive in the full models. Indeed, internalizing symptoms have been demonstrated to predict partner violence in other research using single-predictor models, but show inconsistent associations when included in models alongside additional predictors (Foshee et al. 2010). Similarly, relationship satisfaction was

significantly associated with victimization in a single predictor model, but was not in the full model. This finding aligns with previous work linking relationship satisfaction to partner violence (Dixon et al. 2015). Self-worth and substance use were also significantly associated with perpetration in a single but not the full model; both of these variables have shown associations with partner violence in previous research (Margolin et al. 2013; Whiting et al. 2009).

A dynamic development systems framework may account for such differences (Capaldi et al. 2005). This framework recognizes that there are multiple risk factors for partner violence, and that those risk factors overlap. Instances of overlapping risk or shared variance may explain why some variables are significantly predictive in a single-predictor model but not in the full model. For example, it is possible that the aspects of internalizing symptoms that are predictive of partner violence are those that overlap with another variable, such as externalizing symptoms. It is also possible that some general psychopathology factor may underlie internalizing and externalizing symptoms and be the component responsible for the associations. Alternatively, internalizing symptoms may be related to another variable that more proximally increases risk for partner violence, such as negative interactions. More research is needed, but the current results illustrate the importance of examining both the unique and shared influence of risk factors.

Overlap Between Victimization and Perpetration Models

Perhaps more interesting than the findings about any single risk factor is the degree of similarity between the patterns of results for the victimization and perpetration models. Of the six individual and relationship risk factors predictive of either victimization or perpetration in single predictor models, three were significantly predictive of both, and two showed at least trend level associations with both. This overlap suggests that the experiences of victimization and perpetration are closely aligned; indeed, studies show that these experiences tend to co-occur (Straus 2011). In the current study, victimization and perpetration were highly correlated ($r = .66$, $p < .05$). Given the high degree of mutuality commonly found in recent work, an involvement model of partner violence wherein the experiences of victimization and perpetration are examined together shows great promise (Connolly et al. 2010; Williams et al. 2008).

Partner Violence and Its Recurrence

Previous work has long suggested that individuals who experience partner violence are at increased risk for similar experiences in later relationships, but the strength of these conclusions has been limited by many of the same methodological problems facing partner violence research, more broadly. To overcome some of these limitations, especially the emphasis on retrospective reporting or two-data point designs in previous work, the current study examined and compared risk for initial and recurrent episodes of partner violence using a prospective, longitudinal design over the course of a decade. By the end of data collection (7 years post-high school), nearly half of all participants had reported being victimized by a partner, and more than half had reported perpetrating against a partner. These rates are higher than average but within the ranges most frequently found in other studies (Desmarais et al. 2012a, b). Our higher than average rates of partner violence may stem from having assessed partner violence across a wide range of severity, as well as our longitudinal design with repeated assessments of violence.

Notably, experiencing an episode of victimization did not significantly increase an individual's likelihood of future victimization, nor did reporting perpetration significantly increase an individual's likelihood of future perpetration. Together, these results suggest that partner violence is an extremely common experience in romantic relationships; however, a single experience of either victimization or perpetration does not appear to substantially alter an individual's risk for these experiences in future relationships. This finding suggests that dyadic influences play a key role in risk for partner violence, which is consistent with a growing body of literature. For example, Capaldi et al. (2003) found that physical aggression toward a partner was stable across time only when the couple remained intact. When the individual entered a relationship with a new partner, his aggression in the new relationship was not significantly predicted by aggression in the prior relationship (Capaldi et al. 2003). Although unexplored in the current study, it is possible that individuals with longer histories of interpersonal violence, such as in their families of origin, may be at greater risk of future violence. For example, social learning and attachment theorists have suggested that individuals with childhood histories of abuse may become entrenched in a pattern of interpersonal abuse warranting specific prevention and intervention work targeted at their unique risk (Foshee et al. 1999; Wekerle and Wolfe 1998). Further, while the current results suggest that risk does not substantially differ between initial and repeated experiences of partner violence, the *impact* of partner violence may differ across these experiences. Overall, additional longitudinal work in diverse populations is needed to elucidate the field's understanding of qualitative differences across multiple episodes of partner violence.

From a prevention standpoint, understanding which risk factors, at both the individual and relationship levels, are

related to partner violence and the possible ways those risk factors may relate to one another is key. A majority of prevention work targets individual-level variables or only one member of a dyad, however, the results of this study suggest that our ability to predict an individual's risk for partner violence is greatest when we take into account aspects of his or her relationship, such as negative interactions. Indeed, a review of existing prevention programs noted that the only programs demonstrated to effectively prevent partner violence addressed relationship skills as part of their curriculum (De Koker et al. 2014). In fact, programs that exclusively target relationship skills (e.g., communication, problem solving) have been demonstrated to effectively reduce partner violence (Braithwaite and Fincham 2014; Rhoades 2015). Responsibility for partner violence unequivocally lies with the perpetrator, but future prevention and intervention work may benefit from addressing risk at the relationship-level or targeting both members of a dyad.

Gender

Men were more likely to report victimization during the course of the study than were women, a finding that aligns with several previous studies (e.g., Williams and Frieze 2005). Perpetration rates did not vary by gender. Partner violence research has given much attention to gender differences; studies suggest that while men and women may report largely similar rates of partner violence, women are more likely to report more severe injuries stemming from victimization (Archer 2000).

Limitations and Future Directions

The present study is one of the few studies examining risk for partner violence across both adolescence and early adulthood. More work is needed exploring the emergence of partner violence across development. Partner violence during adolescence may have different implications for well-being than violence in adulthood, especially as the nature and significance of romantic involvement changes across this period. In addition, despite the significant amount of time examined during this study, participants were not asked about their experiences of partner violence prior to the first wave of data collection. Therefore, initial reported episodes of partner violence during the study do not necessarily represent participants' first lifetime experience of partner violence. Finally, future work should include racially and sexually diverse samples. Doing so will allow for a better understanding of how the risk for partner violence across development may vary in different cultures or among sexually diverse samples.

Conclusion

The present study makes a significant contribution to the literature by longitudinally exploring individual and relationship-level risk for partner violence across adolescence and adulthood. The findings indicated that risk for partner violence stems from both individual levels of influence (e.g., internalizing symptoms) and relationship levels of influence (e.g., negative interactions). Moreover, experiences of victimization and perpetration are closely entwined. It is also one of the few longitudinal studies to compare risk for recurrent versus initial risk for partner violence. In sum, the present results contribute to the field's understanding of risk for partner violence across time and, in doing so, outlines implications for prevention and intervention work.

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Author Contributions JN and WF conceived of the study together. JN performed the statistical analyses, interpretation of the data, and drafted the manuscript. WF also participated in the interpretation of the data and contributed to the writing of the manuscript. Both authors read and approved the final manuscript.

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Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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