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EMPIRICAL RESEARCH

Chronic and Acute Relational Risk Factors for Dating Aggression in Adolescence and Young Adulthood

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Abstract Dating aggression is a prevalent and costly public health concern. Using a relational risk framework, this study examined acute and chronic relational risk factors (negative interactions, jealousy, support, and relationship satisfaction) and their effects on physical and psychological dating aggression. The study also examined the interaction between chronic and acute risk, allowing us to assess how changes in acute risk have differing effects depending on whether the individual is typically at higher chronic risk. A sample of 200 youth (100 female) completed seven waves of data, which spanned 9 years from middle adolescence to young adulthood (*M* age at Wave 1 = 15.83). Using hierarchical linear modeling, analyses revealed both acute (within-person) and chronic (between-person) levels in jealousy, negative interactions, and relationship satisfaction, were associated with physical and psychological dating aggression. Significant interactions between chronic and acute risk emerged in predicting physical aggression for negative interactions, jealousy, and relationship satisfaction such that those with higher levels of chronic risk are more vulnerable to increases in acute risk. These interactions between chronic and acute risk indicate that risk is not static, and dating aggression is particularly likely to occur at certain times for youth at high risk for dating aggression. Such periods of increased risk may provide opportunities for interventions to be particularly effective in preventing dating aggression or its consequences. Taken together, these findings provide support for the role of relational risk factors for dating aggression. They also underscore the importance of considering risk dynamically.

Keywords Dating aggression · Dating violence · Romantic relationships · Relationship qualities · Conflict · Support · Jealousy · Satisfaction

Introduction

Dating aggression has been identified as a serious public health concern among adults and, increasingly, adolescents (Breiding et al. 2014). Consequently, significant attention has been paid to identifying risk factors for dating aggression among adolescents and young adults (Capaldi et al. 2012). Although much research has been done, the literature has been critiqued for often being atheoretical (Shorey et al. 2008), focusing primarily on individual risk factors, and not sufficiently considering relational risk factors (i.e., the characteristics of the relationship, such as satisfaction; Reese-Weber and Johnson 2013). Relational risk factors are theorized to increase risk for aggression by intensifying the frequency and severity of conflict situations (Riggs and O'Leary 1989). Indeed, research suggests that relational risk factors may be more predictive of dating aggression than commonly studied factors such as alcohol use (Foran and O'Leary 2008) or psychopathology (Capaldi et al. 2012).

In response to these criticisms, Reese-Weber and Johnson (2013) extended Riggs and O'Leary (1989) background-situational theory to further emphasize relationship risk factors. In their original theory, Riggs and O'Leary conceptualized risk factors as fitting into two components: background risk factors and situational risk factors. Background risk factors are features that an

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individual may be bringing to a relationship, such as individual psychopathology. In contrast, situational risk factors are specific to the context of dating aggression, such as stress, alcohol use, and relational risk factors. Reese-Weber and Johnson (2013) contended that relational risk factors warrant increased attention, on par with other sets of risk factors. Therefore, Reese-Weber and Johnson argued that relational risk factors should be separated from situational risk factors to emphasize their critical role in the etiology of dating aggression. Instead, they proposed an extension to Rigg's and O'Leary's theory of dating aggression such that risk factors are organized into three components: background risk factors (e.g., individual psychopathology), immediate situational risk factors (e.g., stress levels), and relational risk factors (e.g., relationship satisfaction). In the present article, we refer to this theoretical extension as a relational risk framework.

The present longitudinal study aimed to contribute to a relational risk framework by longitudinally examining relational risk factors that have been identified as theoretically and empirically linked to dating aggression. Specifically, we examined negative interactions, jealousy, support, and relationship satisfaction. Negative interactions have received the most attention as a relational risk factor for dating aggression. It has been shown to be a consistent predictor of dating aggression (O'Keefe 2005), and is thought to be the most proximal relational risk factor preceding aggression (Riggs and O'Leary 1989). Similarly, jealousy and relationship satisfaction are theorized to contribute to risk by exacerbating hostile patterns of communication, which may then escalate into dating aggression. Indeed, each has been empirically linked to greater risk for dating aggression as well (O'Leary and Smith Slep 2003; Kaura and Lohman 2007), although little work has examined them longitudinally (Vagi et al. 2013). Theoretically, support may also be expected to function as a protective factor for dating aggression, as it reflects a stronger bond and positivity in the relationship (Riggs and O'Leary 1989). Empirical support for this idea is limited, however, as support behavior has been associated with no differences in risk for aggression (Marcus and Swett 2002) or greater dating aggression risk (Giordano et al. 2010). Thus, theoretically and empirically, negative interactions, jealousy, relationship satisfaction, and support may all be important relational factors that increase risk dating aggression.

The current study also examined both psychological aggression and physical aggression, as psychological aggression is also associated with psychological consequences (Lawrence et al. 2012), and is often a precursor to physical aggression (O'Leary and Maiuro 2001). Finally, consistent with prior work on ecological models of aggression, we used an involvement model of dating aggression, which included victimization, perpetration, and mutual aggression (Connolly et al. 2010; Williams et al. 2008). During this developmental period, victimization and perpetration are highly correlated and most often co-occur (O'Leary and Smith Slep 2003; Whitaker et al. 2007; Williams et al. 2008); thus, it is best to examine them together.

Importantly, a relational risk framework of dating aggression is consistent with the idea that risk for dating aggression is not static, and that individuals may be at higher risk at some times than at other times. For example, if individuals are very jealous regarding a specific partner's behaviors, they may be at greater risk at that time. We refer to this as *acute risk*. Moreover, individuals may also have *chronic relational risk*. For example, some individuals may typically be more jealous than others, placing them at greater risk over the course of time. Finally, if risk is indeed dynamic, we might expect interactions between chronic and acute risk. That is, those who are chronically jealous about their partners may be more likely to be involved in dating aggression when they are acutely jealous than when not; on the other hand, risk for dating aggression may not be particularly elevated at times of acute risk for those who are not chronically jealous. Alternatively, those who are not chronically jealous may be more likely to be involved in dating aggression if they have a partner who elicits greater feelings of jealousy than usual for them, whereas those who are chronically jealous may be at high risk regardless of whether their acute level of jealousy is particularly high for them. Thus, examining acute and chronic risk, as well as the interaction between the two, offers important information regarding when, and for whom, risk for dating aggression increases.

Although they are conceptually critical to the understanding of dating aggression, relatively little work has examined relational risk factors, and findings have been mixed (see Reese-Weber and Johnson 2013). Existing work has primarily examined associations at one time point, not allowing for an examination of variations in risk across time. To more fully understand the links between relational risk factors and dating aggression, we examined both between-person (chronic risk) and within-person effects (acute risk) (Curran and Bauer 2011). Between-person effects (chronic risk) refer to whether differences between people on one variable are associated with differences in dating aggression. For example, is a person who has higher levels of jealousy on average at greater risk for dating aggression? In contrast, within-person effects (acute risk) refer to whether variations in relational factors within a person over time are associated with variations in dating aggression over time. For example, if a person has a higher level of jealousy than she typically does, does her risk for dating aggression also increase? Studies of within-person variation are central to many psychological theories, as

social scientists are often interested in understanding changes or differences within a person, rather than differences between people per se. For example, developmental psychologists have increasingly relied on longitudinal studies of the same people over time, rather than inferring change rom cross-sectional comparisons of different individuals. Studies of within-person effects can also provide information about when activities occur (vs. who is likely to engage in them). They may also be less prone to spurious associations stemming from third variables because third variables that are relatively stable over time cannot account for variation within a person.

Finally, the current study also examined an interaction between within and between person effects to assess whether the association between acute risk and aggression depends on the level of chronic risk. To our knowledge, no research has examined these interaction effects; evidence of such interactions would highlight potential periods of increased risk and inform more targeted interventions.

Hypotheses

First, consistent with a relational risk framework, we hypothesized that higher levels of negative interactions and jealousy will be associated with more physical and psychological dating aggression. Lower levels of support and relationship satisfaction will be associated with higher levels of physical and psychological dating aggression. Second, acute (within-person) increases in relational risk factors will be associated with acute (within-person) increases for both psychological and physical aggression. Thus, when a person is experiencing higher levels of negative interaction and jealousy than usual or lower levels of support and satisfaction than usual, psychological and physical aggression will be greater. Finally, interactions will occur between acute (within-person) and chronic (between-person) risk for both psychological and physical aggression. We expected the specific nature of these interactions would illustrate one of two patterns. One possibility is that those who are not chronically at risk may show greater levels of aggression at times of acute risk, whereas those at chronic risk may consistently be at greater levels of risk, regardless of acute risk. Alternatively, those with chronic risk may be more vulnerable to changes in acute risk.

Methods

Participants

The participants were part of a longitudinal study investigating the role of relationships with parents, peers, and romantic partners on psychosocial adjustment. Two hundred 10th grade high school students (100 boys, 100 girls; *M* age at Wave 1 = 15 years 10.44 months old, SD .49) were recruited. The participants came from working class to upper middle class neighborhoods in a large Western metropolitan area. We sought to obtain such 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 neighborhoods. We were unable to determine the ascertainment rate because we used brochures and because the letters were sent to many families who did not have a 10th grader. We contacted interested families with the goal of selecting a 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 homes. Of the families that heard the description, 85.5 % expressed interest and carried through with the Wave 1 assessment.

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. With regard to family structure, 57.5 % were residing with 2 biological or adoptive parents, 11.5 % were residing with a biological or adoptive parent and a step parent or partner, and the remaining 31 % were residing with a single parent or relative. The sample was of average intelligence (WISC-III vocabulary score $M = 9.8$, SD 2.44) comparable to national norms on multiple measures of adjustment (see Furman et al. 2009); 55.4 % of their mothers had a college degree, indicating that the sample was predominately middle or upper middle class.

In Wave 1, 59.8 % of participants reported having had a romantic partner in the last year; in Wave 2, 66 % had a romantic partner; in Wave 3, 78.2 % had a romantic partner; in Wave 4, 75.9 % had a romantic partner; in Wave 5, 73.5 % had a romantic partner; in Wave 6, 79.9 % had a romantic partner; in Wave 7, 80.6 % had a romantic partner. In Wave 5, 11 % of participants were cohabitating with a romantic partner or married; 22 % in Wave 6; 32 % in Wave 7.

Procedure

Adolescents participated in a series of 2–3 laboratory sessions in which they were interviewed about romantic relationships, completed questionnaires, and observed with a romantic partner (see blinded citation 1 for further information). For the purposes of the current study, we used the questionnaire data from the first through seventh waves of data collection, beginning when the participants were in the 10th grade and ending approximately 5.5 years after graduation from high school. Data were collected on a yearly basis in Waves 1 through 4, and then one and a half

years later for Waves 5–7. The seven waves of data were collected between 2000 and 2010. 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: $N = 179$). There were no differences on the variables of interest between those who did and did not remain in the study.

Participants were compensated between $30 and $75 for completing questionnaires in the various waves of data collection. The study was approved by the local Institutional Review Board.

Measures

Physical and Psychological Aggression

Dating aggression was assessed with the Conflict Resolution Style Inventory (CRSI; Kurdek 1994). The CRSI consists of 16 items pertaining to means of handling conflict. Using a 7-point scale, adolescents rated how often they and their partner had each engaged in various behaviors with their most important romantic partner in the past year. The dominance subscale consists of 4-item (e.g., "throwing insults and digs") and was used as a measure of psychological aggression (M alpha = .84). Four items from the Conflict Tactics Scale (Straus 1979) were added to assess adolescents' physical aggression (e.g., "slapping or hitting"; M alpha = .90). We examined dating aggression in three forms. First, based on an involvement model of dating aggression, we combined ratings of victimization and perpetration. Correlations between psychological victimization and perpetration (M $r = .76$) and physical victimization and perpetration (M $r = .65$) supported this conceptualization. We also examined victimization and perpetration separately to further assess the effects.

Support and Negative Interactions

Participants completed the short version of the Network of Relationships Inventory: Behavioral Systems Version (NRI), to assess their perceptions of their most important romantic relationship in the last year (Furman and Buhrmester 2009). The NRI included five items regarding social support (e.g., How much do you turn to this person for comfort and support when you are troubled about something?) and six items regarding negative interactions (e.g., How much do you and this person get on each other's nerves?). Participants rated how much the characteristic occurred using a 5-point scale. Romantic support was derived by averaging the five social support items and negative interaction scores were derived by averaging the six negative interactions items (M alphas = .89 and .92, respectively).

Relationship Satisfaction

Relationship satisfaction was measured with a version of the Quality of Marriage Inventory (QMI; Norton 1983) that was adapted to assess relationship satisfaction among adolescents and young adults. The measure consisted of 5 seven-point Likert items and 1 ten-point Likert item. An example of a question is "My relationship with my boy/girlfriend makes me happy" (M alpha = .97). Scores on items were transformed so that all items had the same range of potential scores; item scores were then averaged to derive a total score.

Jealousy

Jealousy was measured using Pfeiffer and Wong's (1989) Multidimensional Jealousy Scale (MJS). Participants were asked to complete 24 questions assessing cognitive, emotional, and behavioral jealousy. Participants rated their responses on a five-point Likert scale (1 = never to 5 = all the time). An example of an item is: "I question my boy/girlfriend about his or her whereabouts." (M alpha = .91). The 24 items were averaged to derive a total score.

Analytic Strategy

We conducted multilevel models to examine the between-person (chronic) and within-person (acute) effects. Each model had the following form.

$$\text{Level 1} \quad Y_i = \beta_0 + \beta_1(age) + \beta_2(\textit{relational risk factor}) + \beta_3(\textit{relationship presence}) + r_i$$

$$\text{Level 2} \quad \beta_0 = \gamma_{00} + \gamma_{01}(gender) + \gamma_{02}(\textit{relational risk factor mean}) + \gamma_{03}(\textit{relational risk factor mean} \times gender)$$

$$\beta_1 = \gamma_{10} + \gamma_{11}(gender)$$

$$\beta_2 = \gamma_{20} + \gamma_{21}(gender) + \gamma_{22}(\textit{relational risk factor mean})$$

$$\beta_3 = \gamma_{30}$$

In these models, Y represented psychological/physical aggression reported by individual i. Age was included as a covariate at Level 1 (β_1). The within-person (acute) effect was examined at Level 1 by the term *relational risk factor* (β_2). This term was group-mean centered, such that scores reflected the score for that relational risk factor relative to that person's average score across the seven waves for that relational risk factor. The between-person (chronic) effect was examined at Level 2 by the term *relational risk factor mean* (γ_{02}). This term was the person's average score on that relational risk factor across the seven waves and is grand mean centered so as to compare it to other participants' relationship characteristics. In addition, interactions

Table 1 Mean relational risk factors and dating aggression (with standard deviations in parentheses)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7
Age	15.88 (0.47)	16.89 (0.47)	17.94 (0.50)	19.03 (0.56)	20.51 (0.56)	22.11 (0.51)	23.70 (0.61)
Negative interactions	1.82 (0.75)	1.71 (0.76)	1.95 (0.94)	1.74 (0.79)	1.88 (0.81)	1.79 (0.75)	1.74 (0.61)
Jealousy	2.51 (0.44)	2.47 (0.45)	2.53 (0.50)	2.44 (0.54)	2.44 (0.81)	2.42 (0.48)	2.36 (0.43)
Support	3.07 (1.03)	3.52 (1.08)	3.52 (1.05)	3.73 (1.00)	3.66 (1.04)	3.84 (0.98)	3.93 (0.96)
Relationship satisfaction	11.34 (4.42)	12.28 (4.56)	12.03 (4.81)	13.63 (4.13)	12.26 (4.87)	13.10 (4.64)	13.18 (4.48)
Psychological aggression	1.86 (0.89)	1.86 (0.88)	2.15 (1.17)	2.00 (1.03)	1.95 (0.96)	1.94 (1.04)	2.03 (1.11)
Physical aggression	1.14 (0.33)	1.14 (0.38)	1.25 (0.53)	1.18 (0.37)	1.14 (0.33)	1.12 (0.32)	1.12 (0.36)

between the within-person (acute) and between-person (chronic) term were estimated by cross-level interactions (γ_{22}). Finally, gender was included as a Level 2 main effect (γ_{01}), in an interaction with the between-person (chronic) term (γ_{03}), in a cross-level interaction with age (γ_{11}) and in a cross-level interaction with the within-person (acute) term (γ_{21}).

Participants who did not have a relationship during a specific wave were assigned missing values to the relationship characteristics in that wave; multilevel modeling uses full information maximum likelihood (FIML) so that participants who had valid data in some waves were retained. FIML provides a powerful alternative to listwise deletion and protects against bias in analyses (Graham et al. 2007; Little et al. 2014). Participants who did not have a romantic relationship during the entire period of the study were removed ($n = 5$). To better meet the assumptions of missing at random (MAR), we included a relationship presence (β_3) measure indicating whether the participant was in a relationship in a wave. Three time-varying predictors (support, jealousy, and satisfaction) were correlated with the time variable (age). Therefore, Curran and Bauer's (2011) procedure for data unbalanced with respect to time was used to disaggregate the within-person and between-person effects of all the independent variables.

Results

Descriptive statistics can be found in Table 1. Univariate growth curve models revealed that jealousy significantly declined ($\beta = -0.02$, $p = .001$), whereas support ($\beta = 0.08$, $p < .001$) and relationship satisfaction ($\beta = 1.47$, $p = .003$) significantly increased over time. Negative interactions, psychological dating aggression involvement, and physical dating aggression involvement did not change over time. To assess between-person and within-person variability, we ran fully unconditional multilevel models. The results indicated that 72 % of the variability of psychological dating aggression involvement and 78 % of the variability of physical dating aggression involvement were within-person; the remaining proportions of variability were between-person.

Table 2 reports the results of the primary analyses.

Negative Interactions

In terms of between-person (chronic) and within person (acute) effects, greater levels of negative interactions were associated with greater psychological and physical aggression. For physical aggression, significant interactions between the chronic and acute effects emerged. To further interpret the interactions, we used Preacher et al. (2006) computational tools to plot the estimated effects of within-person (acute) relational risk factors for physical aggression for two values of between-person relational risk factors: 1 SD above the mean for the between-person effect of the relational risk factor (i.e., "high chronic risk") and 1 SD below the mean (i.e., "low chronic risk"). For both those with high and low chronic risk, acute increases in negative interactions were associated with physical aggression ($\beta = 0.30$, $p < .001$; $\beta = 0.22$, $p < .001$, respectively), though the effect was stronger for those with high chronic risk (see Fig. 1).

Jealousy

In terms of between-person (chronic) and within-person (acute) effects, greater levels of jealousy were associated with greater psychological and physical aggression. For physical aggression, significant interactions between the chronic and acute effects emerged such that acute increases in jealousy was associated with physical aggression for those with high chronic risk ($\beta = 0.14$, $p < .001$), but not for those with low chronic risk (see Fig. 2).

Support

For psychological aggression, there was a significant interaction of the between-person (chronic) and within-

Table 2 Summary of multilevel models testing the between and within person effects of relational risk factors and dating aggression

	Psychological aggression involvement	Physical aggression involvement
Negative interactions		
Intercept (β_0)	1.98 (.22)	1.17 (.10)
Mean negative interactions (γ_{01})	1.35*** (.12) .41	0.26*** (.05) .13
Age (β_1)	0.02 (.01) .00	−0.01 (.00) .00
Negative interactions (β_2)	0.70*** (.04) .26	0.16*** (.02) .07
Gender main effect (γ_{02})	0.02 (.08) .00	−0.03 (.03) .00
Mean negative interactions × negative interactions (γ_{22})	0.11 (.12) .00	0.13* (.05) .01
Age × gender (γ_{11})	−0.01 (.02) .00	0.00 (.01) .00
Mean negative interactions × gender (γ_{03})	0.18 (.24) .00	0.16 (.10) .01
Negative interactions × gender (γ_{21})	0.08 (.08) .00	0.03 (.04) .00
Jealousy		
Intercept (β_0)	1.84 (.25)	1.13 (.10)
Mean jealousy (γ_{01})	1.49*** (.23) .19	0.21* (.08) .04
Age (β_1)	0.01 (.01) .00	−0.01 (.00) .00
Jealousy (β_2)	0.60*** (.08) .06	0.10** (.03) .02
Gender main Effect (γ_{02})	−0.12 (.09) .01	−0.06 (.03) .01
Mean jealousy × jealousy (γ_{22})	0.33 (.41) .00	0.22* (.11) .01
Age × gender (γ_{11})	−0.00 (.02) .00	0.00 (.01) .00
Mean jealousy × gender (γ_{03})	0.12 (.45) .00	−0.26 (.17) .00
Jealousy × gender (γ_{21})	−0.22 (.16) .00	−0.13* (.06) .01
Support		
Intercept (β_0)	1.80 (.27)	1.13 (.10)
Mean support (γ_{01})	−0.15 (.11) .01	−0.07 (.04) .01
Age (β_1)	0.02 (.01) .00	−0.01 (.01) .00
Support (β_2)	−0.05 (.04) .00	−0.02 (.02) .00
Gender main effect (γ_{02})	−0.07 (.10) .00	−0.04 (.04) .01
Mean support × support (γ_{22})	−0.23* (.12) .01	−0.02 (.05) .00
Age × gender (γ_{11})	−0.00 (.02) .00	0.01 (.01) .00
Mean support × gender (γ_{03})	0.13 (.21) .00	0.04 (.07) .00
Support × gender (γ_{21})	−0.05 (.08) .00	−0.05 (.03) .00
Relationship satisfaction		
Intercept (β_0)	1.84 (.07)	1.15 (.03)
Mean relationship satisfaction (γ_{01})	−0.12** (.03) .08	−0.02* (.01) .02
Age (β_1)	0.02 (.01) .00	−0.00 (.00) .00
Relationship satisfaction (β_2)	−0.06*** (.01) .04	−0.01*** (.00) .02
Gender main effect (γ_{02})	−0.04 (.10) .00	−0.03 (.04) .00
Mean relationship satisfaction × relationship satisfaction (γ_{22})	−0.00 (.00) .00	0.002* (.00) .01
Age × gender (γ_{11})	−0.04 (.07) .00	−0.01 (.03) .00
Mean relationship satisfaction × gender (γ_{03})	−0.02 (.07) .00	−0.05 (.03) .01
Relationship satisfaction × gender (γ_{21})	−0.03 (.02) .00	−0.02* (.01) .01

The primary numbers in the table are the unstandardized coefficients for the fixed effects. Standard errors are in parentheses. Effect sizes follow the standard errors for the involvement measure of dating aggression

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

person (acute) effects; acute increases in support were negatively associated with psychological aggression ($\beta = -0.16$, $p = .02$), but only for those with low chronic risk (i.e., high support on average) (see Fig. 3).

Relationship Satisfaction

In terms of between-person (chronic) and within-person (acute) effects, lower levels of relationship satisfaction

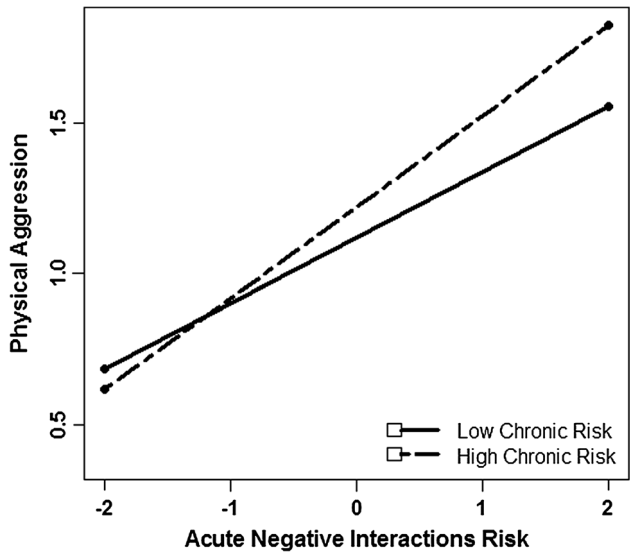

Fig. 1 Interaction between within-person negative interactions and between-person negative interactions on physical aggression. The *two lines* depict the association between within-person levels of negative interactions and physical aggression at one SD below the mean of between-person level of negative interactions (labeled "*low chronic risk*"), and one SD above the mean of between-person level of negative interactions (labeled "*high chronic risk*")

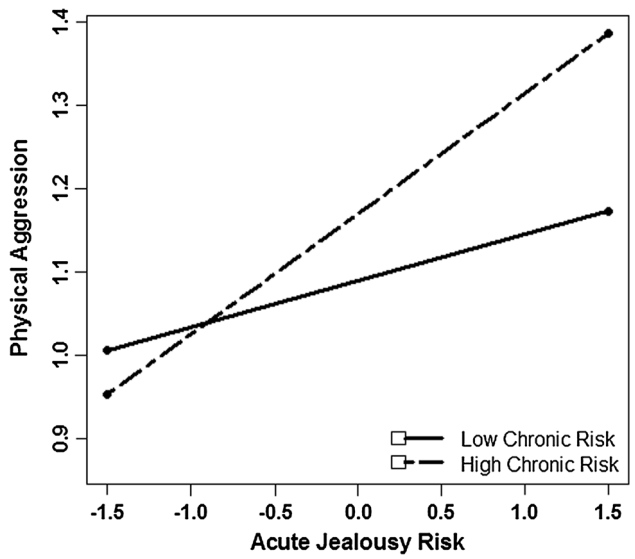

Fig. 2 Interaction between within-person jealousy and between-person jealousy on physical aggression. The *two lines* depict the association between within-person levels of jealousy and physical aggression at one SD below the mean of between-person level of jealousy (labeled "*low chronic risk*"), and one SD above the mean of between-person level of jealousy (labeled "*high chronic risk*")

were associated with greater psychological and physical aggression. For physical aggression, significant interactions of the between-person and within-person effects emerged such that acute increases in relationship satisfaction were

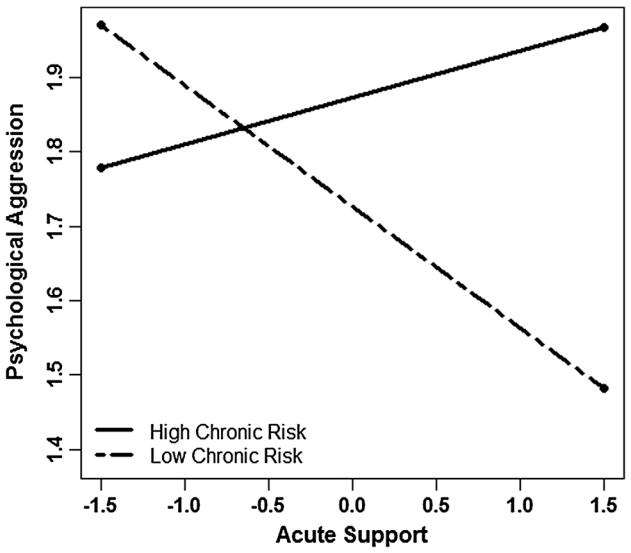

Fig. 3 Interaction between within-person support and between-person support on psychological aggression. The *two lines* depict the association between within-person levels of support and psychological aggression at one SD below the mean of between-person level of support (labeled "*high chronic risk*"), and one SD above the mean of between-person level of support (labeled "*low chronic risk*")

negatively associated with physical aggression for those with high chronic risk (i.e., low relationship satisfaction on average) ($\beta = -0.02$, $p < .001$), but not for those with low chronic risk (see Fig. 4).

Gender

No main effects of gender were found. No interaction effects were found between age and gender. We then tested interactions between each chronic and acute relational risk factor and gender for physical dating aggression involvement. Out of 16 potential interactions, only 2 instances of a significant interaction with gender emerged. Specifically, acute increases in jealousy were associated with increases in physical dating aggression involvement for women ($\beta = .13$, $p = .01$), but not men. Similarly, acute reductions in relationship satisfaction were associated with increases in physical dating aggression involvement for women ($\beta = -0.02$, $p < .001$), but not men.

Age

No main effects of age were found.

Severe and Mild Psychological Aggression

In the prior analyses, interaction effects between chronic and acute risk emerged for physical aggression, but they did not for psychological aggression. One reason such

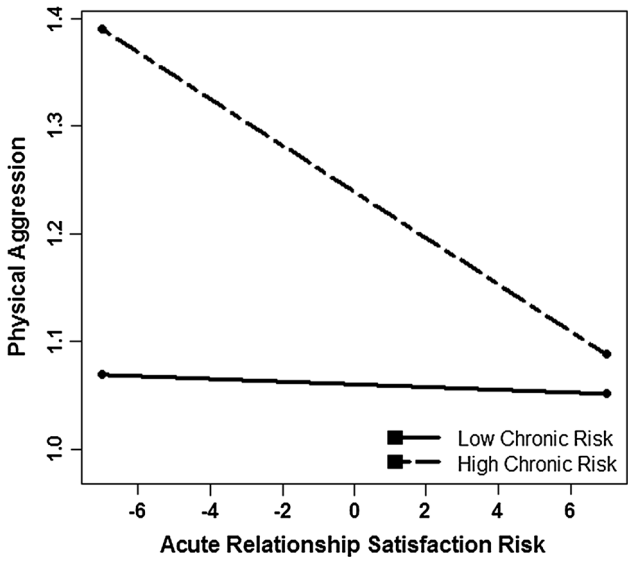

Fig. 4 Interaction between within-person relationship satisfaction and between-person relationship satisfaction on physical aggression. The *two lines* depict the association between within-person levels of relationship satisfaction and physical aggression at one SD below the mean of between-person level of relationship satisfaction (labeled "*high chronic risk*"), and one SD above the mean of between-person level of relationship satisfaction (labeled "*low chronic risk*")

effects may not have emerged is because of the commonality of psychological aggression; thus, we suspected that distinguishing between mild and severe degrees of psychological aggression may yield different patterns. In a series of post hoc exploratory analyses, we examined associations between chronic and acute effects and mild or severe psychological aggression separately (Table 3). For mild psychological aggression, the patterns mirrored those of the broader psychological aggression measure. That is, main effects of both chronic and acute risk in the form of negative interactions, jealousy, and relationship satisfaction were related to mild psychological aggression (see Table 4); no interactions between chronic and acute risk were found. In contrast, the main effects of chronic and acute risk for severe psychological aggression were qualified by significant interactions between chronic and acute risk also emerged. For both those with high and low chronic risk, acute increases in negative interactions were associated with physical aggression ($\beta = 0.52$, $p < .001$; $\beta = 0.72$, $p < .001$, respectively), though the effect was stronger for those with high chronic risk (see Fig. 5). Similarly, significant interactions between the chronic and acute effects emerged such that acute increases in jealousy were associated with physical aggression for those with high chronic risk ($\beta = 0.80$, $p < .001$), but not for those with low chronic risk (see Fig. 6).

Perpetration and Victimization

In other secondary analyses, we examined how the risk factors were associated with perpetration and victimization, separately. We conducted the same models as those reported on previously, but examined effects with psychological dating aggression perpetration and victimization separately as well as physical dating aggression perpetration and victimization separately. We found similar broad patterns of effects as those found using an involvement model (see Tables 2, 4).

Discussion

This study used a relational risk factor framework to better understand both acute and chronic risk for dating aggression. Relational risk factors are understudied, yet emerging empirical work suggests that they may be critical to our understanding of dating aggression and its development. The current findings bolster the relational risk framework's proposition that relational risk factors warrant a larger role in conceptual and empirical models of dating aggression. Additionally, this study contributed by examining when, and for whom, relational risk factors are associated with dating aggression.

Notably, we found similar broad patterns of effects when examining effects using an involvement model (i.e., victimization and perpetration together) and when examining each separately. Such a pattern is consistent with the idea that perpetration and victimization so frequently co-occur that it is difficult, and perhaps conceptually unwarranted, to disentangle the two (Connolly et al. 2010). Thus, we discuss the results in the context of an involvement model only.

Relational Context and Dating Aggression

Consistent with Reese-Weber and Johnson's (2013) relational risk framework, between- and within-person effects on both psychological and physical aggression were found for negative interactions, jealousy, and relationship satisfaction. The presence of between-person effects indicates that individuals with chronically more negative interactions and greater jealousy as well as lower relationship satisfaction are at greater risk for dating aggression. Such a pattern is consistent with prior cross-sectional work (Cano et al. 1998; Marcus and Swett 2002; O'Keefe 1997; O'Keefe and Treister 1998) as well as person-oriented results (Burk and Seiffge-Krenke 2015). The present study extends these findings by showing the pattern of effects in

Table 3 Summary of multilevel models testing the between and within person effects of relational risk factors and degree of psychological aggression

	Mild psychological aggression involvement	Mild psychological aggression victimization	Mild psychological aggression perpetration	Severe psychological aggression involvement	Severe psychological aggression victimization	Severe psychological aggression perpetration
Negative interactions						
Intercept (β_0)	2.25 (.27)	1.91 (.30)	2.60 (.30)	1.75 (.25)	1.76 (.30)	1.74 (.27)
Mean negative interactions (γ_{01})	1.56*** (.13)	1.64*** (.07)	1.47*** (.14)	1.26*** (.14)	1.34 (.15)	1.18*** (.14)
Age (β_1)	0.02* (.01)	0.02 (.01)	0.03* (.01)	.02 (.01)	0.03* (.01)	0.01 (.01)
Negative interactions (β_2)	0.74*** (.06)	0.81*** (.07)	0.68*** (.06)	.62*** (.05)	0.69*** (.06)	0.56*** (.06)
Gender main effect (γ_{02})	0.01 (.09)	−0.01 (.10)	0.03 (.09)	.07 (.09)	0.04 (.10)	0.09 (.09)
Mean negative interactions × negative interactions (γ_{21})	0.12 (.15)	0.10 (.17)	0.16 (.17)	.30* (.14)	0.17 (.16)	0.41** (.15)
Jealousy						
Intercept (β_0)	2.10 (.30)	1.75 (.34)	2.47 (.32)	1.63 (.28)	1.62 (.32)	1.63 (.30)
Mean jealousy (γ_{01})	1.82*** (.25)	1.85*** (.28)	1.80*** (.25)	1.41*** (.25)	1.56*** (.27)	1.29*** (.25)
Age (β_1)	0.02 (.01)	0.02 (.02)	0.02 (.02)	0.01 (.01)	0.03† (.02)	0.00 (.01)
Jealousy (β_2)	0.69*** (.10)	0.70*** (.12)	0.66*** (.11)	0.51*** (.09)	0.47*** (.11)	0.55*** (.10)
Gender main effect (γ_{02})	−0.15 (.10)	−0.18 (.12)	−0.13 (.11)	−0.05 (.10)	−0.08 (.11)	−0.02 (.10)
Mean jealousy × jealousy (γ_{21})	0.45 (.45)	0.23 (.51)	0.68 (.49)	1.39** (.42)	1.52** (.49)	1.25** (.44)
Support						
Intercept (β_0)	2.03 (.31)	1.68 (.35)	2.40 (.33)	1.61 (.30)	1.60 (.33)	1.62 (.31)
Mean support (γ_{01})	−0.15 (.12)	−0.16 (.13)	−0.12 (.12)	−0.16 (.11)	−0.19 (.12)	−0.13 (.12)
Age (β_1)	0.02 (.01)	0.02 (.02)	0.02 (.01)	0.02 (.01)	0.03 (.01)	0.01 (.01)
Support (β_2)	−0.06 (.05)	−0.10 (.05)	−0.02 (.05)	−0.05 (.04)	−0.08 (.05)	−0.02 (.05)
Gender main effect (γ_{02})	−0.10 (.12)	−0.13 (.13)	−0.08 (.12)	−0.02 (.11)	−0.05 (.12)	0.00 (.11)
Mean support × support (γ_{21})	−0.24 (.13)	−0.31* (.14)	−0.18 (.14)	−0.11 (.12)	−0.16 (.14)	−0.08 (.12)
Relationship satisfaction						
Intercept (β_0)	2.03 (.08)	1.96 (.09)	2.09 (.09)	1.67 (.08)	1.71 (.09)	1.63 (.08)
Mean relationship satisfaction (γ_{01})	−0.13** (.04)	−0.14** (.04)	−0.12** (.04)	−0.11** (.03)	0.13** (.04)	0.11** (.04)
Age (β_1)	0.02 (.01)	0.02 (.02)	0.02 (.01)	0.02 (.01)	0.03* (.01)	0.01 (.01)
Relationship satisfaction (β_2)	−0.08*** (.01)	−0.10*** (.01)	−0.07*** (.01)	−0.07*** (.01)	−0.09*** (.01)	−0.06*** (.01)
Gender main effect (γ_{02})	−0.06 (.11)	−0.09 (.12)	−0.04 (.11)	0.02 (.11)	−0.02 (.12)	0.04 (.11)
Mean relationship satisfaction × relationship satisfaction (γ_{21})	−0.00 (.00)	−0.00 (.00)	−0.00 (.00)	0.00 (.00)	−0.00 (.00)	0.00 (.00)

The primary numbers in the table are the unstandardized coefficients for the fixed effects. Standard errors are in parentheses

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

youth ranging in age from middle adolescence to early adulthood.

In addition, acute increases in negative interactions and jealousy as well as worse relationship satisfaction; that is, more risk than is typical for that person was associated with greater likelihood of dating aggression. The presence of acute risk is consistent with ecological models of dating aggression (e.g., Capaldi et al. 2004), and suggests that, among adolescents and young adults, risk may be partially dyad dependent. That is, increases and decreases in risk within a specific relationship, or across dyads, are associated with changes in experiencing aggression. Moreover, risk could be either stable or variable depending on whether the relationship(s) varies or is relatively consistent. These finding are important as they suggest that intervention efforts to decrease acute relationship risk may be a promising means of reducing dating aggression. Taken together, these findings provide further evidence that relational risk factors are indeed an important aspect of theories aiming to understand dating aggression.

Table 4 Summary of multilevel models testing the between and within person effects of relational risk factors and dating aggression victimization and perpetration

	Psychological aggression victimization	Psychological aggression perpetration	Physical aggression victimization	Physical aggression perpetration
Negative interactions				
Intercept (β_0)	1.82 (.26)	2.15 (.24)	1.19 (.12)	1.15 (.10)
Mean negative interactions (γ_{01})	1.41*** (.13) .40	1.27*** (.12) .38	0.30*** (.06) .12	0.23*** (.05) .10
Age (β_1)	0.02 (.01) .01	0.01 (.01) .00	−0.01 (.01) .00	−0.00 (.00) .00
Negative interactions (β_2)	0.75*** (.05) .21	0.65*** (.05) .16	0.18*** (.02) .09	0.14*** (.02) .05
Gender main effect (γ_{02})	−0.01 (.09) .00	0.05 (.08) .02	−0.08 (.04) .02	0.01 (.03) .00
Mean negative interactions × negative interactions (γ_{22})	0.00 (.14) .00	0.22 (.13) .00	0.11 (.06) .00	0.15* (.06) .01
Age × gender (γ_{11})	−0.01 (.02) .00	−0.01 (.02) .00	0.00 (.01) .00	0.00 (.01) .00
Mean negative interactions × gender (γ_{03})	0.18 (.27) .00	0.18 (.25) .00	0.11 (.12) .01	0.23* (.10) .03
Negative interactions × gender (γ_{21})	0.06 (.10) .00	0.10 (.09) .00	0.02 (.05) .00	0.04 (.04) .00
Jealousy				
Intercept (β_0)	1.67 (.29)	2.03 (.26)	1.15 (.12)	1.11 (.10)
Mean jealousy (γ_{01})	1.59*** (.25) .18	1.40*** (.23) .17	0.26* (.10) .04	0.17* (.08) .03
Age (β_1)	0.02 (.01) .01	0.01 (.01) .00	−0.01 (.01) .00	−0.00 (.00) .00
Jealousy (β_2)	0.61*** (.09) .05	0.60*** (.08) .06	0.12** (.04) .01	0.07* (.03) .01
Gender main effect (γ_{02})	−0.16 (.10) .01	−0.09 (.09) .01	−0.10* (.04) .03	−0.03 (.03) .01
Mean jealousy × jealousy (γ_{22})	0.24 (.55) .00	0.42 (.50) .00	0.64* (.25) .01	0.37* (.18) .01
Age × gender (γ_{11})	−0.01 (.03) .00	0.01 (.01) .00	0.01 (.01) .00	0.00 (.01) .00
Mean jealousy × gender (γ_{03})	−0.06 (.50) .00	0.23 (.46) .00	−0.39 (.20) .02	−0.12 (.17) .00
Jealousy × gender (γ_{21})	−0.17 (.19) .00	−0.27 (.17) .00	−0.11 (.08) .00	−0.15* (.07) .01
Support				
Intercept (β_0)	1.63 (.30) .01	1.98 (.28)	1.15 (.12)	1.12 (.11)
Mean support (γ_{01})	−0.17 (.12) .01	−0.12 (.11) .01	−0.06 (.04) .01	0.01 (.03) .00
Age (β_1)	0.02 (.01) .00	0.02 (.01) .01	−0.01 (.01) .00	−0.00 (.01) .00
Support (β_2)	−0.08 (.05) .01	−0.02 (.04) .00	−0.02 (.02).00	−0.02 (.02) .01
Gender main effect (γ_{02})	−0.11 (.11) .00	−0.05 (.10) .00	−0.09* (.04) .03	0.01 (.03) .00
Mean support × support (γ_{22})	−0.26* (.13) .00	−0.18 (.12) .00	−0.00 (.06) .00	−0.24* (.05) .03
Age × gender (γ_{11})	−0.01 (.03) .00	0.01 (.02) .00	0.01 (.01) .00	0.01 (.01) .00
Mean support × gender (γ_{03})	0.14 (.23) .00	0.11 (.21) .00	0.01 (.09) .00	0.08 (.07) .01
Support × gender (γ_{21})	−0.10 (.09) .00	0.02 (.08) .00	−0.07 (.04) .00	−0.03 (.03) .00
Relationship satisfaction				
Intercept (β_0)	1.83 (.08)	1.85 (.07)	1.13 (.03)	1.14 (.03)
Mean relationship satisfaction (γ_{01})	−0.12*** (.03) .08	−0.12*** (.03) .08	−0.02 (.01) .02	−0.03** (.01) .05
Age (β_1)	0.02 (.01) .01	0.01 (.01) .00	−0.01 (.01) .00	0.00 (.01) .00
Relationship satisfaction (β_2)	−0.08*** (.01) .07	−0.06*** (.01) .04	−0.01*** (.001) .10	−0.01** (.003) .01
Gender main effect (γ_{02})	−0.09 (.11) .00	−0.01 (.10) .00	−0.08* (.04) .02	0.01 (.03) .00
Mean relationship satisfaction × relationship satisfaction (γ_{22})	0.00 (.00) .00	0.00 (.00) .00	0.002* (.001) .01	0.002** (.001) .01
Age × gender (γ_{11})	−0.02 (.08) .00	−0.04 (.07) .00	−0.02 (.08) .00	0.01 (.03) .00
Mean relationship satisfaction × gender (γ_{03})	−0.07 (.07) .01	0.02 (.07) .00	−0.07 (.07) .01	−0.04 (.02) .02
Relationship satisfaction × gender (γ_{21})	−0.03 (.02) .00	−0.03 (.02) .00	−0.04* (.02) .01	−0.02* (.01) .01

The primary numbers in the table are the unstandardized coefficients for the fixed effects. Standard errors are in parentheses. Effect sizes follow the standard errors for the involvement measure of dating aggression

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

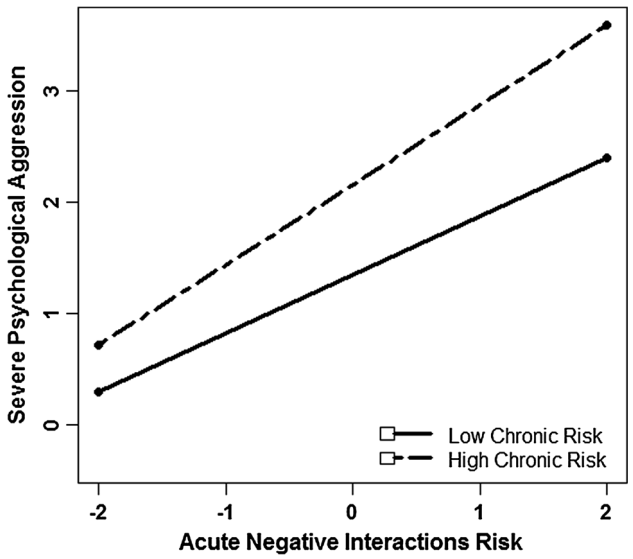

Fig. 5 Interaction between within-person negative interactions and between-person negative interactions on severe psychological aggression. The *two lines* depict the association between within-person levels of negative interactions and psychological aggression at one SD below the mean of between-person level of negative interactions (labeled "*high chronic risk*"), and one SD above the mean of between-person level of negative interactions (labeled "*low chronic risk*")

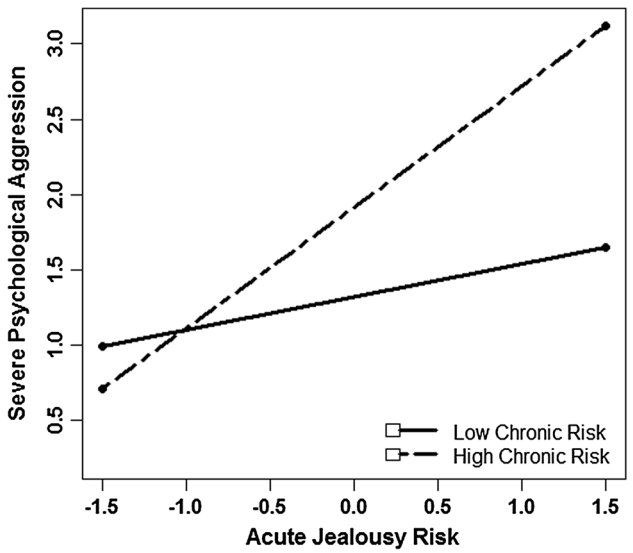

Fig. 6 Interaction between within-person jealousy and between-person jealousy on severe psychological aggression. The *two lines* depict the association between within-person levels of jealousy and severe psychological aggression at one SD below the mean of between-person level of severe psychological aggression (labeled "*high chronic risk*"), and one SD above the mean of between-person level of jealousy (labeled "*low chronic risk*")

Additionally, they highlight the need for a greater focus on relational risk factors in the dialogue to reduce dating aggression among adolescents and young adults.

The current findings are also notable in their consistency. Between-person and within-person effects are often not the same (Curran and Bauer 2011). The presence of consistent between and within person effects allows us to reduce the number of likely alternative explanations of the current findings. Specifically, for a third variable to explain these effects it would need to be sufficiently stable to allow for the between-person effects, but not so stable to preclude the within-person effects. Moreover, it would need to covary with both the relational risk factors and dating aggression. These are challenging criteria for a third variable to meet.

Interactions Between Chronic and Acute Risk

The current study also examined the interactions between chronic risk and acute risk of relational factors, something we believe has not been done previously. Significant interactions were found for negative interactions, jealousy, and relationship satisfaction in predicting physical aggression.

These interactions revealed a pattern in which those with high chronic risk may be more affected by changes in their acute risk. Specifically, the increase in acute risk for those with high chronic risk was associated with a significant increase in physical aggression, whereas increases in acute risk for those with low chronic risk were not associated with increases in physical aggression. Moreover, when acute risk was low for those with high chronic risk, they had similar levels of physical aggression as those with low chronic risk. That is, decreases in acute risk may be able to return those who are usually at high risk to low levels of risk. Thus, although they may be susceptible to increases in relational risk, they are also more likely to benefit from reductions in acute risk. Consequently, these results indicate that we should not treat risk as static; rather, risk is dynamic and influenced by both acute and chronic factors simultaneously. As such, we should aim to conduct our assessments in a manner that captures risk's dynamic nature, by conducting multiple levels of analysis and gathering longitudinal data.

The presence of interactions between chronic and acute risk also suggest that intervention efforts targeting relational risk factors among adolescents and young adults may be particularly fruitful. Even incremental change in acute risk, as noted in the presence of within-person effects, particularly for those considered at high risk, may be protective. Further, the opportunity to address relational context risk factors may be greater before youth enter into marital relationships and relational processes become more stabilized. Further work should aim to parse apart potential mechanisms of these interactions by assessing changes in relational risk within specific dyads and examining

multiple levels of risk (e.g., individual risk factors, developmental characteristics) in conjunction with the relational context.

Notably, unlike the main effects, the patterns of interactions were not the same across both psychological and physical aggression; rather, the interactions between chronic and acute risk were only found for predicting physical aggression in most instances. The only significant interaction for psychological aggression was support. We hypothesized that the broad lack of interaction effects for psychological aggression may be related to the commonality of psychological aggression. If this was the case, then acute changes in risk may more easily translate to greater psychological aggression, regardless of the level of chronic risk. To test this hypothesis, we conducted a series of exploratory analyses in which we distinguished between mild and severe psychological aggression. As expected, the main effects for both mild and severe psychological aggression were the same and were consistent with the broader measure of psychological aggression. However, interactions between chronic and acute risk emerged for severe psychological aggression, but not mild psychological aggression. Further, these interactions are similar in pattern to those for physical aggression. Taken together, this pattern suggests that more intense psychological aggression may have similar effects as physical aggression. Although exploratory, these results suggest that researchers should consider examining the severity of the psychological aggression to avoid potentially overstating effects which may only be true for more severe psychological aggression or to avoid failing to capture significant effects.

Gender

No main effects of gender were found for dating aggression. This is consistent with other work in both adolescence (Brooks-Russell et al. 2015) and young adulthood (Capaldi et al. 2012) that has shown similar rates of dating aggression across genders. We also examined interactions between gender and each chronic relational risk factor and each acute relational risk factor. Out of 16 potential interactions, only two instances of significant effects emerged for dating aggression involvement. Acute increases in jealousy and decreases in relationship satisfaction were associated with increased risk for dating aggression in involvement for women but not men. This pattern is consistent with some work suggesting that relational risk factors may be especially important for understanding the etiology of women's dating aggression (Luthra and Gidycz 2006). However, future work with a larger sample size should aim to replicate these patterns, as the small proportion of significant effects suggests they may be spurious.

Limitations

There are several notable limitations in the current study. First, it is limited by its reliance on self-report assessments of both relational risk factors and dating aggression. Future research should strive to examine relational risk factors through observations of dyads to further understand these processes. Additionally, although the current study assessed both aggression perpetration and victimization, reports were made only by one member of the dyad.

The current study is strengthened by its longitudinal design spanning adolescence into young adulthood, but as a consequence, we were limited to collecting data on a moderate size sample of 200 participants. Future work with a larger sample would benefit from examining additional factors and moderators of the effects. For example, the predominance of bidirectional aggression in the current study precluded conducting analyses examining unidirectional versus bidirectional perpetration and victimization. Further work assessing aggression from both partners' perspective and including sufficient power to examine unidirectional aggression is necessary. Additionally, although the sample was representative of the ethnic and racial composition of the United States, we did not have a sufficient number of each ethnic and racial minority to examine potential differences in the role of relational risk factors. Evidence suggests heterogeneity exists across different racial and ethnic groups with regard to dating aggression, and so future work should examine potential racial/ethnic differences in the pattern of results observed in this study (O'Leary et al. 2008). Finally, we did not have sufficient power to examine potential interactions between the status of a relationship (e.g., cohabitation) and relational risk factors in association with dating aggression. Future work should test for such potential effects, as we may anticipate that relational risk factors become increasingly important as relationship commitment increases.

Although we examined both between- and within-person effects, the associations were concurrent; therefore we were unable to determine the directionality of the links between relational factors and dating aggression. For the purposes of the present article, we focused solely on the relational variables as risk factors, due to the relational theoretical framework. However, it is also possible that greater levels of aggression negatively impact relational characteristics. Indeed, such effects would be equally interesting. This pattern would indicate that both chronic and acute experiences of dating aggression negatively impact relational characteristics. Such adverse relationship experiences may be partially responsible for the physical and psychological consequences frequently linked to

interpersonal violence (see Lawrence et al. 2012). Perhaps most likely, and consistent with a relational theoretical framework, a feedback loop may exist wherein relational risk factors contribute to aggression in a relationship which then increase relational risk factors. Longitudinal studies that examine such changes would help elucidate these potential processes. Additionally, relational risk factors are theorized to contribute to greater risk for dating aggression by increasing the frequency and severity of conflict which may then escalate. The current study, however, did not examine the nature of conflict that occurred most proximally to the incidences of dating aggression. Future work aimed at understanding the potential mechanisms through which relational risk factors contribute to risk should address this facet of a relational risk framework.

Conclusion

Past cross-sectional research has examined the links between relational risk factors and dating aggression (Capaldi et al. 2012). To the best of our knowledge, however, the current study is the first to demonstrate the critical role of relational risk factors by examining both between (chronic) and within (acute) person effects longitudinally. Consistent with Reese-Weber and Johnson's (2013) relational risk framework, we found between- and within-person effects on both psychological and physical aggression for negative interactions, jealousy, and relationship satisfaction. The presence of between-person effects indicates that individuals with chronically more negative interactions and greater jealousy as well as lower relationship satisfaction are at greater risk for dating aggression, which is consistent with prior cross-sectional work. Moreover, when someone was engaged in more negative interactions, more jealous, or less satisfied with the relationship than usual, she or he was at greater risk for dating aggression. The presence of acute risk suggests that risk may be partially relationship specific. Moreover, the present study examined and found significant interactions between chronic and acute risk in predicting physical aggression. Those with higher levels of chronic risk are more vulnerable to changes in acute risk. Accordingly, relational risk factors may be particularly important targets for interventions as the pattern of results suggests that relational risk factors are dynamic, not static; thus, they may be responsive to intervention efforts to change them. Taken together, the findings contribute to a greater understanding of relational risk factors for aggression and underscore their importance for researchers, policy developers, and care providers working toward the reduction of dating aggression in adolescence and young adulthood.

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Authors Contributions CC and WF conceived of the study together. CC 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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Conflict of interest Wyndol Furman and Charlene Collibee declare that they have no conflicts of interest.

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.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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