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Autoregressive and Cross-lagged Associations between Psychological Intimate Partner Aggression and Psychopathology in Newlyweds

Amber M. Jarnecke, Ph.D.,

Medical University of South Carolina

Susan C. South, Ph.D.

Purdue University

Abstract

Most research to date relies on cross-sectional data to identify associations between psychopathology (i.e., internalizing and externalizing disorders) and intimate partner aggression (IPA). Studies that utilize longitudinal data tend to survey only one member of a dyad, examine only perpetration or victimization, and/or use statistical methods that converge within- and between-person effects. The current study examines the associations between psychopathology, psychological IPA perpetration, and psychological IPA victimization at three time points over the course of one year in a sample of newlyweds. An autoregressive latent trajectory model with structured residuals (ALT-SR) tested the hypotheses that within-person internalizing and externalizing psychopathology would predict IPA perpetration and victimization at each subsequent time point, and IPA victimization would predict subsequent internalizing and externalizing symptoms. Results of the ALT-SR model did not support hypotheses. Rather, results suggest internalizing symptoms were negatively associated with externalizing symptoms at subsequent time points, and vice versa. IPA perpetration was positively associated with IPA victimization at the following time points. These results elucidate the interplay between psychopathology and IPA, suggesting that although these constructs show bivariate relationships with one another, psychopathology is not a significant within-person predictor of subsequent psychological IPA.

Keywords

domestic violence; predicting domestic violence; mental health and violence

Intimate partner aggression (IPA) presents a major public health concern, affecting a substantial proportion of the population (Black et al., 2011). IPA can take a number of forms ranging from psychological to physical and sexual abuse. Much of the literature examining IPA has focused on physical aggression, demonstrating that it is associated with an array of adverse outcomes (e.g., physical injury, chronic pain, substance use, etc.) (Coker et al.,

2002; Ehrensaft, Moffitt, & Caspi, 2006). Psychological aggression perpetration and victimization have been less thoroughly studied but these constructs serve as predictors of physical aggression in early marriages (Murphy & O'Leary, 1989), and they are also associated with numerous adverse outcomes, particularly in community samples (Lawrence, Yoon, Langer, & Ro, 2009; Shorey, Temple, et al., 2012; Taft et al., 2006).

To best target and reduce psychological IPA along with its negative sequelae it is necessary to understand the individual and contextual factors that surround its occurrence. One well-studied correlate of IPA perpetration and victimization, in general, is psychopathology (e.g., Afifi et al., 2009; Coker et al., 2002; Crane, Hawes, Devine, & Easton, 2014; Ehrensaft et al., 2006; Shorey, Febres, Brasfield, & Stuart, 2012). Indeed, both IPA perpetration and victimization are associated with a range of psychiatric disorders, including post-traumatic stress disorder (PTSD), depression, anxiety, and substance use disorders (Afifi et al., 2009; Shorey, Febres, et al., 2012; Smith, Homish, Leonard, & Cornelius, 2012). Some studies demonstrate that these types of disorders are antecedents of IPA perpetration and victimization (El-Bassel, Gilbert, Wu, Go, & Hill, 2005; Narayan, Englund, & Egeland, 2013; Temple, Weston, Stuart, & Marshall, 2008; Testa, Livingston, & Leonard, 2003) and findings from other studies suggest that psychopathology is a consequence of IPA victimization (Blasco-Ros, Sánchez-Lorente, & Martinez, 2010; Brown et al., 2009; McPherson, Delva, & Cranford, 2007). Taken together, these findings suggest that the temporal associations between IPA victimization, IPA perpetration, and psychopathology are murky, at best, and may be bidirectional or cyclic.

Many studies exploring temporal associations between IPA and psychopathology examine only IPA perpetration or victimization in conjunction with a specific disorder or set of disorders (e.g., Brown et al., 2008; Ehrensaft et al., 2006). However, examining psychopathology through hierarchical dimensional models has shown to demonstrate more predictive utility for various outcomes than examining individual disorders alone (e.g., South, Krueger, & Iacono, 2011). Further, previous studies investigating temporal associations between IPA perpetration or victimization and psychopathology have largely used statistical methods that conflate within-person and between-person effects. As scholars have recently discussed, when these effects are aggregated it can be difficult to meaningfully interpret findings (e.g., Berry & Willoughby, 2017). In contrast, if within-person and between-person effects are disaggregated, data will likely yield more meaningful interpretations of developmental processes within individuals.

Examining the within-person temporal associations between psychopathology, IPA perpetration, and IPA victimization has implications for elucidating the interplay between these constructs and informing assessment and treatment of IPA. Because treating psychopathological symptoms can indirectly impact physical IPA perpetration (e.g., Taft et al., 2010), understanding the temporal role of psychopathology in psychological IPA may enhance when or how partner aggression is targeted in treatment. Similarly, if IPA victimization is associated with subsequent symptom onset or exacerbation, targeting psychological IPA may have implications for reducing psychopathological symptoms (e.g., Ehrensaft et al., 2006). As such, the current study sought to examine the temporal associations between psychological IPA perpetration, IPA victimization, and

psychopathology at three time points over the course of one year in a sample of newlyweds. With an aim to expand the existing literature, the current study examined IPA perpetration and victimization simultaneously along with broad measures of internalizing and externalizing symptomatology using statistical techniques that disaggregated within-person and between-person effects. Given findings from previous studies, it was hypothesized that internalizing and externalizing dimensions of psychopathology would predict IPA perpetration and IPA victimization at each time point (e.g., Afifi et al., 2009; Shorey, Febres, et al., 2012; Smith, et al., 2012), and IPA victimization would predict subsequent internalizing and externalizing symptoms (e.g. Blasco-Ros, et al., 2010; Brown et al., 2009; McPherson, et al., 2007).

Method

Participants & Procedures

As part of a larger study, newlywed couples, cohabitating and married 12 months or less at the first wave of data collection, were recruited from the community. Both partners in the couple were required to be between the ages of 18 and 55 and be comfortable with reading and answering questions in English. One hundred and two couples were enrolled in the study and one couple withdrew at Wave 1, thus 101 couples remained in the final sample. Wave 1 was completed by 100 women and 99 men (one couple had missing data due to a technical error, and data for one man was lost due to computer malfunction). Wave 2 was completed by 151 individuals (86 couples), and Wave 3 was completed by 134 individuals (83 couples). One hundred-twenty one participants completed all waves of data collection (see Jarnecke, Reilly, & South, 2016 for a detailed description of participant characteristics).

During Wave 1, participants scheduled laboratory appointments where they completed informed consent and assessments. Partners were placed into separate rooms to complete a battery of questionnaires. Following the baseline assessment, couples completed a 2-week daily diary. During the second week of the diary portion, half of the couples were randomized to an intervention aimed at increasing their nonverbal behaviors. These data are not analyzed here, but we found no significant effects of intervention on IPA perpetration ($t = -0.69$, $p = 0.49$ at Wave 2; $t = -0.38$, $p = 0.70$ at Wave 3), IPA victimization ($t = -0.69$, $p = 0.49$ at Wave 2; $t = -0.38$, $p = 0.70$ at Wave 3), internalizing symptoms ($t = -0.57$, $p = 0.57$ at Wave 2; $t = -0.41$, $p = 0.68$ at Wave 3), and externalizing symptoms ($t = -0.67$, $p = 0.51$ at Wave 2; $t = -0.49$, $p = 0.63$ at Wave 3) at Waves 2 and 3. Each partner received \$75 for the completion of the baseline assessment at Wave 1, and received a \$25 gift card if they completed the daily diary for at least 75% of the days. Couples completed Wave 2 (6-months after baseline) and Wave 3 (12-months after baseline) through the use of online surveys. Participants were instructed to complete questionnaires away from their partner. Each participant received a \$25 gift card compensation upon completion of Waves 2 and 3, respectively.

Measures

Psychological Intimate Partner Aggression—Psychological IPA perpetration and victimization was assessed at all three waves with self-reports of the Psychological

Aggression subscale of the Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). The CTS2 has been shown to be a valid measure of partner violent behavior and demonstrates good reliability (Straus et al., 1996). The Psychological Aggression subscale contains 8 items and was scored by summing the total number of unique acts of aggression that occurred over the previous 12 months. Higher scores reflect a greater number of unique acts. Alpha reliabilities for psychological aggression perpetration were .60, .64, and .69 at Waves 1, 2, and 3, respectively. For psychological aggression victimization alpha reliabilities were .67, .70, and .72 at Waves 1, 2, and 3, respectively.

Inventory of Depression and Anxiety Symptoms (IDAS)—The IDAS (64-items; Watson et al., 2007) assesses symptoms of depression and anxiety. The measure shows good internal consistency, short-term validity, and convergent and discriminant validity (Watson et al. 2007). It consists of 10 symptom scales (i.e., Lassitude, Insomnia, Suicidality, Appetite Loss, Appetite Gain, Ill Temper, Well-being, Social Anxiety, Panic, Trauma Intrusions) and two broad scales (General Depression and Dysphoria). A total score of all items was summed and used in the current study to capture a broad range of internalizing symptoms. Higher scores reflect more internalizing symptoms ($\alpha=.92$ at Wave 1, $\alpha=.93$ at Wave 2, $\alpha=.93$ at Wave 3).

Externalizing Spectrum Inventory (ES)—The Externalizing Scale-100 (ES-100), a 100-item version of a full 415-item inventory (Hall et al, 2007), was used to assess a range of externalizing symptoms. The ES-100 is highly correlated with the larger inventory, which demonstrates good validity (Krueger et al., 2007). It consists of 23 lower-order subscales and two higher-order scales (Externalizing Personality and Substance Abuse). The Externalizing Personality scale measures relational aggression, physical aggression, destructive aggression, empathy (reverse scored), blame externalization, alienation, fraud, honesty (reverse scored), dependability (reverse scored), planful control (reverse scored), impatient urgency, rebelliousness, boredom proneness, and excitement seeking. Of note, the aggression items assessed in the ES-100 are not specific to aggression toward intimate partners and do not overlap with CTS-2 items. The Substance Abuse scale measures alcohol problems, alcohol use, marijuana use, marijuana problems, other drug use, other drug problems, theft, irresponsibility, and problematic impulsivity. All items were summed and a total score was used to capture a range of externalizing symptoms, with higher scores reflecting more externalizing symptoms ($\alpha=.93$ at Wave 1, $\alpha=.94$ at Wave 2, $\alpha=.93$ at Wave 3).

Data Analysis

Hypotheses were tested using an autoregressive latent trajectory model with structured residuals (ALT-SR). As compared to an autoregressive cross-lagged model, for example, which produces estimates that aggregate within- and between-person effects, the ALT-SR allows for the disaggregation of within-person and between-person effects so more interpretable estimates of developmental processes are yielded (see Berry & Willoughby, 2017; Curran, Howard, Bainter, Lane, & McGinley, 2014). Thus, the ALT-SR model allows us to address our hypotheses that: internalizing and externalizing psychopathology predicts subsequent IPA perpetration and IPA victimization and IPA victimization predicts

subsequent internalizing and externalizing symptoms by yielding disaggregated within-person effects.

As a preliminary step, repeated measures of IPA perpetration, IPA victimization, internalizing symptoms, and externalizing symptoms were fitted to independent linear growth models, which estimated baseline levels (intercepts) and rates of change (slopes). These models were fully saturated ($df=0$), thus fit statistics were not calculated. However, fitting the independent growth models ensured convergence of data and absence of Heywood cases. Next, variables were entered simultaneously into the ALT-SR (see Figure 1). Intercepts were centered at Wave 1 and assumed to vary randomly between participants. As such, the intercept represents random between-participant variation in the given variable. Slopes were constrained to equality among participants, preserving the rank-order of individuals across time. Residual variances after Wave 1 were constrained to be equal over time. That is, Wave 2 and 3 residuals were modeled to be homogenous over time. Within-person residuals were modeled as structured residuals, and all possible autoregressive and cross-lagged parameters were fitted to the structured residuals. Regression parameters were also constrained to be equal over time, given that assessments were given at regularly, evenly spaced intervals.

These model specifications, outlined above, allowed for the disaggregation of between-and within-person effects. Specifically, the model captured between-person effects using latent intercept and slopes and within-person effects were captured by analyzing associations between structured residuals. Thus, the covariances between latent factors represent total between-person associations and the autoregressive and cross-lagged parameters represent within-person associations.

The model was fit in Mplus version 7.3 Given that some of our variables were skewed, a maximum-likelihood robust (MLR) estimator was used. Further, to handle the interdependent nature of the data (participants nested within couples) the COMPLEX function was used with CLUSTER which identified the couple unit. This function accounts for interdependence by adjusting standard errors and chi-square tests of model fit. Specifications of this model yielded unstandardized estimates, and model fit was evaluated using Chi-square, Root-Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) and standardized root mean square error (SRMR). Acceptable model fit met the following criteria: $RMSEA < 0.06$, CFI and TLI > 0.95 (Hu & Bentler, 1999).

Results

Descriptive Statistics and Correlations

Descriptive statistics and correlations are presented in Table 1. Average levels of externalizing symptoms decreased across time while average levels of internalizing symptoms increased and then decreased. Average levels of psychological IPA perpetration and victimization increased somewhat over the three waves of data. Both IPA perpetration and victimization were associated with internalizing symptoms at each wave. Wave 1 IPA

perpetration and victimization was significantly correlated with Waves 1 and 3 externalizing symptoms.

ALT-SR Model

The autoregressive latent trajectory model with structured residuals (ALT-SR), where we entered repeated measures of externalizing, internalizing, IPA perpetration, and IPA victimization, resulted in adequate model fit, $\chi^2(36) = 84.77$, $p < .001$; CFI = .96; TLI = .93; RMSEA = .08 (90% CI: .06 – .11). All latent intercepts were significantly positively associated with one another (Table 2). This suggests that, on average, individuals who reported greater levels of psychopathology (internalizing and externalizing) were more likely to report psychological IPA perpetration and psychological IPA victimization.

Autoregressive effects for externalizing symptoms and aggression perpetration were significant and positive, suggesting that individuals at baseline who reported higher levels of externalizing and aggression perpetration were more likely to report high levels in these constructs across waves of data collection. Cross-lagged effects testing whether internalizing or externalizing psychopathology predicted subsequent IPA perpetration and victimization were nonsignificant. Cross-lagged effects examining the associations IPA victimization and subsequent internalizing and externalizing psychopathology were also non-significant. However, cross-lagged effects demonstrated that internalizing symptoms were negatively associated with externalizing symptoms at each the subsequent wave. This suggests that an individual presenting with higher levels of internalizing at Wave 1 was less likely to show prominent levels of symptoms of externalizing at Wave 2 and Wave 3. Likewise, externalizing symptoms were negatively associated with internalizing symptoms at each following wave. Aggression perpetration was positively associated with later aggression victimization, suggesting that individuals who perpetrated higher rates of psychological aggression were more likely to be victims of aggression at each subsequent wave. No other autoregressive or cross-lagged effects were statistically significant.

Discussion

The aim of the current study was to disentangle temporal associations between psychological IPA and dimensions of psychopathology across a year as a means to identify the developmental process that puts individuals at increased risk for IPA. Results yielded significant bivariate associations between psychological IPA and psychopathology across time points. Based on this initial screening, one might expect there to be cross-lagged associations between IPA and psychopathology. However, the ALT-SR model did not find any significant cross-lagged associations between dimensions of psychopathology and IPA. Rather, results from the model found that internalizing symptoms were negatively associated with externalizing symptoms at following time points (and vice versa), and psychological IPA perpetration was positively associated with psychological IPA victimization at the subsequent time point.

Based on these findings, it appears there is not a strong temporal association between dimensions of psychopathology and *psychological IPA* over the course of one year. This runs counter to other studies that have used different statistical techniques and samples to

examine longitudinal associations between IPA and psychiatric disorders (e.g., Afifi et al., 2009; Blasco-Ros, et al., 2010; Brown et al., 2009; McPherson, et al., 2007; Shorey, Febres, et al., 2012; Smith, et al., 2012). However, many of these studies have examined *physical* IPA perpetration or victimization. Indeed, our results may have differed if we had examined physical IPA or used a clinical sample. Future research should examine how psychological and physical IPA are differentially associated with psychopathology across time. Still, psychological IPA is prevalent among couples and associated with a range of adverse outcomes; thus, understanding the process between psychopathology and IPA is crucial for reducing the risks and outcomes associated with both.

Even though dimensions of psychopathology did not predict IPA at following time points, this does not mean these constructs are not related. Indeed, the model also yielded significant between-person effects among all variables (i.e., significant covariances between intercepts), suggesting that individuals who reported greater levels of internalizing and externalizing psychopathology also reported greater psychological IPA perpetration and victimization at baseline. It is possible that there is a confounding variable (e.g., intoxication, hostility, anger), not captured in the current study, which explains the significant between-person associations. If this is the case, it may be more important to target the confounding variable in order to reduce IPA, rather than targeting the psychopathological symptoms directly.

Taken together, findings from the current study suggest that an increase in psychopathology may not predict a subsequent increase in psychological IPA perpetration or victimization (or vice versa) but individuals with higher levels of symptomatology are at increased risk for IPA. From a treatment perspective, this would imply that targeting psychopathological symptoms may reduce risk for IPA (as was found in Taft et al., 2010), but because a temporal association is not present targeting psychopathology at the time of symptom exacerbation alone may not be useful in reducing psychological IPA. However, our unexpected findings should be interpreted with caution. Rather, our null findings highlight the need for more longitudinal research in the field of IPA, as such research is critical for informing treatments that dually target IPA and psychopathology. The current study was limited in several regards. First, the sample utilized consisted of opposite-sex, relatively healthy, and largely well-educated and White couples who were newlyweds at baseline assessment and who presented with low average levels of internalizing and externalizing symptoms and IPA. Thus, this sample might not be fully representative of couples presenting in a clinical setting. Newlywed couples, however, are important for understanding interplay between IPA and psychopathology. Because each of these variables can be conceptualized dimensionally, it is expected that findings may translate to a clinical sample. Second, we did not have measures of physical IPA at all three time points and thus cannot speak to how effects may have varied if physical IPA was examined in the model. As noted above, this should be a direction for future research. Third, the alpha reliability of our measures of psychological IPA perpetration and victimization was somewhat low; therefore, we may have had limited power and the strength of the associations found may have been attenuated. This is likely because this measure consists of a relatively few items but other studies have found that this measure demonstrates adequate internal consistency (e.g., Christensen & Sullaway, 1984; Straus et al., 1996). Fourth, our measure of externalizing psychopathology

included items that tapped into relational aggression. Although these items did not overlap with items assessing IPA, this may have inflated our associations between IPA and externalizing psychopathology. Fifth, we only examined couples at three time points over the course of a year. Results may have varied if we had looked at couples over a longer duration or used a diary study to assess day-to-day aggression and symptomatology over the course of weeks. Finally, our sample was somewhat small compared to others that utilize structural modeling. We attempted to adjust for this utilizing data from both partners in the sample and adjusting for interdependence; however, findings may have differed if a larger sample had been used.

Despite limitations, the current study provides an initial examination of the interplay between psychological IPA and dimensions of psychopathology using advanced statistical techniques. Findings further conceptualize how psychopathological symptoms are associated with psychological IPA. Future research should build upon the current findings by utilizing larger samples and examining other facets or dimensions of both IPA and psychopathology.

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References

- Afifi TO, MacMillan H, Cox BJ, Asmundson GJG, Stein MB, Sareen J. 2009; Mental health correlates of intimate partner violence in marital relationships in a nationally representative sample of males and females. *Journal of Interpersonal Violence*. 24(8):1398–1417. DOI: 10.1177/0886260508322192 [PubMed: 18718882]
- Berry D, Willoughby MT. 2017; On the Practical Interpretability of Cross-Lagged Panel Models : Rethinking a Developmental Workhorse. 88(4):1186–1206. DOI: 10.1111/cdev.12660
- Black, MC, Basile, KC, Breiding, MJ, Smith, SG, Walters, ML, Merrick, MT, ... Stevens, MR. The National Intimate Partner and Sexual Violence Survey (NISVS): 2010 summary report. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; Atlanta, GA: 2011.
- Blasco-Ros C, Sánchez-Lorente S, Martínez M. 2010; Recovery from depressive symptoms, state anxiety and post-traumatic stress disorder in women exposed to physical and psychological, but not to psychological intimate partner violence alone: a longitudinal study. *BMC Psychiatry*. 10(1):98.doi: 10.1186/1471-244X-10-98 [PubMed: 21108834]
- Brown A, Cosgrave E, Killackey E, Purcell R, Buckby J, Yung AR. 2008; The Longitudinal Association of Adolescent Dating Violence With Psychiatric Disorders and Functioning. *Journal of Interpersonal Violence*. 24(12):1964–1979. DOI: 10.1177/0886260508327700 [PubMed: 19098215]
- Brown A, Cosgrave E, Killackey E, Purcell R, Buckby J, Yung AR. 2009; The longitudinal association of adolescent dating violence with psychiatric disorders and functioning. *Journal of Interpersonal Violence*. 24(12):1964–79. DOI: 10.1177/0886260508327700 [PubMed: 19098215]
- Christensen, A, Sullaway, M. Unpublished Manuscript. Department of Psychology, University of California; Los Angeles: 1984. Communications Patterns Questionnaire.
- Coker A, Davis K, Arias I, Desai S, Sanderson M, Brandt HB, Smith PH. 2002; Physical and mental health effects of intimate partner violence for men and women. *American Journal of Preventive Medicine*. 23(4):1–34.
- Crane CA, Hawes SW, Devine S, Easton CJ. 2014; Axis I Psychopathology and the Perpetration of Intimate Partner Violence. *Journal of Clinical Psychology*. 70(3):238–247. DOI: 10.1002/jclp.22013 [PubMed: 23824500]

- Curran PJ, Howard AL, Bainter SA, Lane ST, Mcginley JS. 2014; The Separation of Between-Person and Within-Person Components of Individual Change Over Time : A Latent Curve Model With Structured Residuals. 82(5):879–894. DOI: 10.1037/a0035297
- Ehrensaft MK, Cohen P, Johnson JG. 2006; Development of personality disorder symptoms and the risk for partner violence. *Journal of Abnormal Psychology*. 115(3):474–83. DOI: 10.1037/0021-843X.115.3.474 [PubMed: 16866588]
- Ehrensaft MK, Moffitt TE, Caspi A. 2006; Is Domestic Violence Followed by an Increased Risk of Psychiatric Disorders Among Women But Not Among Men? A Longitudinal Cohort Study. *The American Journal Of Psychiatry*. 1163(5):885–892.
- El-Bassel N, Gilbert L, Wu E, Go H, Hill J. 2005; Relationship between drug abuse and intimate partner violence: A longitudinal study among women receiving methadone. *American Journal of Public Health*. 95(3):465–470. DOI: 10.2105/AJPH.2003.023200 [PubMed: 15727978]
- Hall JR, Bernat EM, Patrick CJ. 2007; Externalizing psychopathology and the error-related negativity. *Psychological Science*. 18:326–333. DOI: 10.1111/j.1467-9280.2007.01899.x [PubMed: 17470258]
- Hu L, Bentler PM. 1999; Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*. 6(1):1–55. DOI: 10.1080/10705519909540118
- Jarnecke AM, Reilly MS, South SC. 2015; Internalizing and Externalizing Symptoms and Marital Relationship Functioning: The Mediating Role of Demand-Withdraw Communication Processes. *Journal of Marital and Family Therapy*. doi: 10.1111/jmft.12153
- Krueger RF, Markon KE, Patrick CJ, Benning SD, Kramer MD. 2007; Linking antisocial behavior, substance use, and personality: an integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology*. 116(4):645–66. DOI: 10.1037/0021-843X.116.4.645 [PubMed: 18020714]
- Lawrence E, Yoon J, Langer A, Ro E. 2009; Is psychological aggression as detrimental as physical aggression? The independent effects of psychological aggression on depression and anxiety symptoms. *Violence and Victims*. 24(1):20–35. DOI: 10.1891/0886-6708.24.1.20 [PubMed: 19297883]
- McPherson MD, Delva J, Cranford JA. 2007; A longitudinal investigation of intimate partner violence among mothers with mental illness. *Psychiatric Services*. 58(5):675–680. [PubMed: 17463349]
- Murphy CM, O’Leary KD. 1989; Psychological aggression predicts physical aggression in early marriage. *Journal of Consulting and Clinical Psychology*. 57(5):579–82. DOI: 10.1037/0022-006X.57.5.579 [PubMed: 2794178]
- Narayan AJ, Englund MM, Egeland B. 2013; Developmental timing and continuity of exposure to interparental violence and externalizing behavior as prospective predictors of dating violence. *Development and Psychopathology*. 25(4 Pt 1):973–90. DOI: 10.1017/S095457941300031X [PubMed: 24229543]
- Shorey RC, Febres J, Brasfield H, Stuart GL. 2012; The Prevalence of Mental Health Problems in Men Arrested for Domestic Violence. :741–748. DOI: 10.1007/s10896-012-9463-z
- Shorey RC, Temple JR, Febres J, Brasfield H, Sherman AE, Stuart GL. 2012; The consequences of perpetrating psychological aggression in dating relationships: a descriptive investigation. *Journal of Interpersonal Violence*. 27(15):2980–98. DOI: 10.1177/0886260512441079 [PubMed: 22550148]
- Smith PH, Homish GG, Leonard KE, Cornelius JR. 2012; Intimate Partner Violence and Specific Substance Use Disorders : Findings From the National Epidemiologic Survey on Alcohol and Related Conditions. 26(2):236–245. DOI: 10.1037/a0024855
- South SC, Krueger RF, Iacono WG. 2011; Understanding General and Specific Connections Between Psychopathology and Marital Distress : A Model Based Approach. 120(4):935–947. DOI: 10.1037/a0025417
- Straus MA, Hamby SL, Boney-McCoy SUE, Sugarman B. 1996; The Revised Conflict Tactics Scales (CTS2): Development and preliminary psychometric data. *Journal of Family Issues*. 17(3):283–316. DOI: 10.1177/019251396017003001

- Taft CT, Farrell TJO, Doron-lamarca S, Panuzio J, Suvak MK, Gagnon DR, Murphy CM. 2010; Longitudinal Risk Factors for Intimate Partner Violence Among Men in Treatment for Alcohol Use Disorders. 78(6):924–935. DOI: 10.1037/a0021093
- Taft CT, Farrell TJO, Torres SE, Panuzio J, Monson CM, Murphy M, Murphy CM. 2006; Examining the Correlates of Psychological Aggression Among a Community Sample of Couples. 20(4):581–588. DOI: 10.1037/0893-3200.20.4.581
- Temple JR, Weston R, Stuart GL, Marshall LL. 2008; The longitudinal association between alcohol use and intimate partner violence among ethnically diverse community women. Addictive Behaviors. 33:1244–1248. DOI: 10.1016/j.addbeh.2008.05.005 [PubMed: 18571335]
- Testa M, Livingston JA, Leonard KE. 2003; Women ' s substance use and experiences of intimate partner violence : A longitudinal investigation among a community sample. 28:1649–1664. DOI: 10.1016/j.addbeh.2003.08.040
- Watson D, O'Hara MW, Simms LJ, Kotov R, Chmielewski M, McDade-Montez EA, ... Stuart S. 2007; Development and validation of the Inventory of Depression and Anxiety Symptoms (IDAS). Psychological Assessment. 19:253–268. DOI: 10.1037/1040-3590.19.3.253 [PubMed: 17845118]

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Figure 1. Autoregressive latent trajectory model with structured residuals

Note. AggPerp= psychological aggression perpetration; AggVict = psychological aggression victimization; EXT = externalizing psychopathology; INT= internalizing psychopathology.

Table 1

Correlations and descriptive statistics for variables

	1	2	3	4	5	6	7	8	9	10	11	Mean (SD)	Range
1. EXT - Wave 1	-											157.31 (26.76)	126–254
2. INT - Wave 1	.34**	-										143.48 (29.47)	93–248
3. IPA Perp - Wave 1	.15*	.29**	-									1.85 (1.50)	0–6
4. IPA Vict - Wave 1	.15*	.23**	.80**	-								1.75 (1.61)	0–7
5. EXT - Wave 2	.88**	0.12	0.12	0.13	-							151.94 (25.85)	120–262
6. INT - Wave 2	-.03	.35**	.25**	.29**	0.01	-						146.08 (30.93)	91–249
7. IPA Perp - Wave 2	0.11	.21*	.72**	.59**	0.15	.34**	-					2.23 (1.59)	0–8
8. IPA Vict - Wave 2	0.16	0.12	.68**	.76**	0.16	.39**	.76**	-				2.22 (1.75)	0–8
9. EXT - Wave 3	.86**	.24**	.22*	0.17	.89**	-.04	0.17	0.16	-			149.07 (21.47)	96–253
10. INT - Wave 3	.30**	.59**	.31**	.33**	0.10	.67**	.23*	.34**	.25**	-		143.33 (31.61)	93–265
11. IPA Perp - Wave 3	0.11	.19*	.54**	.44**	0.17	.33**	.71**	.60**	0.14	.28**	-	2.19 (1.68)	0–8
12. IPA Vict - Wave 3	0.08	.23*	.52**	.62**	0.16	.27**	.50**	.70**	0.11	.35**	.70**	2.23 (1.77)	0–7

Note. EXT = externalizing psychopathology; INT = internalizing psychopathology; IPA Perp = psychological aggression perpetration; IPA Vict = psychological aggression victimization.

* p<.05,

** p<.01,

*** p<.001.

Table 2

Parameter estimates from autoregressive latent trajectory model with structured residuals

	B	SE
Fixed effects		
EXT on EXT _{t-1}	0.458 **	0.14
EXT on INT _{t-1}	-0.108 *	0.05
EXT on IPA Perp _{t-1}	1.333	3.146
EXT on IPA Vict _{t-1}	-0.741	3.879
INT on INT _{t-1}	-0.093	0.226
INT on EXT _{t-1}	-0.785 *	0.308
INT on IPA Perp _{t-1}	5.952	15.107
INT on IPA Vict _{t-1}	-7.751	18.635
IPA Perp on IPA Perp _{t-1}	0.572 **	0.217
IPA Perp on EXT _{t-1}	0.013	0.013
IPA Perp on INT _{t-1}	-0.003	0.005
IPA Perp on IPA Vict _{t-1}	0.256	0.253
IPA Vict on IPA Vict _{t-1}	-2.16 †	1.112
IPA Vict on EXT _{t-1}	-0.008	0.055
IPA Vict on INT _{t-1}	-0.018	0.03
IPA Vict on IPA Perp _{t-1}	2.241 ***	0.574
(Co)variances		
EXT ₁ with INT ₁	192.30 *	75.195
EXT ₁ with IPA Perp ₁	6.601 *	3.284
EXT ₁ with IPA Vict ₁	7.726 *	3.287
INT ₁ with IPA Perp ₁	13.518 ***	3.515
INT ₁ with IPA Vict ₁	13.957 ***	3.038
IPA ₁ Perp with IPA Vict ₁	2.01 ***	0.21
EXT ₁	651.076 ***	128.341
INT ₁	533.478 ***	84.211
IPA Perp ₁	2.214 ***	0.203
IPA Vict ₁	2.555 ***	0.28
Residual (co)variances		
EXT _{t2, t3}	92.817 ***	17.409
INT _{t2, t3}	332.906 ***	73.085
IPA Perp _{t2, t3}	1.391 ***	0.179

	B	SE
IPA Vict _{t2, t3}	0.887***	0.236
Mean		
EXT _I	157.923***	2.209
INT _I	144.655***	2.276
IPA Perp _I	1.861***	0.134
IPA Vict _I	1.756***	0.142
EXT _S	-3.003***	0.552
INT _S	0.168	1.319
IPA Perp _S	0.163*	0.07
IPA Vict _S	0.26***	0.07

Note. EXT = externalizing psychopathology; INT= internalizing psychopathology; IPA Perp= psychological aggression perpetration; IPA Vict = psychological aggression victimization; I=intercept; S=slope; t=time.

[†]
p<.07,

*
p<.05,

**
p<.01,

p<.001.