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Cumulative Risk and Intimate Partner Aggression

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Abstract

Objective: Intimate Partner Aggression (IPA) is recognized as a serious challenge to public health, and numerous models specify individual, interpersonal, and contextual antecedents of relationally aggressive behavior. The present study aims to synthesize prior work by determining whether the accumulation of selected factors at these three levels of analysis, when considered simultaneously, predicts IPA.

Method: We collected self-report, observational, and social network data from 462 newlywed spouses (231 couples) from low-income neighborhoods at three separate time points across the first 18 months of marriage.

Results: Latent growth curve analyses showed that individual and relational risk were consistently related to IPA initial status (i.e., intercepts), for husbands and wives. Effects of contextual risk on IPA were less consistent. All risk indices were unrelated to 18-month changes in IPA. Furthermore, individual and dyadic deficits increased risk for IPA independent of partners' contextual risk.

Conclusions: Even after adjusting for potential distal influences, individual and dyadic variables emerge as clear risk factors of IPA. Although there were no significant associations between contextual variables and IPA intercepts and slopes in LGCM, we did find evidence for correlations between all three facets of risk. In light of this co-occurrence of risk across various domains, we recommend locating interventions that target individual and relational risk (e.g., therapies addressing neurotic tendencies and couple therapy with a communication skills training component) specifically within higher-risk environments.

Keywords

Couples; Intimate Partner Aggression; Latent Growth Curve Modeling; Risk Factors

Intimate Partner Aggression (IPA) is among the greatest public health challenges of our time, due to its high prevalence (WHO, 2014) and its lasting negative consequences for physical and psychological health, parenting and child development, and economic

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stability (e.g., O'Campo et al., 2006; Vu, Jouriles, McDonald, & Rosenfield, 2016; Wright, Pinchevsky, Benson, & Radatz, 2015). Typically conceptualized as a private form of violence, most research on IPA has focused on individual-level risk markers, such as substance use and personality traits, or couple-level risk markers, such as relationship satisfaction and communication skills (see Slep, Foran, Heyman, & Snarr, 2010). Because individuals and couples are embedded in their environments, efforts to conceptualize IPA in relation to various contextual factors, such as couples' physical and social surroundings, have also emerged (e.g., Copp et al., 2015; Jackson, 2016; Miller-Graff & Graham-Bermann, 2016). While scholars from different perspectives vary in their emphasis of these risk domains, attempts to examine various domains simultaneously are lacking. The present study aims to synthesize prior work by examining individual, dyadic, and contextual risk factors for IPA in one model.

The socio-ecological model (Bronfenbrenner, 1979) provides a useful framework for organizing factors theorized to affect risk for IPA (Beyer, Wallis, & Hamberger, 2015; Heise, 1998). From this perspective, predictors of IPA can be grouped into different categories or layers, including factors defined at the individual, couple, and community level. Individual-level risk factors include developmental characteristics, such as exposure to violence in one's family of origin (e.g., Ehrensaft et al., 2003), parental divorce (e.g., Story, Karney, Lawrence, & Bradbury, 2004), personality traits (e.g., Moffitt, Krueger, Caspi, & Fagan, 2000), and substance use (Feingold, Kerr, & Capaldi, 2008; Flanzer, 2005; Testa, Livingston, & Leonard, 2003). Low self-esteem is also related to IPA (e.g., Capaldi & Crosby, 1997).

At the dyadic level, predictors of IPA center around couples' capacities for skilled communication and emotion regulation, typically when partners disagree about important relationship issues (Capaldi, Knoble, Shortt, & Kim, 2012). For example, high levels of relationship distress, disagreement, and conflict increase the likelihood of IPA (Capaldi et al., 2012; Hammett, Lavner, Karney, & Bradbury, 2017), and detailed behavioral analyses demonstrate that IPA is more likely to occur among couples whose interactions are marked by negative communication patterns, anger, and contempt (e.g., Sommer, Iyican, & Babcock, 2019).

Macro-level factors have long been cited as influencing relationship processes and outcomes (e.g., Karney & Bradbury, 1995), and within the IPA literature research has begun to examine the neighborhoods couples inhabit as potential risk factors for aggressive behavior, albeit with mixed support. For example, some studies show that individuals living in communities with high unemployment and low incomes (O'Campo et al., 2006), as well as higher proportions of female-headed households and higher proportions of households with children (Lauritsen & Schaum, 2004), are at increased risk for IPA. Partners' social ties to family and friends have also been proposed as macro-level risk factors of IPA (Pinchevsky & Wright, 2012). Certain characteristics of social ties, such as increased social support and decreased social isolation, may reduce the likelihood of IPA (e.g., Lanier & Maume, 2009; Van Wyk, Benson, Fox, & DeMaris, 2003), whereas individuals who live in communities that evidence high rates of crime and violence may be at increased risk for IPA (Raghavan, Mennerich, Sexton, & James, 2006). However, in outlining the possibility that IPA is

embedded in specific social and economic contexts, it is important to consider an alternative view, based on the premise that IPA is a private phenomenon, not influenced by macro-level elements indicative of social cohesion and social control (Beyer et al., 2015). In support of this view, in a sample of 1,136 married and cohabitating couples, perceived neighborhood characteristics such as social cohesion and social control showed little association with IPA (Caetano, Ramisetty-Mikler, & Harris, 2010).

The Present Study

A complete understanding of the micro- and macro-level elements related to IPA requires consideration of a broad range of variables across individual, relational, and contextual socio-ecological layers. While it is the case that, collectively, existing literature already ties variables at each of these layers to IPA, relatively few studies have adopted a broad-based approach. We propose to fill this gap by examining the predictive utility of risk across the three domains outlined above, in accumulation, and their association with IPA. To overcome potential bias of self-report data, we use a multi-method approach for assessing risk across multiple domains, relying on interview data, observational data collected via video-recorded problem-solving discussions, interviewer ratings, and data collected via a comprehensive social network interview.

We situate our study in a sample of 231 young, newlywed couples from low-income neighborhoods who provided data at three separate time points across the first 18 months of marriage. This sample provides a valuable setting for studying the aforementioned research topics, because IPA and its many correlates tend to be overrepresented among economically disadvantaged and minority group couples (e.g., Tjaden & Thoennes, 2000). Because disadvantaged couples are at greater risk for relationship dissolution, couples living in low-income communities tend to be exposed to more external stress and financial strain and tend to rely more heavily on their environment for support, thereby allowing us to better assess the potential contributions of contextual risk to IPA, in addition to individual and relational risk factors (Heflin, London, & Scott, 2011).

Using this methodology, our primary research aim (Aim 1) is to study whether the accumulation of key indicators at the individual, relational, and contextual levels, when studied simultaneously, is associated with IPA. We predict that the accumulation of risk at each of these socio-ecological layers will be related to higher initial levels of IPA and to increases in IPA over time. Furthermore, because the literature is mixed regarding the main effects of context on IPA (e.g., Caetano et al., 2010), before accepting the conclusion that contextual influences are inconsequential, we must also address whether other effects are moderated by context. Therefore, in Aim 2, we explore whether individual- or couple-level risk factors interact with contextual risk in predicting IPA. For example, two identical individuals or couples, embedded within different kinds of environments, might behave or respond to stress very differently depending on their contexts: A couple surrounded by a supportive environment (e.g., safe neighborhood, close-knit network of family and friends), who is faced with a sudden stressor (e.g., loss of job or illness), may be able to turn to their environment for support, both material and emotional. However, a couple in a non-supportive environment (e.g., neighborhood with high crime rates, socially isolated)

faced with the same stressor may be unable to rely on such resources, thereby further exacerbating their issue and increasing the likelihood that they will lash out at each other during an argument. Thus, contextual risk may increase or decrease the likelihood of IPA, either on its own or by interacting with existing vulnerabilities at the individual or couple level. We predict that individual risk will interact with contextual risk such that individual risk will be more strongly associated with IPA when coupled with contextual risk. Similarly, we predict that relational risk will interact with contextual risk in that relational risk will be more strongly associated with IPA when coupled with contextual risk.

Method

Sampling

Sampling was undertaken to yield couples living in high-poverty neighborhoods in Harris County, Texas. Recently-married couples were identified through names and addresses on marriage license applications, which were obtained from the Harris County Recorder's Office in 2014 and 2015. Addresses were matched with census data to identify applicants living in high-poverty communities, defined as census block groups for which no less than 30% of the households were categorized by the census as living below poverty, thereby oversampling an understudied population of couples living in high-poverty neighborhoods. Couples were screened by telephone or in person to ensure that they were married and in a different-sex relationship, that neither partner had been previously married, and that both partners were in their first marriage. A total of 4,916 couples were identified through addresses listed on their marriage licenses. Among the couples identified, 3,535 could not be reached and 1,157 agreed to be screened. Of those, 506 couples were screened as eligible, and 401 agreed to participate, with 231 couples providing data within the recruitment window.

Participants

The sample consisted of 231 couples in their first marriages identified with the above procedures. Average ages at baseline were 29.5 (SD = 7.5) for husbands and 28.1 (SD = 7.4). Fifty-two percent of husbands and 53% of wives were Hispanic. Of the remaining participants, husbands and wives were either Black (32% and 35%, respectively), White (10% and 9%), or Other/Multiracial (6% and 3%). Average relationship length was 4.7 years. Approximately 60% of couples had children, and household income averaged $40,885 (SD = $29,146). On average, the highest level of formal education was completion of high school diploma (or GED), for husbands (60%) and for wives (54%); 12% of husbands and 16% of wives completed college.

Procedure

Couples were visited in their homes by two interviewers who took spouses to separate areas to obtain informed consent and to orally administer self-report measures at baseline (N = 231), 9-months (N = 193), and 18-months (N = 157). Couples were compensated for their participation ($100, $140, and $180 per couple at Time 1, 2, and 3, respectively).

After completing self-report measures individually, partners were reunited for 8-min videotaped discussions. Discussions took place in a location of the couples' choosing that would enable them to talk privately and without interruption. Partners were asked to identify a topic of disagreement in their relationship and to devote 8 min working toward a mutually satisfying resolution of that topic. Common topics included management of money, chores, communication, and spending time together as a couple. Twelve undergraduate research assistants were trained in the coding procedures, and four trained observers, on average, coded a given 8-min conflict interaction. Couples spoke English (76%) and Spanish (24%) during their interactions. Coders participated in a 6-hour introductory training, followed by 1-hour weekly group meetings for the duration of the project. Videos were viewed three times, once without rating, and then once again for each partner in the couple. Videos were presented in blocked-randomized order so that order of video and whether husband or wife was rated first differed across observer within a block. Reliabilities of each coded interaction were calculated each week and reviewed in the weekly meetings in an effort to standardize coding decision-making and thus reduce observer drift.

Following the interaction task, partners separately participated in social network interviews (Kennedy et al., 2015). After first providing the names of 25 people over the age of 18 in the respondent's social network (network "alters"), partners provide information about each alter and information about the relationship between each unique pair of network alters. Specifically, questions were asked about each of these alters to determine their demographic characteristics and the nature of their relationship with the respondent. These questions provide raw data for constructing measures of network composition (e.g. % relatives, % friends, % supportive, % interfering, etc.) The work was completed in accordance with APA Ethical Principles and received approval from the RAND Corporation Institutional Review Board.

Measures

Observational Data.—To quantify the quality of couple communication, composite positivity and negativity scores were created based on a series of ratings that coders made of each partner's behaviors immediately after observing the 8-min problem-solving interactions. Husband and wife *positivity* scores were created by averaging codes capturing individuals' engagement (ICCs = .78 and .73 for husbands and wives, respectively), listening (ICCs = .65 and .65), willingness (ICCs = .81 and .82), caring (ICCs = .74 and .64), acknowledgement (ICCs = .77 and .77), productive contribution (ICCs = .74 and .71), positivity (ICCs = .78 and .77), solutions (ICCs = .80 and .74), expressiveness (ICCs = .33 and .83), discussion (ICCs = .74 and .87), acceptance of responsibility (ICCs = .61 and .71), and cooperation (ICCs = .84 and .78) as observed during video-recorded discussions. Husband and wife *negativity* scores were created by averaging codes that tapped into individuals' negativity (ICCs = .78 and .80), demands (ICCs = .75 and .77), blame (ICCs = .80 and .79), interruption (ICCs = .79 and .68), and defensiveness (ICCs = .79 and .73).

Predictors: Cumulative risk indices.—The 21 measures, all assessed at Time 1, are described in Table 1. From these measures, we calculated three cumulative risk indices composed of individuals' scores on six individual, five relational, and ten contextual risk

measures. Following Rauer, Karney, Garvan, and Hou (2008), husbands and wives were given one point when their scores on the individual measure comprising the risk index fell into the riskiest quartile as measured in the current sample (e.g., highest 25% of substance use).

Outcome: Intimate Partner Aggression.—Couples' IPA was assessed at baseline, 9-month follow-up, and 18-month follow-up using an adapted version of the revised Conflict Tactics Scales (CTS-R; Straus & Douglas, 2004) assessing seven acts of aggression and violence during the past nine months (viz., insulting or swearing; stomping out of the room or leaving the house during an argument; threatening to hit; throwing something; pushing, grabbing, or shoving; slapping, hitting, biting, or punching; beating up). For each item, participants were asked if they had engaged in the act described (i.e., perpetration) and if their spouse had engaged in the act described (i.e., victimization). If they responded positively to the item, participants were asked to indicate the number of times each event had occurred, with 1 = Once or twice, 2 = Several times), and 3 = Often. To control for underreporting, maximum reported perpetration scores (created by comparing individual reports of perpetration and partner reports of victimization and using the higher of the two) —resulting in one husband- and one wife-perpetrated IPA score—were used for all analyses (see Salis, Salwen, & O'Leary, 2014). As shown in Table 2, IPA means were highest at Time 1, for husbands and wives, and then decreased at Time 2 and Time 3, consistent with prior studies (e.g., Lawrence & Bradbury, 2007).

Analytic Plan

Structural equation modeling (SEM) analyses were conducted in Mplus Version 8 with Maximum Likelihood Robust (MLR) as the estimator. As MLR accommodates non-normal distributions and missing data, all models were estimated using all $N = 231$ observations. To account for the effects that a partner has on an individual's outcome, husband and wife variables were allowed to correlate in all models, thereby accounting for the non-independence of partners' data (see Kenny, Kashy, & Cook, 2006).

We conducted Latent Growth Curve Modeling (LGCM) using husbands' and wives' IPA scores at baseline, 9-month follow-up, and 18-month follow-up as indicators for the IPA intercept and slope variables. To test whether partners' IPA intercepts and slopes differed significantly from zero, we first ran a model including only husband and wife intercepts and slopes (and correlations between intercepts and slopes and husband and wife variables) without predictor variables. To test Aim 1, examining whether different facets of cumulative risk are associated with intercept levels and changes in IPA across time, we ran a LGCM that included husband and wife individual, relational, and contextual cumulative risk as predictors and husband and wife IPA intercepts and slopes as outcomes. In this model, intercept growth factors are interpreted as husbands and wives' initial level of IPA or the systematic part of variation in husbands and wives' IPA at baseline. Slope growth factors are interpreted as husbands and wives' IPA growth rate or the systematic part of the increase in husbands and wives' IPA for a time score increase of one unit (i.e., 9 months). All husband and wife variables as well as intercept and slope variables were allowed to correlate (see Figure 1). To test Aim 2, exploring whether context moderates the effects of individual and

relational risk on IPA, we ran a LGCM that included husband and wife individual, relational, and contextual cumulative risk as well as interactions between individual and contextual risk and between relational and contextual risk as predictors and husband and wife IPA intercepts and slopes as outcomes. All husband and wife variables as well as intercept and slope variables were allowed to correlate. For significant interaction terms, we conducted simple slope analyses examining differences between individual (or relational) risk and IPA for husbands and wives with high (+1 standard deviation), medium (mean), and low (−1 standard deviation) contextual risk.

To determine overall model fit, we assessed the root mean square error of approximation (RMSEA), an index of overall model fit with values less than .08 indicative acceptable model fit (Steiger, 1990), and the Standardized Root Mean Residual (SRMR), an absolute index of overall model fit with values less than .08 indicative acceptable model fit (Hu & Bentler, 1999). A power analysis was conducted to estimate the required sample size to detect an effect. To achieve a statistical power level of .80, with anticipated effect size of .80 and $\alpha = .05$, the recommended minimum sample size to detect an effect in our model with 12 observed (husband and wife IPV at T1-T3, husband and wife individual, relational, and contextual risk) and 4 latent variables (husband and wife IPV intercepts and slopes) was $N = 200$ (Soper, 2020). This recommended minimum sample size remained the same when setting the anticipated effect size to .60 or .40, thereby supporting appropriateness of a sample size of $N = 231$ couples for our analyses.

Results

Preliminary Analyses

We first examined correlations between the three facets of risk. Individual risk correlated with relational risk ($r = .28$ for husbands and $r = .20$ for wives, both $p < .01$) as well as contextual risk ($r = .33$ for husbands and $r = .16$ for wives, both $p < .05$). Relational risk also correlated with contextual risk ($r = .20$ for husbands and $r = .20$ for wives, both $p < .01$). Means, standard deviations, and coefficient alpha of all measures included in the risk indices can be found in Table 2. For descriptive purposes, we then examined husbands' and wives' IPA at different levels of risk by dividing them into three equal groups based on their individual, relational, and contextual risk scores. As expected, for all types of risk, IPA was highest in the high-risk group, followed by the medium-risk group and then the low-risk group. Participants with high levels of individual and relational risk were more aggressive than those with medium and low levels of such risk. This was not the case for contextual risk, however, as all three groups were statistically equivalent in their levels of IPA (see Table 3).

Main Analyses (Aim 1): Latent Growth Curve Model

A LGCM including husband and wife IPA intercept and slope latent variables (but no predictors) showed that correlations between the intercept and slope latent variables for husbands ($r = −0.40$, $p = .43$) and wives ($r = −0.68$, $p = .25$) were not statistically significant. IPA intercept latent variables differed significantly from zero ($M = 2.53$, $p < .001$ for husbands and $M = 3.17$, $p < .001$ for wives), as did IPA slope latent variables ($M = −0.25$,

p = .001 for husbands and $M = -0.33$, $p < .001$ for wives). Husbands' IPA intercepts were significantly lower than wives' IPA intercepts ($Wald(1) = 7.27$, $p = .01$) but slopes did not differ significantly for husbands as compared to wives ($Wald(1) = 2.14$, $p = .14$). There was individual variation in the person-specific intercepts for both husbands ($\sigma^2 = 5.05$, $p < .001$) and wives ($\sigma^2 = 8.65$, $p < .001$) as well as for wives' ($\sigma^2 = 1.19$, $p = .01$) but not husbands' ($\sigma^2 = 0.47$, $p = .30$) IPA slopes. Thus, husbands' and wives' IPA intercept and slope latent variables were included in all subsequent analyses.

Table 4 shows estimates, standard errors, and p-values of a LGCM including baseline levels of husband and wife individual, relational, and contextual cumulative risk as predictors and husband and wife IPA intercepts and slopes (calculated from data collected across three time points spaced by 9-months intervals) as outcomes. Figure 2 provides a visual depiction of these results. Overall, higher cumulative risk at baseline was associated with higher initial levels of IPA (i.e., intercepts) but not with IPA trajectories (i.e., slopes). Specifically, higher husband ($b = 0.30$, $p = 0.01$) and higher wife ($b = 0.27$, $p = 0.01$) individual risk, higher husband ($b = 0.35$, $p = 0.02$) and wife ($b = 0.36$, $p = 0.02$) relational risk, and higher wife contextual risk ($b = 0.19$, $p = 0.05$) at baseline were related to higher initial levels of husband IPA. Higher wife individual risk ($b = 0.41$, $p = 0.01$) and higher husband relational risk ($b = 0.55$, $p = 0.01$) at baseline were also related higher initial levels of wife IPA. Higher husband individual risk ($b = 0.25$, $p = 0.09$) and higher wife relational risk ($b = 0.37$, $p = 0.06$) at baseline were marginally related to higher initial levels of wife IPA. All other effects were non-significant (see Table 4).[1]

Exploratory Analyses (Aim 2): Interactions by Context

Because contextual risk factors surround individuals and couples and may not be as closely tied to IPA perpetration as risk factors at the individual or relational level, we aimed to examine whether contextual risk might be better understood as a moderator rather than a direct predictor. This prediction was in line with results of the LGCM described above showing more consistent patterns of associations between individual and relational risk and IPA. To test whether the associations between individual/relational risk and IPA differed for husbands and wives exposed to different levels of contextual risk, we added interaction terms of individual-by-contextual risk and relational-by-contextual risk as predictors to the above-described LGCM. Estimates, standard errors and p-values are shown in Table 3. Only one of the 16 possible interaction effects (Wife relational-by-contextual risk to Wife IPA Intercept, $b < 0.18$, $p = 0.04$) was statistically significant, lending minimal support for the prediction that contextual risk may be better understood as a moderating variable. Examination of simple effects showed that the association between wife relational risk at baseline and initial levels of wife IPA was statistically significant for wives exposed to low ($b = 0.80$, $p < 0.01$) and medium ($b = 0.44$, $p = 0.02$) contextual risk but not for wives exposed to high contextual risk ($b = 0.08$, $p = 0.73$). Although some of the context-to-IPA effects in this moderation model were statistically significant, we do not interpret these

[1]Sensitivity analyses showed that this pattern of results replicated when defining risk as the top 33.3% rather than the top 25%. However, when calculating risk via a latent variable using the original, continuous individual, relational and contextual measures as indicators, only two significant effects (husband relational risk to husband and to wife IPA intercept) remained, confirming the value of using cumulative risk indices. Additionally, quadratic effects were not statistically significant.

effects here as these effects cannot be understood as main effects given the presence of the interaction terms in the model.

Discussion

Violence between intimate partners presents a serious challenge to public health, leading to lasting negative consequences for individuals, couples, and society in general (e.g., O'Campo et al., 2006; Wright et al., 2015). In an attempt to understand this common and costly phenomenon, we simultaneously examined multivariate risk indices at each layer of Bronfenbrenner's (1979) socio-ecological model using a sample that varied substantially in their socioeconomic status and in their reports of IPA. Dyadic LGCM revealed that individual and relational risk were consistently related to IPA initial status, for husbands and wives. Effects of contextual risk on IPA were less consistent, with only one statistically significant association linking wives' contextual risk to husbands' IPA intercepts. Risk failed to predict IPA slopes across the first 18 months of marriage. Furthermore, examination of interaction effects between individual risk and relational risk by contextual risk did not support moderation: Individual and dyadic deficits put partners at higher risk for IPA, independent of whether partners resided in supportive or non-supportive environments. The relatively weak associations between contextual risk and IPA were unexpected and, pending replication, suggest for future efforts to examine contextual influences controlling for individual and relational risk factors. These results provide the necessary synthesis to integrate prior knowledge: Even after adjusting for potential distal influences, individual and dyadic variables present clear risk factors of IPA initial status. The absence of any associations between risk and IPA slopes suggest that changes in aggression are largely independent of early couple characteristics and that even very risky couples could experience decreases in aggression over time. However, it is also possible that the 18-month time span used in the present study was too short to capture such effects, which might become more evident when studying couples across longer periods of time.

Limitations

Although the use of a multi-method approach (social network, observational, and self-report dyadic data collected across three time points) and a large and diverse sample from an understudied population are key strengths of this work, interpretation of our findings is limited by several factors. Despite taking steps to reduce underreporting, IPA was assessed via self-report and may be subject to uncontrolled bias. In addition, generalization of our findings is as yet unknown, and we cannot say whether these results would apply to dating couples or couples in more established relationships, same-sex couples, higher income couples, or couples with higher levels of aggression and violence. Many participants in our sample identified as Hispanic, and we do not know whether these results may generalize to populations with different ethnic backgrounds. Potential selection effects raise further questions about generalizability; it is possible that more severely violent couples may not have volunteered to participate in the study. Similarly, although the use of three time points allowed us to study growth curves and effects of risk on IPA initial levels and slopes, the relatively brief intervals between assessments might mask potential trajectory effects that only become evident when using longer time intervals.

Future Directions

Future research could address the aforementioned limitations by studying additional types of couples (e.g., dating couples or more established marriages) across longer periods of time; assessing couples at additional time points might allow for examination of time-varying variables as predictors of the IPV trajectory. For example, couples whose environments or stress levels change over time might show more dramatic increases or decreases in IPA. In addition, it is possible that a more proximal assessment of context is needed. Although the present study does not support previously identified associations between macro-contexts and IPA, it could be that micro-level contextual factors, such as perceptions of stress, are more strongly related to IPA (Hammett, Karney, & Bradbury, 2020) and to negative couple interaction behaviors (Williamson, Karney, & Bradbury, 2014). Therefore, future research could compare the effects of macro- and micro-contexts on IPA, for example by not only examining more remote neighborhood and socioeconomic contexts but also more immediate contexts that could exert stress and strain. A process-oriented framework (e.g., Finkel, 2014) might be useful in guiding future studies examining how micro-level contextual factors may fit with other individual and dyadic factors to better understand which conditions pose the greatest risk for IPA. It is also possible that previous research identifying associations between contextual risk and IPA has confounded context with marital status. For example, although prior work supports an association between socio-economic variables and IPA, these effects may appear stronger than they actually are because the samples used in these studies included couples of various statuses including unmarried and cohabitating couples (e.g., Beyer et al., 2015). As individuals with low incomes are less likely to be married (Ooms & Wilson, 2004), cohabitators and dating couples may be more likely to engage in IPA, not because they have low incomes but because they may be less committed than married couples. Future research could address this possibility.

Research Implications

Notwithstanding these limitations, the present findings may have implications for understanding how different types of risk influence expression of intimate partner aggression and violence among underserved populations. Even after adjusting for potential distal influences, individual and dyadic variables emerge as clear risk factors of IPA. Although associations between contextual variables and IPA intercepts and slopes were far less consistent in LGCM, we did find evidence for correlations among all three facets of risk.

Clinical Implications

Based on correlations showing that risky individuals in risky relationships tend to be found in risky environments, we recommend locating interventions that target individual and relational risk (e.g., therapies addressing neurotic tendencies and couple therapy with a communication skills training component) specifically within higher-risk environments. Future research is needed to tease apart exactly which environmental facets are involved in determining risk for IPA as it is possible that a more proximal assessment of context (e.g., stress) would result in stronger associations with aggression and violence.

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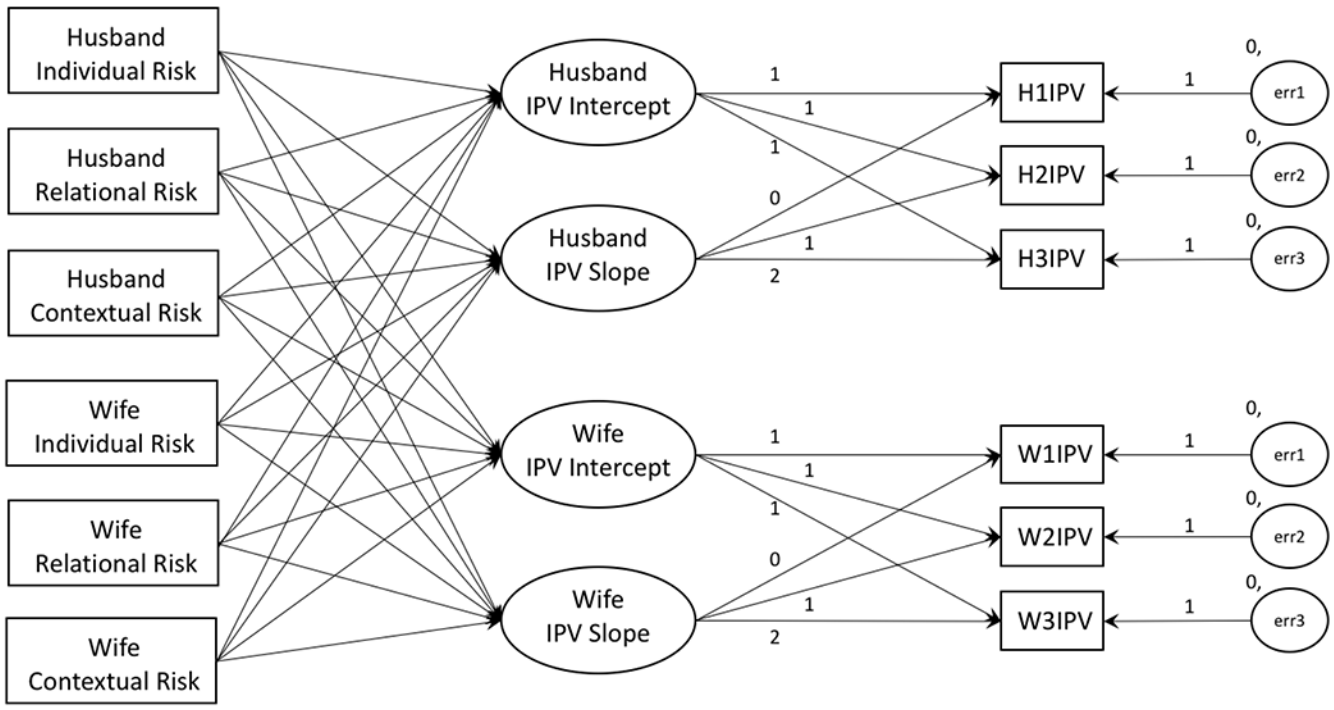

Figure 1.

Visual depiction of Latent Growth Curve Model (LGCM) Linking Three Domains of Risk with IPA Intercepts and Slopes for Husbands and Wives.

Note: In addition to the paths depicted here, all husband and wife variables were allowed to correlate.

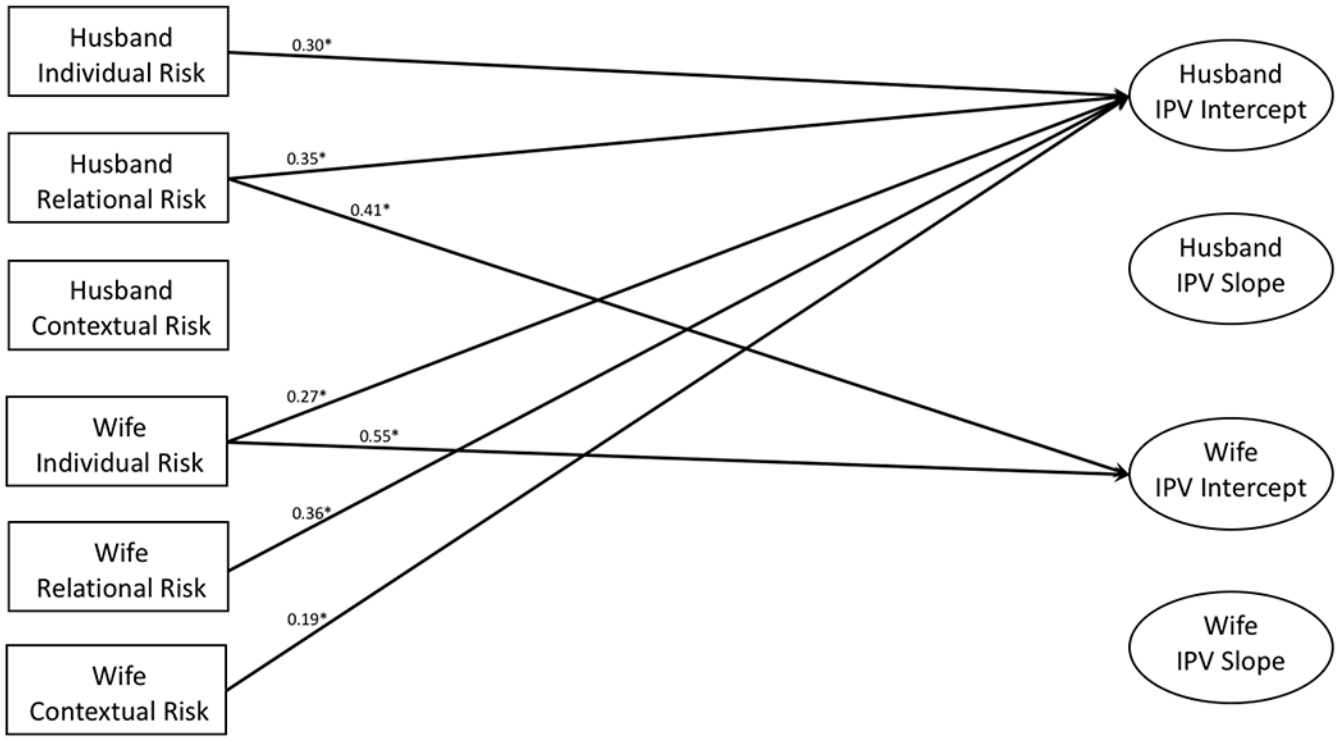

Figure 2.

Results of Latent Growth Curve Model (LGCM) Linking Three Domains of Risk with IPA Intercepts and Slopes for Husbands and Wives.

Note: $*p < .05$. Non-significant paths not shown.

Table 1.

Description of Measures Included in Cumulative Risk Indices

Variable (Source)	# of items	Scale	Description
		Individual Risk	
Neuroticism (Goldberg, 1993)	8 items	4-pt scale	Higher scores indicate higher levels of neuroticism
Self-esteem (Rosenberg, 1965)	4 items	4-pt scale	Higher scores indicate higher levels of slef-esteem
Substance use (Mayfield, McLeod, & Hall, 1974)	7 items	binary (0 = no, 1 = yes)	Higher scores indicate higher levels of substance sue problems
Adverse childhood experiences (Felitti et al., 2019)	14 items	binary (0 = no, 1 = yes)	Higher scores indicate more direct physical, psychological, and sexual abuse, and observed violence in one's family of origin
Parental divorce (developed by authors)	1 item	binary (0 = no, 1 = yes)	"Did your parents ever divorce or separate permanently?"
Family environment (Rivera et al., 2008; Snyder & Aikman, 1999)	7 items	binary (0 = no, 1 = yes)	Higher scores indicate more conflict
		Relational Risk	
Relationship satisfaction (Funk & Rogge, 2007)	10 items	6-pt scale	Higher scores indcate higher global satisfaction
Ineffective arguing (Kurdek, 1994)	6 items	4-pt scale	Higher scores indicate more arguing
Marital problems (Fincham & Bradbury, 1992)	6 items	10-pt scale	Higher scores indicate more problems
Observed positivity (developed by authors)	12 behavioral codes	n/a	Higher scores indicate higher levels of observed positivity
Observed negativity (developed by authors)	5 behavioral codes	n/a	Higher scores indicate higher levels of observed negativity
		Contextual Risk	
Use of government services (OKDHS, 2018)	7 items	binary (0 = no, 1 = yes)	Higher scores indicate using more services
Social support (developed by authors)	4 items	3-pt scale	Higher scores indicating more people to count on when needing emotional and material help
Neighborhood (Molina, Alegria, & Chen, 2012)	6 items	4-pt scale	Higher scores indicate less disorder
Annual household income (developed by authors)	1 item	n/a	Couples' self-reported income from all sources
Observed home environment (developed by authors)	7 items	binary (0 = no, 1 = yes)	Interviewer ratings of couple's home environment, with higher scores indicating a more disordered living environment
Proportion of good relationships (developed by authors)	1 item	binary (0 = no, 1 = yes)	From the social network interview (please see Procedures section): How is your relationship with [NAME]? Would you say good, neutral, or bad?
Proportion married (developed by authors)	1 item	binary (0 = no, 1 = yes)	From social network interview (please see Procedures section): Is [NAME] currently married?
Proportion employed (developed by authors)	1 item	binary (0 = no, 1 = yes)	From social network interview (please see Procedures section): Is [NAME] currently employed?
Proportion tangible support (developed by authors)	1 item	binary (0 = no, 1 = yes)	From social network interview (please see Procedures section): Which of the people you just mentioned do you turn to when you need concrete support,

Variable (Source)	# of items	Scale	Description
Proportion emotional support (developed by authors)	1 item	binary (0 = no, 1 = yes)	From social network interview (please see Procedures section): Which of the people you just mentioned do you turn to when you need emotional support,

Table 2.

Means, Standard Deviations, and Alpha Coefficients of Study Variables

	Husbands					Wives				
	Minimum	**Maximum**	**Mean**	**SD**	**Alpha**	**Minimum**	**Maximum**	**Mean**	**SD**	**Alpha**
Individual Risk	0.00	6.00	1.84	1.44	--	0.00	6.00	1.77	1.35	--
Neuroticism	0.00	23.00	9.17	5.21	0.83	0.00	23.00	12.94	4.79	0.81
Self-esteem	4.00	11.00	6.92	1.97	0.62	4.00	13.00	6.91	1.99	0.63
Substance use	0.00	7.00	0.65	1.15	0.66	0.00	7.00	0.30	0.86	0.72
Adverse childhood experiences	0.00	14.00	2.69	3.04	0.83	0.00	13.00	3.21	3.47	0.86
Parental divorce		26.8% divorced			--		31.2% divorced			--
Family environment	0.00	7.00	1.65	1.98	0.80	0.00	7.00	2.21	2.40	0.87
Relational Risk	0.00	5.00	1.32	1.45	--	0.00	5.00	1.31	1.45	--
Relationship satisfaction	10.00	52.00	44.12	7.93	0.91	9.00	52.50	43.32	8.84	0.94
Ineffective arguing	0.00	17.00	7.35	4.08	0.80	0.00	18.00	7.46	4.03	0.80
Marital problems	0.00	58.00	18.47	12.84	0.78	0.00	60.00	21.13	13.06	0.76
Observed positivity	1.00	5.00	3.40	1.11	0.93	1.00	5.00	3.55	1.02	0.90
Observed negativity	1.00	5.00	2.03	1.03	0.84	1.00	5.00	1.92	0.96	0.85
Contextual Risk	0.00	9.00	3.35	2.05	--	0.00	9.00	3.12	2.01	--
Use of government services	0.00	3.00	0.60	0.89	0.51	0.00	4.00	1.07	1.06	0.57
Social support	0.00	8.00	5.60	2.18	0.82	0.00	8.00	5.58	2.11	0.78
Neighborhood	0.00	17.00	7.12	4.15	0.76	0.00	18.00	7.73	4.37	0.83
Annual household income	0.00	170000.00	40885.15	29146.05	--	--	--	--	--	--
Observed home environment	0.00	6.00	0.96	1.28	0.58	0.00	6.00	1.22	1.22	0.46
Proportion of good relationships	0.00	1.00	0.83	0.21	--	0.00	1.00	0.75	0.22	--
Proportion married	0.00	0.96	0.47	0.20	--	0.08	0.92	0.47	0.17	--
Proportion employed	0.12	1.00	0.78	0.14	--	0.21	1.00	0.73	0.14	--
Proportion tangible support	0.00	1.00	0.20	0.20	--	0.00	0.96	0.25	0.23	--
Proportion emotional support	0.00	1.00	0.18	0.21	--	0.00	1.00	0.24	0.21	--
Intimate Partner Aggression (IPA)										
Time 1 IPA	0.00	13.00	2.51	2.51	0.70	0.00	16.00	3.16	3.17	0.80
Time 2 IPA	0.00	17.00	2.42	2.90	0.78	0.00	18.00	2.92	3.47	0.82

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	Husbands					Wives				
	Minimum	**Maximum**	**Mean**	**SD**	**Alpha**	**Minimum**	**Maximum**	**Mean**	**SD**	**Alpha**
Time 3 IPA	0.00	13.00	2.03	2.47	0.72	0.00	20.00	2.64	3.34	0.81

Table 3.

Intimate Partner Aggression at High, Medium, and Low Risk Levels

Variable	Risk Means			Tukey HSD Mean Difference Tests		
	High	Medium	Low	High vs Medium	High vs Low	Medium vs Low
Husbands						
Individual Risk	3.70	2.26	1.95	1.44*	1.75*	0.31
Relational Risk	4.31	2.49	1.60	1.81*	2.71*	0.89*
Contextual Risk	3.01	2.57	2.11	0.44	0.91	0.46
Wives						
Individual Risk	4.59	2.45	2.74	2.14*	1.85*	0.28
Relational Risk	5.82	2.85	2.25	2.97*	3.57*	0.60
Contextual Risk	3.85	3.23	2.67	0.62	1.19	0.57

* $p < .05$

Note: High risk = 1 SD above the mean, medium risk = mean, low risk = 1 SD below the mean.

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Table 4.

Unstandardized Estimates, Standard Errors, and P-Values of Main Effect and Moderation Latent Growth Curve Models

Outcome	Husband IPA Intercept				Husband IPA Slope				Wife IPA Intercept				Wife IPA Slope			
	Estimate	95% CI	S.E.	P-Value	Estimate	95% CI	S.E.	P-Value	Estimate	95% CI	S.E.	P-Value	Estimate	95% CI	S.E.	P-Value
Main Effect Model																
Husband Individual Risk	0.30*	0.12, 0.49	0.11	0.01	<−0.01	−0.14, 0.13	0.08	0.98	0.25	0.01, 0.49	0.15	0.09	<0.01	−0.12, 0.13	0.08	0.96
Wife Individual Risk	0.27*	0.09, 0.45	0.11	0.01	−0.02	−0.12, 0.08	0.06	0.76	0.41*	0.16, 0.66	0.15	0.01	−0.02	−0.16, 0.11	0.09	0.77
Husband Relational Risk	0.35*	0.10, 0.59	0.15	0.02	−0.03	−0.15, 0.09	0.07	0.68	0.55*	0.23, 0.88	0.20	0.01	−0.09	−0.26, 0.08	0.10	0.38
Wife Relational Risk	0.36*	0.11, 0.62	0.16	0.02	−0.05	−0.17, 0.07	0.07	0.48	0.37	0.05, 0.69	0.19	0.06	0.02	−0.15, 0.19	0.10	0.87
Husband Contextual Risk	−0.09	−0.24, 0.06	0.09	0.31	−0.05	−0.13, 0.03	0.05	0.30	<−0.01	−0.17, 0.16	0.10	0.94	−0.04	−0.14, 0.06	0.06	0.48
Wife Contextual Risk	0.19*	0.03, 0.36	0.1	0.05	0.02	−0.07, 0.12	0.06	0.68	0.10	−0.10, 0.30	0.12	0.40	−0.01	−0.11, 0.09	0.06	0.88
Moderation Model																
Husband Individual Risk	0.18	−0.20, 0.56	0.23	0.44	−0.06	−0.28, 0.16	0.13	0.65	0.04	−0.34, 0.42	0.23	0.86	0.06	−0.19, 0.31	0.15	0.68
Wife Individual Risk	0.14	−0.21, 0.49	0.21	0.51	0.04	−0.14, 0.23	0.11	0.71	0.56*	0.15, 0.98	0.25	0.03	−0.12	−0.37, 0.14	0.15	0.45
Husband Relational Risk	0.13	−0.26, 0.53	0.24	0.58	0.01	−0.20, 0.21	0.13	0.96	0.20	−0.27, 0.67	0.28	0.48	−0.27	−0.63, 0.10	0.22	0.23
Wife Relational Risk	0.48	0.02, 0.95	0.28	0.08	0.01	−0.21, 0.23	0.13	0.97	1.00*	0.44, 1.56	0.34	<0.01	−0.12	−0.43, 0.20	0.29	0.55
Husband Contextual Risk	−0.26*	−0.44, −0.07	0.11	0.02	−0.07	−0.19, 0.05	0.07	0.35	−0.29*	−0.54, −0.05	0.25	0.05	−0.05	−0.19, 0.09	0.09	0.57
Wife Contextual Risk	0.20	−0.03, 0.44	0.15	0.16	0.07	−0.04, 0.18	0.07	0.28	0.45*	0.20, 0.71	0.25	<0.01	−0.09	−0.22, 0.04	0.08	0.26
Husband Individual*Contextual	0.04	−0.05, 0.12	0.05	0.48	0.02	−0.05, 0.09	0.04	0.70	0.07	−0.04, 0.17	0.07	0.30	−0.02	−0.08, 0.03	0.03	0.52
Wife Individual*Contextual	0.03	−0.07, 0.13	0.06	0.59	−0.02	−0.07, 0.03	0.03	0.54	−0.06	−0.18, 0.06	0.07	0.42	0.03	−0.05, 0.10	0.05	0.58
Husband Relational*Contextual	0.06	−0.03, 0.16	0.06	0.27	−0.01	−0.08, 0.05	0.04	0.73	0.09	−0.02, 0.20	0.07	0.17	0.06	−0.05, 0.16	0.06	0.36

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Outcome	Husband IPA Intercept				Husband IPA Slope				Wife IPA Intercept				Wife IPA Slope			
	Estimate	95% CI	S.E.	P-Value	Estimate	95% CI	S.E.	P-Value	Estimate	95% CI	S.E.	P-Value	Estimate	95% CI	S.E.	P-Value
Wife Relational*Contextual	0.04	−0.16, 0.08	0.07	0.62	−0.02	−0.07, 0.04	0.03	0.65	−0.18*	−0.32, 0.04	0.09	0.04	0.03	−0.04,0.10	0.04	0.42

* $p < 0.05$

Note. Main Effect Model: RMSEA = 0.13, SRMR = 0.03. Moderation Model: RMSEA = 0.35, SRMR = 0.23

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