

When Does Verbal Aggression in Relationships Covary With Physical Violence?

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Objective: Psychological aggression is common in intimate relationships, yet only a subset of psychologically aggressive couples also engage in physical violence. We examine 2 factors proposed to identify which psychologically aggressive couples display physical violence, emphasizing (a) couples' negative and ineffective communication during relationship-focused conversations and (b) the demands imposed upon couples by chronic social and economic disadvantage. **Method:** Using a final analysis sample of 862 spouses (431 couples), we collected self-report data on psychological and physical aggression, observational data capturing the quality of their communication, and self-report data assessing established indicators of socioeconomic vulnerability. Tests of moderation were conducted with structural equation modeling (SEM). **Results:** The association between psychological and physical aggression was stronger among couples who displayed lower-quality communication and among couples facing higher levels of socioeconomic disadvantage. The moderating effect of couple communication remained significant after controlling for socioeconomic disadvantage, and the moderating effect of socioeconomic disadvantage remained significant after controlling for communication. All effects remained after controlling for relationship satisfaction. **Conclusions:** Specific communication skills and broad indices of socioeconomic vulnerability make independent contributions to acts of physical aggression among psychologically aggressive couples. Conceptual frameworks are needed to integrate these 2 levels of analysis, and intervention models are needed that identify at-risk couples and that modify the conditions that heighten their likelihood of physical aggression.


Keywords: communication, intimate partner violence, newlyweds, socioeconomic deprivation

Intimate partner violence (IPV) is a pervasive, costly, and even lethal phenomenon that manifests in a variety of forms. Physical IPV, which has a lifetime prevalence of 28.1% to 32.9%, is defined as the intentional use of physical force with the potential to cause death, disability, injury, or harm. It includes, but is not limited to, scratching, pushing, shoving, throwing, grabbing, biting, choking, shaking, hair-pulling, slapping, punching, hitting, burning, use of a weapon, and use of restraints on one's body, size, or strength against another person. Psychological IPV, which has a lifetime prevalence of about 48%, is defined as the use of verbal and nonverbal communication with the intent to harm another person mentally or emotionally, and/or exert control over another person. This includes, but is not limited to, acts of expressive aggression, coercive control, threats of physical violence, and exploitation

of vulnerability (Breiding, Basile, Smith, Black, & Mahendra, 2015). Although psychological aggression, in some cases, may not be perceived as aggression by outside observers because it is covert and manipulative in nature, psychological aggression is an essential component of IPV that can significantly influence the impact of other forms of IPV (Breiding et al., 2015). Similarly, it has often been observed that psychological IPV is more common in relationships where physical IPV is also present (Carney & Barner, 2012) and that psychological IPV is a precursor to physical IPV (Saint-Eloi Cadely et al., 2020). However, even though virtually all physically aggressive couples report also engaging in psychological IPV (Carney & Barner, 2012), the opposite is not true: Most psychologically aggressive couples do not engage in slapping and hitting—particularly when psychological IPV is less frequent and severe (Salis, Salwen, & O'Leary, 2014).

Why might some verbally aggressive couples manage to keep physical aggression out of their interpersonal repertoires while others fail to do so? The dynamic developmental systems (DDS) perspective, which conceptualizes IPV as an interactional pattern, responsive to the conjoint developmental characteristics and behaviors of each partner, as well as contextual factors and relationship influences (Capaldi, Kim, & Shortt, 2004), may provide a possible answer to this question. Using the DDS perspective as an organizing conceptual framework, we propose that the interactional pattern underlying the association between psychological and physical IPV is responsive to

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couples' communication skills (a relationship influence) and to couples' sociodemographic risk (a contextual factor). Here, we test (a) whether either of these two factors moderates the association between psychological aggression and physical violence and (b) whether either moderating effect is independent of the other.

Decades of observational research highlight effective communication and emotion regulation as critical ingredients for well-functioning relationships. Skillful management of conflict neutralizes negative affect and promotes closeness (e.g., Bloch, Haase, & Levenson, 2014), whereas persistent mismanagement of this key task increases the likelihood of aggressive exchanges (e.g., Babcock, Jacobson, Gottman, & Yerington, 2000). Couples' capacity for effective communication and emotion regulation is implicated in all leading models of IPV (e.g., Finkel, 2007). While it is apparent that couples who struggle to communicate effectively are also inclined toward hostile outbursts, empirical work does not yet demonstrate whether verbally aggressive couples who communicate poorly are at greater risk for engaging in more destructive acts of physical violence. Addressing this hypothesis directly can serve to refine models that address how hostile verbal exchanges become physical, and evidence consistent with this hypothesis would lend support to interventions that aim to modify communication skills with the goal of reducing hostile escalation (e.g., Babcock, Graham, Canady, & Ross, 2011).

Although analysis of interpersonal processes holds promise for identifying which psychologically aggressive couples will also engage in physical aggression, this view fails to acknowledge robust evidence linking couples' life circumstances with their capacity to effectively manage emotionally charged situations in their relationship. Lower socioeconomic status (SES)—as indexed by lower incomes, lower rates of stable employment, and lower levels of formal education—is a reliable risk marker for IPV (e.g., Sokoloff & Dupont, 2005); at all levels of IPV severity, couples living with lower incomes, fewer resources, more discrimination, and greater financial strain display IPV at higher rates (e.g., Matjasko, Niolon, & Valle, 2013). Critically, however, effects are sometimes weak, and some studies fail to demonstrate an association between SES and IPV (e.g., Neff, Holman, & Schluter, 1995), underscoring the fact that many underresourced couples are not physically aggressive (and that many relatively affluent couples are). Because main effect models fail to fully capture the sociodemographic strain-to-IPV association, we propose that verbally aggressive couples are most likely to also be physically aggressive when their level of sociodemographic disadvantage is relatively high. In contrast, when sociodemographic risk is low, verbal and physical aggression are less likely to covary, even within a sample of couples who report verbal aggression and who are economically vulnerable (Matjasko et al., 2013). To our knowledge, this prediction remains untested. Evidence that the association between psychological and physical IPV is stronger among couples enduring higher levels of social and economic disadvantage would lend support to efforts that aim to reduce aggression through reductions in stress and economic hardship, potentially preventing acts of verbal aggression from developing into physical violence.

Separate testing of behavioral and socioeconomic moderators could provide insight into why only some verbally aggressive couples also engage in acts of physical aggression. However, there is growing appreciation for the need to examine these two levels of analysis simultaneously: Couples with high-quality communication may nevertheless encounter high levels of social and economic deprivation, and well-resourced couples living with low stress may nevertheless struggle to communicate their needs and feelings effectively. In either case, moments of psychological aggression might escalate to physical violence, even as communication skills are adequate or sociodemographic vulnerability is low. In response to calls for joint investigation of “the context and proximal events associated with IPV episodes” (Bell & Naugle, 2008, p. 1101), we will examine both moderators simultaneously, consistent with the view that various “contextual units” such as socioeconomic status are implicated in IPV, and that within each defined contextual unit, there are a number of behavioral “proximal variables” that render violent acts more likely. On the basis of prior research, (Bell & Naugle, 2008; Capaldi et al., 2004) we expect that both moderating effects will remain significant when considered simultaneously.

With data from a large, ethnically diverse, and economically disadvantaged sample of newlywed couples, we test three main predictions. First, using observational data collected from couples' in-home discussions of salient relationship concerns, we predict that reports of verbal aggression will covary with concurrent reports of physical aggression primarily among couples who display interactional skill deficits. For the purpose of this study, “interactional skill deficits” is used synonymously with “nonadaptive behavioral processes,” which are operationalized as (a) more negative or hostile tone or emotional content (e.g., insulting and interrupting one's spouse); (b) less positive emotional content (e.g., sharing in jokes, complimenting one's spouse); and (c) less effectiveness in working toward a resolution of one's issues (e.g., proposing possible solutions, soliciting one's spouse's opinion) as observed during behavioral interactions (see Williamson, Bradbury, Trail, & Karney, 2011 for details). We hypothesize that when communication is more positive, less negative, and more effective, covariation between psychological and physical IPV should be weaker or nonsignificant (Aim 1). Second, using a cumulative index of sociodemographic risk developed and validated by Amato (2014), we predict that verbal aggression will covary with physical aggression primarily among couples who are socially and economically vulnerable. When sociodemographic risk is low, covariation between psychological and physical IPV should be weaker or nonsignificant (Aim 2). Third, we predict that the moderating effect of observed communication will remain significant after controlling for sociodemographic risk, and that the moderating effect of sociodemographic risk will remain significant after controlling for observed communication (Aim 3). Because there is no evidence to date to suggest that the communication-based and sociodemography-based explanations are necessarily competing models, we predict that both will uniquely moderate the association between psychological and physical IPV. Under Aim 3, we also control for relationship satisfaction, to test whether variance shared with the proposed moderators or the IPV variables generates spurious findings. As this is a commu-

nity sample, our emphasis is on situational couple violence rather than on coercive controlling violence or battering, which likely have different causes and topographies (Johnson, 2017).

Method

Participants

The sampling procedure was designed to yield only first-married newlywed couples in which both partners were of the same ethnicity (Hispanic, African American, or Caucasian), living in neighborhoods with a high proportion of low-income residents in Los Angeles County. Recently married couples were identified through names and addresses on marriage license applications. Addresses were matched with census data to identify applicants living in low-income communities, defined as census block groups wherein the median household income was no more than 160% of the 1999 federal poverty level for a four-person family. Next, names on the licenses were weighted using data from a Bayesian Census Surname Combination, which integrates census and surname information to produce a multinomial probability of membership in each of four racial/ethnic categories. Couples were chosen using probabilities proportionate to the ratio of target prevalences to the population prevalences, weighted by the couple's average estimated probability of being Hispanic, African American, or Caucasian. These couples were telephoned and screened to ensure that they had married, that neither partner had been previously married, and that both spouses identified as Hispanic, African American, or Caucasian. A total of 3,793 couples were contacted through addresses listed on their marriage licenses; of those, 2,049 could not be reached and 1,522 (40%) responded to the mailing and agreed to be screened for eligibility. Of those who responded and agreed to be screened for eligibility, 824 couples were screened as eligible, and 658 of those couples agreed to participate in the study, with 431 couples actually completing the study within the data collection window.

In the final sample of 431 couples, marriages averaged 4.8 months in duration ($SD = 2.5$), and 39% of couples had children. Husbands' mean age was 27.9 ($SD = 5.8$) and wives' mean age was 26.2 ($SD = 5.0$). Couples had a median household income of \$45,000 ($M = \$55,364$, $SD = \$42,671$). Eighty-nine (21%) of husbands and 63 (15%) of wives had less than a high school degree, 117 (27%) of husbands and 108 (25%) of wives had a high school degree, 140 (32%) of husbands and 139 (32%) of wives had completed some college, and 84 (20%) of husbands and 121 (28%) of wives had a college degree or higher. Two-hundred and 80 husbands (65%) and 200 wives (46%) reported working full time, and 77 husbands (18%) and 85 wives (20%) reported working part-time. Fifty couples (12%) were Caucasian, 51 (12%) were African American, and 330 (76%) were Hispanic.

Procedure

Couples were visited in their homes by two interviewers who took spouses to separate areas to obtain informed consent and orally administer self-report measures assessing psychological and physical IPV, sociodemographic risk, and relationship satisfaction. Couples were debriefed and paid \$75 for participating. After completing self-report measures individually, partners were re-

united for three 8-min videotaped discussions that were used to measure adaptive behavioral processes. Discussions took place in a location of the couples' choosing that would enable them to talk privately and without interruption. For the first interaction, partners were asked to identify a topic of disagreement in their relationship and to then 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. The second and third discussion used procedures designed to assess social support behaviors (Pasch & Bradbury, 1998). One randomly chosen spouse was asked to "talk about something you would like to change about yourself" while the partner was instructed to "be involved in the discussion and respond in whatever way you wish." Spouses were instructed to avoid selecting or discussing topics that were sources of tension or difficulty within the relationship. After a short break, a second discussion was held that was identical to the first discussion, with the roles reversed. Common topics included losing weight, making a career change, and dealing with stress. Videotapes were scored by 16 trained coders using the Iowa Family Interaction Rating Scales (IFIRS; Melby et al., 1998). The RAND Corporation Institutional Review Board approved all procedures.

Measures

Husband- and wife-perpetrated intimate partner violence. IPV during the past 9 months was assessed with an adapted version of the revised Conflict Tactics Scales (CTS-2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996), which contained a total of 14 items (seven items assessing perpetration and seven items assessing victimization). There were three items discussing psychological IPV (swearing at partner; stomping out of the room after an argument; threatening to hit partner) and four items discussing physical IPV (throwing something at partner; pushing, grabbing, or shoving partner; slapping, kicking, biting, or punching partner; beating partner). 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 indicated that an act had happened, participants were asked to indicate the number of times each event had occurred, with the response options being 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) were used for all analyses (see Salis et al., 2014). Psychological IPV (three acts) and physical IPV (four acts) items were then summed separately for husband- and wife-perpetrated IPV.

Couple adaptive behavioral processes. Six indicators—husband and wife positivity, husband and wife negativity, and husband and wife effectiveness—all assessed via video-taped discussions, were used to define a latent variable of couple adaptive behavioral processes. A composite *positivity* behavioral scale was created by averaging an individual's scores on the group enjoyment, positive mood, warmth/support, physical affection, humor/laugh, endearment, and listener responsiveness codes. A composite *negativity* behavioral scale was created by averaging an individual's scores on the hostility, disruptive process, contempt, denial, angry coercion, dominance, verbal attack, interrogation, and ex-

ternalized negative codes. A composite *effectiveness*, or problem-solving skill, behavioral scale was created by averaging an individual's scores on the assertiveness, communication, effective process, solution quality, and solution quantity. Positivity, negativity, and effectiveness scores were calculated for each of the three discussion tasks and then the three scores were averaged to create a positivity composite (ICC = .83 for husbands, .81 for wives), a negativity composite (ICC = .73 for husbands, .74 for wives), and an effectiveness composite (ICC = .74 for husbands, .80 for wives).

Couple sociodemographic risk. Risk at the outset of marriage was assessed following guidelines as outlined by Ross, Karney, Nguyen, and Bradbury (2018), using a 10-item index developed originally by Amato (2014). Couples were given 1 point for the presence of each of the following items: (a) either partner was under the age of 23, (b) husband had less than a high school education, (c) wife had less than a high school education, (d) husband was unemployed, (e) wife was unemployed, (f) couple's income was below the poverty line, (g) husband was receiving public assistance, (h) wife was receiving public assistance, (i) husband reported no one to help in an emergency, and (j) wife reported no one to help in an emergency. Actual values on the risk index ranged from 1 to 9 (out of 10 possible). This index has been shown to moderate the effects of skill-based interventions on couple communication and satisfaction, lending some support to its validity (Williamson, Altman, Hsueh, & Bradbury, 2016).

Relationship satisfaction. An eight-item questionnaire was used to assess relationship satisfaction, conceptualized as spouses' global sentiment toward the relationship. The measure was adapted from Rauer, Karney, Garvan, and Hou (2008) and included items from the General Social Survey (Davis, Smith, & Marsden, 2006). It has been used in large surveys with low-income couples (e.g., Rauer et al., 2008) and has been shown to covary systematically with observed communication, thus lending support to its validity as an indicator of relationship functioning (Williamson, Karney, & Bradbury, 2013). Five items asked how satisfied the respondent was with certain areas of their relationship (e.g., "satisfaction with the amount of time spent together") and were scored on a 5-point scale (1 = *very dissatisfied*, 2 = *somewhat dissatisfied*, 3 = *neutral*, 4 = *somewhat satisfied*, 5 = *very satisfied*). Three items asked to what degree the participant agreed with a statement about their relationship (e.g., "how much do you trust your partner") and were scored on a 4-point scale (1 = *not at all*, 2 = *not that much*, 3 = *somewhat*, 4 = *completely*). Scores could range from 8 (*very dissatisfied*) to 37 (*very satisfied*). Coefficient alpha was .72 for husbands and .74 for wives.

Analytic Plan

Structural equation modeling (SEM) in Mplus Version 8 with maximum likelihood robust (MLR) as the estimator was used for all analyses. MLR accommodates for missing data so that models were estimated using all available observations ($N = 431$ couples for each of the models described below). Furthermore, the use of MLR was appropriate due to non-normal distribution of the data. This analytic approach was chosen, because partners in intimate relationships do not operate independently of one another. Rather, their behaviors and perceptions tend to be interrelated. In order to statistically account for the effects that a partner has on an indi-

vidual's outcome, Kenny, Kashy, and Cook (2006) have proposed dyadic approaches using the couple as the unit of analysis, rather than the individual. Following this approach, in the present study, husband and wife variables were allowed to correlate in all models, thereby accounting for the nonindependence of partners' data.

We first examined the association between psychological IPV and physical IPV as established in previous research (e.g., Salis et al., 2014) by testing a model that included husband- and wife-perpetrated psychological IPV as predictors and husband- and wife-perpetrated physical IPV as outcomes. To account for dyadic interdependence of data, husband- and wife-perpetrated psychological IPV and husband- and wife-perpetrated physical IPV were allowed to correlate. We also tested two additional models that were consistent with this first model but included (a) couple adaptive behavioral processes (latent variable); and (b) couple sociodemographic risk as additional predictors.

Then, three separate models were fit to the data to address our main research questions. In Aim 1, we examined whether couples' adaptive behavioral processes moderate the association between psychological and physical IPV. This model included husband- and wife-perpetrated psychological IPV, couple behavioral processes, and husband-perpetrated psychological IPV-by-couple behavioral processes and wife-perpetrated psychological IPV-by-couple behavioral processes interactions as predictors. See Figure 1 for a visual depiction of the model for Aim 1. In Aim 2, we examined whether couples' sociodemographic risk moderates the association between psychological and physical IPV. This model included husband- and wife-perpetrated psychological IPV, couple sociodemographic risk, and husband-perpetrated psychological IPV-by-couple sociodemographic risk and wife-perpetrated psychological IPV-by-couple sociodemographic risk interactions as predictors. To test the robustness of our moderation findings from Aims 1 and 2, we ran additional models including (a) husband and wife satisfaction; and (b) the second moderator (couple sociodemographic risk in the psychological IPV-by-behavior model and couple adaptive behavioral processes in the psychological IPV-by-risk model) as covariates (Aim 3). For models with statistically significant interaction terms, we tested simple slope effects at low ($-1 SD$), mean, and high ($+1 SD$) levels of adaptive behavioral processes and sociodemographic risk.

To determine overall model fit, we assessed the root mean square error of approximation (RMSEA), an absolute index of overall model fit with values less than .08 indicating 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). χ^2 tests are reported for completeness. We also report loglikelihood, Akaike information criterion (AIC), Bayesian information criterion (BIC), and sample-size adjusted BIC as RMSEA, SRMR, and χ^2 are not calculated in models with latent variable interaction terms.

A power analysis was conducted to estimate the required sample size to detect an effect for the most comprehensive model, including the highest number of latent and observed variables (i.e., Aim 3a: behavior and psychological IPV to physical IPV, controlling for husband and wife satisfaction). To achieve $d = .80$ with $\alpha = .05$, the minimum sample size to detect an effect was $N = 87$ (Soper, 2020), supporting appropriateness of the current sample size of $N = 431$ couples for the present analyses.

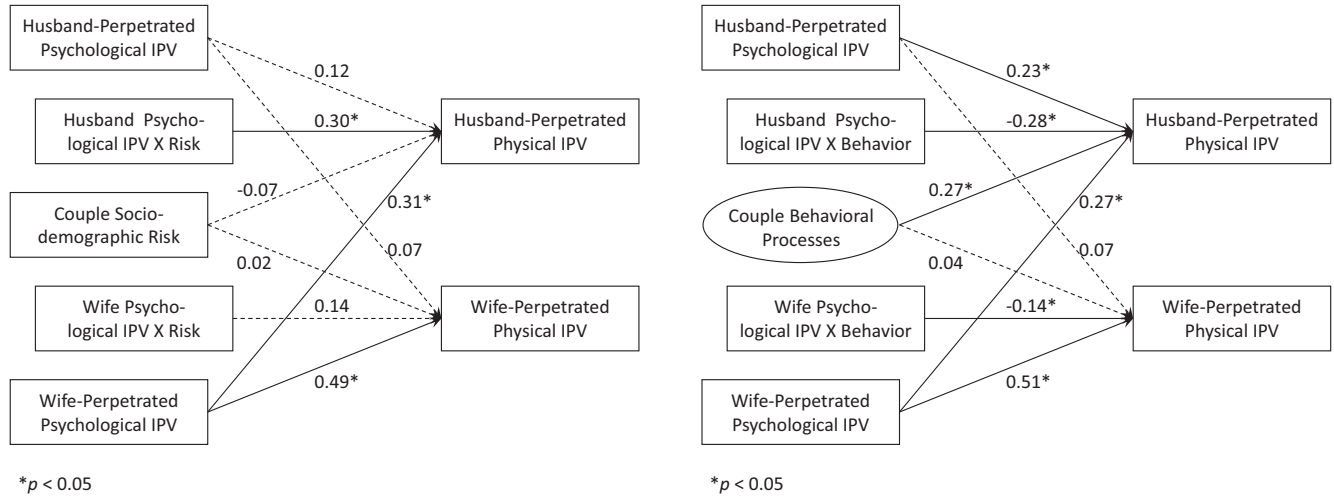


Figure 1. Aims 1 and 2 examining couple adaptive behavioral processes and sociodemographic risk as moderators in the association between husband and wife psychological and physical intimate partner violence (IPV). Straight lines indicate statistically significant regression paths; dotted lines indicate nonsignificant paths. Model fit (Aim 1): $\log = -5104.40$; Akaike information criterion (AIC) = 10,284.79; Bayesian information criterion (BIC) = 10,439.31; Adj. BIC = 10,318.72. Model fit (Aim 2): $\chi^2(8) = 438.38$; root mean square error of approximation (RMSEA) = 0.35; standardized root mean residual (SRMR) = 0.20.

Results

Descriptive Statistics and Preliminary Results

Table 1 shows means, standard deviations, and correlations of all study variables. Means for psychological IPV and physical IPV perpetration were higher for wives than for husbands and for psychological as compared with physical IPV (all *p* values < .001). Correlations between psychological and physical IPV were 0.48 and 0.59 for husbands and wives, respectively. The intercorrelations between husbands and wives' psychological IPV ($r = .62$) and between husbands and wives' physical IPV ($r = .65$) were medium in magnitude. Correlations between behavioral skills and psychological and physical IPV, and between sociodemographic risk and psychological and physical IPV, were relatively low, ranging from $r = 0.031$ to 0.181 .

Seventy-eight percent of husbands and 81% of wives reported engaging in one or more acts of psychological IPV in the past 9 months and 17% of husbands and 29% of wives reported engaging in one or more acts of physical IPV in the past 9 months. With regards to psychological IPV, 22.5% of husbands and 19.0% of wives reported having engaged in no IPV in the past 9 months, 37.4% of husbands and 33.9% of wives reported having engaged in one type, 37.1% of husbands and 39.9% of wives reported having engaged in two types, and 3.0% and 7.2% reported having engaged in all three types. With regards to physical IPV, 82.6% of husbands and 70.3% of wives reported having engaged in no IPV in the past 9 months, 11.8% of husbands and 14.4% of wives reported having engaged in one type, 4.4% of husbands and 7.0% of wives reported having engaged in two types, and 1.2% and 8.4% reported having engaged in three types.

Table 1
Means, Standard Deviations, and Correlations of Study Variables

Variable name	1	2	3	4	5
1. Physical IPV	0.65***	0.59***	0.01	0.09	-0.18***
2. Psychological IPV	0.48***	0.62***	-0.06	-0.03	-0.15**
3. Satisfaction	-0.06	-0.15**	0.47***	-0.17**	0.22***
4. Risk	0.10*	0.09	-0.19**	—	-0.18***
5. Observed behavior	-0.15**	-0.15**	0.23***	-0.18***	—
<i>M (SD)</i> for husbands	0.37 (0.93)	1.67 (1.41)	3.99 (1.06)	2.47 (2.12)	0.00 (0.00)
<i>M (SD)</i> for wives	0.84 (1.68)	2.00 (1.62)	3.85 (1.04)		

Note. IPV = intimate partner violence. Husbands' correlations are reported below the diagonal and wives' correlations are reported above the diagonal. Intercorrelations between husbands and wives' variables are reported on the diagonal. Risk and behavior are couple-level variables. All values are derived from the standardized Mplus output with MLR as the estimator and thus make use of the full sample ($N = 431$ couples). All variables reported here are considered observed variables, except for behavior, which is a latent variable and thus by default has a mean and standard deviation of zero.
* $p < .05$. ** $p < .01$. *** $p < .001$.

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Thus, as required for our analysis, substantial numbers of couples engage in IPV.

As seen in Table 2, there was a significant association between husbands' psychological IPV and husbands' physical IPV ($\beta = 0.31, p < .01$) as well as between wives' psychological IPV and both husbands' physical IPV ($\beta = 0.27, p < .01$) and wives' physical IPV ($\beta = 0.53, p < .01$). The association between husbands' psychological IPV and wives' physical IPV was not statistically significant ($\beta = 0.09, p = .11$), although the significant wife-to-husband and the nonsignificant husband-to-wife partner effects were not statistically different from one another ($TRd = 0.27, p = .60$). These findings support previous research highlighting significant and positive actor effects between psychological and physical IPV.

Controlling for husbands and wives' psychological IPV, higher couple adaptive behavioral processes were related to lower physical IPV for wives ($\beta = -0.09, p = .01$). However, there was no statistically significant association between couple adaptive behavioral processes and husbands' physical IPV ($\beta = -0.07, p = .12$). Furthermore, controlling for husbands and wives' psychological IPV, higher couple sociodemographic risk was related to higher physical IPV for husbands ($\beta = 0.08, p = .03$) and for wives ($\beta = 0.10, p = .01$).

All model fit indices of structural equation models are provided in Table 4.

Table 2
Results of Main Effect Analyses Examining the Effects of Psychological IPV, Behavior, and Risk on Physical IPV

Regression path	Estimate	SE	Est./SE	p-value
Psychological IPV to Physical IPV				
H Physical ON				
H Psychological	0.31	0.08	4.19	<.01
W Psychological	0.27	0.07	4.01	<.01
W Physical ON				
H Psychological	0.09	0.06	1.59	0.11
W Psychological	0.53	0.06	9.04	<.01
Behavior and Psychological IPV to Physical IPV				
H Physical ON				
H Psychological	0.31	0.08	4.10	<.01
W Psychological	0.27	0.07	3.95	<.01
Couple behavior	-0.07	0.04	-1.54	0.12
W Physical ON				
H Psychological	0.09	0.06	1.46	0.14
W Psychological	0.52	0.06	8.40	<.01
Couple behavior	-0.09	0.03	-2.68	0.01
Risk and Psychological IPV to Physical IPV				
H Physical ON				
H Psychological	0.30	0.07	4.02	<.01
W Psychological	0.28	0.07	4.20	<.01
Couple risk	0.08	0.04	2.32	0.03
W Physical ON				
H Psychological	0.08	0.06	1.25	0.21
W Psychological	0.55	0.06	8.73	<.01
Couple risk	0.10	0.04	2.46	0.01

Note. H = husband; W = wife; IPV = intimate partner violence. Estimate values from overall model represent standardized coefficients that can be interpreted as effect sizes (STDYX output). "Behavior" variable is a latent variable; all other variables are observed variables.

Aim 1: Do Adaptive Behavioral Processes Moderate the Association Between Psychological IPV and Physical IPV?

As seen in Table 3 and Figure 1, the behavior-by-psychological IPV interaction was statistically significant for husbands ($\beta = -0.28, p = .01$) and for wives ($\beta = -0.14, p = .02$). Specifically, for husbands, the positive association between psychological and physical IPV was statistically significant for low ($b = 0.33, p < .01$) and medium behavioral skills ($b = 0.15, p < .01$) and statistically nonsignificant for high behavioral skills ($b = -0.03, p = .71$). For wives, the positive association between psychological and physical IPV was significant for all behavioral skills levels ($b = 0.66, 0.52, \text{ and } 0.37, \text{ all } p < .01$ for low, medium, and high behavioral skills, respectively; see Figure 2). To test whether the interaction effect differed between husbands versus wives, we constrained the two interaction paths to be equal and tested whether there was a significant decrease in model fit. There was no statistically significant decrease in fit, indicating that sex did not moderate the interaction effect ($TRd = 0.37, p = .54$).

Aim 2: Does Sociodemographic Risk Moderate the Association Between Psychological IPV and Physical IPV?

As seen in Table 3 and Figure 1, the risk-by-psychological IPV interaction was statistically significant for husbands ($\beta = 0.30, p = .02$) but not for wives ($\beta = 0.14, p = .20$). Specifically, for husbands, the positive association between psychological and physical IPV was statistically nonsignificant for low risk couples ($b = 0.09, p = .07$) and statistically significant for medium risk ($b = 0.17, p < .01$) and high risk ($b = 0.25, p < .01$) couples. For wives, the positive association between psychological and physical IPV was statistically significant for all risk levels ($b = 0.49, 0.56, \text{ and } 0.63, \text{ all } p < .01$ for low, medium, and high risk, respectively; see Figure 2). To test whether the interaction effect differed between husbands and wives, we constrained the two interaction paths to be equal and tested whether there was a significant decrease in model fit. There was no statistically significant decrease in fit, indicating that gender did not moderate the interaction effect ($TRd = 0.05, p = .82$).

Aim 3: Do Results Hold When Controlling for the Alternative Moderator Effect and for Relationship Satisfaction?

Under Aim 3 we reran the Aim 1 and 2 models, while also controlling for the alternative interaction term and relationship satisfaction. The pattern of results remained unchanged in both instances. We then computed a new model that included both interaction terms and relationship satisfaction simultaneously; results again remained unchanged (see Table 3).

Discussion

Verbal hostility is common among intimate partners, yet only some of these psychologically aggressive couples also engage in acts of physical aggression. Why might this be? One line of research and theory asserts that basic skills in communication will

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Table 3
Results of Moderation Analyses Examining the Effects of Psychological IPV, Behavior, and Risk on Physical IPV

Regression path	Behavior as a moderator				Risk as a moderator			
	Estimate	SE	Est./SE	p-value	Estimate	SE	Est./SE	p-value
No covariates								
H Physical ON								
Intercept	-0.25	0.05	-4.85	<.01	-0.21	0.07	-2.86	<.01
H Psychological	0.23	0.07	3.52	<.01	0.12	0.08	1.43	.15
W Psychological	0.27	0.07	3.92	<.01	0.31	0.07	4.59	<.01
Moderator	0.18	0.07	2.46	.01	-0.07	0.06	-1.30	.19
H Psych × Moderator	-0.28	0.10	-2.77	.01	0.30	0.12	2.40	.02
W Physical ON								
Intercept	-0.22	0.06	-4.01	<.01	-0.28	0.08	-3.62	<.01
H Psychological	0.07	0.06	1.15	.25	0.07	0.06	1.12	.26
W Psychological	0.51	0.06	8.76	<.01	0.49	0.09	5.41	<.01
Moderator	0.04	0.05	0.76	.45	0.02	0.05	0.40	.69
W Psych × Moderator	-0.14	0.06	-2.30	.02	0.14	0.11	1.29	.20
Simple slopes								
H Low moderator	0.33	0.09	3.75	<.01	0.09	0.05	1.73	.08
H Medium moderator	0.15	0.05	3.28	<.01	0.17	0.05	3.54	<.01
H High moderator	-0.03	0.09	-0.38	.71	0.25	0.07	3.76	<.01
W Low moderator	0.66	0.11	6.06	<.01	0.49	0.10	4.77	<.01
W Medium moderator	0.52	0.08	6.66	<.01	0.56	0.09	6.44	<.01
W High moderator	0.37	0.09	3.99	<.01	0.63	0.10	6.29	<.01
Satisfaction as a covariate								
H Physical ON								
Intercept	-0.68	0.20	-3.48	<.01	-0.33	0.22	-1.53	.13
H Psychological	0.23	0.06	3.78	<.01	0.12	0.08	1.48	.14
W Psychological	0.25	0.06	3.96	<.01	0.31	0.07	4.61	<.01
Moderator	0.14	0.08	1.78	.08	-0.07	0.06	-1.18	.24
H Psych × Moderator	-0.25	0.10	-2.45	.01	0.29	0.12	2.36	.02
H Satisfaction	0.09	0.04	2.14	.03	0.03	0.04	0.59	.56
W Physical ON								
Intercept	-1.76	0.13	-13.12	<.01	-0.74	0.16	-4.60	<.01
H Psychological	0.11	0.06	2.06	.04	0.09	0.06	1.38	.17
W Psychological	0.42	0.06	7.47	<.01	0.48	0.09	5.35	<.01
Moderator	-0.07	0.05	-1.22	.22	0.03	0.05	0.53	.60
W Psych × Moderator	-0.10	0.05	-1.90	.06	0.15	0.11	1.38	.17
W Satisfaction	0.35	0.03	11.92	<.01	0.10	0.03	3.23	<.01
Simple slopes								
H Low moderator	0.33	0.09	3.68	<.01	0.09	0.05	1.79	.07
H Medium moderator	0.16	0.05	3.50	<.01	0.17	0.05	3.60	<.01
H High moderator	-0.01	0.09	-0.12	.91	0.25	0.07	3.79	<.01
W Low moderator	0.61	0.10	5.85	<.01	0.48	0.10	4.76	<.01
W Medium moderator	0.49	0.08	6.25	<.01	0.55	0.09	6.45	<.01
W High moderator	0.38	0.10	3.90	<.01	0.63	0.10	6.32	<.01
Behavior/Risk as a covariate								
H Physical ON								
Intercept	-0.31	0.07	-4.52	<.01	-0.19	0.07	-2.59	.01
H Psychological	0.23	0.07	3.41	<.01	0.11	0.08	1.38	.17
W Psychological	0.28	0.07	4.03	<.01	0.30	0.07	4.53	<.01
Moderator	0.19	0.07	2.58	.01	-0.08	0.06	-1.46	.14
H Psych × Moderator	-0.28	0.10	-2.72	.01	0.30	0.12	2.40	.02
H Behavior/Risk	0.05	0.04	1.46	.15	-0.05	0.04	-1.22	.22
W Physical ON								
Intercept	-0.32	0.07	-4.40	<.01	-0.24	0.08	-3.07	<.01
H Psychological	0.05	0.06	0.90	.37	0.07	0.06	1.04	.30
W Psychological	0.53	0.06	8.96	<.01	0.48	0.09	5.33	<.01
Moderator	0.05	0.05	1.01	.31	0.01	0.05	0.13	.90
W Psych × Moderator	-0.14	0.06	-2.25	.02	0.14	0.11	1.32	.19
W Behavior/Risk	0.08	0.04	2.08	.04	-0.08	0.03	-2.39	.02
Simple slopes								
H Low moderator	0.32	0.09	3.64	<.01	0.08	0.05	1.70	.09
H Medium moderator	0.14	0.05	3.19	<.01	0.17	0.05	3.50	<.01
H High moderator	-0.04	0.08	-.42	.68	0.25	0.07	3.72	<.01

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Table 3 (continued)

Regression path	Behavior as a moderator				Risk as a moderator			
	Estimate	SE	Est./SE	p-value	Estimate	SE	Est./SE	p-value
W Low moderator	0.67	0.11	6.10	<.01	0.48	0.10	4.73	<.01
W Medium moderator	0.53	0.08	6.71	<.01	0.55	0.09	6.38	<.01
W High moderator	0.39	0.09	4.13	<.01	0.62	0.10	6.23	<.01

Note. H = husband; W = wife; IPV = intimate partner violence. Estimate values from overall model represent standardized coefficients that can be interpreted as effect sizes (STDYX output). Simple slope estimates are not available in STDYX output and thus represent unstandardized coefficients. "Behavior" variable is a latent variable; all other variables are observed variables.

enable some couples to avoid or exit situations marked by frustration and intense emotion, whereas less skilled couples will struggle to navigate these same situations, de-escalate their negative exchanges at a slower rate, and engage in acts of physical violence. A second tradition, not necessarily at odds with the first, instead situates couples within the larger set of social and economic forces that impinge upon them, asserting that psychologically aggressive couples are more likely to be physically aggressive to the extent they are underresourced and compromised by chronic economic strain and social isolation. After replicating the robust association between psychological and physical IPV in a sample of ethnically diverse couples living with low incomes, we obtained evidence for both explanations, thus providing (a) grounds for integrating behavioral and socioeconomic models of risk for physical aggression (Karney & Bradbury, 1995); and (b) justification for identifying risky couples on the basis of their communication skills and social disadvantage, and for actively targeting both domains in preventive efforts.

Our primary finding is that the association between psychological and physical IPV is stronger among couples who display lower-quality communication (that is, less positivity, more negativity, and less effectiveness) and among husbands who report greater levels of socioeconomic disadvantage (as indexed by, e.g., education, income, employment). Effects remained intact after controlling for the alternative interaction term (thus documenting their independent effects), and after controlling for relationship satisfaction (thus indicating that spouses' global appraisals of the relationship were not inflating associations). In short, whereas *main effects* relating observed behavior and socioeconomic risk to physical IPV are rela-

tively weak, we see consistent evidence that these two variables moderate the psychological-to-physical IPV association, thereby serving to specify two key conditions that may govern expression of potentially harmful physical acts in intimate relationships.

Results were similar but not identical for husbands and wives. Communication operated as a reliable moderator for husbands and for wives, but the moderating effect of sociodemographic risk differed reliably from zero only for husbands. On one hand, the failure of sociodemographic risk to moderate effects among wives might reflect a greater tendency for men to be exposed to discrimination or the demands of lower-wage jobs (e.g., because men in this sample were more likely than women to work outside the home). On the other hand, it is important to point out that effects were consistently larger among wives than husbands. Moreover, among couples with the highest communication quality, slope effects were nonsignificant for husbands but reliable for wives. These findings hint at the possibility that wives' IPV may be more responsive to interpersonal and extradyadic influences, and future work is needed to corroborate this possibility. The overarching conclusion, however, is that verbal aggression covaries with physical violence when communication quality is low and sociodemographic risk is high, with no formal evidence of moderation by gender.

Limitations

Although observational data, dyadic data, 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. Perhaps the greatest limitation of this work is our reliance

Table 4
Model Fit Indices for Structural Equation Models

	Log	AIC	BIC	Adj. BIC	ChiSqu (df)	RMSEA	SRMR
Main effect models							
Psychological IPV to Physical IPV	-2652.74	5333.47	5390.40	5345.97	0.00 (0)*	0.00*	0.00
Behavior and Psychological IPV to Physical IPV	-5119.29	10310.57	10456.95	10342.71	361.68 (29)*	0.16*	0.11
Risk and Psychological IPV to Physical IPV	-2649.22	5330.44	5395.50	5344.72	8.33 (2)*	0.09	0.02
Interaction models							
Behavior as moderator (No Covariates)	-5104.40	10284.79	10439.31	10318.72	—	—	—
Behavior as moderator (Satisfaction as a Covariate)	-5920.85	11941.70	12145.01	11986.34	—	—	—
Behavior as moderator (Risk as a Covariate)	-5102.17	10284.35	10446.99	10320.06	—	—	—
Risk as moderator (No Covariates)	-2642.34	5320.68	5393.87	5336.74	438.38 (8)*	0.35*	0.20
Risk as moderator (Satisfaction as a Covariate)	-3417.72	6893.43	7011.35	6919.32	613.05 (16)*	0.29*	0.17
Risk as moderator (Behavior as a Covariate)	-5109.62	10299.25	10461.89	10334.95	1123.52 (55)*	0.21*	0.17

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; IPV = intimate partner violence; SRMR = standardized root mean residual; RMSEA = root mean square error of approximation.

* p < .05.

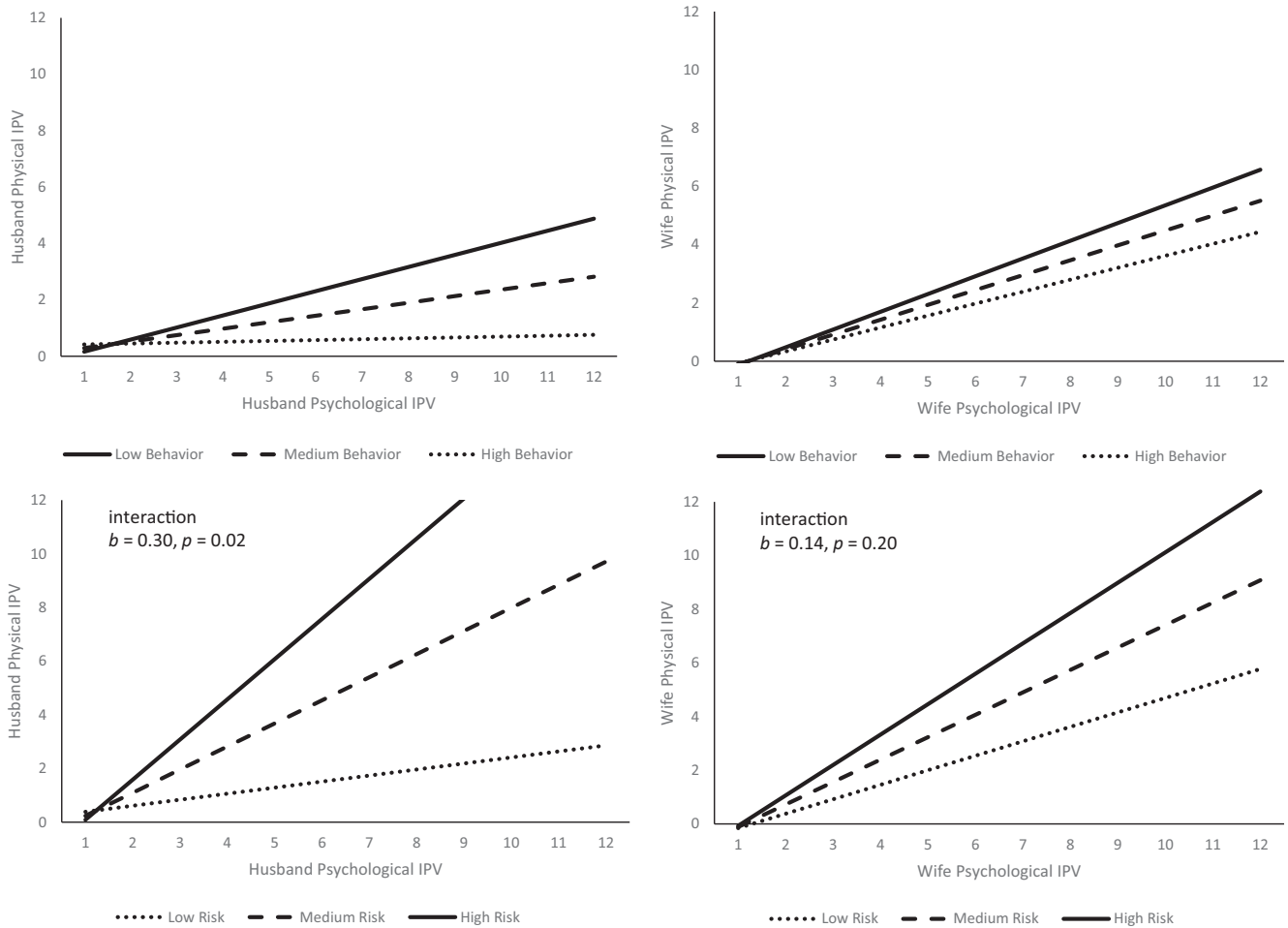


Figure 2. Couple behavior and sociodemographic risk as moderators of the association between husband and wife psychological and physical aggression. The lines above portray standardized coefficients.

on cross-sectional data, preventing conclusions about any causal relationships. However, by focusing on hypothesized moderators, our primary emphasis was not on causal relationships but on the relational and environmental conditions under which psychological and physical aggression are most closely associated. Furthermore, the directional order of psychological to physical IPV is in line with the literature (e.g., Saint-Eloi Cadely et al., 2020), strengthening confidence in the present results. Second, although we did take steps to reduce underreporting of IPV, IPV was assessed via self-report and may be subject to uncontrolled biases due to couples' discomfort in discussing such a sensitive topic. Furthermore, bias may have been introduced as 60% of the eligible couples were never reached, potentially excluding couples in more dysfunctional relationships. Third, generalization of our findings is as yet unknown, and we cannot say whether these results would apply to dating couples, couples in more established relationships, or same-sex couples. Similarly, it is unclear whether our results would generalize to higher income couples. Couples from low-income communities, as represented in the current research, may be particularly susceptible to effects of sociodemographic risk and communication skills; future research may benefit from exploring

whether the moderating effects of these two variables on the association between psychological and physical IPV remains among couples of different sociodemographic strata. It is important to note that our assessment of psychological and physical IPV was based on only three and four items, respectively, and that relatively few couples engaged in severe levels of psychological IPV. Therefore, it is unknown whether the current results would generalize to couples with higher levels and severity of aggression and violence. Finally, although our choice of controlling for underreporting of IPV by choosing the highest score of partners' reported IPV is supported by prior research (e.g., Salis et al., 2014) and provides a more conservative approach, results might look differently with another analytic choice (e.g., averaging partners' reports).

Research Implications

Notwithstanding these limitations, the present findings may have implications for understanding the association between psychological and physical IPV. In trying to tease apart how hostile verbal exchanges become physical, previous research has called

for integration across socioecological levels of analysis (Capaldi et al., 2004). However, the specifics for such an integration remain unclear, as few studies link factors at different socioecological levels. We provide some of these specifics, suggesting that IPV may need to be conceptualized differently than previously thought. Rather than focusing on main effects of risk on IPV, focusing on moderated effects in the association between psychological and physical IPV may be more important. We show that verbally aggressive couples are most likely to also be physically aggressive when their communication skills are relatively low and their level of sociodemographic disadvantage is relatively high. Critically, these two levels of analysis are independent of one another, showing that poor communication skills and sociodemographic strain, each on their own, may influence whether psychological and physical IPV covary.

The current work did not document specific instances when psychological aggression either did or did not eventuate into acts of physical aggression as a function of the moderators tested. Our findings set the stage for such work. For example, future studies could include (a) diary studies that track instances of escalation of aggression for various types of couples; and (b) experimental studies in which moderators are manipulated (e.g., via communication skills or stress management training) and pretest effects of the intervention on the escalation of aggression are examined. Furthermore, future work may be aimed at examining alternative models using longitudinal data. For example, it could be that factors such as communication skills and sociodemographic risk contribute to increased psychological aggression, which in turn leads to physical IPV.

Prevention and Clinical Implications

With regard to intervention, findings support efforts to improve couple communication. However, given that the moderating effects of communication and sociodemographic strain were independent of one another, focusing on communication alone may not be sufficient, because even partners with strong communication skills, when exposed to stressful environments, will be at risk for violence escalation. For these partners, greater appreciation of the harsh contexts they find themselves in will be of utmost importance. We conclude that in addition to behavioral skills training, which is already a component in many programs, efforts that reduce economic hardship and stress, such as support in the form of financial assistance, Medicaid, and financial education (Matjasko et al., 2013), may have the potential to prevent IPV. In fact, it may be easier to prevent escalation of violence by identifying at-risk couples than to modify violent behavior once it has started. Targeted prevention efforts, specifically focusing on high-risk couples, such as those living in low-income, high-crime environments, may be indicated.

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