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The Actor-Partner Interdependence Model in the Study of Aggression and Victimization within Couples: An Empirical Examination in 361 Dyads

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ABSTRACT

Studies of intimate partner violence (IPV) have generally focused on only one partner. Although this has allowed advances in scientific knowledge on the causes of IPV, currently recent literature is demanding the need to study both members of the couple. Methodologically, the study of dyads requires the use of appropriate statistical techniques to avoid possible systematic biases (for example, type I error due to dependence of observations). We used the Actor-Partner Interdependence Model to study aggression and victimization in 361 heterosexual couples of young adults. The results indicated, on the one hand, that self-reported mutual aggression was found in more than 50% of the couples. On the other hand, we found that participants' victimization was largely predicted by their own aggressive behavior towards the other member of the couple. While this result suggests the existence of a victim-offender overlap, it may also hide an upwards victimization scores bias: when participants are aggressive toward their partners, they may bias their victimization scores upwards to justify their levels of aggression ("I was aggressive because I felt victimized").

El modelo de interdependencia actor-pareja en el estudio de la agresión y la victimización en la pareja: un estudio empírico de 361 díadas

RESUMEN

Los estudios sobre la violencia de pareja (en inglés IPV) generalmente han centrado sus análisis sólo en uno de los miembros. Aunque esto ha permitido avanzar en el conocimiento de las causas de la IPV, la literatura reciente ha señalado la necesidad de estudiar a los dos miembros de la pareja. Metodológicamente el estudio de las parejas requiere el uso de técnicas estadísticas apropiadas para evitar posibles sesgos sistemáticos (por ejemplo, error tipo I debido a la dependencia de las observaciones). En este estudio utilizamos el modelo de interdependencia actor-pareja para el estudio de la agresión y la victimización en 361 parejas jóvenes heterosexuales de jóvenes adultos. Los resultados indicaban, por una parte, que había agresión mutua autoinformada en más de la mitad de las parejas. Por otro lado, encontramos que el principal predictor de la victimización de los participantes fue su propio comportamiento agresivo hacia el otro miembro de la pareja. Este resultado sugiere que la víctima y el agresor son la misma persona. Sin embargo, también puede ocultar un posible sesgo al alza de las puntuaciones de victimización: cuando los participantes son agresivos con sus parejas, pueden sesgar al alza sus puntuaciones de victimización para justificar sus niveles de agresión ("Fui agresivo porque me sentí victimizado").

Palabras clave:

Violencia de pareja
Modelo de interdependencia actor-pareja
Sesgo de autoinforme
Discrepancia agresión-victimización
Agresión mutua

After more than four decades of study, now there is strong empirical evidence available to researchers on the main correlates of IPV against women. These correlates are in personal, family, community, and even socio-structural domains. The members of the couple may present individual characteristics that make them prone to the use of IPV (Capaldi & Kim, 2007; Cavanaugh & Gelles, 2005). Aspects such as their personality profile, with a special incidence of

cluster-B personality profile, which includes narcissistic, antisocial, histrionic, and borderline personality, have been associated with IPV (Cascardi et al., 2018; Fernández-Suárez et al., 2018; Juarros-Basterretxea et al., 2018; López-Ossorio et al., 2018; Spencer et al., 2019). In addition, the role played by gender attitudes in explaining IPV has been emphasized, pointing out at sexist attitudes as an important correlate of IPV (Juarros-Basterretxea et al., 2019; Juarros-

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Basterretxea et al., 2018; Lila et al., 2019; Martín-Fernández et al., 2018).

There is also empirical evidence of the predictive potential of the aggressive nature of the members of the couple as a candidate to explain episodes of IPV (Herrero, Torres, et al., 2017). Alcohol and substance use and abuse have also been empirically linked to IPV (Juarros-Basterretxea et al., 2020; Cafferky et al., 2018, for a meta-analytic review) both at the time of a violent incident and as a distal correlate.

As far as family relations are concerned, researchers have traditionally focused on studying the influence of the family of origin on IPV in adulthood. As Herrero et al. (2016) noted, family of origin might be a source of poor parenting skills, antisocial modeling, socioeconomic deprivation, and low attachment between child and parents that might be linked to partner violence. Of particular relevance in this area are studies that empirically link abuse in childhood with both IPV victimization and perpetration in adulthood (Gracia et al., 2017; Herrero, Torres, et al., 2018; Tolan et al., 2006).

As for community context, empirical evidence on the ecology of partner violence (Voith, 2019) suggests that disadvantaged communities might influence IPV (Arbach & Bobbio, 2018; Gracia et al., 2015; Pinchevsky & Wright, 2012), due to its ability to make its residents more vulnerable (higher stress, social alienation, etc.). Studies that have focused on the influence of socio-structural variables on IPV have indicated how structural inequalities could have a positive effect on IPV rates (Herrero, Rodríguez-Díaz, et al., 2017; Herrero, Torres, et al., 2017; Herrero, Torres, et al., 2018; Herrero, Vivas, et al., 2018).

Most of these studies have focused on data from only one of the members of the couple, however, so they are opaque to the type of interaction that occurs in the couple and that might explain the rates of IPV. Although these studies have allowed a better understanding of the complex phenomenon of partner violence, they provide only a partial view of the problem: that of the participant analyzed. To overcome this limitation, studies analyzing partner violence attending to the two members of the couple are becoming more frequent. While this strategy provides a more reliable estimation of IPV prevalence, it also allows for the analysis of the potential bidirectionality of violence (Cunradi et al., 2009; Riesgo-González et al., 2019; Yoshikawa et al., 2018).

Mutual IPV

Studies on mutual IPV using representative (often probabilistic) national samples of the general population show equal IPV rates for men and women (Langhinrichsen-Rohling et al., 2012, for a review of studies)—with some exceptions depending on the type of aggression (sexual and physical)—although these men and women may not belong to the same couples (see also, Anderson, 2002; Caetano et al., 2005; Field & Caetano, 2005; Hamberger, 2005; Sullivan et al., 2005).

Less research effort has been directed to the analysis of both partners of the couple, despite the fact that the study of dyads allow a more fine-grained analysis of the bidirectional nature of violence. Many dyad studies examine the role certain background characteristics of members (problematic drinking, self-control, personality, family of origin relationships, etc.) have in both their own victimization and that of their partners (Leone et al., 2016; Quigley et al., 2018; Rodríguez et al., 2013; see Dokkedahl, & Elkliit, 2019, for a review). The study of the relationship between partners' aggression and victimization is a much more neglected topic in the literature (Brousseau et al., 2011; Marcus, 2012). For example, violence of one member generates victimization and/or violence on the other member.

Studies of couples have found a certain disparity between perceptions of members' views (Straus, 2015). Research in this area

explains potential disagreement in members' views as a kind of bias. This bias might stem from a cognitive process such as encoding or recall, but it might be a consequence of social desirability (Freeman et al., 2015; Yoshikawa et al., 2018). Thus, members of the couple predictably do not disclose all aggression. These circumstances suggest caution in interpreting self-reported rates of IPV perpetration and victimization and require new tools to analyze IPV statistically.

A Note on the Dyadic Analysis of IPV

When behaviors of the members of the couple are interdependent (A's aggression on B may be a consequence of previous B's aggression on A), mutual IPV cannot be analyzed statistically in the same way as unidirectional IPV (ANOVA, multiple linear regression, etc.). Violation of the assumption of independence of observations in these techniques may bias statistical inference because of the increased probability of Type I error (rejection of a true null hypothesis). One way to deal with non-independence of observations in dyadic analysis could be the use of all the information of individuals but consider them nested within dyads (Cook & Kenny, 2006). The Actor-Partner Interdependence Model (APIM; Kenny, 1996) allows these types of analyses by considering two types of effects: actor and partner. The study of aggression and victimization within the couple involves two actor effects: a) the effect of the violence of A over B in the victimization of A and b) the effect of the violence of B over A in the victimization of B. Two partner effects are also identified: a) the effect of the violence of A on B in the victimization of B and b) the effect of the violence of B on A in the victimization of A (see Figure 1).

Actor effects are the effects of a person's own characteristics on his or her own outcomes, and partner effects are the effects of a partner's characteristics on a person's outcome. Actor effects thus refers to the relationship between each member's own rates of IPV aggression and victimization.

Criminological studies label this relationship as victim-offender overlap and it has been empirically verified across a number of types of offenses, including IPV (Jennings et al., 2012; Taylor et al., 2019). Straus (2012) synthesized four reasons for the existence of mutual aggression or victim-offender overlap in the couple. First, aggression begets aggression (reciprocity); second, members may respond with greater aggressiveness than that received (escalation); third, the aggressive behavior of one member serves as a model for the behavior of the other member (modeling); and, lastly, the members of the couple share risk and protective factors that equally influence their (aggressive) behaviors.

The upwards Victimization Scores Bias

We propose an alternative yet complementary type of explanation by which mutual aggression also hides a methodological nuance: "upwards victimization scores bias". Part of the covariation between the self-reported rates of IPV aggression and victimization of each member may reflect the fact that they try to make congruent his/her own scores on IPV aggression and victimization. Thus, when members recognize being aggressive with their partner they might try to bias their victimization scores upwards to justify their own aggressive behaviors ("I am aggressive because I feel victimized"). This mechanism of cognitive justification of the aggressive behavior can lead partners to try to match their self-reported levels of aggression and victimization, thereby artificially increasing their covariation. Because of this bias, the members of the couple will present higher levels of IPV victimization under conditions of high IPV perpetration. However, their IPV victimization levels will be systematically lower when they are not aggressive in turn, even if their partners admit to being aggressive with them. In his research on patterns of IPV within

1,294 couples from the National Longitudinal Study of Adolescent Health (Add Health), Marcus (2012) found that self-reported IPV perpetration and victimization presented a larger covariation (Pearson correlation = .67-.72, $p < .001$) than actor aggression and partner victimization (Pearson correlation = .34-.37, $p < .001$). That is, the variation in victimization scores was influenced more by own self-reported aggression than by partners' self-reported aggression. This undoubtedly points to the existence of mutual violence in the couple, but does not exclude the incidence of systematic bias in self-reported levels of IPV perpetration and victimization. Therefore, it is worth considering this potential bias in IPV research in order to make IPV victimization measures more accurate. This is one aspect in which this research seeks to deepen.

We used APIM to study aggression and victimization in 361 heterosexual young couples belonging to the general population. Our objective was threefold: a) to better estimate IPV distribution in couples, b) to compare actor and partner effects using APIM, and c) to assess the existence of potential systematic biases related to the need of participants to make their scores in aggression and victimization consistent.

Method

Participants

Participants were recruited from a Spanish university campus. Student participants who were currently in a relationship were asked to invite their partners to participate in the study. Three conditions had to be fulfilled to participate: (i) people had to be engaged in a heterosexual relationship at the time of participation, (ii) they had to be involved in this relationship for at least 1 month, and (iii) both partners had to be willing to participate.

Three hundred and sixty-one heterosexual couples participated in this study. Women's mean age was 21.96 years ($SD = 2.79$), whereas the men's mean age was 23.30 years ($SD = 3.18$). The length of the relationship was measured in months ($M = 34.80$, $SD = 32.20$).

Variables

Aggression and victimization. We used CUVINO-VA (*Cuestionario de Violencia entre Novios-Víctima/Agresor* in Spanish) to evaluate levels of aggression and victimization among members of the couple. CUVINO-VA is an extension of DVQ-R (Dating Violence Questionnaire- Revised; Rodríguez-Díaz et al., 2017) to measure perpetration. Participants were asked whether they had suffered any aggressive behavior on the part of their partners and if they had committed such behaviors on their partners. CUVINO-VA consists of 20 items grouped into five dimensions: detachment, coercion, humiliation, sexual, and physical. For each of the dimensions, four items measure both victimization and perpetration. Detachment: victimization (Cronbach's $\alpha = .70$) ("Your partner does not acknowledge any responsibility regarding the relationship or what happens to both of you") and perpetration (Cronbach's $\alpha = .71$) ("You do not acknowledge any responsibility regarding the relationship or what happens to both of you"). Coercion: victimization (Cronbach's $\alpha = .72$) ("Your partner 'tests' your love, setting traps to find out if you are cheating") and perpetration ("You 'test' your partner's love, setting traps to find out if he/she is cheating") (Cronbach's $\alpha = .70$). Humiliation: victimization ("Your partner ridicules your way of expressing yourself") (Cronbach's $\alpha = .71$) and perpetration ("You ridicule the way your partner expresses himself/herself") (Cronbach's $\alpha = .65$). Sexual: victimization ("Your partner forces you to undress even if you do not want to") (Cronbach's $\alpha = .72$) and perpetration ("You force your partner to undress even if s/he does not want to") (Cronbach's $\alpha = .74$). Physical: victimization ("Your partner

has hurt you with an object") (Cronbach's $\alpha = .76$) and perpetration ("You have hurt your partner with an object") (Cronbach's $\alpha = .71$). Category responses ranged from 0 = *never* to 4 = *almost always*. We summed and averaged item scores for each dimension. CUVINO-VA dimensions were also combined into two measures of aggression and victimization for men and women: psychological and general. Psychological aggression (Cronbach's $\alpha = .75$) and victimization (Cronbach's $\alpha = .71$) was obtained by adding the scores of detachment, coercion, and humiliation. General aggression (Cronbach's $\alpha = .81$) and victimization (Cronbach's $\alpha = .75$) were obtained by adding the scores in CUVINO-VA's five dimensions. Table 2 presents the detailed distribution of the scores of CUVINO-VA's dimensions and their combined measures in four different types of couples.

Procedure

After informing all participants of the nature of the study, the procedure used to guarantee anonymity was explained to them. A separate battery of tests was then applied to each member of the couple. Each member of the couple verified for themselves that they could not be identified later.

APIM Analyses

APIM uses structural equation modeling (SEM) techniques to calculate actor and partner effects. APIM takes the form of a cross-lagged model, although it does not necessarily incorporate variables at different time points: the exogenous variables predict endogenous variables and both are correlated. APIM allows estimation of specific effects of each of exogenous variables on dependent variables (actor and partner effect). Initial APIM is a saturated model (with zero degrees of freedom) whose statistical significance cannot be evaluated. Subsequent imposition of equality constraints (for example, between the effects of actor and partner) allows increasing degrees of freedom; therefore, its statistical significance can be tested. The likelihood ratio test (LRT) allows for comparison of more restricted models with less restricted models. Given that dyads were considered distinguishable (one male and one female member), standard procedures used in previous studies were followed in this analysis (Gareau et al., 2016).

Results

Social Desirability

We carried out a pilot study with 48 of the original couples in which social desirability was also assessed through Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1961). Means for women ($M = 29.87$, $SD = 4.84$) and men ($M = 30.75$, $SD = 4.50$) were approximately equal, $t(64) = -0.65$, $p = .52$, suggesting that potential systematic bias due to social desirability would be similar across sex.

We checked whether CUVINO-VA dimensions were statistically related to social desirability using linear regression techniques. These analyses were performed separately for women and men. For victimization, none of the CUVINO-VA dimensions significantly predicted social desirability scores for women, and social desirability was related to underreporting sexual victimization in men ($\beta = -.45$, $p = .02$). For aggression, social desirability was related to underreporting sexual aggressions in women ($\beta = -.51$, $p = .01$). None of the CUVINO-VA dimensions of aggression significantly predicted social desirability scores for men.

As for combined measures of victimization and aggression, we found only that women underreported psychological aggression at higher levels of social desirability ($\beta = -.42$, $p = .04$). For general

Table 1. Percentages of Types of Aggressive Couples ($N = 361$)

	Detachment	Coercion	Humiliation	Physical	Sexual	Psychological ¹	General ²
Non-aggressive	31.3	44.4	46.2	81.2	70.8	19.6	18.6
Female-only	18.2	17.4	14.1	9.0	5.4	15.0	14.8
Male-only	19.0	10.3	15.8	3.3	18.8	11.7	11.2
Mutual	31.5	27.8	23.9	6.5	4.9	53.7	55.3

Note.¹Psychological aggression combines scores on detachment, coercion, and humiliation.

²General aggression combines all five types of aggression.

aggression, none of the relationships reached statistical significance. Taken together, these results suggested no systematic bias of social desirability in CUVINO-VA scores.

Types of Couple violence

We classified couples into four types according to their levels of aggression in each of the five dimensions provided by CUVINO-VA: detachment, coercion, humiliation, physical, and sexual aggression. We also classified couples according to their levels of psychological and general aggression scores. Mutual aggression: couples in which

both members admitted to being aggressive to each other. Male-only: couples in which the man admitted to having carried out aggressive behaviors but the woman did not. Female-only: couples in which the woman admitted to having carried out aggressive behaviors but the man did not. Non-aggressive: couples in which none of the members reported aggressive behaviors towards the other. Table 1 summarizes percentages of couples in each category for the five dimensions of CUVINO-VA as well as psychological and general aggression scores. Physical and sexual aggression were not frequent among participants (81.2% and 70.8% of couples did not recognize these respective types of violence against their partners).

Table 2. Results from MANOVAs and ANOVAs of Aggression and Victimization Scores across Types of Couples ($N = 361$)

	Mean (Standard Deviation)				Wilk's (partial η^2)
	Mutual aggression	Female-only	Male-only	Non-aggressive	
Detachment					.28 (.35)
Male victimization	0.43 (0.43) ^a	0.20 (0.34) ^b	0.37 (0.49) ^a	0.10 (0.21) ^b	
Female victimization	0.69 (0.55) ^a	0.31 (0.48) ^b	0.27 (0.47) ^b	0.08 (0.19) ^c	
Male aggression	0.58 (0.41) ^a	0.00 (0.00) ^c	0.40 (0.26) ^b	0.00 (0.00) ^c	
Female aggression	0.55 (0.44) ^a	0.40 (0.25) ^b	0.00 (0.00) ^c	0.00 (0.00) ^c	
Coercion					.17 (.45)
Male victimization	0.68 (0.61) ^a	0.21 (0.30) ^c	0.39 (0.35) ^b	0.06 (0.17) ^d	
Female victimization	0.47 (0.40) ^a	0.32 (0.45) ^b	0.12 (0.22) ^c	0.06 (0.16) ^c	
Male aggression	0.55 (0.37) ^a	0.00 (0.00) ^c	0.37 (0.20) ^b	0.00 (0.00) ^c	
Female aggression	0.51 (0.28) ^a	0.43 (0.22) ^b	0.00 (0.00) ^c	0.00 (0.00) ^c	
Humiliation					.17 (.45)
Male victimization	0.47 (0.36) ^a	0.08 (0.15) ^b	0.34 (0.41) ^a	0.07 (0.17) ^b	
Female victimization	0.43 (0.39) ^a	0.29 (0.31) ^b	0.14 (0.51) ^c	0.06 (0.17) ^c	
Male aggression	0.45 (0.32) ^a	0.00 (0.00) ^c	0.38 (0.40) ^b	0.00 (0.00) ^c	
Female aggression	0.39 (0.22) ^a	0.33 (0.15) ^b	0.00 (0.00) ^c	0.00 (0.00) ^c	
Physical					.07 (.59)
Male victimization	0.54 (0.31) ^a	0.24 (0.26) ^b	0.31 (0.28) ^b	0.03 (0.15) ^c	
Female victimization	0.38 (0.36) ^a	0.14 (0.26) ^b	0.33 (0.56) ^a	0.02 (0.11) ^c	
Male aggression	0.57 (0.28) ^a	0.00 (0.00) ^c	0.44 (0.26) ^b	0.00 (0.00) ^c	
Female aggression	0.50 (0.27) ^a	0.42 (0.25) ^b	0.00 (0.00) ^c	0.00 (0.00) ^c	
Sexual					.11 (.52)
Male victimization	0.19 (0.18) ^a	0.13 (0.22) ^a	0.25 (0.35) ^a	0.03 (0.10) ^b	
Female victimization	0.42 (0.46) ^a	0.33 (0.33) ^b	0.28 (0.37) ^b	0.04 (0.12) ^c	
Male aggression	0.43 (0.20) ^a	0.00 (0.00) ^b	0.51 (0.54) ^a	0.00 (0.00) ^b	
Female aggression	0.41 (0.11) ^a	0.34 (0.20) ^b	0.00 (0.00) ^c	0.00 (0.00) ^c	
Psychological					.45 (.24)
Male victimization	1.14 (0.96) ^a	0.13 (0.22) ^c	0.86 (0.89) ^b	0.21 (0.38) ^c	
Female victimization	1.14 (0.98) ^a	0.66 (0.72) ^b	0.18 (0.32) ^c	0.22 (0.42) ^c	
Male aggression	1.03 (0.85) ^a	0.00 (0.00) ^c	0.58 (0.39) ^b	0.00 (0.00) ^c	
Female aggression	0.97 (0.70) ^a	0.52 (0.33) ^b	0.00 (0.00) ^c	0.00 (0.00) ^c	
General					.50 (.21)
Male victimization	1.40 (1.20) ^a	0.15 (0.34) ^c	1.03 (1.18) ^b	0.22 (0.39) ^c	
Female victimization	1.41 (1.30) ^a	0.77 (0.91) ^b	0.26 (0.52) ^c	0.24 (0.47) ^c	
Male aggression	1.30 (1.22) ^a	0.00 (0.00) ^c	0.64 (0.48) ^b	0.00 (0.00) ^c	
Female aggression	1.14 (0.87) ^a	0.50 (0.29) ^b	0.00 (0.00) ^c	0.00 (0.00) ^c	

Note. $a > b > c$, $p < .05$.

All MANOVAs statistically significant at $p < .001$.

Overall, in each of the five CUVINO-VA dimensions, the most frequent type was the non-aggressive couple. When these dimensions were combined, however, ratios decrease considerably. While separately, percentage of nonviolent couples in each dimension exceeded 30%, combined psychological aggression only registered 19.6% of nonviolent couples. General aggression showed a very similar percentage (18.6%) of nonviolent couples. Percentage of couples with mutual psychological aggression encompassed more than half of the couples in the study (53.7%). Finally, couples with unidirectional aggression (male to female or female to male) represented a lower percentage (approximately 10-20% separately and 11-15% combined for psychological and general aggression).

Next, a series of MANOVAs were carried out to compare levels of aggression and victimization of men and women in each type of couple. These MANOVAs were estimated for each of the five dimensions of CUVINO-VA, as well as for combined psychological and general aggression scores. We present a summary of the MANOVAs in Table 2. MANOVAs' results are presented in the column to the right of the table. For all five dimensions of the CUNINO-VA, effect sizes (partial η^2) were close to medium (from .35 to .59) according to the standards described by Cohen (1977). For the combined measures, effect sizes were smaller (.24 and .21, for psychological and general aggression respectively). These results suggested that victimization and aggression scores clearly differed across types of couples. We also present in Table 2 ANOVA results for each of the five dimensions of CUVINO-VA and the two combined measures of aggression (psychological and general).

A general pattern is observed in Table 2. The highest levels of victimization and aggression for men and women occurred systematically in couples with mutual violence. Second, in couples with unidirectional aggression (from man to woman or from woman to man) levels of victimization were similar, or even greater, in the aggressor than in the victimized member of the couple. Thus, male victimization was greater in only male aggressor couples,

and female victimization was greater in only female aggressor couples. This effect was statistically significant for detachment (although not for females), coercion, humiliation, and physical (although not for males), psychological, and general aggression. Sexual aggression did not reflect this trend: male and female victimization were approximately equal for both members when they were the only aggressors. These results pointed to a bias in the experiences of victimization of the members of the couple when they declared themselves the only aggressors (alternatively, when the other member did not declare himself aggressive). In addition, in conditions of lack of aggression (as is the case of couples in which both members declared themselves non-aggressive) victimization was experienced in both members of the couple, albeit at very low levels.

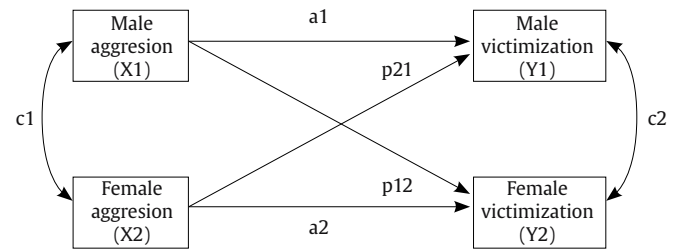


Figure 1. The Actor-Partner Interdependence Model for the Study of Aggression and Victimization within Couples.

Note. a1 = male actor effect; a2 = female actor effect; p12 = male partner effect; p21 = female partner effect; c1= covariation male-female aggression; c2 = covariation male-female victimization.

APIMs

APIMs involve two actor (a) and two partner effects (p) (see Figure 1). Actor effects are one male actor effect, a1 (Y1 on X1) and

Table 3. Summary of Results of APIM Models (N = 361)

	Actor effect	Partner effect	Aggression			Victimization			χ^2 (df)
			Mean	Variance	Covariance	Mean ¹	Variance	Covariance	
Detachment					0.04***			0.00	9.04(5), p = .10
Female	0.52***	0.27***	0.25***	0.13***		0.15***	0.14***		
Male	0.52***	0.27***	0.25***	0.13***		0.07***	0.14***		
Coercion					0.04***			-0.01	3.47(5), p = .62
Female	0.52***	0.22***	0.21***	0.10***		0.07***	0.09***		
Male	0.93***	0.22***	0.21***	0.10***		0.07***	0.09***		
Humiliation					0.02***			-0.02	7.38(5), p = .19
Female	0.55***	0.39***	0.15***	0.05***		0.06***	0.07***		
Male	0.55***	0.39***	0.15***	0.09***		0.06***	0.07***		
Physical					0.02***			-0.00	4.24(6), p = .63
Female	0.31***	0.46***	0.06***	0.04***		0.03***	0.03***		
Male	0.31***	0.46***	0.06***	0.04***		0.03***	0.03***		
Sexual					0.00			0.00	0.45(1), p = .49
Female	0.83***	0.28***	0.03***	0.01***		0.06***	0.05***		
Male	0.31***	0.28***	0.12***	0.10**		0.04***	0.03***		
Psychological					0.29***			0.04	7.87(5), p = .16
Female	0.72***	0.20***	0.61***	0.47***		0.21***	0.43***		
Male	0.72***	0.20***	0.61***	0.64***		0.21***	0.43***		
General					0.47***			0.06	8.27(5), p = .14
Female	0.67***	0.24***	0.73***	1.21***		0.70***	0.03***		
Male	0.67***	0.24***	0.73***	0.70***		0.70***	0.03***		

Note. ¹It is the expected value of victimization after accounting for actor and partner effects.

Explained variances of dependent variables were: detachment (27.3%), coercion (41.3%), humiliation (35.1%), physical (30.7%), sexual (female 19.5%, male 28.7%), psychological (43.5%), and general aggression (44.5%).

** p < .01, *** p < .001.

one female actor effect, a_2 (Y2 on X2). Partner effects, are one male partner effect, p_{12} (Y1 on X2) and one female partner effect, p_{21} (Y2 on X1).

To implement APIMs, we first evaluated a model that imposed several equality constraints across sex: 1) means of aggression and victimization scores, 2) variances of aggression and victimization scores, and 3) the two actor effects ($a_1 = a_2$) and the two partner effects ($p_{12} = p_{21}$). We estimated models using MPLUS 8.2 software. Models showing a poor fit to the data were re-estimated after releasing constraints that were not tenable according to the results of the models. Table 3 presents results of APIMs for each of the five dimensions of CUVINO-VA as well as for the combined measures of psychological and general aggression.

First, all actor and partner effects were statistically significant ($p < .001$) across the five CUVINO-VA's dimensions as well as across combined measures of psychological and general aggression. In only two cases, actor effects were different for men and women: coercion (actor effect, female = 0.52, actor effect, male = 0.93) and sexual aggression (actor effect female = 0.83, actor effect, male = 0.31). All estimated partner effects, were equal for men and women.

Second, means of aggression were also approximately equal across sex, with the exception of sexual aggression where females ($M = 0.03$) scored significantly lower than males ($M = 0.12$, $p < .001$). Means of victimization were also similar for both females and males, with the exception of sexual victimization, for which females ($M = 0.06$) scored significantly higher than males ($M = 0.04$, $p < .05$). Variances of sexual ($0.03 < 0.12$, $p < .001$) and psychological ($0.47 < 0.64$, $p < .001$) aggression scores were also lower for females than for males while variances of victimization were approximately equal for female and male members of the couple, except for sexual aggression (female = 0.05, male = 0.03, $p < .05$). Finally, model R^2 s were moderate, indicating a significant percentage of the variance of dependent variables was explained by the model (see Note on Table 3), ranging from 19.5% for female sexual victimization to 44.5% for general aggression.

Results of these models suggest that aggressive behaviors of both partners not only appear to be of similar magnitude but also probably exert a similar effect on the experience of victimization of the other member.

We further tested models with the full equality of actor and partner effects ($a_1 = a_2 = p_{12} = p_{21}$). These models showed a poor fit to the data except for the case of physical aggression, $\chi^2(7) = 4.90$, $p = .67$, and humiliation, $\chi^2(6) = 5.57$, $p = .47$, where partner and actor effects were approximately equal at 0.38 ($SE = 0.06$, $p < .001$) and 0.47 ($SE = 0.02$, $p < .001$), respectively. In all other dimensions, models with full equality of actor and partner effects showed a poor fit to the data and were not finally retained for further analysis: detachment, $\chi^2(6) = 18.45$, $p < .05$; coercion, $\chi^2(6) = 27.46$, $p < .001$; sexual; $\chi^2(3) = 9.77$, $p < .05$; psychological, $\chi^2(6) = 38.62$, $p < .001$; and general aggression, $\chi^2(6) = 26.15$, $p < .001$.

Aggression scores within the couple significantly covaried, indicating that higher levels of aggression in one partner resulted in higher levels of aggression in the other partner for all of five CUVINO-VA's dimensions as well as for combined measures of psychological and general aggression. The models fully explained covariation of victimization scores for both partners, resulting in a nonsignificant covariation of victimization residual errors.

To test the different patterns of interdependence within the couple, we further estimated the partner effect/actor effect ratio for each member. This estimation was done by creating different k parameters ($k_1 = p_{12}/a_1$ for males and $k_2 = p_{21}/a_2$ for females) through the use of phantom variables (Kenny & Ledermann, 2010). Since k is the ratio of the partner effect to the actor effect, this parameter informs about the importance of partner effect relative to the actor's effect. Given that distribution of the k ratios are likely to be skewed due to their mathematical nature, we followed Kenny and

Ledermann's (2010) suggestion to use a bias-corrected bootstrap 95% confidence interval (CI) to ease interpretation of results.

For detachment, the model showed an almost perfect fit, $\chi^2(3) = 0.48$, $p = .92$. Male ratio ($k_1 = .29$, CI [0.05, 0.67]) was lower than the female ratio was ($k_1 = .69$, CI [0.41, 1.05]), suggesting that the partner effect relative to the actor effect was less relevant for males (29%) than it was for females (69%). For coercion, the model showed a good fit, $\chi^2(4) = 7.81$, $p = .10$. The results of this model showed k_1 (.31) and k_2 (.33) were very similar, so the model was re-estimated by imposing the equality $k_1 = k_2$. This model showed a good fit to the data, $\chi^2(5) = 7.82$, $p = .17$. The likelihood ratio test showed that both models were statistically equivalent, $\Delta\chi^2(1) = .01$, $p = .92$, making the re-estimated model better because of the gain of a degree of freedom. In this re-estimated model k ratio was .33 (CI [0.15, 0.55]). For humiliation, the model showed a good fit, $\chi^2(4) = 9.13$, $p > .05$. The male ratio ($k_1 = .42$, CI [0.06, 1.09]) was lower than the female ratio ($k_2 = .79$, CI [0.15, 1.89]), suggesting that the partner's effect relative to the actor's effect was less relevant for males (42%) than it was for females (79%). For sexual aggression, a fully saturated model was estimated based on the previous results of the APIM for sexual aggression (see Table 3). The male ratio ($k_1 = .68$, CI [0.11, 1.55]) was higher than the female ratio was ($k_2 = .36$, CI [0.23, 0.60]), suggesting that the partner effect relative to the actor effect was more relevant for males (68%) than it was for females (36%). For physical aggression, the model showed a good fit, $\chi^2(4) = 7.55$, $p = .11$. Males' ratio ($k_1 = .52$, CI [0.90, 2.07]) was lower than females' ratio ($k_2 = .64$, CI [2.34, 20.96]), suggesting that the partner effect relative to the actor effect was less relevant for males (52%) than for females (64%).

We also estimated k parameters for the combined measures of psychological and general aggression. For psychological aggression, the model showed a good fit, $\chi^2(4) = 8.40$, $p = .08$. Males' ratio ($k_1 = .15$, CI [0.03, 0.33]) was lower than females' ratio ($k_2 = .32$, CI [0.14, 0.57]), suggesting that the partner effect relative to the actor effect was less relevant for males (15%) than for females (32%). Finally, for general aggression, the model fit was good, $\chi^2(3) = 7.06$, $p = .07$. The results of this model showed k_1 (.24) and k_2 (.32) were similar, so the model was re-estimated by imposing the equality $k_1 = k_2$. This model showed a good fit to the data, $\chi^2(4) = 7.46$, $p = .11$. The likelihood ratio test showed both models were statistically equivalent, $\Delta\chi^2(1) = 0.46$, $p = .50$, making the re-estimated model better because of the gain of a degree of freedom. In this re-estimated model, the k ratio was .33 (CI [0.15, 0.55]).

To summarize, partner effects were smaller in magnitude than actor effects for both men and women (all k 's < 1). This finding suggests that to understand the victimization rates of each member of the couple, the actor effect is more relevant than the partner effect, although both are statistically significant.

These are specific effects: actor effects are estimated controlling for partner effects, and partner effects are estimated controlling for actor effects. Therefore, regardless of the level of aggression disclosed by one member of the couple towards the other member (partner effect), the aggression disclosed by each of the members is largely related to their own experienced victimization (actor effect).

Discussion

The study of causes of IPV has been nourished by different methodological approaches. Most of the empirical studies have been carried out with only one partner, whereas the study of IPV using information on both partners has traditionally been more limited. In the present study, we have analyzed IPV using information on both members of 361 couples. We used APIM statistical approach to take full advantage of the information that both members provided with IPV in the couple. The objectives of our research were focused on analyzing the bidirectionality of the IPV, studying actor and partner

effects, as well as identifying potential systematic biases in self-reported measures of IPV in both members.

The distribution of aggression in couples was analyzed, considering the existence of four types: non-aggressive, only the woman is aggressive, only the man is aggressive, and mutual aggression. We studied the distribution of these couples in the five CUVINO-VA's dimensions as well as in two combined measures: psychological aggression (which included detachment, coercion, and humiliation) and general aggression (which included psychological dimensions, sexual aggression, and physical aggression).

Non-aggressive Couples

The results showed a high percentage of couples in which neither member used a specific form of aggression. This percentage was very high in sexual and physical aggressions (approximately 80%) and somewhat lower in detachment, coercion, and humiliation (approximately 30-46%). The percentage of couples that did not use any form of aggression was, however, much lower (it did not reach 20%). This result suggests that couple members combined their aggressive strategies. For example, although physical and sexual aggression were not common among participants, in four of five couples a member reported some aggressive behavior against their partner.

Unidirectional Aggression

One in four couples was involved in unidirectional aggression and the frequency of this type of aggression was similar in men and women. Men scored higher in unidirectional aggression on detachment and humiliation, while women scored more in unidirectional aggression on coercion and physical aggression. The combined measures (psychological and general aggression) suggest women were more often involved in this type of unidirectional aggression, although the differences with men were small. These results suggest that couple members exercise asymmetric aggression, in which one member plays the role of aggressor and the other acts as victim. It also suggests men are somewhat more likely to be victims of less serious forms of aggression than women (Moffitt & Caspi, 1999; Straus, 2008).

Mutual Aggression

Our results clearly point to the existence of mutual aggression in the couples analyzed, in line with other research (see Strauss, 2015 for a review of studies). When the five dimensions of CUVINO-VA were analyzed separately, mutual aggressions were more frequent in detachment, followed by coercion and humiliation, all approximately 23-31% of couples studied. Mutual physical or sexual aggression were much less frequent (no more than 7%). When frequencies of mutual aggression were analyzed in combined measures (psychological aggression and general aggression), the percentage of couples with mutual aggressions increased considerably (more than 50% of the couples analyzed). Other research has found similar percentages in national samples of the general population (Whitaker et al., 2007; Williams & Frieze, 2005). These results point out, first, that aggression of the two members of the couple was equally frequent and, second, that couples with mutual aggression did not specialize in one or the other type of aggression but used a set of aggressive strategies combined.

Couples with mutual aggression were the most frequent couple type, and had the highest levels of aggression, in accordance with recent empirical evidence on national representative samples (see also Taylor et al., 2019). In this type of couple, both members showed the highest rates of victimization. According to our findings,

men and women are more aggressive when there is mutual aggression than when the aggression is only unidirectional. In addition, they feel more victimized. These data suggest that in the general population both men and women show hostile responses to aggressions of the partner and that, because of these aggressive interactions, both members feel victimized. In addition, aggression may arise from both male and female partners. These results are consistent with other studies conducted with the general population showing that mutual aggression is more the rule than the exception (Tyller & Wright, 2014). Theoretically, a relational process such as interpersonal aggression is, not surprisingly, largely the result of actions and behaviors of those involved (i.e., partners).

These results, however, do not allow ruling out an explanation of violence in terms of gender: while men use aggression proactively to gain control in the relationship, women use aggression reactively to defend themselves. Although the present investigation did not explore who initiated aggression or its motives (Shorey et al., 2010; see also Ferres et al., 2019 for an analysis of couple conflict resolution and gender), and therefore we cannot completely discard an explanation based on gender, the results obtained tentatively allow us to explore the plausibility of this explanation. The mere existence in our data of unidirectional violence from men to women and from women to men would suggest that both members sometimes initiated aggressive episodes. Both used nonreactive aggression. Rather, research on which member initiated the aggressive episode reveals that, although self-defense is a reason provided by women, it explained only a low percentage of aggressions perpetrated by women (see Straus, 2012, for a review of 17 empirical studies). We will return to this point when commenting on the actor and partner effects results of APIMs tested.

Actor Effects

Actor effects are the effects of a person's own characteristics on his or her own outcomes. This effect was statistically significant and positive across all dimensions of CUVINO-VA as well as in combined measures of psychological and general aggression. In most cases, actor effects were approximately equal for both males and females, with the exceptions of coercion (male actor effect being greater than female actor effect) and sexual aggression (female actor effect being greater than male actor effect). According to these results, an important part of victimization experienced by each member is significantly related to his/her own levels of perpetration. Higher levels of perpetration were associated with higher levels of victimization, and lower levels of perpetration were related with lower levels of victimization.

Actor effect may point to multiple scenarios on which we can only briefly comment here. First, actor perpetration and their own victimization are closely related, suggesting the existence of a victim-offender overlap: aggressors and victims are the same people. Literature in this area suggesting this type of overlap between victim and offender is substantial, especially in relation to less serious forms of IPV (Tillyer & Wright, 2014). The moderate size of actor effect is consonant with high rates of mutual aggression found in study's participants. The aggressive actor suffers victimization because their partner is aggressive with them, probably in retaliation. However, the partner may not disclose this retaliation, so much of the effect would be concentrated on the actor. This explanation is hypothetical, and future research should analyze it in detail.

Second, a response bias may also be associated with the need in participants to reconcile their levels of victimization and aggression; this need could have inflated covariation between both scores. This process would reflect participants' needs to justify their levels of aggression by biasing their levels of victimization upwards ("I was aggressive because the other member was also aggressive to me").

Our results provide some empirical evidence of this effect. When there is only unidirectional aggression, levels of victimization of non-aggressive members are very low: victimization scores do not need being biased upwards. Males felt less victimized in non-aggressive and female-only aggressive couples, whereas females felt less victimized in non-aggressive and male-only aggressive couples. This tendency was observed for males in detachment, coercion, and humiliation, as well as in combined measures of psychological and general aggression. For females, this effect was found for coercion, humiliation, and combined measures of psychological and general aggression. However, when members admit to being aggressive, they tend also to score high in victimization, even in the absence of aggression disclosed by the other member. These seemingly contradictory results could be explained by the need for partners to justify their aggressive behaviors by biasing their experiences of victimization upwards.

Partner Effects

Partner effects are the effects of a partner's characteristics on a person's outcome. Our findings indicated victimization suffered by both male and female members of couples was due to the aggressive behavior of the other member. The variation in aggression did not correspond point by point with variations in victimization, however. The unstandardized partner effect ranged from 0.20 for psychological aggression to 0.46 for physical aggression. Thus, a one-unit increase in aggression disclosed by one partner translated into a 0.20-0.46 unit-increase in victimization experienced by the other partner. These effects were approximately equal for male and female participants. This aspect has been extensively addressed in the literature on disagreement between aggression and victimization in couples (Armstrong et al., 2002 for a review of studies). Most of research in this area tends to view potential disagreement about partner violence in members of the couple as a kind of bias. Our results from pilot study indicated no systematic bias in the responses to CUVINO-VA due to social desirability. However, social desirability would be only one among the possible reasons for not recognizing the existence of aggression by a couple's members. For instance, victims or perpetrators may not only try to conceal victimization or aggression but also may misunderstand questions or forget about occurrences of aggressive episodes in affective interpersonal relationships (Caetano et al., 2009). Thus, members of the couple predictably do not disclose all the aggression. Partner effect reflects the effect that aggression disclosed by one member exerts on victimization experienced by the other member. However, this relationship is significantly lower than actor effect. Our results suggest that in order to understand the levels of victimization of a member of the couple it is necessary to know not only the levels of aggression of the other member of the couple but also his or her own. This conclusion adds a new insight to the study of discrepancy: when actors perceive they are aggressive, they may be more sensitive to perceiving themselves as victimized as well.

This upwards victimization scores bias when the respondent is also aggressive may have diminished partner effect as well. Although actors may bias their victimization scores upwards, their partners' aggression scores do not change as they are provided by partners and not by actors. This result may have had the consequence of decreasing covariation of actors' aggression and partners' victimization scores, as our results seem to suggest.

Our results point to different origins in aggressive dynamics of couples. On some occasions, some members may exercise unidirectional aggression, while at other times these aggressions may be seen as a reaction to a previous victimization. Research indicating both symmetric and asymmetric aggression between members of the couple would be in line with our results (Winstok &

Straus, 2016). However, this result is not exclusive in terms of sex. For example, men are most involved in unidirectional or asymmetrical aggression and women make use of reactive or symmetrical aggression. Despite the relevance of these results, further research is needed to understand symmetry in IPV properly and the way findings may be used to provide better intervention and prevention services (Winstok & Straus, 2016).

In a third step, we introduced parameter k in APIMs to evaluate the ratio of the actor-to-partner effect. Overall, k_1 (male) and k_2 (female) ratios were positive and smaller than 1 for both men and women, suggesting actor effect was more relevant in explaining victimization than partner effect. Returning to our analysis of the relationship between perpetration and victimization made previously, we can now add that aggression disclosed is a more important predictor of experienced victimization (actor effect) than aggression disclosed by the other member of the couple (partner effect).

Limitations

The present investigation is not free from potential limitations. First, participants belonged to the general population. Perhaps for this reason, the levels of aggression and victimization found were low in any case, so a generalization to other risk groups—couples with more serious aggressions for example—must be done with a great deal of caution. Second, IPV was not assessed or modeled at situational or event level; rather, couple-level data came from a single self-report measure and did not reflect specific incidents of IPV. Future research analyzing specific, and perhaps critical, incidents could bring new insights to this field of study. Third, due to research design, participants completed the questionnaire in the presence of both their partner and the researcher. Although their responses were private and anonymous and neither the other partner nor the research team could identify individual members from their answers, the fact that the two members of the couple were present may have had some influence on their responses to the questionnaire. Finally, the cross-sectional nature of data does not allow the antecedents of the consequences to be distinguished, limiting generalizability of the results of the study. New research in this field incorporating the temporal dimension is warranted.

Conclusions

The results of this study allowed us to identify two important trends in our data. First, when dimensions of aggression are considered together, the rate of couples with mutual aggression exceeds 50%. Unidirectional aggression (from man to woman or from woman to man) is substantially lower, at approximately 25%. In couples with mutual aggression, the levels of both aggression and victimization are higher in comparison with couples who exercise unidirectional aggression. The existence of couples with mutual aggression seems to confirm the presence of victim-offender overlap in IPV: aggressors and victims in intimate relationships tend to be the same person.

On the other hand, the results point to the existence of a systematic bias—an upwards victimization scores bias—by which study participants who recognized being aggressive with their partner tended to show higher victimization scores. Predictably, this result has produced an increase in the covariation between an actor's aggression and victimization (for both men and women). In fact, actor aggression is revealed in this study as the main predictor of actor victimization. The implications of these results are certainly disturbing: as long as studies on IPV continue to focus on only one member of the couple, many of their conclusions could be biased due to the uncontrollable effect of systematic biases. Specifically, self-declared levels of victimization could reflect an attempt by

respondents to make their levels of aggression and victimization artificially congruent (“upwards victimization scores bias”). This not only offers new avenues of research on levels of IPV among couples but also may shed light on the discrepancy between their aggression and victimization scores. As long as multiple sources of bias that may be interfering in responses to self-reports are not clarified, our ability to generate empirical evidence about causes of IPV will be limited. Although the study of couples offers numerous advantages, it also reveals new limitations that are opaque when analyzing exclusively one member of the couple. Undoubtedly, future research on IPV should concentrate its efforts on the detailed study of IPV considering all parties involved.

Conflict of Interest

The authors of this article declare no conflict of interest.

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