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Daily Associations among Anger Experience and Intimate Partner Aggression within Aggressive and Nonaggressive Community Couples

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Abstract

Anger is an empirically established precipitant to aggressive responding toward intimate partners. The current investigation examined the effects of anger, as experienced by both partners, as well as gender and previous aggression, on in vivo intimate partner aggression using a prospective daily diary methodology. Participants ($N = 118$ couples) individually provided 56 consecutive, daily reports of affective experience and partner aggression. Multilevel models were estimated using the Actor Partner Interdependence Model framework to analyze the daily associations between anger and partner aggression perpetration among male and female participants as moderated by aggression history. Results revealed that both Actor and Partner anger were generally associated with subsequently reported daily conflict. Further, increases in daily Partner anger were associated with corresponding increases in partner aggression among females who reported high anger and males, regardless of their own anger experience. Increases in Actor anger were associated with increases in daily partner aggression only among previously aggressive females. Previously aggressive males and females consistently reported greater perpetration than their nonaggressive counterparts on days of high Actor anger experience. Results emphasize the importance of both Actor and Partner factors in partner aggression and suggest that female anger may be a stronger predictor of both female-to-male and male-to-female partner aggression than male anger, when measured at the daily level.

Keywords

Partner Aggression; Partner Violence; Negative Affect; Anger; Couples

Verbal and physical intimate partner aggression (IPA) remains prevalent among married and cohabitating couples in the United States, with nationally representative survey data indicating that a high percentage of males (9.0–46.1%) and females (9.2–41.3%) have been victimized by their current partner (Afifi et al., 2009). Partner aggression is defined here as behavior intended to cause harm to one's intimate partner (Anderson & Bushman, 2002), and is commonly conceptualized as including both verbal (e.g., insulting) and physical (e.g., grabbing, shoving) behaviors. Intimate partner victimization has been associated with a greater risk of physical and mental health problems, such as chronic pain, sexually

transmitted infections, substance abuse and dependence, anxiety, and depressive symptoms (Coker, Smith, Bethea, King, & McKeown, 2000). Both males and females perpetrate and experience IPA, with research indicating that IPA is most often a bidirectional phenomenon within couples (Archer, 2000; Straus, 2008). Although survey and experimental research implicate anger as a correlate of both male and female perpetrated IPA (see Stith et al., 2004), little is known about the proximal antecedents of naturally occurring IPA. The present study utilized couple reports to examine anger as a specific correlate of IPA to inform our understanding of the proximal risk factors among both partners for perpetration at the daily level.

Few etiological models of IPA have directly addressed the role of anger, leading researchers and treatment providers to rely upon the broader anger-aggression literature for guidance (Norlander & Eckhart, 2005). The existing research does not favor univariate models in which anger is conceptualized as a sufficient cause of aggressive behavior (e.g., Tavis, 1989). The complexity of this relationship is evident in contemporary, integrative models in which anger may not cause aggressive behavior but can increase the likelihood of aggressive responding by reducing natural inhibitions against aggression, increasing the salience of aggressive cognitive scripts used to interpret and respond to social stimuli, and increasing physiological arousal (Anderson & Bushman, 2002). Notably, the Cognitive Neoassociationistic (CNA; Berkowitz, 1990) model postulates that aversive stimuli (e.g., noxious smell, disciplinary action at work, relationship problems) precipitate general negative affective experiences. Environmental stimuli (e.g., perceptions of one's partner as well as the partner's real time inputs), personal experiences, and associated cognitive, affective, and physiological processes are used to contextualize, interpret, and differentiate between the experience and severity of negative affect (e.g., anger, anxiety). Individual resources, such as conflict resolution or behavioral coping strategies and cognitive processing skills, may then influence (aggressive) behavioral responses to ongoing interpersonal interactions. Existing research generally supports etiological models of anger and aggression in suggesting that individual differences may be instrumental in predicting IPA following anger provocation (e.g., Norlander & Eckhardt, 2005).

Survey studies indicate that IPA perpetration is positively associated with trait anger. In a meta-analysis of 11 studies, Stith and colleagues (2004) found a medium sized effect of male anger on the perpetration of IPA. In a separate meta-analysis, Norlander and Eckhardt (2005) evaluated the results of 33 studies that distinguished between previously aggressive and nonaggressive males based upon a history of perpetrating physically aggressive acts against a partner. Moderate effect sizes for hostility and anger in aggressive, compared to nonaggressive, males emerged and larger effect sizes were detected among perpetrators of severe aggression relative to perpetrators of moderate aggression. Specifically, data indicated that aggressive husbands reported greater trait anger, greater dispositional aggression, and lower anger control than dissatisfied, nonaggressive husbands following anger induction (Barbour et al., 1998; Eckhardt, Barbour, & Davison, 1997). More recent experimental designs provide additional support for a causal relationship between anger and subsequent IPA. Participant exposure to simulated relationship scenarios designed to elicit anger are associated with significant increases in verbally aggressive and belligerent content relative to control scenarios (e.g., Eckhardt, 2007; Eckhardt & Crane, in press). Thus,

research indicates that greater dispositional or state anger may increase the risk of IPA perpetration.

Although the association between anger and IPA appears strong, evidence suggests that previously physically aggressive partners respond more aggressively to anger provocation than previously nonaggressive partners under laboratory conditions. One investigation exposed a sample of 78 males to the simulated relationship scenarios previously mentioned and reported that previously aggressive husbands articulated greater aggressive content than either dissatisfied or satisfied, nonaggressive husbands following anger provocation (Barbour, Eckhardt, Davison, & Kassino, 1998). These results have been replicated in subsequent husband (e.g., Eckhardt, 2007) and dating (Eckhardt & Crane, in press) samples in which previously aggressive participants expressed greater verbal aggression and associated cognitive biases than their nonaggressive counterparts following the anger eliciting simulated relationship scenario. Eckhardt and Crane (2008) used the simulation paradigm to determine that greater aggressive responding was detected among both males and females with high, relative to low, aggressive tendencies. Finally, previously aggressive men reported experiencing greater anger and responded with greater hostility than nonaggressive husbands when exposed to written and videotaped stimuli depicting sample statements made by a simulated female partner (Holtzworth-Monroe & Smutzler, 1996). Thus, research indicates that the relationship between anger and IPA may be stronger among previously aggressive, compared to previously nonaggressive, participants. Consistent with the CNA model, participants who have utilized IPA in the past may be more likely to rely upon salient aggressive scripts when responding to aversive stimuli, particularly when perceiving a threat from an intimate partner.

Previous investigations have advanced our understanding of the relationships between anger and IPA but have been limited in methodology. First, these studies have neglected the effects of partner anger on one's own IPA perpetration. Leonard and Roberts (1998) speculated that partner variables may affect behavior due to the transactional processes involved in interactions between members of a dyad (e.g., one partner's anger may elicit anger and concordant aggression from the other partner). Indeed, initial evidence suggests that the affective experience of one's partner, including disturbances with and impaired control of anger, may be associated with an increased likelihood of aggressive responding during conflict (Cordova et al., 1993; Stuart et al., 2006). Second, IPA research has historically aimed to evaluate precipitants to male perpetrated aggression but our functional understanding of female-to-male IPA, as well as the role of anger in this relationship, has grown considerably over the past two decades. Cross sectional data largely supports similar rates, motivations, and associated physical and mental health conditions for both male-to-female and female-to-male IPA (Archer, 2000; Dutton, 2007). Nevertheless, relatively few empirical or observational studies have examined the theoretical processes associated with IPA, at the daily or event level, among individuals or couples. Finally, previous investigations have relied heavily upon the use of retrospective, self-report methodologies to assess the anger-IPA association at a single point in time. As etiological models suggest that anger experience and aggressive responses should be proximally associated, prospective research is needed to investigate the relationships between time-varying anger and

subsequent IPA among male and female partners outside of artificial laboratory simulations, in real-world situations.

Prospective Methodology

Naturalistic examination of the relationship between anger and IPA at the event-level requires the use of prospective methods which allow for the temporal sequencing of target stimuli and behaviors. The daily diary is a reliable method of collecting and assessing data pertaining to the antecedents to and consequences of IPA, which are highly susceptible to memory degradation over time (e.g., Wolfer, 1999). Few prospective diary studies have evaluated the association between anger experience and partner aggression at the daily-level and none have utilized couples or attempted to determine the influence of aggression history. Elkins and colleagues (2013) examined the daily reports of 146 females and 38 males to 3 anger items and 8 items assessing psychological and physical IPA perpetration over a 2-month period. Results indicated that men and women were significantly more likely to report the perpetration of both psychological and physical aggression on days in which they had experienced greater-than-average anger. Crane and Eckhardt (2013) utilized the self-reports of 43 female college students over a 6-week period to determine that female participants reported perpetrating greater IPA on days of greater-than-average female negative affect (i.e., anger, sadness, and anxiety). Female-reported perceived male partner affect had neither an independent nor interactive effect on female perpetration.

Together, these studies provide initial support for a greater risk of IPA perpetration on days of high anger experience. However, none of these studies have enrolled couples or evaluated the influence of partner anger on IPA. Given the interdependent nature by which partner inputs may influence the anger-aggression association (Berkowitz, 1990) and the relationship processes involved in couple outcomes, it is recommended that researchers examine the effects of both the participant and his or her partner on outcomes of interest (Kenny, Kashy, & Cook, 2006). Further, the samples involved in both the Elkins and colleagues (2013) as well as the Crane and Eckardt (2013) studies were similar in that they consisted primarily of female college students. It is unclear if findings will generalize to males or community samples. Finally, none of the studies attempted to differentiate between or control for other forms of negative affect in addition to anger. A study examining mood experience determined that, in addition to being the strongest predictor of self-reported general hostility ($r=.27$), anger was also associated with daily reports of sadness ($r=.78$) and anxiety ($r=.58$) (Shapiro, Jamner, & Goldstein, 1997). Because it is possible that other negative affective states may independently contribute to aggressive behavior, evaluation of the anger effects on IPA should take into account the experience of sadness and anxiety.

Current Study

The present investigation represents the first prospective examination of the daily association between anger and aggression among community couples. Although we conducted parallel analyses predicting both daily conflict and IPA, our primary aim was to assess the influence of anger on IPA, as the more well-defined predictor of negative individual and relationship outcomes. Drawing from general models of anger and aggression

behavior as well as the previously described literature, we hypothesized that 1) perpetration of IPA will be more likely to occur on days of high a) Actor anger and b) Partner anger. We further hypothesized that 2) physical aggression history and anger will interact to predict daily IPA such that increases in daily anger will be associated with increases in IPA only among previously aggressive participants. Finally, we hypothesized that 3) the anger experienced by one's partner will be positively associated with IPA perpetration on days of high, but not low, Actor anger. Due to the aforementioned limitations in the existing literature, gender differences were evaluated but no a priori hypotheses were generated regarding gender interactions with anger or aggression history in the prediction of daily IPA.

METHOD

Participants

The current sample was recruited from a group of prospective participants deemed eligible for an alcohol administration study, in which 96 (81.3%) of the current couples had participated (for additional details on the laboratory study, see Testa et al, 2014). Recruitment efforts consisted of a local advertising campaign that involved household mailers, newspaper advertisements, and Facebook advertisements in the Buffalo, NY metropolitan area. Interested participants were screened for the alcohol administration study via telephone interview and determined to be eligible for participation if both partners were married or cohabiting together, consumed alcohol at least weekly, and reported heavy episodic drinking at least once a month. They were excluded if either reported psychiatric or medical contraindications to alcohol consumption (i.e. substance use dependence or treatment). For ethical and safety reasons related to the alcohol administration paradigm, couples (n=36) in which either or both members reported having engaged in or experienced extreme or frequent severe acts of physical IPA (e.g., injury needing medical care; use of a weapon) were excluded from participation and given appropriate referrals.

The present study presents the affective component of a larger study examining the daily relationships among alcohol consumption and partner aggression within 118 heterosexual couples recruited from the eligible alcohol administration study subject pool (see Testa & Derrick, 2013). Male and female participants ranged in age from 21 to 46 years ($M=33.92$, $SD=6.78$; $M=32.72$, $SD=6.92$, respectively). The sample consisted of Caucasian, African American, and Asian participants (94.1%, 3.8%, and 0.9%, respectively). Most of the married (75.8%) or cohabiting (24.2%) sample had children living in the household (63.1%), pursued education beyond high school (91.1%), and were employed full or part time (83.9%). The median household income in the current sample was between \$60,000 and \$75,000. See Table 1 for more detailed information on males and females in the current sample.

Procedure

Prior to participating in the daily diary study, participants completed and returned questionnaires that included 1) demographic data, and 2) the *Revised Conflict Tactics Scale* (CTS2; Straus, Hamby, Boney-McCoy, Sugarman, 1996), a widely used, reliable, and valid 78-item self-report measure assessing the number of times verbally aggressive, physically

aggressive, and sexually coercive acts had ever been used within conflicts with one's current intimate partner. They also completed the Physical Aggression subscale of the *Buss Perry Aggression Questionnaire* (BPAQ; Buss & Perry, 1992), a 9-item inventory used to assess the tendency to respond aggressively across situations (aggressivity), a characteristic associated with the perpetration of general aggression and IPA (Eckhardt & Crane, 2008; Giancola, 2002). Couples then reported for a 45 minute training session during which they were taught how to use the interactive voice response (IVR) system and given the opportunity to complete their first 5-minute daily entry.

Daily logs—Participants were asked to submit daily entries, independent from their partner, for 8 weeks (56 days). During each entry, participants were first asked to report their own affective experience for the current day, including anger (irritated, angry, angry with partner; $\alpha=.75$), anxiety (anxious) and depressed mood (sad) using items from the revised Positive and Negative Affect Schedule (PANAS-X; Watson & Clark, 1994). Responses to each item ranged on a 5-point scale from “not at all” to “very much.” Participants were then asked whether or not they had a conflict, argument or disagreement with their partner on the previous day. Participants who reported any prior day conflict were then asked to report whether they had engaged in psychological aggression (i.e., 3 items; yelled at, threatened, and insulted my partner) or physical aggression (2 items; threw things at, kicked, or hit and pushed or grabbed my partner) during the conflict. Items were selected from the CTS2. Participants were instructed to complete each entry within the calendar day. The IVR system also provided participants with the option to complete a missed entry at the end of the report submitted on the subsequent day. Couples received weekly reminder calls and were paid \$1.00 for each complete report, \$10.00 for each complete week of reports, and \$30.00 for a complete set of 56 daily entries for a potential total of \$166.00 each for full compliance with daily logs.

Analyses

We used the Mixed procedure in SPSS to estimate multilevel models under the Actor-Partner Interdependence Model (APIM; Kenny, Kashy, & Cook, 2006). APIM provides a framework for the analysis of dyadic data whereby each participant's daily IPA may be predicted by the participant's own daily anger (Actor effect) as well as his or her Partner's daily anger (Partner effect). In the current analyses, Actor and Partner daily reports were crossed at the first level of analysis and nested within dyads at the second level of analysis (Laurenceau & Bolger, 2005). We conducted formal tests of distinguishability and determined that the effects or variances of males and females differed meaningfully and, thus, individuals within couples were distinguishable by gender (Kenny et al., 2006). Actor gender was included in all models. Aggression histories for both Actor and Partner (dichotomized, uncentered) as well as Actor and Partner daily reports of anger (continuous, grand mean centered) were included as within-subject variables.

Models were constructed to predict the occurrence of conflict as well as IPA within conflicts. While IPA was assessed continuously, conflict was a dichotomous variable. Conflict models were estimated using a binomial distribution with a logit link function. We estimated preliminary models to determine whether outcomes were predicted by a set of

control variables, including ethnicity (Caucasian or other), marital status (married or dating), Buss Perry aggressivity (continuous, grand mean centered), daily sadness (continuous, grand mean centered), and daily anxiety (continuous, grand mean centered). Only daily anxiety was associated with aggression and retained in subsequent models. In keeping with recommended practice (Kenny et al., 2006), we further controlled for autocorrelation among variances in IPA over time by including the lagged report of prior day partner aggression in the model.

All predictors were modeled using fixed effects while intercepts and error components were allowed to vary randomly. All main effects as well as hypothesized two and three-way interactions were included in the full models. Higher order interactions, though conceivable, were not included for the purposes of model stability and interpretability. The final, trimmed models were parsimonious and contained all significant covariates, main effects, and significant, theoretically derived interactions. The two-intercept approach, which produces distinct parameter estimates for males and females when individuals within couples are distinguishable by gender under the APIM framework (Kenny, Kashy, & Cook, 2006), was used in conjunction with simple slope analyses to interpret significant interactions predicting same day conflict and IPA perpetration.

RESULTS

Descriptive Data

Full compliance of all 236 partners in our 118 couples across the 56 day study period would have yielded a potential 13,216 daily reports. Data on the 56th day (236 entries) were excluded because no 57th day report existed to provide IPA information on the final day of data collection. Actors failed to submit an additional 1,614 entries on time and partners failed to submit 910 more entries on time. Late entry days were omitted from analyses because anger was not assessed in make-up reports due to the high potential for memory decay and retrospective bias. Participants provided sufficient and on-time data for the analysis of 10,456 (79.1%) daily reports. Daily anger was used to predict IPA later in the same day, necessitating the lagging of the IPA variable (e.g., anger reported on the 24th day was used to predict IPA that occurred on the 24th day as reported on the 25th day). In order to ensure proper temporal sequencing between anger and IPA, an additional 126 daily reports with timestamps indicating that they had been submitted after the reported time of IPA were excluded from subsequent analyses, resulting in a total of 10,330 (78.2%) viable daily reports.

Aggression histories and daily anger served as the primary predictors of daily IPA. Following convention (Straus et al., 1996), participants were classified as previously aggressive based on the highest CTS2 lifetime report of either partner, resulting in classification of 46 (39.0%) male and 54 (45.8%) female participants as previously relationally aggressive (RA). The remaining participants were classified as previously nonaggressive (NA) according to the reports of both partners. Most (82.0%) of RA participants were engaged in relationships that included prior bi-directional aggression, leaving 5 (5.0%) of RA participants in couples in which only the male had previously perpetrated physical aggression, and 13 (13.0%) in couples in which only the female had

perpetrated physical aggression. Nearly all male (96.6%) and female (96.6%) participants had previously been psychologically aggressive toward their current partner. Mean daily anger was low ($M=0.41$, $SD=0.65$) with Actors reporting no anger on 5,717 (55.3%) and partners reporting no anger on 5,695 (55.1%) reporting days. Actor and Partner anger were modestly associated ($r = .18$, $p < .001$) with congruent anger reported on 2,524 (24.4%) reporting days. Table 2 contains detailed information regarding the breakdown of anger and IPA across daily entries among NA and RA participants.

Conflict was reported on 592 (5.7%) days and participants reported perpetrating at least one of the five aggression items in 54.2 % of conflicts and on 321 (3.1%) days. There was a small but significant association between Actor IPA perpetration and Partner IPA perpetration ($r = .32$, $p < .001$). IPA was generally mild with a single verbal act on 225 (70.1%) and physical acts on only 26 (8.1%) of IPA days. The five aggression items were significantly correlated with one another. Principal component analysis revealed that items loaded on a single factor, with communalities between .50 and .75, an eigenvalue over 2.0, and all factor loadings exceeding .50. Physical items were weighted twice as heavily as psychological items and summed to generate a composite daily IPA score (e.g., Crane & Eckhardt, 2013) that served as the primary dependent measure.

APIM Analyses

We used Multilevel Modeling (MLM) with restricted maximum likelihood to estimate the effects of a participant's self-reported anger and aggression history (i.e. the Actor effects) as well as the effects of the partner's self-reported anger and aggression history (i.e. partner effects) on the participant's own reports of conflict and IPA.

Conflict—The trimmed model predicting daily conflict included significant gender ($b = -.19$, $SE = .04$, $p < .001$), Actor anger ($b = .11$, $SE = .02$, $p < .001$), and Partner anger ($b = .09$, $SE = .02$, $p < .001$), and Actor aggression history ($b = .17$, $SE = .07$, $p = .02$) main effects. Main effects were qualified by a single significant three-way interaction between gender, Actor anger, and Actor aggression history ($b = -.04$, $SE = .02$, $p = .03$). Simple slope analyses revealed that the relationship between Actor anger and conflict was stronger for RA than for NA females. For males, the anger and conflict relationship was not altered by Actor aggression history. Thus, as hypothesized, greater Actor and Partner anger were associated with a significantly greater likelihood of reporting daily conflict.

IPA—We also detected significant Actor and Partner effects in the trimmed model predicting IPA (see Table 3). Even though IPA was assessed on the following day, anger and IPA measures are in reference to the same day and anger assessments occurred prior to the time of reported IPA. Results revealed that Actor anger was associated with significantly greater IPA (see Table 3 for parameter estimates). Similarly, increases in daily Partner anger were associated with corresponding increases in Actor IPA. As expected, the main effect for Actor aggression history was also significant; RA Actors reported greater daily IPA than NA Actors. The effect of Partner aggression history was marginal, suggesting a trend in which Actors with RA, as opposed to NA, partners reported greater daily IPA as well. The main effect for gender revealed greater IPA among female than male participants. We further

detected two three-way interactions within the same model and will first discuss the interpretation of the gender X Actor anger X Actor aggression history interaction, followed by the interpretation of the gender X Actor anger X Partner anger interaction.

IPA: Actor anger and Actor aggression history interaction: We estimated an additional MLM with the two-intercept approach to deconstruct and interpret the gender X Actor anger X Actor aggression history interaction (see Table 4). With this method, we estimated separate parameters for males and females, using Actor anger and Actor aggression history to predict daily IPA. Two dummy codes were created in place of the single effect coded gender (previously coded -1 and 1) variable to identify the participants who provided each observation as either male (now coded 1 for male and 0 for female) or female (now coded 1 for female and 0 for male).

The results of the two-intercept model indicated that the effect of Actor anger on IPA was statistically significant for females but not males. Accordingly, females reported perpetrating greater IPA on days of high anger ($b = .01$, $SE < .01$, $p = .003$) while male reports of IPA were not associated with the experience of anger ($b < .01$, $SE < .01$, $p = .56$). In terms of Actor aggression history, results indicated that a history of aggression was a statistically significant risk factor for daily IPA among both males and females but that the association between aggression history and IPA was stronger among females ($b = .02$, $SE < .01$, $p < .001$) than males ($b = .01$, $SE < .01$, $p = .03$).

We estimated two follow-up simple slopes models to examine the interaction between Actor anger (i.e. ± 1 SD) and Actor aggression history among male and female participants (Aiken & West, 1991). These relationships are depicted in Figure 1. Analyses revealed that anger was not associated with daily IPA among either NA males ($b = .00$, $SE < .01$, $p = .72$) or NA females ($b = .00$, $SE < .01$, $p = .39$). Among RA Actors, increases in daily anger were associated with corresponding increases in daily IPA for female ($b = .02$, $SE < .01$, $p < .001$), but not male ($b < .01$, $SE < .01$, $p = .19$), participants. Further analysis revealed that, relative to their NA counterparts, RA males and females reported significantly greater IPA on days of high ($b = .01$, $SE = .01$, $p = .01$ and $b = .04$, $SE = .01$, $p < .001$, respectively), but not low ($b = .01$, $SE = .01$, $p = .38$ and $b = .00$, $SE = .01$, $p = .61$, respectively), anger. Thus, increases in Actor anger were associated with corresponding increases in daily IPA only among RA females and RA participants reported greater IPA than NA participants only on days of high anger.

IPA: The interaction between Actor anger and Partner anger: The two-intercept approach was also used, within the same base model, to deconstruct and interpret the gender X Actor anger X Partner anger interaction (see table 4). We estimated separate male and female parameters using Actor anger and Partner anger as predictors of daily IPA. The results of the two-intercept model indicated that the effect of Partner anger on IPA was statistically significant for both females and males. Accordingly, females ($b = .01$, $SE < .01$, $p = .006$) and males ($b = .01$, $SE < .01$, $p = .001$) reported perpetrating greater IPA on days of high Partner anger. As previously reported, females ($b = .01$, $SE < .01$, $p = .003$), but not males ($b < .01$, $SE < .01$, $p = .56$), perpetrated greater IPA on days of high Actor anger.

Follow-up simple slopes models were used to examine the interaction between Actor anger and Partner anger among male and female participants (see Figure 2). Estimates of low (–1 SD) and high (+1 SD) Actor anger were calculated for use in these analyses (Aiken & West, 1991). Increases in Partner anger were associated with increases in Actor IPA among males ($b = .01$, $SE < .01$, $p = .001$) but not females ($b = .00$, $SE < .01$, $p = .78$) on days of low Actor anger. On days of high Actor anger, Partner anger was a statistically significant risk factor for daily IPA among both males and females but the association between Partner anger and Actor IPA was stronger among females ($b = .01$, $SE < .01$, $p < .001$) than males ($b = .00$, $SE < .01$, $p = .02$). Thus, increases in Partner anger were associated with corresponding increases in daily IPA among females who had also experienced high anger and among males, regardless of their own anger.¹

DISCUSSION

The current study was the first to investigate the effects of time-varying Actor and Partner anger on daily IPA perpetration within dyads. Using 8 weeks of daily diary data independently reported by male and female couple members, our results revealed that one's own anger as well as the anger of one's partner was important in understanding the occurrence of both daily conflict and IPA within the intimate dyad. Findings are consistent with contemporary models of anger and aggression in which anger experience may influence anger expression and the interpretation or response to partner inputs may further modify the relationship (Berkowitz, 1990). Even after controlling for other negative affective experiences, conflict was generally more likely to occur on days of either high Actor or Partner anger. We found that Actor Anger, however, interacted dynamically between genders with both Partner anger and Actor aggression history to predict daily IPA. The nature of these interactions differed for females and males.

Regarding the Actor by Partner anger interaction, females were more likely to express aggression on days of high Partner anger only if they had also experienced high anger themselves. Conversely, males were more likely to become aggressive on days of high Partner anger regardless of their own anger experience. These findings support Partner anger as a unique, previously unexplored factor which contributed to the prediction of daily IPA among both males and females. The manner in which male and female behavior differed following Partner anger suggests the possibility that males may have a particularly low threshold for IPA induction through Partner anger. Indeed, research on accommodation processes reveals that females are more prone than males to accommodate the negative or destructive behaviors of a romantic partner through the inhibition of urges to reciprocate as well as the generation of constructive responses (Rusbult, Verette, Whitney, Slovik, & Lipkus, 1991) and that these accommodative processes may be disrupted through disinhibiting influences, such as depleted self control (e.g., Finkel & Campbell, 2001). The current results suggest that anger may represent another factor capable of disrupting accommodative behaviors among females. Alternatively, behaviors observed within

¹We conducted parallel analyses using only the "anger toward partner" item, rather than the 3-item composite anger score, in the prediction of subsequent daily aggression. The alternative analyses yielded no changes in the direction or significance of parameters and simple slopes interpretations were unchanged.

couples' interactions are, by definition, highly interdependent. Other proximally related Partner factors, such as expression of aggression by the partner, may disrupt the appearance of accommodative behaviors through concurrent effects on Actor anger as well as Actor IPA behavior within the relationship context. Indeed, Partner anger may represent, to some extent, a proxy variable for Partner IPA, suggesting that the Actor-Partner interactions may be influenced by Partner IPA in addition to Partner anger. Experimental research is needed to fully evaluate the influence of Actor anger on accommodative behavior during periods of high Partner anger.

We also found strong evidence for the hypothesized interaction between Actor anger and Actor aggression history among females but surprisingly not among males. The current main effect of female anger on female IPA at the daily level is consistent with both established theory (Berkowitz, 1990) and previous diary research (Crane & Eckhardt, 2013; Elkins et al., 2013). The interaction that we detected between Actor anger and Actor aggression history, however, further clarifies the nature of this relationship. The association between anger and IPA was detected only among RA, not NA, females. Prior research has demonstrated that NA participants are more capable than RA participants at generating and enacting anger control strategies to diffuse potentially dangerous situations (Eckhardt, Barbour, & Davison, 1997; Norlander & Eckhardt, 2005). NA females in the current sample reported experiencing anger as frequently as RA females but may have been more capable at coping with the experience of anger using nonaggressive strategies.

Contrary to current hypotheses and prior research (see Norlander & Eckhardt, 2005), we found no evidence for main effects of male anger on male-to-female IPA at the daily level. Daily IPA was consistently higher among RA, compared to NA, males, suggesting that anger may be insufficient to elicit IPA among NA males and unnecessary to elicit IPA among RA males. It should be noted, however, that rates of IPA in the current study were low among both NA and RA males, which may have limited our ability to detect anger effects. Indeed, increases in Actor anger were associated with greater male-reported conflict, which occurred more frequently than aggression. Similarly, further examination of the non-significant interaction between Actor anger and Actor aggression history revealed that, while anger was not associated with IPA among NA or RA males, NA males reported consistently lower IPA than RA males and significantly lower IPA on days of high Actor anger. As with the current female sample and in accordance with predictions from the Berkowitz's CNA model, these results suggests that NAmale, relative to RA males, may possess a stronger, more comprehensive set of coping skills that contributed to low levels of daily IPA, particularly on days of high anger experience. Low rates of IPA further demonstrate that RA males were not consistently aggressive and that additional transient factors, such as motivational influences to perpetrate IPA or Partner perpetration, may help account for variation in the daily occurrence of IPA among this subset of males.

Measurement issues may further account for the inconsistency between the current findings and the larger IPA literature, in which male anger often precedes male-to-female IPA. Experimental methods have detected strong effects of anger on IPA within close temporal proximity, particularly among RA males (e.g., Barbour, Eckhardt, Davison, & Kasson, 1998; Eckhardt & Crane, 2008; Leonard & Roberts, 1998). With the exception of a small

subset of participants in the study conducted by Elkins and colleagues (2013), the daily diary method has not been previously used to examine the relationship between anger and IPA within male samples and is incapable of assessing anger immediately prior to IPA in the same unbiased manner that is permissible through controlled experimental procedures. However, in the current study, we were unable to obtain reports of anger just prior to conflict, rather we obtained daily reports averaged for the day. Thus, estimates of average daily anger, prior to the time of reporting, may have been submitted several minutes or hours before IPA. By this metric, experimental methods should be superior to the diary methodology at detecting the proximal influence of anger on IPA, whereas diary methods may be better suited to register the naturalistic occurrence of anger prior to IPA over longer periods of time.

The current diary findings found stronger associations between female, relative to male, anger and the subsequent occurrence of both female-to-male (i.e., Actor anger effects) as well as male-to-female (i.e., Partner anger effects) IPA at the daily level. Previous studies have detected gender differences in the experience of anger whereby females, in comparison to males, have reported anger at greater intensity and over more prolonged periods in response to comparable interpersonal interactions (e.g., Fisher & Manstead, 2000; Timmers, Fisher, & Manstead, 1998). Birditt and Fingerman (2003) postulated that this may reflect the tendency of females to ruminate over or avoid expressing anger while males may be more prone to act upon anger. Indeed, Bushman (2000) determined that rumination resulted in greater aggressive behavior than other methods of addressing anger (e.g., distraction), suggesting that females may be more likely to exert aggression following prolonged periods of anger than males. Thus offering support for one possible interpretation of the current findings in which Actor anger generally predicted greater conflict while its greatest and only significant effects on IPA were observed among females with additional risk factors, including previous aggression perpetration and congruently angered male partners. Under this interpretation, the diary methodology may tap into the differential processes by which males and females attempt to address and resolve anger by detecting earlier, worsening female anger while failing to detect unstable or fleeting male anger that could more immediately precede IPA.

Many of the significant effects reported in the current paper are expectedly small in magnitude (Cohen, 1988). These effects must, however, be interpreted within a larger temporal context (Cohen, 1994) in which small, daily effects may cumulatively represent much larger effects across days, weeks, months, and years (Abelson, 1985). As Levitt and Leonard (2012) remind us, small, additive daily effects are of particular interest in close relationships, compared to individual research, since small effect may accumulate over the course of the relationship. Thus, while our findings speak to daily risk, these relationships will likely be even more pronounced at an aggregate level.

Limitations and Future Research

Findings should be interpreted with several limitations in mind. Data represent self-reported affect and IPA perpetration, which is susceptible to biases through both deliberate false reporting and unintentional errors over time (e.g., retrospective recall bias). Moreover,

reports of IPA perpetration were collected using relatively few items from the established CTS2. The use of brief IPA assessments has been supported in the literature (see Crane, Oberleitner, & Easton, in press) and the need to minimize daily participant burden precluded the use of standard administration procedures involving the entire instrument. Some IPA may have gone unobserved due to the fact that participants only responded to specific behaviors after endorsing the occurrence of conflict, and conflicts, which were reported for the previous day, may have been forgotten and not reported. To further minimize daily participant burden, participants were asked to report only the most commonly occurring types of IPA; however, it is possible that other forms of aggression may have occurred but went unreported. The need to minimize participant burden further limited the number of daily variables assessed. IPA occurs within the relationship context and perpetration is likely a response to a great many Actor and Partner processes beyond our assessment of anger. Future research may assess participant motivation for aggression, described as proactive (e.g., jealousy or control), and reactive (e.g., self-defense) among both males and females (Swan & Snow, 2006). It is plausible that the relationship between anger and IPA may be attenuated in cases of reactive, compared to proactive, aggression.

Among the greatest strengths of the prospective, daily diary method is the ability to determine the relative ordering of events in an effort to approximate causal relationships. In an effort to ensure proper temporal ordering of anger and IPA in the current analyses, we eliminated daily Actor reports that were submitted *following* the reported time of IPA perpetration. Nevertheless, the current methodology negates the possibility of firmly establishing causal relationships. Anger varies dramatically within and between individuals and is, therefore, a fleeting affective state. As previously stated, it would not have been possible to assess anger immediately prior to IPA using the once-daily methodology. Future research may consider methodological changes that would allow for a stronger analysis of the daily association between anger and IPA. Greater specificity in the proximal relationships between interdependent Actor and Partner anger as well as relationship aggression will require more sophisticated methodologies, such as ecological momentary assessment methods which call for multiple reports per day.

It should be noted that several characteristics of our sample may limit the generalizability of our findings, which need to be replicated more broadly. The current community sample largely consisted of economically stable, Caucasian partners in intact relationships. Couples with extremely frequent or severe levels of IPA were screened out. Although the current sample reported greater previous relational aggression than other general population samples (e.g., Schafer, Caetano, & Clark, 1998; Tjaden & Thoennes, 2000), our findings may not apply to a clinical sample in which aggression is both more frequent and more severe. Further, all participants reported heavy episodic drinking, indicating greater alcohol use than is observed in the general population (e.g., Naimi et al., 2003). Because the proximal and distal effects of binge drinking interfere with executive functioning (e.g., goal-oriented behavior and affect regulation), the effects of anger on IPA may be stronger in the current sample than in the general community sample (Giancola, 2000). We recommend that future research evaluate constructs that may address alternative explanations for the observed effects or provide further insight into the occurrence of IPA at the daily level by including measures of motivation for aggression, considering the utility of assessing severe acts of

IPA, recruiting samples at higher and lower risk for IPA, and implementing more temporally specific methodologies.

Conclusions

While the majority of research on the association between anger and partner aggression has focused exclusively on individual participants using survey or laboratory methods, the current study examined the influence of both partners' self-reported anger, while controlling for other negative affective experiences, on acts of IPA in real-world situations using a prospective methodology that collected 8 weeks of couples' reports. Partner anger emerged as a significant, previously unexamined, indicator of IPA for both males and females, while Actor anger was associated with IPA only among previously aggressive females. The current findings demonstrate that univariate models of anger and aggression are insufficient to predict IPA at the daily level. The daily association between anger and IPA in the current sample was moderated by aggression history and Partner inputs, suggesting that anger may be proximally associated with a greater risk of aggressive behavioral responding but that additional internal processes and external stimuli may be capable of attenuating or exacerbating the strength of this association. While additional research is required to determine causality and to improve our understanding of the cognitive processes as well as differentiated Partner inputs that are associated with the anger-IPA relationship, the current findings offer further support for the inclusion of anger and dyadic factors in etiological models of IPA while highlighting the importance of methodological issues, such as gender as well as when and how anger is assessed, in the study of daily relationships between anger and IPA.

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Figure 1.

Female and Male Aggression Perpetration as a Function of Actor Anger and Actor Aggression History

NA = Relationally Nonaggressive, RA = Relationally Aggressive

Figure 2.
Female and Male Aggression Perpetration as a Function of Actor and Partner Anger

Table 1

Descriptive Statistics for Study Variables among Males and Females

Variable	Males		Females	
	Mean (SD)	%	Mean (SD)	%
Age	33.92 (6.78)		32.72 (6.92)	
Education (years)	15.38 (1.84)		15.98 (1.82)	
Physical Aggressivity	18.64 (6.20)		15.02 (4.86)	
Caucasian		91.52		96.61
History of Prior Aggression		38.98		45.76
Daily Anger	1.45 (0.68)		1.37 (0.62)	
Daily Anxiety	1.65 (0.95)		1.45 (0.80)	
Daily Sadness	1.29 (0.72)		1.29 (0.73)	
Daily Aggression	0.03 (0.27)		0.06 (0.34)	

Note. IPA = Intimate Partner Aggression; Physical Aggressivity from the Buss Perry Aggression Questionnaire consists of the sum of 9 items (e.g., given enough provocation, I may hit another person) rated from 1 = extremely characteristic of me to 5 = extremely uncharacteristic of me; History of prior aggression was determined by positive responses to the 12-item physical assault subscale of the Revised Conflict Tactics Scale and represents the percentage of participants who had perpetrated any acts of physical aggression toward their current partner prior to their involvement in the current study; Daily Anger, Daily Anxiety, Daily Sadness, and Daily aggression values represent averages across all daily reports.

Table 2

Daily Entries among Previously Nonaggressive and Aggressive Males and Females

	Males		Females	
	NA (n = 72)	RA (n = 46)	NA (n = 64)	RA (n = 54)
Daily Entries	3,281	1,898	2,852	2,299
Days of Anger	1,392	1,082	1,032	1,107
Days of Conflict	116	125	140	211
Days of Aggression	45	72	74	130
Days of Aggression following Anger	21	48	33	77

Note. NA = Relationally Nonaggressive, RA = Relationally Aggressive.

Table 3

Multilevel Model Predicting Daily Aggression with Actor and Partner Anger and Aggression History

	b	SE	p
Intercept	.049	.004	<.001
Gender	-.009	.003	.001
Actor Anxiety	.010	.004	.005
Previous Day Aggression	.058	.009	<.001
Actor Anger	.005	.002	.009
Partner Anger	.007	.002	<.001
Actor Aggression History	.015	.004	<.001
Partner Aggression History	.007	.004	.058
Gender X Actor Anger	-.004	.002	.037
Gender X Actor Aggression History	-.005	.003	.055
Actor Anger X Actor Aggression History	.007	.004	.058
Gender X Actor Anger X Actor Aggression History	-.005	.001	.001
Actor Anger X Partner Anger	.001	.001	.220
Gender X Partner Anger	<.001	.002	.837
Gender X Actor Anger X Partner Anger	-.002	.001	<.001

Note. Coefficients are unstandardized. Gender was effect coded as Female = -1 and Male = 1. Actor anxiety, previous day aggression, Actor and Partner anger were grand mean centered; Actor and Partner aggression history were effect coded as Nonaggressive = -1 and Aggressive = 1.

Table 4

Two-Intercept Model Estimating Actor and Partner Effects in the Prediction of Daily Aggression

	b	SE	p
Intercept			
Male	.039	.004	<.001
Female	.058	.005	<.001
Actor Anger			
Male	.001	.002	.556
Female	.009	.003	.003
Partner Anger			
Male	.007	.002	.001
Female	.007	.002	.006
Actor Aggression History			
Male	.009	.004	.026
Female	.002	.005	<.001
Actor Anger X Actor Aggression History			
Male	.002	.002	.203
Female	.012	.002	<.001
Actor Anger X Partner Anger			
Male	-.001	.001	.080
Female	.003	.001	.003