Emotional Flooding in Response to Negative Affect in Couple Conflicts: Individual Differences and Correlates

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Abstract

This study explored whether individual differences in self-reported emotional flooding were associated with observational behaviors and experienced and displayed anger during a 10-minute problem solving discussion. A sample of 233 married or cohabitating couples, comprising four groups (distressed with intimate partner violence (IPV), distressed/nonIPV, satisfied/IPV, and satisfied/nonIPV) was recruited via random digit dialing. Consistent with predictions, both men's and women's flooding were positively associated with partners' negative affect variables, including partners' experienced and displayed anger, as well as positively associated with their own anger. A multinomial logistic regression revealed significant differences between flooding in prediction of couples' group status, specifically that higher levels of emotional flooding were reported by distressed and IPV couples compared with other types of couples. Finally, couples that included at least one member high on self-reported emotional flooding were less effective in solving problems during the conflict discussion. Implications and future directions are discussed.

Keywords

flooding; anger; couples; intimate partner violence; communication

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The expression of intense anger in couple relationships has been consistently negatively associated with relationship adjustment (Baron et al., 2007) and longevity (Gottman, 1993). Anger has also been shown to be positively associated with intimate partner violence (IPV; Birkley & Eckhardt, 2015) and with physical (e.g. Kiecolt-Glaser & Wilson, 2017; Robles, Slatcher, Trombello, & McGinn, 2014) and emotional (e.g., depression; Koh, Kim, & Park, 2002) health problems. Although much research has been conducted on correlates of anger and its effects on couples' relationships (e.g., Gottman, 2015), less is known about what happens to the individual to whom the relationship anger is being directed.

Expressing emotions allows for a communicative exchange from source to receiver (Van Kleef, 2010). These expressions are often thought to be beneficial to an individual, dyad, or group (e.g., increasing understanding/likeness among members; Barsade, 2002); however, problems can arise when expression is aversive, intermittent, unpredictable, or disorganized (Gottman, 1993). Even when negative emotion expression achieves immediate intrapersonal

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goals (e.g., coercing partner to give in; Dishion & Snyder, 2016), it can ultimately work against intrapersonal (e.g., Levenson, 1999) and interpersonal (e.g., Greenberg & Goldman, 2008) interests, both the mid-and long-term. Emotional exchanges contain expressive and receptive components; the likelihood that an intensely angry emotional expression could be disorganizing is high, but its destabilizing effects on the recipient's coping capacity is under-explored.

Emotional flooding (Gottman, 1993) is a construct that may aid understanding how one's intrapersonal experience as the object of partner's anger and negative affect might affect one's reactions, and ultimately, relationship outcomes. Gottman (1993, p. 64) defined emotional flooding as what occurs when "the partner's negative emotions are unexpected ('seem to come out of nowhere'), unprovoked, intense, overwhelming, and disorganizing and that the [recipient] will do anything to terminate the interaction (e.g., run away)." It is unique from other (albeit perhaps related) constructs such as distress intolerance (a perceived inability to tolerate negative emotional and somatic states; McHugh & Otto, 2012) and experiential avoidance (one's attempt to avoid painful events, such as negative emotions; Reddy, Meis, Erbes, Polusny, & Compton, 2011). Research on distress intolerance has largely focused on its relationship with such avoidance behaviors. In this regard, flooding may be a more specific form of distress intolerance, and may be related to (but not overlap with) experiential avoidance: Flooded responses not only promote *escape or withdrawal behaviors,* but are also *unexpected* and *disorganizing/overwhelming.* Thus, emotional flooding is conceptualized as an inability to maintain effective and organized functioning in reaction to one's partner's negative affect.

Individual differences in the propensity to flood have emerged and relate to other variables of interest. For example, Gottman (1994) reported gender differences in flooding; compared with women, men were more likely to flood and required less intense partner negative affect to withdraw or stonewall. Gottman (1993) also identified flooding as an indicator for the start of a "distance and isolation cascade," a trajectory toward relationship dissatisfaction and dissolution). O'Leary, Slep, and O'Leary (2007) found that flooding was an indirect predictor of IPV for both men and women, distinct from variables such as anger and stress. In separate multivariate models for men and women, relationship adjustment and partner attributions of responsibility for aversive and ambiguous events mediated the relations between flooding and IPV. Relatedly, in parenting research, flooding has been shown to be related to, but distinct from, the experience of negative emotion (Del Vecchio et al., 2016; Lorber, Mitnick, & Slep, 2016).

Although this research implies that flooding is an important construct in delineating how anger in couples leads to negative outcomes, much remains unknown. For example, is propensity to flood primarily an intrapersonal, individual difference variable? We hypothesize that individuals may be more or less likely to flood in a relatively stable, trait-like way. Gottman (1993) conceptualizes the experience of emotional flooding as a diffuse (i.e., not specifically cognitive, affective, or physiological), automatic reaction; as such, flooding may be a proxy for one's ability to generally tolerate aversive and stressful internal and external triggers. Because flooding is an internal reaction to external stimuli, it is possible that flooding is positively associated with other individual differences in gross

emotional reactions that have been previously studied, such as experienced and expressed anger during conflict.

Further, flooding is also a function of another person's expressed negative affect, requiring an interpersonal context and necessarily involves interpersonal inputs (i.e., is not solely reflective of an individual's propensity to flood). An individual's propensity to flood is irrelevant if his/her partner rarely directs aversive, angry behavior toward him/her. Perhaps the most developed literature of the dyadic context for flooding is that of crying infants. Infant cries are particularly hard to ignore and have a disorganizing effect on mothers, leading to symptoms such as maternal exhaustion, sleep deprivation, increased irritability, and psychophysiological arousal (Frodi, 1985). When crying is uncontrollable, it can have a negative effect on the mother-infant relationship, in that the mother often feels helpless or guilty and is increasingly likely to categorize the cries as aversive (Soltis, 2004), and even more so when the crying is high-pitched or abnormal (Zeskind & Lester, 1978). This negative cycle is associated with child neglect and abuse (Joosen, Mesman, Bakermans-Kranenburg, & van Ijzendoorn, 2013), and abusive mothers compared with nonabusive mothers experienced greater increases in heart rate, reported more aversion, and less sympathy to infant cries (Out, Pieper, Bakermans-Kranenburg, & van Ijzendoorn, 2010). Additionally, abusive mothers physiologically responded similarly to both infant cries and smiles (e.g., were reactive in both situations), whereas nonabusive mothers attended to infant smiles, but did not react physiologically (Frodi & Lamb, 1980). These findings suggest that properties of both the interpersonal inputs (e.g., infant cries) and the recipient's qualities likely interact to result in flooding.

In addition, the history of intense anger and its sequelae — in the relationship or family of origin —likely contribute to flooding by impacting partners' sensitivity and propensity to flood (e.g., anger at partner is frequent or intense and therefore salient, Gordis, Margolin, & Vinkerman, 2005; couple is distressed, for review see Heyman, 2001; developmental learning history, Walker, Holman, & Busby, 2009). Thus, both the interpersonal context (e.g., frequency and intensity of anger) *and* intrapersonal differences in thresholds for flooding, perhaps influenced by one's perceptions of the partners' anger, likely lead to the flooded response.

How Might Flooding Operate to Contribute to Negative Couple Outcomes?

A state of being flooded is a state of being overstimulated, overwhelmed, and cognitively disorganized. From an evolutionary perspective, this state may involve the cognitive narrowing implicated in the "fight or flight," response (or in the couple's context, one person responding to anger with anger [e.g., Heyman, 2001] or withdrawal [e.g., Woodin, 2011). This is evidenced in distressed (and especially distressed/IPV) partners, compared with nondistressed ones, behaving more angrily and reciprocating each other's angry behavior more often (Burman, Margolin, & John, 1993). Further, individuals in distressed/IPV, compared with nondistressed/IPV, relationships are more likely to withdraw and less likely to negotiate during conflict, with both types of IPV couples using anger and verbal attacks during conflict (Lloyd, 1990). Thus, both flight and fight responses to couple conflict are the

subject of study in the literature and have been found to be destructive relationship processes, processes that might be triggered by emotional flooding.

The aim of this study is to test (a) individual differences in emotional flooding, (b) how these may relate to and interact with other individual traits and qualities of the partner's speech (an index of aversiveness), and (c) how emotional flooding relates to interpersonal processes such as the dyadic problem solving abilities, propensities to withdraw from conflict, and anger intensities during conflict.

The Current Study

For the purposes of replication, we tested two of Gottman's (1993) gender differences: (1) men, compared with women, would self-report a higher propensity to flood; and (2) flooded men, compared with flooded women, would withdraw more often during conflict conversations. Our main focus, however, was to extend flooding research novelly and did not predict any gender differences in the main study hypotheses; as such, our first main hypothesis predicted that individual flooding scores would be positively associated with both degree and frequency of own and partner negative behaviors (e.g., withdrawal) and expressed (e.g., vocal arousal and anger display) and experienced affect (e.g., experienced anger). Our second hypothesis predicted that flooding and anger (e.g., anger display, vocal arousal, experienced anger), and the interaction of flooding and anger, will each significantly discriminate distressed/IPV couples from other couples. Finally, our third hypothesis predicted that couples with at least one partner high on flooding, compared with those where both were low on flooding, would perform worse on specific and global aspects of observed dyadic problem solving.

Method

Participants

Participants were 291 English-speaking, heterosexual couples who were married or living together for at least one year. Couples were recruited from a representative sampling frame of Suffolk County, New York using random digit dialing (RDD). A total of 229,106 phone numbers were dialed by research assistants who ultimately reached 12,009 individuals that answered at least one question in the interview. Respondents were screened for eligibility via the telephone interview. To participate, a respondent had to (a) report that he or she was married or had been cohabiting for at least 1 year, (b) report that both the respondent and the partner could understand and read English, and (c) meet criteria for one of the four relationship satisfaction X IPV groups detailed below. A total of 2,212 respondents were completed RDD interviews and were eligible for the study. Of these respondents, 291 ultimately participated in the study and received $250 for their participation in a 4-hour lab protocol. Participants in the phone survey were found to be fairly representative of the county population, compared with the 2000 U.S. Census; further, study participants were quite representative of couples who were eligible but did not participate in the study (for detailed information see Slep, Heyman, Williams, Van Dyke, & O'Leary, 2006).

Participants were preliminarily screened (through the RDD interview) for inclusion criteria, relationship satisfaction and IPV history via the Quality of Marriage Index (QMI; Norton, 1983) and the mild IPV items on the Conflict Tactics Scale-Revised (CTS2; Straus et al., 1996). Both male-to-female IPV in the past year and ever in the relationship were assessed.

Based on the phone respondents' answers, couples were preliminarily placed in one of four groups: distressed/IPV, distressed/nonIPV, satisfied/IPV, and satisfied/nonIPV. However, it was ultimately responses to the QMI and the CTS2 by both members of the dyad during the lab assessment that determined the couple's group status. Fifty-eight couples were excluded from analysis because they did meet dyadic criteria for membership in any of the four groups (e.g., dyadic discrepancies on satisfaction), yielding a final sample of 233 couples (*N* = 466).

Satisfied and clinical distress cutoff scores were based on Heyman, Sayers, and Bellack's (1994) formula for converting QMI scores from Dyadic Adjustment Scale (DAS; Spanier, 1976) scores. Clinical distress was determined using the DAS validated threshold of 97 for clinical distress (Eddy, Heyman, & Weiss, 1991), which is equivalent to QMI scores of 27 (Heyman et al., 1994). The Eddy et al. (1991) multi-study data set had a mean DAS of 114, so we used a QMI equivalent of 37 for the "satisfied" threshold. IPV classification was as follows: NonIPV couples did not endorse any male-to-female physical IPV items on the CTS-2 ever in the current relationship on the screener (but were allowed one reported lifetime mild physical IPV act [but none in the last year] on the more detailed lab assessment), and IPV couples endorsed at least two male-to-female physical IPV acts (mild and/or severe) in the past year. Male-to-female IPV was the focus of the study because of its higher likelihood of causing physical injury and/or fear (e.g., Foran, Slep, Heyman, & U.S. Air Force Family Advocacy Program, 2011). Additionally, because physical IPV is negatively associated with age (see O'Leary, 1999), efforts were made to match the ages of all groups to the ages of those in the distressed/IPV group (see Online Supplemental Table 1).

Measures

Relationship satisfaction.—The QMI (Norton, 1983) is a six-item measure of relationship satisfaction. Five of the items are rated on a Likert scale from 1 (*very strongly disagree*) to 7 (*very strongly agree*), and the sixth, more global rating of the relationship, on a scale from 1 (*very unhappy*) to 10 (*perfectly happy*). The QMI yields a summary score from 6 to 45, with higher scores indicating greater relationship satisfaction. It has evidence of excellent convergent validity with other satisfaction/adjustment measures as well as high internal consistency (Heyman et al., 1994). In this sample the internal consistency was excellent for both women (α = .98) and men (α =.97).

Intimate Partner Violence (Psychological and Physical).—The Revised Conflict Tactics Scale (CTS2; Straus et al., 1996) is the most widely used self-report measures of IPV, and its scores consistently correlate with several factors in the nomological network of couple IPV (O'Leary et al., 2007). The CTS-2's subscales for Psychological IPV and Physical IPV were used. Participants reported both perpetration and victimization

frequencies in the past year on a 7-point Likert-type scale (0 = *never,* 1 = *1 time,* 2 = *2 times,* 3 = *3–5 times,* 4 = *6–10 times,* 5 = *11–20 times,* and 6 = *more than 20 times*). The psychological and physical IPV scores used for analysis were calculated based on the higher of one partner's perpetration responses and the partner's victimization responses. The CTS2 is an index measure that inquiries about a variety of aggressive acts. It was not designed to sample a construct with a number of related items; thus, Cronbach's α was not calculated (Shortt, Capaldi, Kim, & Owen, 2006).

Areas of Change Questionnaire—(ACQ; Weiss, Hops, & Patterson, 1973) assesses the desired change in 34 common areas of couple disagreement. Items are rated from −3 (*much less*) to 3 (*much more*), and a score of 0 indicates that no change is desired. The ACQ has demonstrated convergent and discriminative validity (e.g., Heyman, Hunt-Martorano, Malik, & Slep, 2009; Margolin, Talovic, & Weinstein, 1983). In this sample the internal consistency was good for both women (α = .86) and men (α =.81).

Flooding.—The Intimate Partner Flooding Scale (IPFS; Heyman & Slep, 1998) is a 15-item spouse-specific measure which assess the degree to which participants are overwhelmed and disorganized by their partner's unexpected anger (please see Online Supplement 3 for full scale). Participants rated their responses from 1 = *almost always* to 5 = *never.* Responses were reflected so that higher numbers indicate a greater propensity to become flooded. The IPFS's internal consistency was high for both women (α = .96) and men (α =.96). It has been shown to have excellent internal consistency and high test-retest reliability in other samples as well (e.g., Foran, Lorber, Malik, Heyman, & Slep, 2018).

Observational Measures

Rapid Marital Interactional Coding System—(RMICS; Heyman & Vivian, 1992) is a micro-analytic observational coding system. The RMICS is a category-based system adapted from the ultra-microanalytic Marital Interaction Coding System–IV (MICS–IV; Heyman, Weiss, & Eddy, 1995), with codes guided by a factor analysis of MICS-IV codes (Heyman, Eddy, Weiss, & Vivian, 1994). Across studies representing over 1,000 couples, RMICS has demonstrated reliability, and discriminative, convergent, predictive, and construct validity (Heyman, 2004). (See Heyman, 2004, for a review of studies using the RMICS and a detailed description of code definitions and coding procedures). The basic coding unit is the speaker turn; if a speaker turns lasts longer than 30 s, it is coded in 30-s intervals. Coders assign only 1 of the 11 codes to each unit; if 2 or more codes are present during a speaker turn, a theoretically derived hierarchy (i.e., negative codes then positive codes then neutral codes) indicates which code to retain. For this study, percentage scores were calculated by taking the frequency of the target code and dividing it by the total number of behaviors. Interrater reliability was high for the target code of withdrawal, with 96% agreement and Guilford's G = .92. (Because of the highly imbalanced cells, Cohen's kappa is extremely biased and G is the preferred statistic [Xu & Lorber, 2014]. As there are no published recommendations for the interpretation of G statistic values, we interpret G similar to Cohen's kappa, with values of .40-.59 "fair," .60–.74 "good", and values > .75 "excellent" [Cicchetti, 1994].)

Global Assessment of Problem-Solving—(GAPS; Heyman, 2005) contains six global codes assessing the quality of problem solving in a couple interaction. Codes assess the degree to which the couple proposed a viable solution, weighed the pros and cons, and operationalized an action plan. Coders also rate the likelihood of the couple following through, the overall extent of resolution of the problem, and the amount of progress made toward solution. Codes are rated on a 4-point Likert scale from 1 (*unresolved*) to 4 (*fairly well/completely resolved*). Inter-rater agreement among 5 coders codes ranged from .60–.86 per code, as measured by Finn's *r* (Whitehurst, 1984).

Intensity of Anger Expression.—Anger expression intensity was based on coding of facial expression, vocal quality, and gesture, each coded separately for each partner in the dyad while the other partner's face was obscured. The facial expression coding was based on the MAX and AFFEX systems (Izard, Dougherty, & Hembree,1983), which define anger facial expressions based on typical anger presentations in each of the three regions of the face: forehead/brow, eyes/cheeks, and mouth/chin. Anger was defined as low, moderate, and high intensity based on the number of regions showing codeable anger (with more regions endorsing anger corresponding with higher intensity). Similarly, vocal cues were coded as no, low, moderate, and strong anger.

To maximize accurate facial expression/gesture data and vocal cue data, coding occurred separately in 500 ms intervals, where facial coding was done with no sound and vocal cue coding with no video. Scores were summed to calculate a total value for the entire 10-minute conversation, which were then used to determine the average amount of facial expression/ gesture data present throughout the entire conversation. Thirty percent of the data was coded by two coders and reliability 0.82, as measured by Finn's *r*.

Intensity of Vocal Arousal.—In addition to the coding detailed above, conversations were also coded for vocal arousal using the PRAAT computer program (Boersma & Weenink, 2005). Vocal arousal has been found to be associated with standard measures of arousal, is easy to collect, and is non-invasive (Baucom et al., 2007). First, each conversation was manually parsed by 9 trained, undergraduate RAs into separate male and female audio files using Adobe Premiere Pro 1.0. Data could only be analyzed when men and women were speaking independently; moments of overtalking were edited out. Measures of mean pitch and jitter (which measures pitch perturbations) were both extracted from the output.

Video-Mediated Recall Ratings of Intensity of Experienced Anger.—As described in the Procedures section, participants watched videos of just-completed conflict discussions and used a rating dial used with 120-degree range of motion that provided measurement to the closest half-degree to rate intensity of their experienced anger. The computer sampled the dial position every 500ms. To facilitate interpretation, ratings were converted to a 0 – 100 scale (proportion of the maximum), corresponding to the 0–100 "thermometer" participants viewed while making their ratings. The average level of anger during the 10-minute conversation was used.

Procedures

All study procedures were approved by the Stony Brook University Institutional Review Board. Data were collected as part of a larger project investigating relations between anger, conflict processes, and violence. Participants were told that they were participating in a study about the way couples resolve problems. Procedures relevant to the current study will be detailed and other procedures summarized below. On arrival, participants read and signed consent forms, and then brought into separate rooms to complete a questionnaire packet that included, among other measures, the QMI, CTS-2, and the ACQ (which was used to determine the topics for the three ten-minute videotaped discussions). Except for the videorecorded observations, the participants were separated for all aspects of the procedures.

Prior to the first conversation, participants were asked to think about anger like a thermometer ranging from completely calm (0) to the angriest they've ever been (100) and to generate their own words to describe how they feel at 20, 40, 60, 80, and 100. (They were given a list of thesaurus anger words to help them with the task.) These words, along with the numbers, were displayed on the computerized thermometer during the video-mediated recall task. Additional pre-conversation measures were completed. As part of the larger study three conflict tasks were collected: a "warm-up" and two typical conversations, the first on one of the woman's top topics and the other the man's, chosen from the ACQ. Only the typical conversation regarding the woman's topic will be analyzed because women are more likely to desire more change and behavioral increases from their male partners (Heyman et al., 2009; Margolin et al., 1983). After the conflict observations, the partners were separated and completed several post-interaction questionnaires and the video-mediated recall task (see Gottman and Levenson, 1982). While watching the videorecorded conversation, participants were instructed to think about how they felt during the conversation (not how they were feeling as they were watching it) and to move the computerized 0–100 anger rating dial as much or as little as needed so that the on-screen "thermometer" always reflected they felt at that point during the conversation.

After completing the full protocol, participants were paid, debriefed, and provided with a list of community resources.

Results

Major study variables were first assessed for normality for men and women separately. Emotional flooding was square root transformed, which normalized skew and kurtosis. For average anger experience and average facial display of anger, scores were log transformed due to the severe positive skew of the distribution. For interpretability of the odds ratio in the performed regression analysis, the transformed scores were converted to z-scores. Non-transformed Means and Standard Deviations for main study variables can be found in Table 1.

As shown in Table 2, men's and women's report of emotional flooding were associated, $r = .256$, $p < .001$; thus, multilevel modeling (e.g., Kenny, Kashy & Cook, 2006) was used to analyze the differences in reporting by men and women. Gender was entered as the level 1 variable and dyad membership was the level 2 variable. The gender-based replication was

not supported (men: $M = 32.09$; $SD = 13.69$; women: $M = 32.54$; $SD = 14.72$; $t(466) = .242, p = ns$): not only were men not significantly more likely to report flooding, men's and women's scores were nearly precisely the same.

However, as hypothesized, men's flooding was positively associated with his own withdrawal during conflict conversations of the women's topic, $r = .162, p < .05$.[1] As hypothesized, both men's and women's flooding were significantly and positively associated with their partners' intensity of anger (a) experienced and (b) expressed during a conflict task (see Table 2). However, neither men's nor women's emotional flooding was significantly associated with their partners' vocal arousal (see Table 2). Additionally, intraindividually, men's and women's flooding were positively associated with their own anger experience and expression (see Table 2).

Further, when both partners' expressed anger, experienced anger, vocal arousal, and flooding were entered as predictors in multinomial logistic regression to predict group status, women's flooding, men's flooding, and women's experienced anger captured significant variance, $\chi^2(24, N = 233) = 143.54$, Nagerlkerke $R^2 = .54, p < .001$ (see Table 3). The parameter estimates for the full model are shown in Table 4. Lastly, we culled the model to exclude all predictors that did not have significant unique effects. The resulting model was statistically significant, $\chi^2(9, N = 233) = 138.25$, Nagerlkerke $R^2 = .49, p < .001$. Ryan-Einot-Gabriel-Welsch tests were used to make univariate pairwise comparisons between groups for each predictor that had a significant, unique effect in the logistic regression. Based on the final model, as shown in Table 5, those in distressed/IPV and distressed/nonIPV, compared with those in satisfied/IPV, relationships reported higher scores on flooding; further, women in these relationships reported more experienced anger. Second, women in satisfied/IPV, compared with those in satisfied/nonIPV, relationships reported experiencing significantly more anger during the conflict discussion and reported more flooding. Third, women in distressed/IPV, compared with distressed/nonIPV and satisfied/IPV, relationships reported more flooding, as did men in distressed/IPV, compared with satisfied/IPV, relationships.

Lastly, as hypothesized, couples ($n = 78$) that contained at least one partner high on flooding (as calculated by two standard deviations above the mean), compared with other couples ($n = 155$), displayed worse problem solving during the conflict discussion (See Online Supplemental Table 2 for Means and Standard Deviations). Specifically, couples containing at least one partner high on flooding were less likely to propose a viable solution, $t(233) = -3.93$, $p < .001$, to weigh the pros/con, $t(233) = -4.54, p < .001$, or to operationalize plans, $t(233) = -4.32$, $p < .001$; they were rated as less likely to follow through on solutions, $t(233) = -4.98$, $p < .001$, to overall have left the problem less resolved, $t(233) = -6.05$, $p < .001$, and to have made less global progress toward a solution, $t(233) = -5.01, p < .001$.

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[1]Authors were able to test same association between men's self-reported flooding and his own withdrawal during men's topic conversation. Results indicated that during the men's topic, men's flooding was not associated with his own withdrawal, $r = .044$, $p = ns$. Likely, this is driven by the fact that men's proportion of withdrawal behaviors was significantly different for his wife's topic, compared to his own topic, $t(232) = 2.885$, $p = .004$.

Discussion

We did not replicate Gottman's (1993) findings that men would report higher levels of flooding than women. Conversely, all hypotheses for the current study were largely supported. As expected, both men and women's self-reported propensity to flooding was positively associated with own experienced and expressed anger, as well as the degree of one's own vocal arousal. Similarly, flooding was positively, though generally modestly, associated with indicators of the aversiveness of partners' behavior and affect (i.e., expressed and experienced anger). There were no significant associations betwee flooding and partners' vocal arousal. Interestingly, partners' vocal arousal was positively associated with other negative affect variables, perhaps indicating that vocal arousal is somewhat less likely to evoke flooding compared with other, possibly more salient, negative affective cues, such as facial anger display.

As expected, in general, women who are in distressed/IPV relationships are more likely than women in other types of relationship to feel flooded by their partner's negative affect. The same pattern is generally true for men, except for men who are in distressed/IPV relationships do not significantly differ with regard to flooding from men in distressed/nonIPV relationships. For men, therefore it appears that flooding is a better predictor of couple distress rather than the presence of IPV. As previous literature suggests, individuals in distressed relationships, particularly distressed/IPV relationships, are more likely to display and reciprocate anger and withdraw from conflict (Lloyd, 1990). Current findings are also consistent with results from prior studies that identified flooding as an indirect predictor of male and female IPV (O'Leary et al., 2007) as well as being positively associated with one's anger, depressive symptoms, and observed negative behavior (Foran et al., 2018). This general pattern is consistent with the notion that flooding can facilitate coercive interchanges where anger and hostility from the partner leads to flooding, which elicits a fight response (characterized by reciprocated anger and hostility) with the goal of ending the partner's aversiveness (see Slep, Heyman, & Lorber, 2016). It is beyond the methods used in this project to more specifically tease apart this causal sequence, but these results do lend initial correlational support.

A somewhat surprising finding was that only male and female flooding and female anger experience, but not other aspects of anger during conflicts, discriminated the four different types of couples sampled in this study[2]. Results indicated that, irrespective of the level of their partners' anger, *women's* flooding better distinguished group membership than men's anger did. For men, the flooding measure may be indicative of a more diffuse arousal and upset, whereas for women emotional flooding may be better able to differentiate a unique reaction, or arousal state, of their reaction to partner's negative affect that is distinct from specific emotions such as anger or fear, although more precise measurement would likely be needed to more powerfully test this supposition. Gender differences have also been reported regarding parental flooding as a distinct, indirect predictor to parent-child IPV (Slep &

[2] It is important to note that 97.3% of the distressed/IPV couples and 74% of the satisfied/IPV couples reported both male-to-female and female-to-male aggression, and therefore the bidirectional pattern of IPV in these couples could also impact individual reporting of flooding in the lab setting.

O'Leary, 2007). Finally, setting effects should also be taken into consideration before concluding any gender difference, as the topic of the discussion was one of the woman's top areas of desired change in the relationship. It is possible that results would be different if it were the man pursuing change, as which partner's topic is being discussed has been shown to make a difference in observed behaviors (see Heyman et al., 2009; Sagrestano, Christensen, and Heavey, 1998).

Finally, as hypothesized, flooding is associated with degraded problem solving. Couples comprising at least one partner with a high propensity to flood, compared with couples with both partners low on such propensity, displayed worse problem solving during the conflict discussion. Therefore, identifying either member of the couple as having a high propensity to flood could be a key marker in helping couples to identify barriers to successful conflict resolution.

A major strength of the current study includes the use of a large, reasonably generalizable sample recruited through random digit dialing. Further, the use of multi-modal techniques to assess in-lab anger allows the testing of the correlates of each to flooding. Further, couple conflict behaviors and affect were elicited in the lab, allowing this study to go beyond questionnaire reports. This study provides the first step in delving into inter-and intra-personal factors associated with flooding to a negative stimulus, such as partner's anger.

However, limitations should also be noted. First, this is a correlational study, so causation cannot be inferred. For example, it could be that individuals high on flooding are more likely to seek out partners with similar traits and this puts them at a higher risk for responding to each other in a hostile way. It could also be that differences in flooding are largely attributable to a learned behavior in reaction to past experiences and could be spuriously related to couple dynamics. Second, due to the interpersonal and intrapersonal mechanisms of emotional flooding, it is hard to parse nuanced differences between purely intrapersonal and interpersonal elements. For example, it could be that one's own heightened anxiety or depression is positively associated with self-reported flooding, but these individual differences may also be a result of a maladaptive, negative cycle of the couple's behavior. Third, it is unlikely that couples who would fit Michael Johnson's (2008) IPV typology for "intimate terrorism" (i.e., instrumental violence to control partner) would either answer the initial RDD screening or volunteer to participate in a laboratory observational study. Thus, the results we obtained likely apply only to flooding in couples who fit Johnson's "situational couple violence" type. Fourth, it is important to note that flooding is measured globally and may not be best captured in a 10-minute state-specific laboratory observation. Finally, this study focused only on topics initiated by the female partner. Although these may be the most generalizable contexts to observe — past research has indicated that women are more likely than men to desire and pursue relationship change (e.g., Heyman et al., 2009; Margolin et al., 1983) — interpersonal behavior, and thus flooding, may be different in topics for which men, instead of women, are pursuing change. Indeed, in a study examining observed behavior (but not flooding) using the current sample (Malik, Heyman, & Slep, 2019), although both men and women rated their partners' behavior as being fairly typical in both female-and male-initiated topics, men were rated by their partners as being

atypically more negative and less positive during female-, compared to and male-, initiated topics.

Future studies that aim to further elucidate flooding in an interpersonal context would benefit from collecting cross-informant data on partner flooding, as well as self-reported data on how emotionally flooded participants felt during the conflict paradigm (instead of an individual difference measure). Therefore, a state-specific flooding questionnaire could be developed and adapted for future studies to better account for these nuances. It may also be of use to manipulate emotional flooding through an aversive interpersonal in-lab task and studying emotional and physiological reactivity to the manipulation in concordance with level of emotional flooding.

As alluded to above, future research could also benefit from focusing on other individual difference variables that may be related to emotional flooding, such as personality or psychopathology. Psychophysiological research on anxiety maintains that individuals high on anxiety, compared with those low on anxiety, tend to have a heightened arousal and an increased attentional allocation to emotional (both threatening and satisfied) stimuli (Fox, Russo, & Dutton, 2002). Specifically, if individuals are keenly aware of their surroundings, then aversive stimuli may be picked up on more quickly (Ohman, 1993) or may be more difficult from which to divert attention (Fox et al., 2002); further, the individual may be more likely to perceive benign stimuli as noxious (Mathews & MacLeod, 1994). Longitudinal data from Gordis et al. (2005) suggests that this phenomenon extends to relationships, in that women who remained in relationships with a history of abuse reported similar amounts of frightening partner behavior a year and a half later, despite desistance, reduction, or continuance of abusive behavior. Additionally, differences in emotional flooding may be linked to a more general, distress intolerance and experiential avoidance for aversive stimuli, which could also be affected by mood state (e.g., depression). A future study that aims to specifically test and delineate the ways in which these related constructs both converge and diverge would likely be instrumental in understanding each's unique variance and the operationalization of these concepts.

The major implication of these findings is that the emotional flooding construct differentially operates in satisfied and distressed couples, as well as couples with and without physical IPV. Further, both men's and women's flooding were stronger predictors of couples' group status than were expressed or experienced anger and other observational codes. Because of these association, it may be beneficial for interventionists to screen for individual differences in emotional flooding to inform prevention or treatment.

As one of the few studies of flooding in couples, these provocative findings regarding flooding necessarily produce several suggestions for research progress. First, we did not collect moment-by-moment ratings of the experience of flooding; video-mediated recall that collected these ratings would allow researchers to understand antecedent→flooding→behavioral sequences that would test whether flooding unfolds as theorized. Second, further work is needed to better understand the mechanisms of flooding and its related constructs (e.g., anger, cognitive disorganization, distress intolerance). This will likely require systematic experimentation high in internal validity rather than via quasi-

naturalistic observation high in external validity. Third, a fuller test of developmental theories is necessary; that is, whether early proneness to flooding leads to frenzied and early escape from conflict, leading to accumulation of unresolved problems, dwindling satisfaction, and increased frequency and intensity of interpersonal conflict (with more frequent flooding→escape sequences). Although the current results are consistent with the hypothesized pattern, longitudinal study is necessary to actually test it. Finally, most IPV treatment is done in non-dyadic (e.g., men's groups) settings and is largely psychoeducational in nature. Flooding poses a challenge for such intervention in two ways: (a) flooding's emotional disorganization may substantially interfere with preferred behaviors learned in less emotional treatment settings; and (b) flooding involves both individual proneness and interpersonal stimuli, implying that both individual and dyadic changes may be necessary to reduce IPV risk from flooding-fraught situations. A two-pronged approach would be viable for situationally-violent couples treated in IPV-focused couples therapy (e.g., Stith, McCollum, & Rosen, 2011) but would be more challenging for non-dyadic approaches.

In conclusion, emotional flooding may provide important insights in how anger is differentially processed and responded to in couples differing in both relationship satisfaction and IPV. Although this study prompts more questions than it answers, it may provide a useful impetus to theoretically-driven study of important but heretofore under studied phenomena involved in processes promoting both relationship deterioration and intimate partner violence.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1

Mean and Standard Deviations of Flooding and Negative Affect Variables

	G1 (n = 85)	G2 (n = 43)	G3 (n = 73)	G4 (n = 32)
	M(SD)	*M(SD)*	*M(SD)*	*M(SD)*
Women				
Flooding	23.59 (8.95)	34.23 (14.43)	43.17 (14.95)	29.97 (10.45)
Experienced Anger	64.45 (115.04)	167.06 (159.15)	216.53 (224.36)	129.64 (149.99)
Expressed Anger	0.41 (0.39)	0.69 (0.45)	0.70 (0.44)	0.57 (0.38)
Vocal Intensity	191.33 (27.28)	195.33 (23.89)	197.84 (25.29)	194.30 (32.24)
Percent Withdrawal	0.02 (.21)	0.06 (0.38)	0.26 (1.97)	0.00 (0.00)
Men				
Flooding	24.07 (10.13)	36.51 (13.19)	40.24 (13.55)	29.13 (9.79)
Experienced Anger	60.96 (104.42)	180.20 (209.79)	159.96 (163.86)	81.31 (117.74)
Expressed Anger	0.35 (0.32)	0.54 (0.48)	0.59 (0.44)	0.47 (0.32)
Vocal Intensity	138.20 (24.66)	140.28 (22.03)	143.30 (29.40)	138.68 (24.54)
Percent Withdrawal	0.03 (.23)	0.04 (0.25)	0.02 (0.18)	0.00 (0.00)

G1 = satisfied/nonIPV couples, G2 = distressed/nonIPV couples, G3 = distressed/IPV couples, G4 = satisfied/IPV couples.

Table 2

Correlations Between Male and Female Flooding and Negative Affect Variables

	Male M experienced anger	Male M expressed anger	Male M vocal intensity	Male percent withdrawal	Female flooding	Female M experienced anger	Female M expressed anger	Female M vocal intensity	Female percent withdrawal
Male flooding	.340**	.193***	−.004	.162*	.256***	.363***	.210**	.028	.106
Male M experienced anger	-	.490***	−.094	.006	.401***	.527***	.526***	.184**	.082
Male M expressed anger		-	.197	−.026	.193*	29***	52***	.155*	.013
Male M vocal intensity			-	.007	.052	.159*	.458**	.210**	.032
Male percent withdrawal				-	.086	−.019	.000	−.056	−.010
Female flooding					-	.249**	.143*	.028	.030
Female M experienced anger						-	.270**	.165*	.023
Female M expressed anger							-	.318**	.013
Female M vocal intensity								-	.005

*
$p < .05$;

**
$p < .01$;

***
$p < .001$.

Table 3

Predictors' Unique Contributions in the Multinomial Logistic Regression (N = 233)

Predictor	χ^2	df	P
Male Flooding	26.09	3	<.001
Female Flooding	49.26	3	<.001
Male Experienced Anger	4.13	3	.248
Female Experienced Anger	10.69	3	.014
Male Expressed Anger	3.48	3	.323
Female Expressed Anger	0.90	3	.826
Male Vocal Intensity	1.52	3	.678
Female Vocal Intensity	2.42	3	.490

Table 4

Multinomial Logistic Regression Predicting Couples' Group Status from Main Study Variables

Predictor	LR x2	1:2	95% CI	1:3	95% CI	1:4	95% CI	2:3	95% CI	2:4	95% CI	3:4	95% CI
Female flooding	49.26***	3.20***	1.71–5.98	6.61***	3.47–12.60	2.09*	1.07–4.10	2.07**	1.29–3.32	1.53	0.80–2.92	3.16***	1.67–6.00
Male flooding	26.09***	2.86***	1.63–5.00	3.67***	2.06–6.54	1.64	0.92–3.00	1.29	0.82–2.03	1.74*	0.96–3.16	2.23**	1.23–4.06
Female experienced anger	20.48***	1.00*	1.00–1.01	1.00**	1.00–1.01	1.01*	1.00–1.01	1.00	1.00–1.00	1.00	1.00–1.00	1.00	1.00–1.00
Male experienced anger	4.13	1.00	1.00–1.01	1.00	1.00–1.00	1.00	0.99–1.00	1.00	1.00–1.00	1.00	1.00–1.01	1.00	1.00–1.01
Female displayed anger	0.9	1.88	0.50–7.11	1.56	0.40–6.15	1.25	0.30–5.16	0.83	0.23–2.68	1.51	0.36–6.34	1.25	0.31–5.11
Male displayed anger	3.48	3.37	0.77–14.71	3.65	0.80–16.76	2.90	0.59–14.38	1.08	0.34–3.45	1.16	0.23–5.80	1.26	0.26–6.20
Female vocal intensity	2.42	1.00	0.98–1.02	1.00	0.98–1.02	1.01	0.99–1.03	1.00	0.98–1.02	0.99	0.96–1.01	0.99	0.97–1.01
Male vocal intensity	1.52	1.00	0.98–1.03	1.00	0.98–1.03	1.01	0.99–1.04	1.00	0.98–1.02	0.99	0.97–1.01	0.99	0.97–1.01

*
p <.05;

**
p < .01;

***
p < .001.

Notes: LR x2=−2Loglikelihood Chi Square; 1 = satisfied/nonIPV couples, 2 = distressed/nonIPV couples, 3 = distressed/IPV couples, 4 = satisfied/IPV couples

Table 5

Multinomial Logistic Regression Predicting Couples' Group Status for the Reduced Model

Predictor	LR x2	1:2	95% CI	1:3	95% CI	1:4	95% CI	2:3	95% CI	2:4	95% CI	3:4	95% CI
Female flooding	52.05 ***	2.36 ***	1.54–3.64	4.12 ***	2.62–6.49	1.80 **	1.16–2.81	1.75 **	1.22–2.49	.76	0.50–1.17	0.44 ***	0.28–0.67
Male flooding	38.21 ***	2.54 ***	1.67–3.89	3.27 ***	2.10–5.08	1.60 *	1.04–2.45	1.28	0.89–1.85	63 *	0.41–0.97	0.49 **	0.32–0.76
Female experienced anger	20.48 ***	2.26 **	1.34–3.79	3.13 ***	1.80–5.54	1.99 **	1.19–3.33	1.39	0.83–2.31	.88	0.50–1.56	0.64	0.36–1.14

*
$p < .05$;

**
$p < .01$;

***
$p < .001$.

LR x2=−2Loglikelihood Chi Square; 1 = satisfied/nonIPV couples, 2 = distressed/nonIPV couples, 3 = distressed/IPV couples, 4 = satisfied/IPV couples.