Published in final edited form as:
J Psychol. 2011 ; 145(6): 521–535.

Negatively Biased Emotion Perception in Depression as a Contributing Factor to Psychological Aggression Perpetration: A Preliminary Study

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Abstract

Based on research linking depressive symptoms and intimate partner aggression perpetration with negatively biased perception of social stimuli, the present authors examined biased perception of emotional expressions as a mechanism in the frequently observed relationship between depression and psychological aggression perpetration. In all, 30 university students made valence ratings (negative to positive) of emotional facial expressions and completed measures of depressive symptoms and psychological aggression perpetration. As expected, depressive symptoms were positively associated with psychological aggression perpetration in an individual's current relationship, and this relationship was mediated by ratings of negative emotional expressions. These findings suggest that negatively biased perception of emotional expressions within the context of elevated depressive symptoms may represent an early stage of information processing that leads to aggressive relationship behaviors.

Keywords

affect recognition; depressive symptoms; intimate partner violence; mood disorders; partner abuse

Depression is considered the most pervasive and burdensome of all psychiatric disorders (Murray & Lopez, 1996). Prevalence rates for current and lifetime diagnoses of major depressive disorder have been estimated at 6.6% and 16.2%, respectively (Kessler et al., 2003). Moreover, community surveys suggest that subsyndromal depressive symptoms may currently affect as much as 20% of the general population (Kessler, Avenevoli, & Merikangas, 2001). In addition to a variety of physical health and employment consequences (Greenberg, Kessler, Nells, Finkelstein, & Berndt, 1996), individuals suffering from depressive symptoms often experience serious social and relationship difficulties (Wade & Cairney, 2000).

Depressive symptoms are associated with a wide range of interpersonal problems (Youngren & Lewinsohn, 1980). Couples in which one partner experiences elevated depressive symptoms demonstrate negative communication styles, including elevated verbal and nonverbal negative behaviors and lack of affectionate behaviors (Gotlib & Hooley, 1988; McCabe & Gotlib, 1993). Depressed partners, in particular, demonstrate high levels of tension, hostility, and criticism during problem-solving tasks (Gotlib & Beach, 1995), as

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well as diminished cooperation (Joiner, 2002), low assertiveness, and negative attributions for their partner's behavior (Gotlib & Whiffen, 1989). Evidence also indicates that elevated depressive symptoms are associated with increased perpetration of psychological aggression (i.e., coercive or aversive acts directed at the recipients' sense of self and intended to produce emotional harm or threat of harm; Murphy & Cascardi, 1999) in their intimate relationships (Kim & Capaldi, 2004).

Development of a clearer understanding of the association between depressive symptoms and psychological aggression perpetration is important for a number of reasons. First, psychological aggression is extremely pervasive, with reported rates of at least 74% of individuals in a nationally representative sample (Straus & Sweet, 1992), and the experience of psychological aggression leads to a host of negative physical and mental health consequences for both men and women (Coker, Smith, McKeown, & King, 2000; Straight, Harper, & Arias, 2003). Second, comparable rates of psychological aggression perpetration have been found across genders (Straus & Sweet, 1992), and the association between depressive symptoms and psychological aggression perpetration exists across genders (Kim & Capaldi, 2004), suggesting that a generalized mechanism may be responsible. Finally, the association between depressive symptoms and psychological aggression perpetration may represent the beginning of a cascade of negative consequences. Among a sample selected based on high risk for externalizing disorders, depressive symptoms in late adolescence have been found to be longitudinally associated with psychological aggression perpetration in young adulthood (Kim & Capaldi, 2004). In addition, premarital psychological aggression perpetration is a strong risk factor for the perpetration of physical aggression during marriage (Murphy & O'Leary, 1989). In the current study, which is based in a social information-processing framework (McFall, 1982), we examine biased perception of emotional expressions as a potential explanatory factor for the association between depressive symptoms and psychological aggression perpetration among a relatively low-risk sample of late adolescence men and women.

Several studies have found that individuals with elevated depressive symptoms have a negatively biased perception of social stimuli such as facial expressions of emotions. Consistent with the mood congruency principle (Bower, 1981) and the negative potentiation hypothesis (Beck, 1967), individuals experiencing elevated depressive symptoms have been found to selectively attend to negative social stimuli and have a negatively biased perception of negative social stimuli (Gur et al., 1992; Kellough, Beevers, Ellis, & Wells, 2008; Krompinger & Simons, 2009). Consistent with the positive attenuation hypothesis, these individuals also demonstrate diminished attention toward positive stimuli and perceive less positive affect in positive social stimuli (Cavanagh & Geisler, 2006; Hale, Jansen, Bouhuys, & van den Hoofdakker, 1998). It appears that individuals with elevated depressive symptoms experience these cognitive patterns simultaneously (Bylsma, Morris, & Rottenberg, 2008; Gur et al., 1992; Kellough et al., 2008). In the context of intimate relationships, particularly during episodes of conflict in which negative emotions (e.g., anger, sadness, disgust) are expressed, an overly negative perception of such emotions may be particularly likely to lead to elevated conflict and the use of psychological aggression.

Biased perception of emotional expressions has not previously been associated with the perpetration of psychological aggression, but two studies have found that emotion recognition deficits are associated with the perpetration of physical aggression in intimate relationships. Babcock, Green, and Webb (2008) found that violent husbands made more errors in the categorical recognition of neutral facial expressions than did nonviolent husbands, suggesting biased perception of these expressions. Unfortunately, the direction of this bias (i.e., whether violent husbands were more likely to choose positively or negatively valenced expressions when the displayed expression was neutral) was not reported. Marshall

and Holtzworth-Munroe (2010), however, examined husbands' perception of their wives' expressions of happiness and fear and found that husbands' physical aggression perpetration was associated with misperceiving their wives' expressions of happiness as each negatively valenced emotion (i.e., anger, disgust, sadness, and fear) but not neutral, suggesting a negatively biased perception of emotional expressions.

In the current study, we examined biased perception of emotional expressions as a potential mechanism accounting for the expected relationship between depressive symptoms and use of psychological aggression in one's intimate relationship. Given the high prevalence rates of both subsyndromal depression (Kessler et al., 2001) and psychological aggression perpetration (Straus & Sweet, 1992), as well as research suggesting that depression may initiate a cascade of negative consequences among late adolescents (Kim & Capaldi, 2004), we examined these relationships among a relatively low-risk sample of late adolescence college students. In addition, based on research indicating that depressive disorders are not taxometric (Ruscio & Ruscio, 2000), we examined depressive symptoms dimensionally among this nonclinical sample. We focused on the perception of anger, disgust, and sad expressions given the relevance of these emotions to relationship conflicts (i.e., events during which psychological aggression is most likely to be used). Finally, to accurately characterize the generality of the negative potentiation hypothesis and to represent contemporary conceptualizations of emotion (LeDoux, 1996; Russell, 2003), we asked participants to rate emotional expressions on a valence dimension ranging from negative to positive. We hypothesized the following: (a) Participants' depressive symptoms will be positively correlated with the degree of their use of psychological aggression in their current relationship, (b) depressive symptoms will be associated with rating negatively valenced emotional expressions (i.e., anger, disgust, sadness) as more negative, (c) degree of psychological aggression perpetration will be associated with rating negatively valenced emotional expressions as more negative, and (d) ratings of negatively valenced emotional expressions will mediate the expected relationship between depressive symptoms and psychological aggression perpetration.

Method

Participants

Participants were 30 undergraduate participants (70% female) who reported currently being in an intimate relationship. We recruited them through an introductory psychology course at a large university in the Northeastern United States. Participants' mean age was 19.18 years ($SD = 1.47$ years). Most participants self-identified as Caucasian (96%). No participants reported having children, and 4.5% of participants indicated that they live with their current partner. Prior to becoming a college student, 50% of the sample lived in a rural area, and 50% of the sample lived in an urban area.

Measures and Materials

Beck Depression Inventory, Second Edition (BDI-II; Beck, Steer, & Brown, 1996)—The BDI-II consists of 21 items for evaluating depressive symptoms experienced in the previous 2 weeks among clinical and nonclinical samples. Each item includes four self-report statements scored on a scale from 0 to 3. Items are summed to yield a total score with higher scores indicative of more severe depressive symptoms. The BDI-II has demonstrated good test-retest reliability and convergent validity with other measures of depression among clinical and nonclinical adult and adolescent samples (Beck, Steer, & Garbin, 1988; Osman, Barrios, Gutierrez, Williams, & Bailey, 2008). In the current sample, the internal consistency reliability coefficient was .82.

Revised Conflict Tactics Scale (CTS2; Straus, Hamby, & Boney-McCoy, 1996)

—The CTS2 is the most widely used self-report measure of partner aggression. The psychological aggression subscale includes eight items ranging from *insulted or swore at my partner* to *threatened to hit or throw something at my partner*. For each listed behavior, participants indicate how many times they or their partner had engaged in the behavior during the past year. Given that we did not expect many participants to be in their current relationship for the full year, we modified the response format to ask participants how many times each behavior occurred in their current relationship. We then dichotomized responses to reflect whether the behavior had or had not occurred and summed the number of positively endorsed items to yield a total score ranging from 0 to 8, indicating the number of different types of psychologically aggressive acts participants engaged in towards their current partner. This method of summarizing partner aggression data has been found to have more desirable psychometric properties than frequency scores, including greater reliability than methods that can be biased by memory limitations when attempting to report behavior frequencies (Moffitt et al., 1997). The CTS2 has demonstrated factorial validity (Connelly, Newton, & Aarons, 2005), and the CTS2 psychological aggression subscale has good internal consistency and test–retest reliability among a variety of samples (O’Leary & Williams, 2006; Straus, 2004; Vega & O’Leary, 2007), as well as convergent validity across a wide range of measures (Schumacher, Slep, & Heyman, 2001; Straus, 2004). In the current sample, the internal consistency reliability coefficient was .75.

Emotional expressions stimuli—Posed static emotional expressions stimuli were developed through the recruitment of untrained actors from the community. Actors consisted of 26 Caucasian, African American, and Asian men and women of various ages, ranging from 19 to 62 years. Emotional expressions stimuli from 19 actors were developed by Marshall and Holtzworth-Munroe (2010). Identical procedures were used to develop emotional expressions stimuli for the additional 7 actors. That is, instructions for eliciting emotional expressions were developed according to the Facial Affect Coding System (FACS; Ekman & Friesen, 1978) and using the minimum muscular movements for each emotion recommended by Parke and Waters (1996). Actors were informed of the target emotion (i.e., fear, sadness, anger, disgust, happiness, or surprise), and the expression was demonstrated; then they were coached to move each muscle included in the target expression. To make the stimuli representative of naturalistic expressions, expressions were obtained at four intensity levels. Actors began by displaying the highest intensity expression, then slowly relaxed their facial muscles while photographs were taken. This process was repeated until four separate intensity levels were obtained, each judged by the first author to provide an accurate portrayal of the target emotion according to the FACS. One photograph of each actor displaying a neutral expression (i.e., no visible muscular movements) was also taken. Photographs were transformed to gray scale, cropped around the face, and increased in brightness, if necessary. The total stimulus set included 650 photos.

Procedures

Participants were asked to view a series of photographs of emotional expressions on a computer and rate the valence of each photograph on a Likert scale ranging from *negative* (1) to *positive* (9). Photographs were displayed one at a time, with the scale shown on the computer screen below the photograph. To decrease participant fatigue, each participant rated half of the total set of 650 photographs, including the full set of photographs from 13 different actors (approximately half were female). After rating the facial affect stimuli, participants completed self-report measures on a computer.

Results

Descriptive Statistics

Of the sample, 23 participants (77%) reported having engaged in psychological aggression during their current relationship, and the individuals' acts ranged among one to six types of psychologically aggressive acts ($M = 2.20$, $SD = 1.85$). BDI-II depression scores ranged from 0 to 27, with a mean of 8.89 ($SD = 6.4$), indicating that most participants were currently experiencing minimal depressive symptoms, but some participants reported moderate to severe depressive symptoms. As expected, expressions of happiness were rated as the most positively valenced ($M = 6.81$, $SD = 0.99$), and all negatively valenced emotional expressions were rated as such. Expressions of anger were rated as most negative ($M = 3.01$, $SD = 0.95$), followed by sadness ($M = 3.15$, $SD = 0.87$), and disgust ($M = 3.36$, $SD = 0.96$). Unexpectedly, neutral expressions ($M = 3.71$, $SD = 0.87$) were rated somewhat more negatively than expressions of fear ($M = 3.89$, $SD = 0.85$). Expressions of surprise ($M = 4.79$, $SD = 0.81$) were also rated somewhat negatively. For both conceptual purposes and to ensure that negatively valenced expressions were truly viewed as negative, we computed a negative-emotions composite score comprised of average ratings of anger, sadness, and disgust. This composite score had a mean valence rating of 3.17 ($SD = 0.89$).

Associations Among Study Variables

Bivariate correlations among study variables are displayed in Table 1. As predicted, depressive symptoms were significantly correlated with psychological aggression perpetration ($r = .37$, $p < .05$). In addition, depressive symptoms were significantly correlated with participant ratings of the negative emotions composite variable ($r = -.36$, $p < .05$). Across individual emotions, depressive symptoms were most strongly correlated with ratings of sad expressions ($r = -.44$, $p < .05$). Also as predicted, psychological aggression perpetration was significantly correlated with participant ratings of the negative emotions composite variable ($r = -.40$, $p < .05$). Across individual emotions, psychological aggression also was most strongly correlated with ratings of sad expressions ($r = -.44$, $p < .05$).

Mediating Effect of Ratings of Negative Emotional Expressions on the Relationship Between Depressive Symptoms and Psychological Aggression Perpetration

To test the hypothesis that participants' ratings of negative emotional expressions will mediate the relationship between depressive symptoms and psychological aggression perpetration, we conducted mediation analyses, including Preacher and Hayes' (2004) procedures for conducting a bootstrap analysis of the sampling distribution of the indirect effect. As displayed in Table 2, the direct effect of depressive symptoms on ratings of negative emotions was statistically significant ($\beta = -0.36$, $p < .05$), the direct effect of ratings of negative emotions on psychological aggression perpetration was statistically significant ($\beta = -0.40$, $p < .05$), and the direct effect of depressive symptoms on psychological aggression perpetration was statistically significant ($\beta = 0.37$, $p < .05$). In addition, the effect of depressive symptoms on psychological aggression perpetration was reduced to nonsignificance when accounting for the effect of ratings of negative emotions ($\beta = 0.27$, ns). Results of the bootstrap analysis indicate that mediation was present ($M = 0.03$, $SE = 0.02$; 95% $CI = 0.001-0.091$).¹

¹To examine alternative directional paths, we also tested two reverse mediation models. First, we examined depressive symptoms as a mediator of the link between ratings of negative emotional expressions and psychological aggression perpetration. The indirect path for this model was not statistically significant ($M = -0.21$, $SE = 0.23$; 95% $CI = -0.776-0.133$). Second, we examined psychological aggression perpetration as a mediator of the link between depressive symptoms and ratings of negative emotional expressions. The indirect path for this model also was not statistically significant ($M = -0.02$, $SE = 0.01$; 95% $CI = -0.046-0.003$).

Discussion

In the current investigation, we examined whether biased perception of emotional expressions serves as an explanatory mechanism in the expected relationship between depressive symptoms and psychological aggression perpetration. As hypothesized, negatively biased ratings of facial expressions of anger, sadness, and disgust mediated the relationship between depressive symptoms and psychological aggression perpetration. This finding integrates prior research demonstrating biased perception of emotional expressions in depression with research demonstrating a relationship between biased perception of emotional expressions and relationship aggression to provide a more comprehensive account of how depressive symptoms may lead to negative relationship consequences such as the use of psychological aggression. Indeed, this is the first known study to demonstrate an association between biased perception of emotional expressions and psychological aggression perpetration. From a social information-processing perspective (McFall, 1982), these results suggest that biased perception of emotional expressions may be an early step in a series of information-processing stages that lead to negative relationship behaviors. For example, biased perception of emotional expressions may contribute to the negative attributions for partners' behavior that have previously been documented among individuals with elevated depressive symptoms (Gotlib & Whiffen, 1989), as well as linked to the perpetration of psychological aggression (Schumacher et al., 2001). The current study provides a foundation upon which to examine such process questions.

The current study result indicating that depressive symptoms were associated with greater perpetration of psychological aggression in one's current relationship is consistent with extensive research documenting negative social and relationship consequences of depression (Gotlib & Beach, 1995; Youngren & Lewinsohn, 1980) and extends the only known prior investigation of this specific phenomenon (Kim & Capaldi, 2004) to a relatively low-risk sample. This extension demonstrates that variability within a relatively mild range of depressive symptoms can have serious consequences for intimate relationships. Moreover, the elevated risk for psychological aggression perpetration among individuals experiencing depressive symptoms may represent the beginning of a cascade of negative relationship behaviors, including physical aggression perpetration, as young adults begin to enter long-term committed relationships. Thus, in addition to demonstrating the utility of a dimensional conceptualization of depression, this research indicates that preventive interventions may be beneficial to individuals experiencing mild to moderate depressive symptoms who may not otherwise be seen in clinical settings.

Participants' depressive symptoms were negatively associated with a composite variable representing valence ratings (from negative to positive) of anger, sad, and disgust expressions and were independently associated with ratings of sad emotional expressions. These results extend prior research supporting the negative potentiation hypothesis (Gur et al., 1992; Kellough et al., 2008; Krompinger & Simons, 2009), which proposes that individuals with elevated depressive symptoms exhibit a negative bias in perceiving emotional stimuli. In contrast, depressive symptoms were not associated with rating positive (i.e., happy) emotional expressions as less positive, thus failing to support the positive attenuation hypothesis. Together, these results may suggest that the negative potentiation hypothesis yields a stronger effect size than the positive attenuation hypothesis and that we were not able to identify an existing association between depressive symptoms and ratings of positive expressions given the limited power of the current study. Alternatively, this pattern of results may be specific to the unique aspects of the current sample. That is, this sample of college students reported less severe symptoms of depression than those reported by other samples; thus, they may not have been experiencing particular aspects of

depression such as anhedonia, which, based on the mood congruency principle, is theorized to be the cause of positive attenuation of perceptions of social stimuli.

The current study is the first known study to demonstrate an association between biased perception of emotional expressions and perpetration of psychological aggression. This research builds upon two prior studies demonstrating associations between emotion recognition skills and physical aggression perpetration (Babcock et al., 2008; Marshall & Holtworth-Munroe, 2010) and indicates that biased perception of emotions may be implicated in a wide range of negative relationship behaviors. Within the context of cognitive-behavioral social skills training, treatment providers have begun to teach violent husbands to accurately label emotional expressions as a means of improving their skills for managing conflict in their relationships and preventing future violence (Babcock & La Taillade, 2000). Although such therapy techniques have not yet been tested, they may also be applicable to therapy for distressed couples who engage in psychological aggression.

Some limitations of the current study warrant discussion. Importantly, the sample size is small, thus limiting confidence in the generalizability of the study results. More specifically, the small sample size prohibited us from exploring possible gender differences in relationships among study variables. Although we do not have reason to propose gender differences given that prior literature has documented similar effects of depressive symptoms on psychological aggression perpetration (Straus & Sweet, 1992) and perception of emotional stimuli (Kellough et al., 2008) across genders, the current sample largely comprised women, and thus the questionable generalizability of the current results is particularly salient when attempting to generalize to men. A second limitation is the fact that we did not obtain independent partner reports of psychological aggression. It may be that the experience of elevated depressive symptoms alters the perception and thus reporting of aggression perpetration in one's relationship. Finally, we did not use a standardized set of emotional expression stimuli. However, these stimuli have been used previously and yielded results as expected (Marshall & Holtworth-Munroe, 2010). In addition, emotional expressions were rated in terms of valence as expected. That is, expressions of happiness were rated as positively valenced, and expressions of anger, sadness, disgust, fear, and surprise were rated as negatively valenced. The only unexpected result was the finding that participants rated neutral expressions as negative and more negative than expressions of fear. This finding may be due to the neutral stimuli being invalid or due to the fear stimuli's being invalid, as suggested by prior research indicating that expressions of fear are the least accurately identified of the basic emotions (Calvo & Lundqvist, 2008; Lederman et al., 2007). In any case, the neutral and fear stimuli were not used in the primary analyses, and thus they should not have biased the current study results. Given these potential limitations, the current study results should be considered extremely preliminary.

Despite these limitations, the current study has a number of strengths. First, the emotional expression stimuli were developed without the use of morphing techniques, and yet they represent emotions expressed at lower intensity levels than the prototypical facial expressions utilized in many other studies. Because low-intensity emotional expressions are more representative of the expressions encountered in everyday life and at the beginning of a conflict episode, these stimuli are likely more externally valid (Russell, 2003). In addition, these stimuli were effectively used with a valence rating system, consistent with prior studies indicating that categorical emotions can be rated along a valence dimension in a valid manner (Dunn, Dalgleish, Lawrence, Cusack, & Ogilvie, 2004). Second, we identified a substantial mediation effect, despite the presence of low power and use of a relatively low-risk sample. Thus, the relationships identified may be present among a wide range of populations (e.g., clinical and nonclinical populations). Finally, the current study moves beyond the examination of simple associations between depressive symptoms and

relationship outcomes to examine a potential cognitive mechanism (i.e., perception of emotional expressions) responsible for the relationship. Moreover, this mechanism is one that is likely malleable through cognitive therapy protocols that address negative biases within depression.

We recommend that future research be designed to replicate and build upon the current study in a number of ways. Because the current results cannot speak to emotion recognition skills among individuals with severe depression and common comorbid disorders, generalizability to such a population should be tested. Generalizability to different age groups and more ethnically and racially diverse samples should also be tested. In addition, because we did not directly measure participants' perception of their partners' emotions, partner-specific emotional expression stimuli should be developed and used to test the current model. Most importantly, because our results are based on cross-sectional data, experimental and longitudinal work should be initiated to test for the causal directionality that is assumed in the current study. Several alternative models may exist. For example, biased emotion perception may lead to elevated depressive symptoms and may lead one to perceive and report on one's use of psychological aggression in an altered fashion. It is also possible that engagement in psychological aggression may lead one to become more depressed and may alter the perception of emotional expressions. Because participants in the current study reported on their use of psychological aggression during the past year, rather than prospectively reporting on such behavior, it is especially important to rule out the possibility that engagement in psychological aggression is a predictor rather than an outcome variable. Particular laboratory methods, such as mood induction techniques and laboratory aggression paradigms, may be used to rule out these alternative explanations.² We hope that with the completion of additional research, the results of this study and future studies can be applied to the development of interventions to alleviate the negative social and relationship consequences of depression.

Acknowledgments

Amy D. Marshall is supported by the National Institutes of Health's Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program (1K12HD055882).

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²We thank an anonymous reviewer for these suggestions.

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TABLE 1

Intercorrelations Among Study Variables

Variable	1	2	3	4	5	6	7	8	9
1. Depressive symptoms	—								
2. Psychological aggression	.37*	—							
3. Ratings of negative emotions	-.36*	-.40*	—						
4. Ratings of angry expressions	-.31†	-.36†	.98***	—					
5. Ratings of disgust expressions	-.31	-.35†	.95***	.90***	—				
6. Ratings of sad expressions	-.44*	.44*	.95***	.92***	.84***	—			
7. Ratings of fearful expressions	-.20	-.19	.79***	.77***	.77***	.75***	—		
8. Ratings of surprise expressions	.01	-.04	.34†	.27	.36†	.36*	.55**	—	
9. Ratings of neutral expressions	-.17	-.12	.37*	.31†	.28	.51**	.15	.52**	—
10. Ratings of happy expressions	.20	.34†	-.33	-.38*	-.30	-.27	-.19	.52*	.48*

Note. Negative emotions composite variable includes ratings of angry, disgust, and sad expressions.

† $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$, all two-tailed.

TABLE 2

Mediating Effect of Ratings of Negative Emotions on the Relationship Between Depressive Symptoms and Psychological Aggression Perpetration

Effect	Unstandardized <i>b</i>	<i>SE</i>	Standardized β	<i>t</i>
Depressive symptoms on ratings of negative emotions	−0.05	0.02	−0.36	−2.07 *
Ratings of negative emotions on psychological aggression	−0.82	0.36	−0.40	−2.29 *
Depressive symptoms on psychological aggression	0.11	0.05	0.37	2.14 *
Depressive symptoms on psychological aggression, accounting for ratings of negative emotions	0.08	0.05	0.27	1.45

* $p < .05$, two-tailed.