Available online at www.sciencedirect.com

ScienceDirect

Behavior Therapy 56 (2025) 866–877

Behavior Therapy

www.elsevier.com/locate/bt

The Impact of Depressive Symptoms on Overidentification of Anger in Couples: A Daily Diary Study

Ramya Ramadurai
Ella S. Sudit
Kathleen C. Gunthert
Nathaniel R. Herr
American University

Anger is intricately linked to symptoms of depression and has implications for functioning outcomes in romantic couples. There is a lack of research on whether symptoms of depression influence empathic accuracy of anger in couples, as well as whether perceptions of anger impact relationship quality for both partners. Using daily diary data, we examined these outcomes among 79 cohabitating couples ($n = 158$). Participants completed a baseline survey assessing relationship satisfaction and depression, as well as daily surveys rating their mood, their perception of their partner's mood, and relationship satisfaction and closeness. Results indicated that partners of individuals with higher depressive symptoms display empathic inaccuracy of anger. They evidenced a bias towards perceiving higher participant anger even when participants themselves report low levels of anger or low overall negative affect. Partner bias towards perceiving their partners as angry predicted poorer ratings of relationship satisfaction and closeness from both partner and participant perspectives. Findings suggest that for couples in which one individual struggles with symptoms of depression, empathic inaccuracy of anger or biased perception of anger may be a mechanism by which interpersonal dysfunction is maintained.

We thank Alanna M. Covington, Ph.D., Evelyn P. Meier, Ph.D., Jenny E. Mitchell, Ph.D., Aria R. Ruggiero, Ph.D., Reid Faith, M. A., Jody Lanza-Gregory, M.A., Danielle M. Weber, Ph.D., and Alexandra D. Long, Ph.D., for their research support on this study. This study was funded by a donation from The Community Foundation Serving Richmond and Central Virginia to the Department of Psychology at American University.
The authors report there are no competing interests to declare.
Address correspondence to Ramya Ramadurai, American University, Department of Psychology, 4400 Massachusetts Ave NW, Washington, DC 20016. e-mail: rr4748a@student.american.edu.

Keywords: empathic accuracy; depression; couples; anger bias

WHILE MOST commonly associated with sadness, depression has been frequently linked with heightened experience of other negative emotions (Rottenberg, 2005). Among these, anger has been highlighted as particularly salient, with theories suggesting that depression is an expression of anger towards oneself (Busch, 2009; Luutonen, 2007), or that anger is a secondary emotion developing from sadness (Greenberg & Watson, 2006). Such theories suggest that ineffective behaviors (e.g., learned helplessness and inaction) and negative cognitions (e.g., about oneself) fuel the reciprocal relation between anger and depressive symptoms. Subsequently, a breadth of research has examined this relation in individuals diagnosed with major depression (Brody et al., 1999; Fava & Rosenbaum, 1998; Moreno et al., 1994; Rude et al., 2012; Schless et al., 1974) or experiencing nonclinical levels of depressive symptoms (Bridewell & Chang, 1997; Clay et al., 1993).

Individuals with major depressive disorder (MDD) have been found to experience greater levels of anger compared to healthy controls (Goldman & Haaga, 1995; Pasquini et al., 2004; Riley et al., 1989), and elevated internal experience of anger has been linked to poor or ineffective outward expression of anger, such as through anger attacks (Fava & Rosenbaum, 1998). Experience and expression of anger may contribute to the well-documented link between depression and poor functioning in intimate relationships (e.g., Carson & Kouros, 2022; Gordon et al., 2013; Harris et al., 2006; Katz et al., 1999; Kouros

et al., 2008; Overall & Hammond, 2013; Tolpin et al., 2006). Research has shown that expressions of anger and depressive symptoms are respectively negatively associated with relationship quality and interpersonal functioning in couples (MacKenzie et al., 2014; Renshaw et al., 2010). When compared to healthy couples, couples with depression symptomology report greater experiences of negative affect, fewer experiences of positive affect, lower frequency of positive verbal behavior, and greater negative verbal and nonverbal behavior (Ruscher & Gotlib, 1988; Whiffen et al., 2001). To reduce confusion when discussing the two members of a relationship, we will refer to the member experiencing depressive symptoms as the *participant* and their partner as the *partner*.

Given that both anger and depressive symptoms affect relationship functioning, it may be especially important that partner perception of participant anger *matches* the participant's own rating of their anger. This type of interpersonal emotion processing is termed *empathic accuracy*, or an individual's ability to identify the emotions, mood, or affect of another individual accurately, based on the reported emotional experience of that individual (Ickes, 1993). Thus, this construct deals with the *correspondence* between partner perception of participant mood and participant report of their own mood, rather than the accuracy of the partner or participant report (Rum & Perry, 2020). While empathic accuracy has been primarily measured using lab-based dyadic interaction or emotional story paradigms, some recent investigations have leveraged ecological momentary assessment data (De Ridder et al., 2016; Gadassi et al., 2011). These investigations engage in statistical approaches that emphasize inclusion of both partner and participant variables of interest (e.g., affect, depressive symptoms, inferences of each other's mood states) in models of empathic accuracy. In line with this approach, conceptually empathic accuracy is heavily influenced by characteristics of the individual and the relationship (Hall & Schmid Mast, 2007; Hodges et al., 2015).

Within heterosexual couples, women's depressive symptoms have been associated with their male partner's lower empathic accuracy of their negative emotions (Gadassi et al., 2011). Specific to anger, partners have difficulty evaluating expressions of anger in participants with depressive symptoms (Harris et al., 2006; Papp et al., 2010). Papp and colleagues (2010) looked at the relation between depressive symptoms and empathic accuracy in heterosexual couples after a lab-based marital conflict task and found that partners displayed lower accuracy in identifying participant anger when participants had higher levels of depressive symptoms. Their findings when looking at empathic accuracy of other participant emotions in the context of depressive symptoms were mixed and seemed to be gender specific: when participants had higher levels of depression, wives had lower empathic accuracy of fear and husbands had higher empathic accuracy of sadness.

Poor empathic accuracy of anger in the context of depressive symptoms may be related to specific partner or participant factors. For the participant, symptoms of depression may result in intense negative mood states (Watson et al., 1988), difficulty differentiating between their own negative emotional states (Demiralp et al., 2012; Thompson et al., 2021; Willroth et al., 2020), and subsequent challenges effectively expressing their present emotional state to their partners. Participants may particularly struggle to effectively express anger, with research finding that, due to symptoms of depression, participants display reduced facial expression of all emotions, including anger (Renneberg et al., 2005), as well as explosive outbursts (Fava & Rosenbaum, 1998). As ineffective anger suppression followed by anger expression has been linked to higher depression symptom severity (Koh et al., 2005), poor anger regulation and expression may contribute to partner difficulty in reading participant anger. For the partner, frequent attempts to understand participant mood may cause burnout, which may in turn lead to increased reliance on generalizations, or top-down schemas, about participant mood. Given depressed participants' tendency to experience and ineffectively express anger, partners may thus display a bias to perceive the participant as angry, even on days the participant is not angry. Taken together, it is understandable, then, that empathic accuracy of anger may suffer in the context of depression symptoms.

As empathic accuracy is further crucial to strong relationship satisfaction and functioning (Ickes et al., 2005; Rum & Perry, 2020; Sened et al., 2017; Zaki et al., 2013), difficulties related to this interpersonal emotion mechanism may detract from relationship experience (Wilde & Dozois, 2019). The dyadic partner-schema model of relationship distress and depression (Wilde & Dozois, 2019) suggests that negative interpersonal schemas build poor communication and behavioral patterns within couples. Extending past work identifying both anger/hostility and depression as unique predictors of relationship distress in couples (MacKenzie et al., 2014; Renshaw et al., 2010), empathic inaccuracy of anger and partner bias towards identifying the participant as angry

may propagate a cycle of poor interpersonal interactions and low relationship satisfaction and closeness for both partners. As it stands, there is little research on empathic accuracy of anger and partner biased perception of anger in participants with depressive symptoms. Understanding how these socio-emotional mechanisms influence relationship functioning in daily life could illuminate clinical intervention targets for couples with depressive symptoms.

In the present study, both members of cohabitating couples provided daily assessments of their own and their partner's mood, as well as their own relationship quality over a 3-week period. This allowed for an ecologically valid approach to understanding relations between these variables. Previous findings emphasize the salience of anger in the context of depression (Goldman & Haaga, 1995; Kaźmierczak et al., 2023; Riley et al., 1989), identify challenges in partner empathic accuracy of anger due to participant depressive symptoms (Harris et al., 2006; Papp et al., 2010), and suggest that partners may evidence a generalized tendency to perceive anger in participants with depressive symptoms. Models of relationship functioning (MacKenzie et al., 2014; Renshaw et al., 2010) suggest that such socio-emotional mechanisms of anger may be relevant to relationship experience for both partners. Thus, we hypothesize the following:

1. Given the salience of anger in depression (e.g., Goldman & Haaga, 1995), regardless of daily participant anger level, partners will report higher daily participant anger when participants have higher baseline depressive symptoms.

2. Given past research highlighting empathic inaccuracy of anger in the context of depression (e.g., Harris et al., 2006), the relation between daily participant anger and daily partner report of participant anger will be attenuated by participant depressive symptoms. Specifically, partners of individuals with higher depressive symptoms will be less empathically accurate, reporting persistently higher levels of anger in the participant regardless of the participant's own daily report of anger.

3. Considering both the prevalence of anger and empathic inaccuracy of anger in the context of depression, the relation between daily participant negative affect and daily partner report of participant anger will also be attenuated by participant depressive symptoms, such that partners of individuals with higher depressive symptoms will report persistently higher levels of anger in the participant regardless of the participant's own daily report of negative affect.

4. Given prevailing models of relationship functioning highlighting the impact of socio-emotional mechanisms, partner perception of anger will negatively impact ratings of baseline relationship satisfaction, daily relationship satisfaction, and emotional closeness for both the partner and participant.

As supplementary analyses, we also sought to replicate Papp and colleagues' (2010) findings. We examined whether partners of individuals with higher depressive symptoms would be less empathically accurate due to reporting persistently higher levels of sadness or anxiety in the participant regardless of the participant's own daily report of sadness or anxiety. We thus aimed to better understand whether, in the context of depressive symptoms, there was evidence for a more general pattern of empathic inaccuracy or whether this inaccuracy was specific to anger.

Method

PARTICIPANTS

Participants in this study were taking part in a larger project that assessed emotional and sleep functioning in couples (Herr et al., 2024). That study is registered at https://doi.org/10.17605/OSF.IO/ZGCMD where we report additional information about how we determined our sample size, all data exclusions and all measures in this study. The sample used in the present study consisted of 79 cohabiting romantic partners (158 participants), of which 71 were male-female pairs, 2 were male-male pairs, and 6 were female-female pairs. Participants were recruited via postings on neighborhood listservs, online message boards, and leaflets distributed in the community of a large Mid-Atlantic urban area. Eligibility criteria were: being between the ages of 18 to 65, having been in the romantic relationship for a minimum of 12 months, currently cohabitating with their partner for a minimum of 2 months, and having daily internet access. Average age of the participants was 33.6 years (SD = 8.1; range = 19–61) and the average relationship length was 7.7 years (SD = 6.3; range = 1.2–34.5). While 84 couples were recruited for the study, 4 were excluded from the present analysis due to at least 1 partner completing too few of the daily diary assessments (i.e., less than 7 out of 21) and 1 was excluded due to accidental data loss when both partners used the

same participant identification number. Participants identified their race and ethnicity as follows: 109 non-Hispanic White, 19 Black, 6 Asian or Pacific Islander, 1 American Indian/Alaskan, 7 multiracial, 4 other or nonspecified, and 12 Hispanic/Latino.

MEASURES

Baseline

Demographics. Demographic information was measured by self-report and collected information including race, gender, ethnicity, age, and relationship length.

Relationship satisfaction. Relationship satisfaction was measured using the Couples Satisfaction Index (4-item; CSI; Funk & Rogge, 2007). Using principal component analysis and Item Response Theory, the CSI was developed from a collection of 180 items commonly used in measuring relationship and marital satisfaction. The CSI is a single-dimension self-report measure on which three of four items are scored on a 6-point scale and one item on a 7-point scale. The CSI has strong convergent validity in relation to other similar measures (Funk & Rogge, 2007). In the present study, internal consistency was excellent (Cronbach's $\alpha = .91$).

Depression. Depression was measured using the Center for Epidemiological Studies Depression (CES-D; Radloff, 1977). The CES-D is a 20-item self-report measure on which participants are asked to indicate their experience with several symptoms typical of depression over the past week. Each statement is scored on a 4-point scale. The CES-D has been found to have strong reliability and validity as a screener tool for depressive symptoms in general populations and primary care settings (Radloff, 1977; Vilagut et al., 2016). In the present study, internal consistency was good (Cronbach's $\alpha = .73$).

Daily Measures

Daily Affect (Self and Partner). Daily emotional state was measured using the Profile of Mood States (POMS; McNair et al., 1971). Each evening, participants received the prompt "To what extent have you experienced the following in the past 24 hours?" They would subsequently indicate, on a 5-point Likert-type scale from 0 (*not at all*) to 4 (*extremely*) how much they experienced each of 15 positive and negative words linked to various emotional states. Emotional state total scores were computed (specific words listed in parentheses): anger (angry, peeved, annoyed), depression (sad, hopeless, worthless), anxiety (on edge, nervous, anxious), vigor (lively, cheerful, vigorous), and relaxed (calm, relaxed, at ease) mood states. Overall negative affect (NA) was the sum of the anger, depression, and anxiety subscales. Internal consistencies of the subscales were all good (Cronbach's α range: .76 to .88), as were overall NA (Cronbach's $\alpha = .88$). Vigor and relaxed subscales were not utilized in any analyses.

Participants were also prompted, "To what extent have you perceived your partner having the following feelings in the past 24 hours," and rated their partners on the same emotion words using the same rating scale. Internal consistencies of the subscales were all good (Cronbach's α range: .75 to .90), as were overall NA (Cronbach's $\alpha = .88$) and PA (Cronbach's $\alpha = .85$).

Emotional Closeness. Daily emotional closeness was measured by a single item on which participants reported their feeling of emotional closeness over the last 24-hours toward their partner on a 7-point scale from 1 = not at all to 7 = extremely. They responded to the question, "How emotionally close did you feel to your partner today?"

Relationship Satisfaction. Daily relationship satisfaction was measured by a single item on which participants reported their feeling of satisfaction with their relationship over the last 24-hours on 6-point scale from 0 = extremely unhappy to 6 = perfect. They responded to the question, "Please indicate the degree of happiness, all things considered, of your relationship."

PROCEDURE

This study received ethics approval from the American University institutional review board [IRB#14216]. Interested participants read and acknowledged an online informed consent form and completed a screening and demographics survey. After confirming eligibility, participants completed informed consent, a baseline assessment in the laboratory or in a community library meeting room, depending on preference, and were introduced to daily diary procedures. Participants then individually completed the baseline questionnaire (CSI, Demographics) along with several other symptom measures not included in the present study. Over the next three weeks, participants completed a daily survey of self-reported affect, perception of partner affect, emotional closeness, and other daily behavioral ratings not included in the present study, approximately 2 hours before going to bed each evening. Across all participants, 3028 of 3318 (91.3%) daily surveys were completed.

DATA ANALYTIC APPROACH

To examine the relation between daily partner perception of participant anger and daily participant emotion ratings, data were treated as multilevel given the structure of days (level 1) within partners (level 2) within couples (level 3) and analyzed using the mixed procedure in SPSS V28. Level 1 predictors were person-mean centered to evaluate individualized fluctuations of affect, while level 2 predictors were grand mean centered. Analyses used all available data and handled missing data under a missing at random assumption. Residuals of all analyses were examined for skew and kurtosis, with no violations of model assumptions found. Because some dyads were same-sex while other were different-sex couples, we considered all dyads as indistinguishable (i.e., dyad members could not be ordered based on a meaningful variable, such as sex).

For tests of our first three hypotheses and the supplementary analyses, partner-rated participant mood (i.e., anger, sadness, anxiety) was used as the dependent variable. Given partner-rated participant negative mood states were the dependent variables, we controlled for the partner daily report of their own NA to eliminate the bias that partners' own affect may introduce to their perception of participant mood. In models where the interaction was significant, we examined simple linear effects to determine whether the independent variable was significantly related to the outcome at +1 standard deviation and -1 standard deviation of the moderator.

For tests of our fourth hypothesis, partner or participant ratings of daily emotional closeness, daily relationship satisfaction, or baseline relationship satisfaction were the dependent variables. For the dependent variables that were daily, data was treated as multilevel in line with analyses for the first two hypotheses. For the model in which baseline relationship satisfaction was the outcome, multiple linear regression was used, and each daily predictor variable included in this model represents the aggregated mean of the variable in question.

We ran post-hoc power analyses for our multilevel models by following the procedures of Lane and Hennes (Lane & Hennes, 2018), who recommend using a simulation study to determine the frequency in which a given result remains significant in many simulations of an analysis. We used the Monte Carlo procedure in Mplus (Muthén & Muthén, 1998) with 1,000 simulations to examine our primary analyses. Adequate power was achieved ($1 - \beta > .80$) for all analyses except one, which is noted below.

Results

DESCRIPTIVES

Depression symptom scores were mild on average ($M = 10.92$, $SD = 9.25$), though 34 individuals (20%) reported above moderate depressive symptoms. Participant-reported daily anger ($M = 6.48$ of 20, $SD = 2.88$), daily sadness ($M = 5.33$ of 20, $SD = 2.24$), and daily anxiety ($M = 6.20$ of 20, $SD = 2.80$), ranged from low to moderate. Daily partner perception of participant anger ($M = 6.42$ of 20, $SD = 2.95$) was rated near moderate. Across participants, baseline relationship satisfaction ($M = 15.93$ of 21, $SD = 3.96$) was reported as high, and daily emotional closeness ($M = 4.42$ of 7, $SD = 1.48$) and daily relationship satisfaction ($M = 4.1$ of 6, $SD = 1.48$) were moderate.

PARTNER PERCEPTION OF PARTICIPANT ANGER

Hypothesis 1 stated that, regardless of daily participant anger level, partners would perceive higher daily participant anger when participants had higher baseline depressive symptoms. To test this, we examined the main effect of participant depression and participant anger on partner perception of participant anger. We found a significant main effect of participant depressive symptoms, daily participant anger, and the control variable (daily partner NA) on higher partner ratings of participant anger (see Table 1).

PARTNER EMPATHIC ACCURACY OF PARTICIPANT ANGER

We then examined hypothesis 2, whether the relation between daily participant anger and daily partner report of participant anger was attenuated by participant depressive symptoms, such that partners of participants with higher depressive symptoms would report persistently higher levels of participant anger. To test this, we ran the same model as for hypothesis 1, then examined the interaction between participant depression and daily participant anger. As shown in Table 1, there was a significant interaction between daily participant anger and participant baseline depressive symptoms predicting daily partner perception of participant anger. Depicted in Figure 1, this interaction suggests a stronger relation between participant anger and partner perception of participant anger among participants with lower levels of

Table 1
Main Effect of Participant Depression and Interaction of Participant Depression and Participant Anger Predicting Partner Perception of Participant Anger[a]

	B	*se*(*B*)	*df*	*t*
Daily Partner NA	0.17	0.01	2403	21.2***
Participant Depression	0.05	0.02	149	3.06**
Daily Participant Anger	0.35	0.02	2622	22.0***
Participant Depression X Participant Anger	−0.004	0.00	2664	−2.79**

*p < .05.
** p < .01.
*** p < .001.
[a] All models include time (study day) as a covariate.

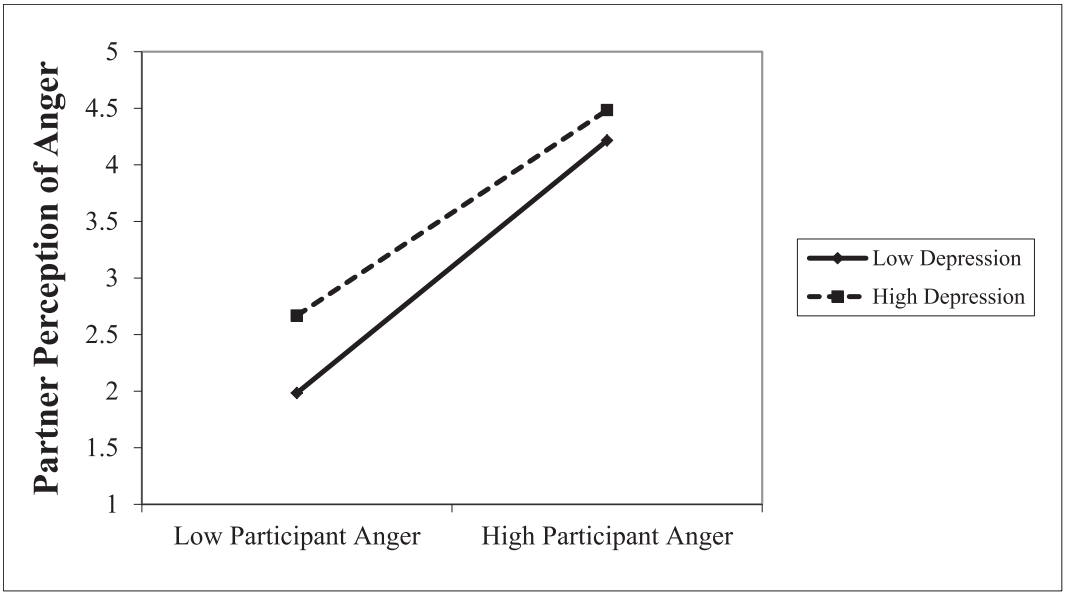

FIGURE 1 Interaction between participant anger and depressive symptoms predicting partner perception of participant anger.

baseline depression. Partners of participants with higher (as compared to lower) levels of depressive symptoms reported ratings of participant anger that were persistently higher.[1] Simple linear effects analyses indicated a significant effect of participant anger at both low, $b = .39$, $se(b) = .024$, $t_{2648} = 16.44$, $p < .001$, and high, $b = .32$, $se(b) = .019$, $t_{2641} = 16.36$, $p < .001$, levels of depression.

PARTNER BIAS TOWARDS PERCEIVING ANGER ACROSS PARTICIPANT NA

Our third hypothesis extended hypothesis 2 to examine whether the relation between daily participant NA and daily partner report of participant anger would also be attenuated by participant depressive symptoms, such that partners of individuals with higher depressive symptoms would display persistently higher ratings of participant anger, regardless of the participant's own daily reported level of NA. As shown in Table 2, there was a significant interaction between daily participant NA and participant baseline depressive symptoms predicting daily partner perception of participant anger. As shown in Figure 2, this interaction, like that which was found in hypothesis 2, suggests that partners of participants with higher levels of depressive symptoms displayed a bias towards perceiving anger in the participant. The persistence in partners' higher ratings of participant anger was most apparent on days the participant reported lower levels of NA.[1] Our post hoc power analysis indicated that this significant interaction was underpowered ($1 - \beta = .56$), indicating that this finding may be less reliable than other sig-

[1] Neither controlling for partner depression nor removing the control variable partner NA changed the pattern of results

Table 2
Interaction of Participant Depression and Participant Negative Affect Predicting Partner Perception of Participant Anger[a]

	B	*se*(*B*)	*df*	*t*
Daily Partner NA	0.18	0.01	2428	21.47***
Participant Depression	0.05	0.02	149	3.05**
Daily Participant NA	0.14	0.01	2426	17.67***
Participant Depression X Participant NA	−0.003	0.00	2506	−4.29***

*p < .05.
** p < .01.
*** p < .001.
[a] All models include time (study day) as a covariate.

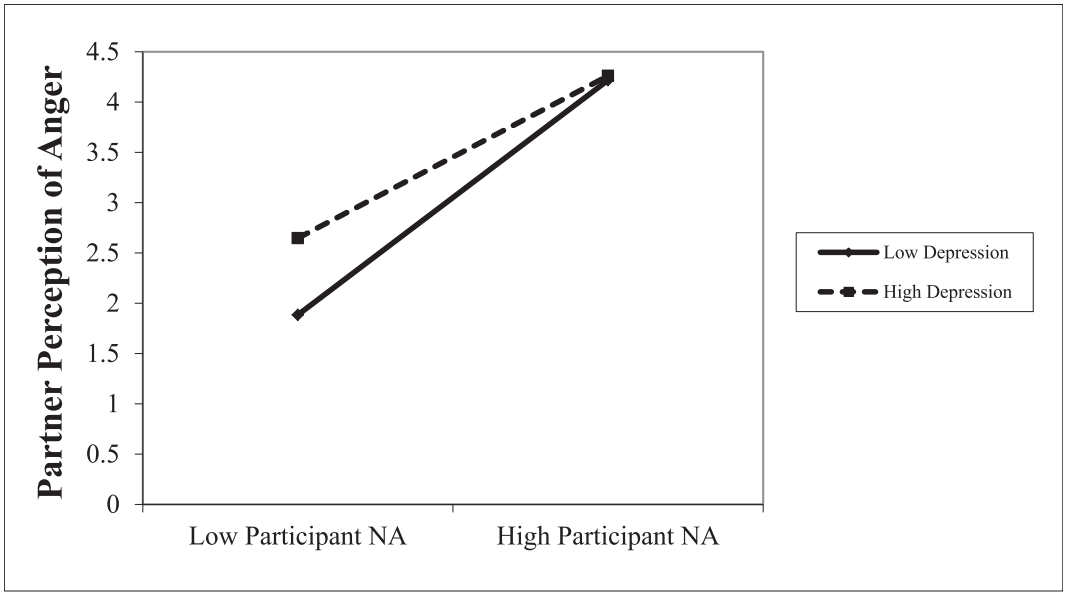

FIGURE 2 Interaction between participant NA and depressive symptoms predicting partner perception of participant anger.

nificant results in the study. Simple linear effects analyses indicated a significant effect of participant anger at both low, $b = .18$, $se(b) = .012$, $t_{2498} = 14.9$, $p < .001$, and high, $b = .12$, $se(b) = .01$, $t_{2413} = 13.14$, $p < .001$, levels of depression. We also tested for main effects using the model above and found that there were significant main effects of daily participant NA, daily partner NA, and baseline participant depressive symptoms on partner ratings of participant anger (see Table 2).

RELATIONSHIP OUTCOMES

For our fourth hypothesis we predicted that partner perception of participant anger would be negatively related to ratings of relationship quality from both the partner and participant perspective. To test this, we ran models with baseline or daily relationship quality variables as the outcome predicted by daily partner perception of anger and controlling for participant depressive symptoms and daily participant anger. Controlling for daily participant anger allowed us to examine the effect of partner bias towards seeing anger on relationship outcomes. As shown in Table 3, we found that partner perception of participant anger was a significant predictor of all partner-reported relationship quality outcomes. Partner perception of participant anger was further a significant predictor of participant reported daily relationship satisfaction and daily emotional closeness, but not participant baseline relationship satisfaction.

EMPATHIC ACCURACY OF PARTICIPANT SADNESS OR ANXIETY

As a supplementary analysis we examined whether, similar to what was found for anger, partners of individuals with higher depressive symptoms displayed empathic inaccuracy of participant sadness or anxiety. As displayed in Table 4, we found no significant interaction

Table 3
Partner Perception of Participant Anger, Participant Depressive Symptoms, and Participant Daily Anger Predicting Relationship Outcomes[a]

	Partner Daily Emotional Closeness				Participant Daily Emotional Closeness			
	B	*se*(*B*)	*df*	*t*	*B*	*se*(*B*)	*df*	*t*
Partner Perception of Participant Anger	−0.11	0.009	2705	−11.41***	−0.029	0.009	2688	−2.97**
Participant Depression	0.01	0.008	137	1.31	−0.007	0.008	134	−0.92
Participant Anger	−0.03	0.009	2747	−11.26***	−0.12	0.009	2738	−12.91***
	Partner Daily Relationship Satisfaction				**Participant Daily Relationship Satisfaction**			
	B	***se*(*B*)**	***df***	***t***	***B***	***se*(*B*)**	***df***	***t***
Partner Perception of Participant Anger	−0.07	0.006	2692	−10.58***	−0.03	0.006	2683	−4.66***
Participant Depression	−0.004	0.006	122	−0.76	−0.004	0.006	120	−0.62
Participant Anger	−0.016	0.006	2759	−2.49**	−0.065	0.006	2757	−10.29***
	Partner Baseline Relationship Satisfaction				**Participant Baseline Relationship Satisfaction**			
	B	***se*(*B*)**	***df***	***t***	***B***	***se*(*B*)**	***df***	***t***
Partner Perception of Participant Anger	−0.61	0.14	138	−4.29***	0.016	0.141	138	0.12
Participant Depression	−0.04	0.03	1123	−11.35	0.004	0.03	121	0.13
Participant Anger	0.11	0.17	147	0.663	−0.76	0.12	147	−4.57***

*p < .05.
** p < .01.
*** p <.001.
[a] All models include time (study day) as a covariate.

between participant baseline depressive symptoms and daily participant sadness predicting partner perception of participant sadness. There were significant main effects such that higher perception of participant sadness was predicted by daily partner NA, daily participant sadness, and baseline participant depressive symptoms. Similarly, there was no significant interaction between participant baseline depressive symptoms and daily participant anxiety predicting partner perception of participant anxiety. There were significant main effects such that higher partner perception of participant anxiety was predicted by daily partner NA, daily participant anxiety, and baseline participant depressive symptoms (see Table 4).

Discussion

The present study examined the relation between participant depressive symptoms and their romantic partner's empathic accuracy of anger and bias towards perceiving anger. We also sought to determine if partner perception of participant anger was related to relationship quality for both partners. We focused on anger because it has been shown to be a salient emotion in the context of depressive symptoms, and may confer challenges for relationship functioning (Carson & Kouros, 2022; MacKenzie et al., 2014; Renshaw et al., 2010).

We found that participant depressive symptoms were significantly related to partner perception of participant anger. This aligns with our hypothesis that, in couples, symptoms of depression confer risk for heightened perception of anger. Further, when participant depressive symptoms were examined as a moderator of the relation between participant daily anger and partner perception of participant anger, we found evidence for empathic inaccuracy among partners of individuals with higher depressive symptoms. This empathic inaccuracy was because of partner's persistently higher ratings of participant anger on days when participants themselves reported low levels of anger, and aligns with the findings of Papp and colleagues (2010). It is possible that this empathic inaccuracy is due to participant underreporting of their "own" anger, and thus partner's persistently higher ratings of participant are, in actuality, accurate inferences of the participant's anger level. Daily diary research, however, has found that depression predicts a bias towards recalling momentary mood over the past week as more negative than it was (Wenze et al., 2013), suggesting that participants with higher depressive symptoms might actually tend to overreport rather than underreport their own anger. A more likely explanation for this empathic inaccuracy of anger in the

Table 4
Predictors of Partner Perception of Participant Sadness and Participant Anxiety[a]

Partner Perception of Participant Sadness					Partner Perception of Participant Anxiety				
	B	*se*(*B*)	*df*	*t*		*B*	*se*(*B*)	*df*	*t*
Daily Partner NA	0.08	0.005	2491	15.2***	Daily Partner NA	0.12	0.007	2558	16.08***
Participant Baseline Depression	0.05	0.008	126	5.4***	Participant Baseline Depression	0.05	0.02	143	2.97**
Daily Participant Sadness	0.33	0.01	2420	23.07***	Daily Participant Anxiety	0.25	0.02	2561	14.5***
Participant Baseline Depression X Participant Sadness	0.002	0.001	2444	1.7	Participant Baseline Depression X Participant Anxiety	−0.0003	0.001	2511	−0.22

*p < .05.
** p < .01.
*** p < .001.
[a] All models include time (study day) as a covariate.

context of depression symptoms may be that, due to the heightened frequency of anger experiences for those with depressive symptoms (Cassiello-Robbins & Barlow, 2016), partners of participants with higher depressive symptoms are primed to perceive anger in the participant even when it is not present. As evaluations of negative emotions in one's partner may occur more quickly or readily than positive emotions even within nondepressed couples (Fletcher & Kerr, 2010), the context of depressive symptoms may only inflate this tendency.

The interpretation that partners of participants with higher depressive symptoms evidence a bias towards perceiving participant anger is further supported by the results of our third hypothesis. We found that partners of participants with higher depressive symptoms perceived anger persistently higher regardless of participant level of daily negative affect. Findings from our supplementary analyses also strengthened this interpretation, as they provided no evidence for partner empathic inaccuracy of sadness or anxiety due to the influence of participant depressive symptoms. Notably, this supplementary finding diverges from Papp and colleagues (2010). It may be important to note, too, that daily partner NA predicted higher partner rating of participant anger, sadness, and anxiety. While this finding may be somewhat intuitive, it provides empirical evidence for momentary mood impacting inference of one's partner's mood. Taken together, our findings suggest that partners of participants with higher depressive symptoms evidence a specific bias towards perceiving anger, rather than a generalized tendency to report higher ratings of all participant negative mood states.

While it is well understood that empathic inaccuracy negatively impacts relational functioning (Ickes et al., 2005; Rum & Perry, 2020), it may be helpful to conceptualize how empathic inaccuracy and biased perception of anger develop within models of depression and interpersonal difficulty. The interpersonal integrative framework for depression (Joiner, 2000) and the stress-generation model of depression (e.g., Hammen, 1991) highlight that attitudes and behaviors of the individual with depressive symptoms, such as pessimism, poor attachment style, poor problem-solving skills, excessive reassurance seeking (Joiner, 2000), and high autonomy (i.e., assertiveness, self-reliance; Daley et al., 1997), contribute to interpersonal challenges (Hammen, 2006). Applied to our study, both empathic inaccuracy of anger and biased perception of anger present as mechanisms of interpersonal challenges, and may be fueled by cognitive and behavioral features of the individual with higher depressive symptoms. Thus, in the context of higher depressive symptoms, perception of anger may be a particularly important factor to attend to when supporting relationship well-being.

To that end, we last examined whether partner perception of participant anger would predict relationship quality. Given that we controlled for partner negative mood and participant daily anger and in these models, we conceptualize partner perception of anger here as a cognitive phenomenon that represents an inference about participant level of anger. Partner perception of anger significantly predicted all three relationship quality outcomes for the partner and both daily (but not the baseline) relationship quality outcomes for the participant. We again stress that we cannot comment on whether the partner or the participant is "correct" in the report of anger, but rather these findings suggest that partner perception of anger, which our previous analyses indicated was biased

towards persistently perceiving higher anger when participants had higher levels of depressive symptoms, adversely impacted relationship quality for both members of the couple.

These findings align with models of relationship dysfunction and depression discussed previously (Hammen, 1991; Joiner, 2000). In general, our findings suggest that partner perception of anger is linked to a cycle of behaviors exhibited by both partners, that subsequently adversely impacts both partners' experiences within the relationship. Partners who perceive the participant as persistently angry may experience high cognitive load, feel burned out, and engage in distancing behaviors to reduce the likelihood of conflict. While each of these sequelae require further study, this chain of events helps inform our understanding of why partner perception of anger would detract from the partner's daily and overall experience in the relationship. A participant, on the other hand, may read their partner's attempts to distance and deescalate as signs of pulling away or lack of commitment (Overall & Hammond, 2013) and accordingly engage in ineffective behaviors (e.g., excessive reassurance seeking). Participants may further feel invalidated if their partner vocalizes their perception of the participant as angry, when the participant is experiencing low negative mood. While participant baseline relationship satisfaction did not seem to be negatively impacted by these experiences, we found evidence that on a daily basis such experiences may leave the participant feeling unsatisfied or less emotionally close. It is possible that partner perception of participant anger therefore does not color the participant's holistic satisfaction with the relationship but does create daily challenges. Future research should examine how specific behaviors on the part of each partner develop from biased perception of anger to better understand why and how relationship experience is diminished for both partners.

LIMITATIONS

Our research is limited by our brief measurements of daily affect and relationship outcomes, which may limit a more comprehensive understanding of these constructs. While the brevity was intentional given the daily diary methodology, future research may consider examining other components of affect such as intensity, duration, or expression, and other components of relationship experience (e.g., time together during the day). Future research may also want to examine gender differences across outcomes, as there may be differences in anger expression across gender. Related to our sample, our study involved primarily non-Hispanic White individuals and solely heterosexual couples, which limits the generalizability of the findings. Additionally, our research is limited in its ability to explore directionality of the relationship between variables. While we examined partner perception of anger as an outcome and as a predictor, it is possible for example that relationship satisfaction predicted both daily affect as well as empathic accuracy. Experimental or lab-based research may be better suited to examine causality among these variables. We also advise caution regarding our significant interaction between participant baseline depressive symptoms and daily participant NA predicting daily partner perception of participant anger. Posthoc power analysis revealed this finding to be underpowered, thus additional replication is needed to ensure the finding is robust. Finally, our research is limited by the use of a nonclinical sample and depressive symptoms rather than diagnosis. It is possible our results may not generalize to clinical populations with diagnoses of major depression.

CONCLUSION

Findings suggest that partners overidentify anger in participants with higher symptoms of depression, particularly on days when the participant reports lower levels of negative emotions, and that this overidentification contributes to poorer relationship experience for both partners. Future research should explore the mechanisms by which empathic inaccuracy operates in the context of romantic relationships and if there is a causal connection between overidentification of anger and poorer relationship quality. Attending to interpersonal emotion processes for romantic couples, especially in the context of depression, could be important for improving relationship quality and well-being for both partners.

References

Bridewell, W. B., & Chang, E. C. (1997). Distinguishing between anxiety, depression, and hostility: relations to anger-in, anger-out, and anger control. *Personality and Individual Differences, 22*(4), 587–590. https://doi.org/10.1016/S0191-8869(96)00224-3.

Brody, C. L., Haaga, D. A. F., Kirk, L., & Solomon, A. (1999). Experiences of anger in people who have recovered from depression and never-depressed people. *The Journal of Nervous and Mental Disease, 187*(7), 400.

Busch, F. N. (2009). Anger and depression. *Advances in Psychiatric Treatment, 15*(4), 271–278. https://doi.org/10.1192/apt.bp.107.004937.

Carson, C. N., & Kouros, C. D. (2022). Couples' perceptions of each other's depressive symptoms: Empathic accuracy and assumed similarity bias. *Journal of Social and Personal Relationships, 39*(2), 285–302. https://doi.org/10.1177/02654075211036514.

Cassiello-Robbins, C., & Barlow, D. H. (2016). Anger: the unrecognized emotion in emotional disorders. *Clinical Psychology: Science and Practice, 23*(1), 66–85. https://doi.org/10.1111/cpsp.12139.

Clay, D. L., Anderson, W. P., & Dixon, W. A. (1993). Relationship between anger expression and stress in predicting depression. *Journal of Counseling & Development, 72*(1), 91–94. https://doi.org/10.1002/j.1556-6676.1993.tb02283.x.

Daley, S. E., Hammen, C., Burge, D., Davila, J., Paley, B., Lindberg, N., & Herzberg, D. S. (1997). Predictors of the generation of episodic stress: a longitudinal study of late adolescent women. *Journal of Abnormal Psychology, 106*(2), 251–259. https://doi.org/10.1037/0021-843X.106.2.251.

Demiralp, E., Thompson, R. J., Mata, J., Jaeggi, S. M., Buschkuehl, M., Barrett, L. F., Ellsworth, P. C., Demiralp, M., Hernandez-Garcia, L., Deldin, P. J., Gotlib, I. H., & Jonides, J. (2012). Feeling blue or turquoise? Emotional differentiation in major depressive disorder. *Psychological Science, 23*(11), 1410–1416. https://doi.org/10.1177/0956797612444903.

Fava, M., & Rosenbaum, J. F. (1998). Anger attacks in depression. *Depression and Anxiety, 8*(S1), 59–63. https://doi.org/10.1002/(SICI)1520-6394(1998)8:1+<59::AID-DA9>3.0.CO;2-Y.

Fletcher, G. J. O., & Kerr, P. S. G. (2010). Through the eyes of love: Reality and illusion in intimate relationships. *Psychological Bulletin, 136*(4), 627–658. https://doi.org/10.1037/a0019792.

Funk, J. L., & Rogge, R. D. (2007). Testing the ruler with item response theory: increasing precision of measurement for relationship satisfaction with the Couples Satisfaction Index – PsycNET. *APA PsycNET, 21*(4), 572–583. https://doi.org/10.1037/0893-3200.21.4.572.

Gadassi, R., Mor, N., & Rafaeli, E. (2011). Depression and empathic accuracy in couples: an interpersonal model of gender differences in depression. *Psychological Science, 22*(8), 1033–1041. https://doi.org/10.1177/0956797611414728.

Goldman, L., & Haaga, D. A. F. (1995). Depression and the experience and expression of anger in marital and other relationships. *The Journal of Nervous and Mental Disease, 183*(8), 505.

Gordon, A. M., Tuskeviciute, R., & Chen, S. (2013). A multimethod investigation of depressive symptoms, perceived understanding, and relationship quality. *Personal Relationships, 20*(4), 635–654. https://doi.org/10.1111/pere.12005.

Greenberg, L. S., & Watson, J. C. (2006). *Emotion-focused therapy for depression* (pp. viii, 353). American Psychological Association. https://doi.org/10.1037/11286-000.

Hall, J. A., & Schmid Mast, M. (2007). Sources of accuracy in the empathic accuracy paradigm. *Emotion, 7*(2), 438–446. https://doi.org/10.1037/1528-3542.7.2.438.

Hammen, C. (1991). Generation of stress in the course of unipolar depression. *Journal of Abnormal Psychology, 100*(4), 555–561. https://doi.org/10.1037/0021-843X.100.4.555.

Hammen, C. (2006). Stress generation in depression: reflections on origins, research, and future directions. *Journal of Clinical Psychology, 62*(9), 1065–1082. https://doi.org/10.1002/jclp.20293.

Harris, T. J. R., Pistrang, N., & Barker, C. (2006). Couples' experiences of the support process in depression: a phenomenological analysis. *Psychology and Psychotherapy: Theory, Research and Practice, 79*(1), 1–21. https://doi.org/10.1348/147608305X41218.

Herr, N. R., Kivity, Y., Ramadurai, R., Covington, A. M., & Gunthert, K. C. (2024). Empathic accuracy of romantic partner negative affect is influenced by borderline personality symptoms. *Personality Disorders: Theory, Research, and Treatment, 15*(1), 74–83. https://doi.org/10.1037/per0000642.

Hodges, S. D., Lewis, K. L., & Ickes, W. (2015). The matter of other minds: Empathic accuracy and the factors that influence it. In *APA handbook of personality and social psychology, volume 3: interpersonal relations* (pp. 319–348). American Psychological Association. https://doi.org/10.1037/14344-012.

Ickes, W. (1993). Empathic accuracy. *Journal of Personality, 61*(4), 587–610. https://doi.org/10.1111/j.1467-6494.1993.tb00783.x.

Ickes, W., Simpson, J., & Oriña, M. (2005). *Empathic accuracy and inaccuracy in close relationships* (pp. 310–322).

Joiner, T. E. (2000). Depression's vicious scree: self-propagating and erosive processes in depression chronicity. *Clinical Psychology: Science and Practice, 7*(2), 203–218. https://doi.org/10.1093/clipsy.7.2.203.

Katz, J., Beach, S., & Joiner, T. (1999). Contagious depression in dating couples. *Journal of Social and Clinical Psychology, 18*, 1–13. https://doi.org/10.1521/jscp.1999.18.1.1.

Kaźmierczak, I., Zajenkowska, A., Rajchert, J., Jakubowska, A., & Abramiuk-Szyszko, A. (2023). The role of anger expression in unmet expectations and depressive symptoms. *Depression Research and Treatment, 2023*(1), 8842805. https://doi.org/10.1155/2023/8842805.

Koh, K. B., Kim, D. K., Kim, S. Y., & Park, J. K. (2005). The relation between anger expression, depression, and somatic symptoms in depressive disorders and somatoform disorders. *The Journal of Clinical Psychiatry, 66*(04), 485–491. https://doi.org/10.4088/JCP.v66n0411.

Kouros, C. D., Papp, L. M., & Cummings, E. M. (2008). Interrelations and moderators of longitudinal links between marital satisfaction and depressive symptoms among couples in established relationships. *Journal of Family Psychology, 22*, 667–677. https://doi.org/10.1037/0893-3200.22.5.667.

Lane, S. P., & Hennes, E. P. (2018). Power struggles: estimating sample size for multilevel relationships research. *Journal of Social and Personal Relationships, 35*(1), 7–31. https://doi.org/10.1177/0265407517710342.

Luutonen, S. (2007). Anger and depression—theoretical and clinical considerations. *Nordic Journal of Psychiatry, 61*(4), 246–251. https://doi.org/10.1080/08039480701414890.

MacKenzie, J., Smith, T. W., Uchino, B., White, P. H., Light, K. C., & Grewen, K. M. (2014). Depressive symptoms, anger/hostility, and relationship quality in young couples. *Journal of Social and Clinical Psychology, 33*(4), 380–396. https://doi.org/10.1521/jscp.2014.33.4.380.

McNair, D. M., Lorr, M., & Droppleman, L. F. (1971). *Manual profile of mood states*. Educational and Industrial Testing Service.

Moreno, J. K., Selby, M. J., Fuhriman, A., & Laver, G. D. (1994). Hostility in depression. *Psychological Reports, 75*(3), 1391–1401. https://doi.org/10.2466/pr0.1994.75.3.1391.

Muthén, L. K., & Muthén, B. O. (1998). *Mplus User's guide* (7th ed.). Author.

Overall, N. C., & Hammond, M. D. (2013). Biased and accurate: depressive symptoms and daily perceptions within intimate relationships. *Personality and Social Psychology Bulletin, 39*(5), 636–650. https://doi.org/10.1177/0146167213480188.

Papp, L. M., Kouros, C. D., & Cummings, E. M. (2010). Emotions in marital conflict interactions: empathic accuracy, assumed similarity, and the moderating context of depressive symptoms. *Journal of Social and Personal Relationships, 27*(3), 367–387. https://doi.org/10.1177/0265407509348810.

Pasquini, M., Picardi, A., Biondi, M., Gaetano, P., & Morosini, P. (2004). Relevance of anger and irritability in outpatients with major depressive disorder. *Psychopathology, 37*(4), 155–160. https://doi.org/10.1159/000079418.

Radloff, L. S. (1977). The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*(3), 385–401. https://doi.org/10.1177/014662167700100306.

Renneberg, B., Heyn, K., Gebhard, R., & Bachmann, S. (2005). Facial expression of emotions in borderline personality disorder and depression. *Journal of Behavior Therapy and Experimental Psychiatry, 36*(3), 183–196. https://doi.org/10.1016/j.jbtep.2005.05.002.

Renshaw, K. D., Blais, R. K., & Smith, T. W. (2010). Components of negative affectivity and marital satisfaction: the importance of actor and partner anger. *Journal of Research in Personality, 44*(3), 328–334. https://doi.org/10.1016/j.jrp.2010.03.005.

Riley, W. T., Treiber, F. A., & Woods, M. G. (1989). Anger and hostility in depression. *The Journal of Nervous and Mental Disease, 177*(11), 668.

Rottenberg, J. (2005). Mood and emotion in major depression. *Current Directions in Psychological Science, 14*(3), 167–170. https://doi.org/10.1111/j.0963-7214.2005.00354.x.

Rude, S., Chrisman, J., Burton Denmark, A., & Maestas, K. (2012). Expression of direct anger and hostility predict depression symptoms in formerly depressed women. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement, 44*, 200–209. https://doi.org/10.1037/a0027496.

Rum, Y., & Perry, A. (2020). Empathic accuracy in clinical populations. *Frontiers in Psychiatry, 11*. https://doi.org/10.3389/fpsyt.2020.00457.

Ruscher, S. M., & Gotlib, I. H. (1988). Marital interaction patterns of couples with and without a depressed partner. *Behavior Therapy, 19*(3), 455–470. https://doi.org/10.1016/S0005-7894(88)80016-9.

Schless, A. P., Mendels, J., Kipperman, A., & Cochrane, C. (1974). Depression and hostility. *The Journal of Nervous and Mental Disease, 159*(2), 81.

Sened, H., Lavidor, M., Lazarus, G., Bar-Kalifa, E., Rafaeli, E., & Ickes, W. (2017). Empathic accuracy and relationship satisfaction: a meta-analytic review. *Journal of Family Psychology, 31*(6), 742–752. https://doi.org/10.1037/fam0000320.

Thompson, R. J., Liu, D. Y., Sudit, E., & Boden, M. (2021). Emotion differentiation in current and remitted major depressive disorder. *Frontiers in Psychology, 12*, 685851. https://doi.org/10.3389/fpsyg.2021.685851.

Tolpin, L. H., Cohen, L. H., Gunthert, K. C., & Farrehi, A. (2006). Unique effects of depressive symptoms and relationship satisfaction on exposure and reactivity to daily romantic relationship stress. *Journal of Social and Clinical Psychology, 25*(5), 565–583. https://doi.org/10.1521/jscp.2006.25.5.565.

Vilagut, G., Forero, C. G., Barbaglia, G., & Alonso, J. (2016). Screening for depression in the general population with the Center for Epidemiologic Studies Depression (CES-D): a systematic review with meta-analysis. *PLOS ONE, 11*(5), e0155431. https://doi.org/10.1371/journal.pone.0155431.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063–1070. https://doi.org/10.1037/0022-3514.54.6.1063.

Wenze, S. J., Gunthert, K. C., Ahrens, A. H., & Taylor Bos, T. C. (2013). Biases in short-term mood prediction in individuals with depression and anxiety symptoms. *Individual Differences Research: IDR, 11*(3), 91–101.

Whiffen, V. E., Kallos-Lilly, A. V., & MacDonald, B. J. (2001). Depression and attachment in couples. *Cognitive Therapy and Research, 25*(5), 577–590. https://doi.org/10.1023/A:1005557515597.

Wilde, J. L., & Dozois, D. J. A. (2019). A dyadic partner-schema model of relationship distress and depression: conceptual integration of interpersonal theory and cognitive-behavioral models. *Clinical Psychology Review, 70*, 13–25. https://doi.org/10.1016/j.cpr.2019.03.003.

Willroth, E. C., Flett, J. A. M., & Mauss, I. B. (2020). Depressive symptoms and deficits in stress-reactive negative, positive, and within-emotion-category differentiation: a daily diary study. *Journal of Personality, 88*(2), 174–184. https://doi.org/10.1111/jopy.12475.

Zaki, L. F., Coifman, K. G., Rafaeli, E., Berenson, K. R., & Downey, G. (2013). Emotion differentiation as a protective factor against nonsuicidal self-injury in borderline personality disorder. *Behavior Therapy, 44*(3), 529–540. https://doi.org/10.1016/j.beth.2013.04.008.

Received: June 10, 2024
Revised: January 16, 2025
Accepted: January 18, 2025
Available online: 27 January 2025