# Depression and Everyday Social Activity, Belonging, and Well-Being

Michael F. Steger Colorado State University Todd B. Kashdan George Mason University

Dysfunctional social behavior has been implicated in the experience of depression. People with higher levels of depressive symptoms report more frequent negative social interactions and react more strongly to them. It remains unknown, however, whether reaction strength differs depending on whether social interactions are positive or negative. Drawing on socioevolutionary models of depression (N. B. Allen & P. B. T. Badcock, 2003), the authors propose that people with higher levels of depressive symptoms should react more strongly not only to negative social interactions but also to positive social interactions and a sense of belonging. Using nonclinical samples, 2 daily process studies examined the role of depression in people's reactivity to social interactions in natural, ongoing, social contexts. In Study 1, the number of positive and negative social events showed a stronger relation to well-being among people with higher levels of depressive symptoms. Study 2 extended this finding to perceptions of belonging in memorable social interactions, finding a stronger link between belonging and well-being among people with higher levels of depressive symptoms. Together these studies provide the first indication that depressive symptoms may sensitize people to everyday experiences of both social rejection and social acceptance.

Keywords: depression, social activity, need to belong, well-being, daily life events

A lonely man is a lonesome thing, a stone, a bone, a stick, a receptacle for Gilbey's gin, a stooped figure sitting at the edge of a hotel bed, heaving copious sighs like the autumn wind.

-John Cheever, Journals of John Cheever

Humans have a profound need to connect with others and gain acceptance into social groups (i.e., belonging; Baumeister & Leary, 1995; Deci & Ryan, 2000). People form bonds readily and organize much of their behavior around establishing and maintaining those bonds. Further, people suffer when relationships deteriorate and social bonds are severed. Although feeling disconnected from others and experiencing a lack of belonging bothers everyone, depressed people may be particularly sensitive to these painful social experiences (Allen & Badcock, 2003). Because of the importance of social experiences to people's well-being (e.g., Diener, 2000), and to the etiology and maintenance of depression (e.g., Allen & Badcock, 2003; Barnett & Gotlib, 1988; Coyne, 1976b), it is vital to examine how depressed people's well-being is enhanced or eroded by positive and negative social interactions. The present research used two daily process studies to test the degree to which naturally occurring positive and negative social interactions interact with depressive symptoms to predict wellbeing.

# Depression and Social Dysfunction

The motivational and affective profile associated with depression can be expected to influence people's ability to feel a sense of social belonging and how, in turn, these feelings influence wellbeing. It is rare for a social interaction to provide objective evidence of rejection or acceptance, leaving the ultimate impact of social interactions up to people's perceptions. When people experience positive social interactions they should be more likely to feel a sense of belonging. However, depressed people's social information-processing biases appear to make it less likely that they will perceive cues of acceptance and belonging in social interactions. For example, in laboratory studies, clinically depressed people have shown preferential attention to sad faces, adjectives, and emotion words (e.g., Gotlib, Kasch, et al., 2004; Gotlib, Krasnoperova, Yue, & Joormann, 2004; Mogg & Bradley, 2005). Further, depressed people typically view ambiguous social interactions as negative, attribute these negative outcomes to the self, and act in accord with expectations that negative social interactions are likely and costly (Beck, Rush, Shaw, & Emery, 1979; Joiner & Coyne, 1999). It appears that depressed people should be more likely to pay attention to negative social interactions and less likely to feel a sense of belonging.

Evidence does indeed suggest that depressed people often fail in their quest to satisfy their need for belonging in relationships (e.g., Hagerty, Williams, Coyne, & Early, 1996), with potentially severe consequences (Leary, 1990). Depressed people report fewer intimate relationships and elicit fewer positive, caring responses and more negative, rejecting responses from others (Gotlib, 1992; Joiner & Coyne, 1999; Segrin & Abramson, 1994). Depressed people also appear to induce negative affect in others, which in turn elicits rejection and the loss of socially rewarding opportunities (Coyne, 1976a; Joiner & Katz, 1999).

Michael F. Steger, Department of Psychology, Colorado State University; Todd B. Kashdan, Department of Psychology, George Mason University.

Todd B. Kashdan was supported by National Institute of Mental Health Grant MH-73937.

Correspondence concerning this article should be addressed to Michael F. Steger, Colorado State University, Department of Psychology, 1876 Campus Delivery, Fort Collins, CO 80523-1876. E-mail: michael.f.steger@ colostate.edu

# Dulled or Heightened Reactions to Negative and Positive Stimuli?

A synthesis of the existing literature leads us to conclude that people with higher levels of depressive symptoms are more likely to create difficult social situations, have worse interactions, and preferentially direct their attention to negative emotional social stimuli. As a result of this cascade of social dysfunction, it seems possible that more depressed people are sensitized to negative social interactions. A number of studies have examined sensitivity to rewards and punishments among clinically depressed samples. In general, laboratory studies have shown that clinically depressed people experience dulled, not heightened, reactions to negative punishment cues and positive reward cues (e.g., winning/losing small-to-large amounts of money in mock gambling paradigms; Henriques & Davidson, 1990, 2000; Sloan, Strauss, & Wisner, 2001). This dulled reactivity has also been extended to social stimuli (e.g., sad and amusing films; Rottenberg, Kasch, Gross, & Gotlib, 2002). Researchers have concluded from such results that dulling of reactions to positive and negative stimuli is a hallmark of major depressive disorder (Henriques & Davidson, 1991; Rottenberg, 2005). Nonetheless, there are some indications that clinically depressed people show greater reactivity to positive reward cues (Must et al., 2006), particularly if they attribute the onset of positive events in everyday life to global and stable causes (Needles & Abramson, 1990).

However, social experience is best understood as a dynamic, communication-driven process with progressive reciprocal influences of actors, partners, and situational demands (e.g., Gable & Reis, 1999; Gilbert, 2006). Cross-sectional survey methods miss this dynamic interchange, asking research participants to retrospectively evaluate and generalize across varying experiences in different social contexts. Laboratory studies often employ singular, sometimes arbitrary, decontextualized stimuli (e.g., words or pictures of facial expressions; Gotlib, Kasch, et al., 2004). For example, it is not clear that images of an angry person would hold the same implications for social acceptance and rejection as would a real-world disagreement with a friend. Daily process studies are able to capture people's everyday social experiences, and their reactions to them, as they unfold in their typical environments. This method confers ecological validity that is often sacrificed with other approaches and can shed light on how people with depressive symptoms react to life events. For example, this type of research has shown that people with higher levels of depressive symptoms reported less intimacy, enjoyment, and perceived influence in everyday social interactions (e.g., Nezlek, Hampton, & Shean, 2000; Nezlek, Imbrie, & Shean, 1994) and reported less day-to-day stability in well-being (Gable & Nezlek, 1998). Of particular relevance to this study, researchers have found that depressed people were more reactive to positive life events, reacting to both positive and negative events with more strongly enhanced positive affect, among other indicators of well-being (Nezlek & Gable, 2001). Whereas prior laboratory studies indicated dampened reactivity to positive reward cues among more depressed people (e.g., Sloan et al., 2001), when positive events occurred outside of the laboratory, an opposite effect was found (see Needles & Abramson, 1990, for a 6-week prospective investigation). Providing additional weight to the notion that results from laboratory studies diverge from studies with stronger links to

everyday functioning, a recent longitudinal epidemiological study showed that depressed people benefitted more from becoming married than did less depressed people (Frech & Williams, 2007).

There is another reason why Nezlek and Gable (2001) may have found greater reactivity to life events in contrast to laboratory studies. Lab-based studies have focused on people with clinical levels of depression, often carrying the diagnosis of major depressive disorder, whereas Nezlek and Gable modeled depressive symptoms on a continuum. Clinical levels of depression may represent a significantly more debilitating condition (e.g., Allen & Badcock, 2003), leading clinically depressed people to feel numb and less reactive to negative social experiences as a self-protective strategy (e.g., Rottenberg, 2005). On the other hand, evidence is emerging that depressive symptoms lie on a continuum of increasing impairment (e.g., Backenstrass et al., 2006; Priciandaro, & Roberts, 2005; Ruscio & Ruscio, 2002). Subthreshold depression may be a premorbid manifestation of psychopathology, and in fact, people with subthreshold depression are at substantial risk of developing major depressive disorder (e.g., Cuijpers, Smit, & van Straten, 2007; Fogel, Eaton, & Ford, 2006; Regeer et al., 2006; Sherbourne et al., 1994) as well as other adverse outcomes such as suicidal behavior (Fergusson, Horwood, Ridder, & Beautrais, 2005). Understanding how social experiences influence the wellbeing of people with subthreshold depression may shed light on the progression to disorder. One study has examined the reactivity of clinically depressed people to life events in their naturalistic environments. This study split the difference, so to speak, converging with laboratory studies of clinically depressed people in finding dulled reactivity to negative life events and converging with daily process studies of subthreshold samples in finding heightened reactivity to positive life events (Peeters, Nicolson, Berkhof, Delespaul, & deVries, 2003).

The social risk hypothesis of depression (Allen & Badcock, 2003) provides one account of how subthreshold levels of depressive symptoms could have evolved to help people reduce the risk of being excluded from social groups. Ancestral humans faced survival challenges that were best met through participation with reliable others in social groups. Being accepted by a social group increased the likelihood of survival, whereas being rejected decreased the likelihood of survival as well as the ability to find suitable mates to produce offspring and continue one's genetic lineage. Allen and Badcock (2003) argued that people with subclinical levels of depressive symptoms should be highly reactive to cues indicative of threats to one's social resources. The central goal of behavior, then, is to ensure that the benefits that a person provides to a social group far outweigh any perceived burden; a positive value-to-burden ratio is synonymous with secure group status. As people perceive their social value falling and their subsequent risk of social exclusion rising, depressive symptoms direct attentional resources to ongoing social information. With this social attunement, behavior can be modified as needed to prevent social rejection or exclusion. Likewise, people's behavioral repertoire will be subdued to prevent further conflict and potentially catastrophic loss (e.g., rejection from the group or physical harm); such responses would be marked by submissiveness and inhibition of exploratory and resource-seeking behaviors (Gilbert, 1992, 2006). These responses mimic depressive symptoms, and research has shown that people with higher levels of depressive symptoms react to perceived dominance from others

with exacerbated submissiveness and feelings of inferiority compared to people with lesser depressive symptoms (e.g., Fournier, Zuroff, & Moskowitz, 2007). Clinical levels of depression may represent a malfunctioning of the evolved mental apparatus that is proposed to monitor risk for social exclusion. Instead of being sensitive to possible rejection, clinical depression might reflect a lack of context sensitivity such that any situation that is not objectively positive is viewed as threatening. As a result, submissive, self-deprecating psychological and behavioral reactions are rigidly enacted (Allen, Gilbert, & Semedar, 2004).

This model prioritizes social events over other types of life events, making Nezlek and Gable's (2001) study an imperfect test. A better test of this model is provided by a daily process study showing that people with higher levels of depressive symptoms react more strongly (i.e., experience more distress) in response to social stressors than do people with lesser depressive symptoms (e.g., O'Neill, Cohen, Tolpin, & Gunthert, 2004). Thus, there is some evidence for the central proposition of the social risk hypothesis in the naturally occurring social experiences of people with subthreshold depressive symptoms.

Theories such as the social risk hypothesis are fairly explicit in predicting that people with higher levels of depressive symptoms should react more strongly to threats of social exclusion, as would be indicated by negative social interactions or social stressors (Allen et al., 2004; Gilbert, 2006). This perspective is in line with the prevailing tradition in psychology to focus on negative expressions of human behavior and psychopathology rather than on the full spectrum of human behavior, including positive experiences and well-being (Seligman & Czikszentmihalyi, 2000). Therefore, as currently articulated, socioevolutionary theories neither predict nor account for evidence of stronger reactions to positive events among people with subthreshold (Nezlek & Gable, 2001) and clinical (Peeters et al., 2003) depression. We believe that these models can be extended to predict heightened reactions to positive social interactions among people with subthreshold depressive symptoms.

# A Balanced Model of Depressive Symptoms as Social Sensitizer

The social risk hypothesis frames social relationships in terms of social value and social burdens-if social burden exceeds, or even equals, one's social value, then one is at elevated risk of being excluded and attracting negative attention (e.g., Allen et al., 2004). Humans presumably evolved the ability to appraise how they are being viewed by others (e.g., whether they are attracting negative attention from their group; Gilbert, 1997). According to this perspective, depressive symptoms evolved to facilitate appraisals of falling social value and rising social burden, and it is because of this function that they sensitize people to threats of social rejection. It seems equally likely that depressive symptoms help people identify when their social value is rising and their social burden is falling; positive social interactions signal rising social value, and therefore more secure belonging. Thus, people with higher levels of depressive symptoms can be expected to capitalize on positive social interactions by experiencing enhanced well-being. From the perspective of a social group, depressed people are prone to unsatisfying, problematic relationships and are often avoided as interaction partners (e.g., Joiner & Katz, 1999). Happy people, in

contrast, tend to possess good relationships, and people with higher positive affect are evaluated more favorably by interaction partners (e.g., Gable, Reis, Impett, & Asher, 2004; Lyubomirsky, King, & Diener, 2005). Thus, it would be adaptive for people with higher levels of depressive symptoms to be highly reactive to positive social interactions because their increased well-being would make them more attractive as social partners (decreasing the likelihood of future rejection and solidifying their social membership). In short, there is no particular reason from a socioevolutionary standpoint to postulate that depressive symptoms might have evolved only to sensitize people to risks of disadvantageous social value/burden ratios. We argue that people with subthreshold depression may be uniquely attentive to both positive and negative social cues-and may be expected to be particularly reactive to their social experiences-because such cues provide valuable information about their degree of acceptance and security within their social group. In our model, mild-to-moderate depressive symptoms direct people's attention to seeking and establishing, not just to protecting and belonging.

### The Present Investigation

Social experiences are strongly implicated in the etiology and maintenance of depression. We propose that mild-to-moderate levels of depressive symptoms sensitize people to cues regarding their degree of social belonging, extending previous theories to include indicators of rising belonging. That is, when people with higher levels of depressive symptoms perceive their belonging to be at risk, as indicated by negative social interactions, they should react more strongly with decreases in well-being. Similarly, when they perceive their belonging to be secure, as indicated by positive social interactions, they should react more strongly with increases in well-being. We are aware of no previous research that has examined the reactivity of people with mild-to-moderate depression symptoms to the full spectrum of positive and negative social interactions.

Inquiry into the ramifications of social experiences can advance through examination of how people differing in levels of depressive symptoms act and react in their natural, ongoing social environments. Therefore, we conducted two daily process studies. In Study 1, we examined how depressive symptoms influenced reactivity to an objective list of specific negative and positive social interactions. To better understand reactions to these social events, we assessed affective (positive and negative affect) and cognitive (appraisals of how meaningful and satisfying life is) markers of well-being. Because no finite list can hope to capture all of the significant interactions people might experience, in Study 2, we examined the role of depressive symptoms in response to appraisals of memorable social interactions. Thus, using both objective and subjective measures of interaction quality, we tested our proposal that depressive symptoms attune people to signals of social rejection as well as belonging. Drawing on previous theory and research, we hypothesized people with higher levels of depressive symptoms would report (a) more frequent negative, and less frequent positive, social interactions and (b) greater reactivity in terms of affective and cognitive markers of well-being to positive social interactions, negative social interactions, and perceptions of belonging.

# Study 1

Study 1 focused on relations between positive and negative social interactions and well-being among people with varying levels of depressive symptoms. Previous lab-based research examined depressive symptoms in the context of positive and negative social stimuli, such as photos of facial expressions, in clinically depressed samples (e.g., Gotlib, Kasch, et al., 2004), and some daily process research examined links between subthreshold depressive symptoms and naturalistic daily life events (e.g., Nezlek & Gable, 2001). However, despite the strong role social functioning is thought to play in the etiology and exacerbation of depressive symptoms (e.g., Coyne, 1976a), research is lacking on the reactivity of people with mild-to-moderate levels of depressive symptoms to both positive and negative social events. To understand how people with higher levels of depressive symptoms react to positive and negative social interactions, we assessed relations between social interactions and a broad range of well-being measures. Specifically, we measured cognitive evaluations of life satisfaction and meaning in life as well as positive and negative affect. Thus, we assessed what we refer to as cognitive well-being (CWB) and affective well-being (AWB). We used a 21-day daily process method in which participants recorded the occurrence of a variety of social interactions and their well-being each day. This method generates hierarchically structured data in which daily life ratings are nested within individuals. Direct relations between well-being and social experiences reported in daily life were assessed. In addition, cross-level interactions assessed the extent to which relations between day-to-day social interactions and wellbeing varied across levels of depression. Thus, we looked at how many positive and negative social interactions people with higher levels of depressive symptoms reported. In addition, we examined whether people with higher levels of depressive symptoms reacted to positive and negative social interactions more strongly in terms of AWB and CWB.

#### Method

#### **Participants**

Participants (N = 106; mean age = 19.7, SD = 3.1; 66% female; 74% European American) were recruited from undergraduate psychology courses at the University of Minnesota and completed the depression measure and daily reports in exchange for course credit. Missing responses and invalid response patterns (i.e., no day-to-day variation in responses, same rating score given for all items) resulted in a final sample size of 104.

# Measures

Global depression. Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression scale (CES–D; Radloff, 1977). Twenty items were rated from 0 (*rarely or none of the time*) to 3 (*most or all of the time*);  $\alpha = .86$ .<sup>1</sup> The mean symptom severity of this sample (M = 16.7, SD = 10.5) was roughly 0.5 SD lower than clinical sample means (Radloff, 1977), with 38.5% of the sample scoring above the mild-to-severe depression cutoff score (17) suggested for comparisons between normal and clinical populations (Radloff, 1977). Thus, this sample appeared to have a sufficient number of individuals reporting subthreshold symptoms to be considered at risk for significant distress and/or impairment.

Daily social interactions. Positive and negative social interactions were assessed using five positive items (e.g., "Flirted with someone or arranged a date" and "Went out socializing with friends/date (e.g., party, dance clubs)") and five negative items (e.g., "A disagreement with a close friend or steady date was left unresolved" and "Was excluded or left out by my group of friends") from the Daily Events Survey (Butler, Hokanson, & Flynn, 1994). Items were rated on whether they happened (1) or not (0). Principal-axis factor analysis with Promax rotation revealed that items assorted into three factors. One factor (eigenvalue = 1.85) comprised three positive social items concerning friends and flirting; the second factor (eigenvalue = 1.55) comprised all five negative social interaction items; the third factor (eigenvalue = 1.05) comprised the two items concerning interactions with steady romantic partners. Because the negative social interactions formed a clear factor and the two small positive factors were highly related (factor r = .55), the items were assorted into one negative social interaction scale and one positive social interaction scale. Reliability estimates were obtained from Hierarchical Linear Modeling (HLM; Version 6.01a; Raudenbush, Bryk, Cheong, & Congdon, 2004), supporting the consistency of the two scales (r = .93 and .91 for positive and negative social interactions, respectively).

*Daily CWB.* CWB was assessed by summing three items used in previous research (Steger, Kashdan, & Oishi, 2008) assessing meaning in life (i.e., "How meaningful does your life feel?" and "How much do you feel your life had purpose today?") and life satisfaction ("How satisfied are you with your life?") rated from 1 (*not at all*) to 7 (*absolutely*). Meaning and life satisfaction items were highly interrelated,  $\gamma = 1.14$ , SE = .03, t(96) = 35.20, p < .0001, r = .98.

*Daily AWB.* AWB was assessed by subtracting average daily negative affect ratings (i.e., sluggish, afraid, sad, anxious, and angry) from average daily positive affect ratings (i.e., relaxed, proud, excited, appreciative, enthusiastic, happy, satisfied, curious, and grateful; see Schimmack & Diener, 1997). Affective items were rated from 1 (*very little/not at all*) to 5 (*extremely*). These emotional adjectives are used frequently in experience-sampling studies of emotion (e.g., Kashdan & Steger, 2006). Positive affect and negative affect subscale scores were highly interrelated,  $\gamma = -.11$ , SE = .00, t(102) = 25.062, p < .0001, r = .93.

# Procedure

During an initial orientation session, participants answered demographic questions and received a packet of 21 duplicate daily reports containing the daily measures specified above, along with

<sup>&</sup>lt;sup>1</sup> The temporal stability of the CES–D is important to the present study because the CES–D was administered at the end of the 3-week diary period. Moderately strong test–retest reliability has been reported over a 2-to 8-week period (*rs* from .51 to .67) and over a 3- to 12-month period (*rs* from .32 to .54; Radloff, 1977). Thus, CES–D scores appear stable enough for the present study. Concerns over when the CES–D was administered also can be allayed somewhat because of the similarity of results from Study 1 (CES–D administered after the daily reports were collected) and Study 2 (CES–D administered before the daily reports were collected).

293

instructions to complete a single form at the end of each day or within 1 hour after waking. Participants were told in class during recruitment and in subsequent e-mails that it was extremely important to complete reports only at the end of each day, and not to complete more than one report on any single day. After 3 weeks, participants turned in their daily reports. All participants completed the CES–D 3 weeks into the study, on the day when they turned in their daily reports. Participants received course credit for their completed daily reports and survey responses.

# Results

The data consisted of 2,118 daily reports nested within 104 people. Participants reported mean daily CWB of 14.3 (SD = 3.9), which is above the midpoint of 12, and mean daily AWB of 0.8 (SD = 1.3). This positive number means that participants reported more positive emotions than negative emotions per day. Participants reported more positive social interactions (M = 1.11, SD =1.19) than negative social interactions (M = 0.33, SD = 0.69). Using recommended formulas for calculating intraclass correlations within multilevel data sets, we calculated the proportion of variance in daily scores due to between-person factors (individual differences) compared to within-person factors (days; Raudenbush & Bryk, 2002, pp. 36, 71). In each case, the percentage refers to the proportion of variance attributable to between-person factors (see Table 1). From these proportions, we can see that only about one-third to two-fifths of the variance in daily positive and negative social interactions, and AWB, are due to stable, dispositional factors, with the majority of the variance attributable to fluctuating daily factors. The reverse case was true for CWB, which appears more stable overall.

Coefficients representing daily social interactions and wellbeing were estimated for each person (Level 1), and individual differences in these variables accounted for by depressive symptoms were estimated (Level 2). Level 1 variables were person-

Table 1Descriptive Statistics for Studies 1 and 2

Variable	М	SD	r <sub>ij</sub>	$u_{0j}$	ICC
	Study 1				
IV			0	0	0
Cognitive well-being	14.27	3.92	5.20	10.31	0.66
Affective well-being	0.81	1.34	1.08	0.72	0.40
DV					
Positive social interactions	1.11	1.19	0.90	0.52	0.37
Negative social interactions	0.33	0.69	0.31	0.16	0.34
	Study 2				
IV					
Cognitive well-being	14.83	2.85	3.12	4.90	0.61
Affective-well-being	0.93	1.21	0.77	0.69	0.47
DV					
Belonging	15.90	3.35	6.50	4.71	0.42

*Note.* The following terms were derived from "empty" models, as described in Equations 1 and 2 (except with the depression term excluded from Equation 2):  $r_{ij}$  = within-persons variance;  $u_{0j}$  = between-persons variance; IV = independent variable; DV = dependent variable; ICC = proportion of variance in each variable attributable to stable individual differences. Separate models were conducted for each variable.

centered, and Level 2 depression ratings were standardized and entered uncentered. First, we tested whether more depressed people reported fewer positive and more negative social interactions than less depressed people using open HLM equations with CES–D scores as a Level 2 covariate of the intercept of positive and negative social interactions.

$$Y_{ij} = \beta_{0j} + r_{ij} (\text{Level 1}) \tag{1}$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01} [\text{depression}] + u_{0j} (\text{Level 2}), \qquad (2)$$

where  $Y_{ij}$  is either positive or negative social interaction reports for person *j* on day *i*;  $\beta_{0j}$  is a random coefficient representing the intercept, or average daily number of interactions for person *j*; and  $r_{ij}$  represents error. At Level 2,  $\beta_{0j}$  is predicted by  $\gamma_{00}$ , which is the average of Level 1 coefficients describing daily reports of interactions,  $\gamma_{01}$ , which is each participant's standardized CES–D score, and  $u_{0j}$ , which is error.

People with more depressive symptoms reported marginally fewer positive social interactions,  $\gamma = -.02$ , SE = .01, t(102) = 1.79, p < .10, and significantly more negative social interactions,  $\gamma = .03$ , SE = .01, t(102) = 4.23, p < .0001.

We next tested whether people with higher levels of depressive symptoms were more reactive to positive and negative social interactions using an equation in which well-being was predicted by an intercept and number of positive and negative social interactions, with CES–D scores as a Level 2 covariate of each term.

 $Y_{ij} = \beta_{0j} + \beta_{1j}$ [positive social interactions]

+  $\beta_{2i}$ [negative social interactions] +  $r_{ii}$ (Level 1) (3)

$$\beta_{0j} = \gamma_{00} + \gamma_{01} [\text{depression}] + u_{0j} (\text{Level 2})$$
(4)

$$\beta_{1j} = \gamma_{10} + \gamma_{11} [\text{depression}] + u_{1j} (\text{Level 2})$$
(5)

$$\beta_{2i} = \gamma_{20} + \gamma_{21} [\text{depression}] + u_{2i} (\text{Level 2}), \tag{6}$$

where  $Y_{ij}$  is either CWB or AWB scores for person j on day i;  $\beta_{0j}$ is a random coefficient representing the intercept, or average daily number of interactions for person *j*;  $\beta_{1j}$  represents each participant's daily positive social interactions;  $\beta_{2i}$  represents each participant's daily negative social interactions; and  $r_{ii}$  represents error. At Level 2,  $\beta_{0i}$  is predicted by  $\gamma_{01}$ , which is the average of Level 1 coefficients describing the relations between both positive and negative social interactions and the corresponding  $Y_{ii}$  (either CWB or AWB),  $\gamma_{00}$ , which is each participant's standardized CES-D score, and  $u_{0i}$ , which is error. Thus,  $\gamma_{01}$  reflects the influence of participants' depressive symptoms on their average daily CWB or AWB.  $\beta_{1i}$  is predicted from  $\gamma_{10}$ , which reflects the Level 1 coefficients describing the average relation between positive social interactions and CWB or AWB,  $\gamma_{11}$ , which represents the influence of depressive symptoms on daily CWB and AWB, and  $u_{1i}$ , which is error.  $\beta_{2i}$  is modeled identically, but with the use of reports of negative social interactions rather than positive social interactions. Thus, we modeled daily CWB and AWB as a function of within-person reactivity (slopes) to positive and negative social interactions,  $\gamma_{10}$  and  $\gamma_{20}$ , allowing these relations to differ for different participants, and using depression scores to predict these individual differences in reactivity,  $\gamma_{11}$  and  $\gamma_{21}$ .

Across participants, positive,  $\gamma_{10}$ , and negative,  $\gamma_{20}$ , social interactions were significantly related to well-being (see Table 1).

People with higher levels of depressive symptoms reported lower average daily CWB and AWB,  $\gamma_{01}$ . Depression also moderated relations between daily positive,  $\gamma_{11}$ , and negative,  $\gamma_{21}$ , social interactions and daily CWB and between daily positive social interactions,  $\gamma_{21}$ , and daily AWB. To decompose the interaction between depression and social interactions, we calculated means at 1 *SD* and -1 *SD*. Compared to people with lower levels of depressive symptoms, people with higher levels of depressive symptoms reported larger positive relations between daily positive social interactions and CWB (see Figure 1) and AWB and larger negative relations between daily negative social interactions and CWB.<sup>2</sup> Positive and negative social interactions, along with the moderating effect of depressive symptoms, accounted for 27% of the variance in daily CWB and 42% of the variance in daily AWB (see Table 2).

### Discussion

As predicted from previous research and theory, people with higher levels of depressive symptoms reported somewhat fewer positive social interactions and a significantly higher number of negative social interactions. Other results extended previous research and provided the first support for our expansion of socioevolutionary models of depression to predict greater sensitivity to both negative and positive social interactions. Specifically, people with higher levels of depressive symptoms were more reactive to both positive and negative daily social interactions. Thus, although previous research has indicated that people with higher levels of depressive symptoms react more strongly to positive life events (e.g., Nezlek & Gable, 2001; Peeters et al., 2003), the present research is the first to develop a conceptual rationale for, and to support with data, greater reactivity to social interactions in general.

# Study 2

In Study 1, we found that people with higher levels of depressive symptoms reacted more strongly to social interactions included on a short list of positive and negative interactions. A priori lists of interactions might not be an accurate representation, in



Relation between Positive Social Interactions and Daily Cognitive Well-Being moderated by

*Figure 1.* Depressive symptom severity moderates relations between positive social interactions and daily cognitive well-being (Study 1).

Table 2						
Depression,	Social	Interactions,	and	Well-Being,	Study	1

DV and predictor	$\gamma$ coefficient	SE	t ratio	%Var
Cognitive well-being				.27
Intercept (y00)	14.37	.28	50.67***	
Depression $(\gamma 01)$	-1.81	.29	6.22***	
Positive social interaction ( $\gamma 10$ )	2.01	.27	7.48***	
Depression $(\gamma 11)$	.65	.29	$2.20^{*}$	
Negative social interaction ( $\gamma 20$ )	-2.67	.50	5.38***	
Depression $(\gamma 21)$	-1.42	.41	3.46**	
Affective well-being				.42
Intercept ( $\gamma 00$ )	.82	.07	11.82***	
Depression $(\gamma 01)$	58	.08	7.53***	
Positive social interaction ( $\gamma 10$ )	1.40	.16	$8.70^{***}$	
Depression $(\gamma 11)$	.55	.18	3.06**	
Negative social interaction ( $\gamma 20$ )	-1.75	.28	4.87***	
Depression (y21)	16	.27	.60	

*Note.* Separate models were conducted for cognitive and affective wellbeing. %Var = proportion of variance in the dependent variable accounted for by the predictors. It was calculated using the variance accounted for by an empty model ( $u_0$ ) relative to the variance accounted for by the full model with predictors ( $u_1$ ) in the equation ( $u_0 - u_1$ )/ $u_0$ . DV = dependent variable.

p < .05. p < .01. p < .001.

terms of number and type, of people's interactions in a given day. People undoubtedly engaged in social interactions that were not included on the list. Further, people likely differ in their interpretations of the magnitude of events and in how upsetting the negative events were or how uplifting the positive events were. For example, on the one hand, some people may not worry about leaving a minor disagreement with a friend unresolved. On the other hand, an unresolved major disagreement may cause some participants to ruminate heavily.

To obtain more naturalistic and representative samples of people's daily social lives, we conducted a second study, allowing participants to rate self-selected "memorable" interactions. Because our central argument is that people with mild-to-moderate levels of depression may be particularly sensitive to social information because that information is relevant to their need to belong, we assessed people's daily

<sup>&</sup>lt;sup>2</sup> To investigate the possibility that there was a range restriction in the number of positive and negative social interactions reported by people with lower and higher levels of depressive symptoms, we split the sample into a low depression group (scoring 16 or lower on the CES-D) and a high depression group (scoring 17 or higher on the CES-D). The low and high depression groups reported an absence of positive social interactions at similar rates (38.9% of days without a positive social interaction for the low depression group versus 40.9% of days for the high depression group). However, the differences were larger for negative social interactions. Whereas the high depression group reported 67.0% of days without having any negative social interactions, the low depression group reported 84.4% of days without having any negative social interactions. Thus, analyses for people with low levels of depressive symptoms are based on less than 16% of the total number of days. This may have attenuated the magnitude of the associations between negative social interactions and well-being, particularly among those low in depressive symptoms. If this was the case, it might result in an overestimate of the influence of depressive symptoms on reactions to negative social interactions, although this does not appear to be a problem for positive social interactions.

sense of belonging. To do this, we measured how close and connected people felt to others and the perceived quality of social interactions, as well as how understood they felt in their interactions. Feeling close, connected, and understood are core features of a sense of belonging (e.g., intimacy; Laurenceau, Barrett, & Rovine, 2005; Reis & Shaver, 1988).

In Study 2, we used a more refined methodology. Whereas we used paper-and-pencil reports in Study 1, in Study 2 we used an Internet-based daily report method. Paper-and-pencil reports are at risk for various compliance errors, such as participants completing more than 1 day's worth of reports at a time. Completing a report for more than 1 day increases the risk of retrospective reporting biases. This response pattern would undermine the ecological validity of daily process methods. Using an Internet-based daily report method corrects for this potential source of error, as well as data entry errors, by virtue of the fact that participants record their own data on the Internet site, which then time and date stamps each report. Reports falling outside of the parameters are deleted from the data set.

# Method

#### **Participants**

Participants (N = 49; mean age = 20.0, SD = 3.9; 61% female; 68% European American) were recruited from undergraduate psychology courses at the University of Minnesota and completed questionnaires and a Web-based daily report for 28 consecutive days in exchange for course credit.

#### Measures

The CES-D ( $M = 16.1, SD = 8.9; \alpha = .86; 25.9\%$  of the sample exceeded the cutoff score of 17 for mild-to-severe depression), daily CWB (r = .94), and AWB measures (r = .92) were administered.

Daily interaction ratings. Participants rated how close and connected they felt to other people each day on a scale from 1 (not at all) to 7 (absolutely) and listed up to four "memorable interactions," the quality of which they rated on a scale from 1 (extremely bad) to 5 (extremely good). Interactions were also rated on feeling understood on a scale from 1 (very little) to 5 (a great deal). Ratings were averaged across all reported interactions. Principal-axis factor analysis with Promax rotation revealed that all three items loaded on one factor (eigenvalue = 1.25), supporting their aggregation as an indicator of belonging (r = .92).

#### Procedure

Participants completed the CES–D at Time 1 and received instructions to complete Internet-based daily reports each night between 7 p.m. and 5 a.m. Participants were told it was extremely important to complete surveys during the time frame we provided for them, to only complete reports for a single day at a time, and that we would only retain daily reports completed during the time frame we provided. Participants were reminded in subsequent e-mails to complete their daily reports under these conditions. Only responses time and date stamped between these times were retained.

#### Results

The data consisted of 1,124 valid daily reports nested within 49 participants, structured as in Study 1. Participants reported mean

daily CWB of 14.8 (SD = 2.9), which is above the midpoint of 12, and mean daily AWB of 0.9 (SD = 1.2). Descriptive statistics were very similar to those in Study 1 for CWB; reports of AWB reflected a larger balance in favor of positive emotions and greater variability, perhaps as a function of the 28-day time frame. Participants' belonging scores (M = 15.9, SD = 3.4) were above the midpoint of 13, indicating a moderately high sense of belonging in daily interactions. According to the intraclass correlation calculations, 41.9% of the variance in daily belonging scores is due to stable, dispositional factors rather than fluctuating daily factors. As in Study 1, more variance was due to stable factors for CWB (61.1%) than for AWB (47.3%).

Depressive symptoms were inversely related to daily CWB,  $\gamma = -1.35$ , SE = .36, t(49) = 3.72, p < .001; AWB,  $\gamma = -.57$ , SE = .13, t(49) = 4.30, p < .001; and belonging,  $\gamma = -.81$ , SE = .34, t(49) = 2.39, p < .05. The focus of Study 2 was on the role of depressive symptoms in moderating the relation between sense of belonging and CWB and AWB (see Table 3). To examine this, we created multilevel models for both outcomes (CWB and AWB) in which outcomes were predicted by daily belonging at Level 1 ( $\gamma$ 10), with depressive symptoms as a Level 2 moderator ( $\gamma$ 01 and  $\gamma$ 11). Across participants, feeling a sense of belonging robustly predicted greater daily CWB and AWB,  $\gamma$ (10). In accordance with the results from Study 1 and our hypotheses, people with higher levels of depressive symptoms reported stronger positive relations between a sense of belonging and daily CWB (see Figure 2), with a trend toward a significant effect for AWB,  $\gamma$ (11).<sup>3</sup>

### Discussion

In line with previous research showing that people with higher levels of depressive symptoms feel that they experience worse social interactions (e.g., Nezlek et al., 2000), Study 2 found that people with higher levels of depressive symptoms reported less satisfaction of their need to belong. Study 2 also provided the first indications that depressive symptoms sensitize people to this subjective sense of belonging. On days when people with higher levels of depressive symptoms did feel a sense of belonging, their pattern of responses demonstrated heightened reward and punishment reactions to social interactions. A strong resemblance exists between the moderation results from Study 1 (see Figure 1), which used a paper-and-pencil method and an a priori list of objective social interactions, and results from Study 2 (see Figure 2), which

<sup>&</sup>lt;sup>3</sup> We repeated these analyses for both Study 1 and Study 2, separating positive affect and negative affect into distinct dependent variables. In Study 1, the pattern of results was the same: Both positive and negative social interactions significantly predicted positive affect and negative affect, separately, with depressive symptoms significantly moderating the influence of positive social interactions (but not negative social interactions). In Study 2, belonging was significantly and directly related to both positive affect and negative affect, but this relation was only significantly moderated by depressive symptoms with regard to positive affect. This split in outcomes is probably what is driving the merely marginally significant moderating influence of depression in Study 2. If this pattern of findings was replicated in future research, it could indicate the possibility that depressive symptoms sensitize people to positive social events by increasing positive affective reactions, as opposed to dampening negative affective reactions.

Table 3Depression, Belonging, and Well-Being, Study 2

DV and predictor	$\gamma$ coefficient	SE	t ratio	%Var
Cognitive well-being				.24
Intercept ( $\gamma 00$ )	9.71	.31	31.75***	
Depression ( $\gamma 01$ )	-1.35	.36	3.72***	
Belonging $(\gamma 10)$	.50	.03	16.55***	
Depression $(\gamma 11)$	.13	.03	3.80***	
Affective well-being				.29
Intercept (y00)	.94	.11	8.46***	
Depression ( $\gamma 01$ )	57	.13	4.30***	
Belonging $(\gamma 10)$	.22	.02	14.61***	
Depression (y11)	.03	.02	$1.80^{\dagger}$	

*Note.* Separate models were conducted for cognitive and affective wellbeing. %Var = proportion of variance in the dependent variable accounted for by the predictors. It was calculated using the variance accounted for by an empty model ( $u_0$ ) relative to the variance accounted for by the full model with predictors ( $u_1$ ) in the equation ( $u_0 - u_1$ )/ $u_0$ . DV = dependent variable.

 $^{\dagger} p < .10. \quad ^{***} p < .001.$ 

used a more rigorous Internet-based method with time and date stamping of entries and a measure of perceived belonging during interactions. Also as in Study 1, the effects were stronger for CWB than for AWB, suggesting that people with higher levels of depressive symptoms view their lives as more satisfying and meaningful when they have positive social experiences, with less of an effect on positive or negative affect than is experienced by other people.

#### General Discussion

Across two daily process studies, people with higher levels of depressive symptoms reported a higher number of negative social interactions and a lower sense of belonging in social interactions. In accord with previous research (e.g., O'Neill et al., 2004; Zautra & Smith, 2001), we found that, in comparison with less depressed people, people with higher levels of depressive symptoms experienced less well-being on days when they had negative social interactions (heightened reactivity). These studies also extended previous research, demonstrating that although people with higher levels of depressive symptoms experienced fewer positive social interactions (e.g., Joiner & Coyne, 1999; Nezlek et al., 2000), they were more reactive to their occurrence (i.e., they experienced higher levels of reward responsiveness). Previous daily diary studies have shown that people with higher levels of depressive symptoms report more strongly enhanced well-being on days when they experience positive life events (Nezlek & Gable, 2001). The present studies are the first to focus on social life events and feelings of belonging, as well as the first to extend the measurement of well-being to include meaning, purpose, and satisfaction in life. We used a strategy of assessing both objective positive and negative social interactions (Study 1) and appraisals of the quality of social interactions (Study 2). The present studies used multiple measures to assess the latent construct of belonging that is thought to motivate human behavior (Baumeister & Leary, 1995). Thus, it is with some confidence that we can say that belonging plays an important role in how people with higher levels of depressive symptoms derive well-being from social experiences, whether this is assessed objectively or subjectively. Specifically, people with higher levels of depressive symptoms reacted with more intense positive life evaluations and more positive affect balance in response to feeling a sense of belonging with others.

Results from both studies were stronger for CWB (judgments of meaning in life, life satisfaction) than for AWB (positive and negative affect balance). Meaning in life concerns people's judgments about whether or not their lives make sense and are endowed with a mission or purpose (e.g., Steger, Frazier, Oishi, & Kaler, 2006; Steger, Kashdan, Sullivan, & Lorentz, 2008). Life satisfaction concerns people's judgments about whether the conditions of their lives are satisfying and conform to their expectations (Diener, Emmons, Larsen, & Griffin, 1985). Together, these variables gauge higher order judgments about life as a whole and would seem to require some amount of perspective taking. In all analyses, the interaction of depressive symptoms and social interactions were significantly related to such judgments. In contrast, only one of three interactions between depressive symptoms and social interactions were significantly related to AWB, which concerns people's prevailing affective states over the course of a day. This pattern suggests that for people with higher levels of depressive symptoms, social interactions influence CWB appraisals more consistently than they influence AWB appraisals. Thus, in comparison with people with lower levels of depressive symptoms, people with higher levels appear to appreciate their lives more when they meet their need to belong.

We derived our hypotheses by extending socioevolutionary ideas about how mild-to-moderate depressive symptoms operate in the social world. In our expansion of such models (e.g., Allen & Badcock, 2003; Gilbert, 1992, 2006), we drew on the idea that depressive symptoms serve as a warning signal, directing people's limited attentional resources to their current social status and the potential danger of possible rejection by other people. At low levels, depressive symptoms may help people adaptively regulate their social interactions to maintain social value and belonging. However, at higher levels of depressive symptoms, this social value warning system may become hypersensitive, leading to distress and impairment. Previous work on socioevolutionary models has focused exclusively on negative interactions as signals of looming rejection; our extension pointed to the importance of



Relation between Daily Belonging and Daily

*Figure 2.* Depressive symptom severity moderates relations between sense of belonging and daily cognitive well-being (Study 2).

positive relations as signals of rising belonging. For example, positive social interactions, particularly when a sense of belonging is felt, suggest to a person that his or her social value is high enough to feel safe and secure, allowing movement away from submissive or defensive postures to more active and exploratory motivational states. Our results provided support for these predictions, bolstering the notion that people with subthreshold levels of depression may be particularly attentive to, and benefit more from, positive social interaction and suffer more from negative social interactions than do people without emotional disturbances.

When considering models informed by evolutionary theories, it is important to note that a distinction is often made between adaptations that provided survival advantaged to humans in our long-passed ancestral environments and the manner in which they function in contemporary life (e.g., Allen et al., 2004). That is, depressive symptoms may have developed to help ancestral humans respond to social cues by modulating their activity in ways that would have been appropriate under much more hazardous and precarious circumstances. Ancient adaptations that evolved in response to particular challenges may not be advantageous in our modern environments.

Positive social interactions are probably an encouraging sign for people struggling with depressive symptoms. These interactions might reinforce the idea that they matter to others, counteract the more frequent negative interactions they experience, and provide a tonic for depressive thoughts and emotions. It also may be the case that heightened reactivity-gaining enhanced well-being from these positive social experiences-may signal excessive attachments and vulnerability among depressed people. Their daily levels of well-being may be more "fragile," subject to the caprices of their daily encounters with others rather than more stable sources of psychological health (see also Gable & Nezlek, 1998; Roberts & Monroe, 1994). Such a possibility fits with some research on sociotropic depression, which finds that sociotropic people are nurturing with relative strangers but more vindictive in closer relationships (Sato & McCann, 2007). It is not clear from the present data whether people were having the majority of their social interactions and feelings of belonging in the context of very close or less close relationships. It is possible that interactions with relative strangers were providing most of the boost in well-being, which would be similar to other reports (Sato & McCann, 2007). People who overinvest in new relationships and neglect or damage closer, more enduring relationships are likely to erode their longterm social resources, which are considered vital to continued functioning (e.g., Baumeister & Leary, 1995; Deci & Ryan, 2000).

An alternative view is that heightened reactivity may indicate potentially potent everyday interventions. Behavioral activation interventions encourage patients to engage in a greater ratio of healthy behavior with the potential for positive psychological, social, and physical benefits (e.g., Hopko, Lejuez, Ruggiero, & Eifert, 2003). In the context of social activity, this means decreasing exposure to situations in which patients attempt to elicit sympathy and patronizing concern from others—reinforcing unhealthy depressive behavior—and increasing exposure to situations in which the patient is provided with genuine social support and acceptance—reinforcing healthy and adaptive social behavior (Hopko et al., 2003). Research on depressive rumination supports this hypothesis. Although frequent ruminators are more likely to seek support and assurance, which can lead to rejection, they respond with greater reductions in distress upon receiving social support and other demonstrations of social acceptance than do nonruminators (Nolen-Hoeksema & Davis, 1999).

There is the possibility, however, that the social interactions that give rise to feelings of belonging among people with higher levels of depressive symptoms are the same ones that reinforce unhealthy depression-sustaining behaviors. For example, although eliciting sympathy from others helps maintain a sense of helplessness and sustains depression, people with higher levels of depressive symptoms may nonetheless desire sympathetic interactions and feel that positive social interactions are those in which they receive sympathy. Thus, they may interpret potentially unhealthy interactions as beneficial. Self-verification theory makes a similar claim in that it proposes that people with higher levels of depressive symptoms may prefer to experience social interactions that are in concordance with their negative self-views. For example people with higher levels of depressive symptoms may prefer being socially rejected to being socially accepted (e.g., Swann, Wenzlaff, Krull, & Pelham, 1992). Thus, in addition to interpreting social experiences in a more negative light, people with higher levels of depressive symptoms may also prefer negative social experiences and find them to be more familiar and consistent with their self-views. Such biased social processing could explain the problematic social behaviors of depressed people, such as eliciting rejection and failing to gain acceptance (e.g., Joiner & Coyne, 1999).

# **Counseling Implications**

The present findings join the growing body of literature linking depression to social functioning. People with higher levels of depressive symptoms experience less pleasant and less rewarding social lives—they report fewer positive interactions and more negative interactions. This situation is exacerbated by their greater reactivity to negative interactions. When working with depressed clients, clinicians should recognize that some part of this bleak social landscape is created through clients' interpretations of events. This observation is consistent with some of the assumptions underlying therapeutic modalities such as interpresonal process therapy and cognitive therapy (e.g., Butler, Chapman, Forman, & Beck, 2006; Hollon, Thase, & Markowitz, 2002). In accordance with these approaches, the present findings support paying attention to helping clients revise and rehabilitate their interpretations of social events.

Although it is the case that the social lives of people with higher levels of depressive symptoms appear less desirable than do the social lives of other people, it is also apparent that when good events occur, people with higher levels of depressive symptoms respond more strongly and positively. Clinicians should find support in these results for efforts to encourage depressed clients to seek out and achieve positive social interactions. In addition to the higher levels of well-being associated with such positive interactions, discussing positive interactions in session with a clinician may help clients capitalize on their experience. Clinicians who are actively encouraging and supportive when listening to clients relate their positive social experience may be further enhancing the well-being benefits that may result from such positive social interchange (Gable et al., 2004). Suggestions to increase positive social interactions would be consistent with behavior activation treatments of depression (e.g., Hopko et al., 2003), which have strong empirical support. Nonetheless, without consideration of the potential for people with higher levels of depressive symptoms to elicit negative responses and initiate uncomfortable social contact (Coyne, 1976a, 1976b), it is possible that encouraging increased social engagement could unintentionally produce increased negative social interaction. The present findings demonstrate that, regardless of whether they are positive or negative, the social lives of our depressed clients warrant considerable attention in session.

#### Limitations and Future Research

Our results are subject to limitations associated with the selfreport methods used in the present investigation. There is the possibility that people systematically represented the quantity and quality of their social interactions in ways related to their level of depressive symptoms. If people with higher levels of depressive symptoms interpret their social interactions more negatively (e.g., Swann et al., 1992), then it would be more difficult to argue that they are more reactive to social interactions in general because people with different levels of depressive symptoms recognize, respond to, and modify their environments in different ways (e.g., Barnett & Gotlib, 1988; Joiner & Katz, 1999). They would be, in a sense, reacting to different events, making comparisons difficult. In the present research, Study 2 used subjective ratings of belonging, which could be influenced by differing interpretive tendencies among people with different levels of depressive symptoms. The fact that Study 1's results, which were based on an objective list of social interactions, mirror those from Study 2 helps allay these concerns. However, it is still possible that people with higher levels of depressive symptoms construe some interactions as being arguments or disagreements, whereas less depressed people might view them as unexceptional, ordinary exchanges (e.g., Fournier et al., 2007). Regardless, it is far from obvious that such a bias in perceiving relatively neutral events as more negative could account for stronger reactions, just as it does not explain why there would be greater reactivity to positive events.

Despite this limitation, it is important to understand the nature of depression's interaction with the complexities of people's dynamic, naturally occurring social contexts, of which interpretations and perceptions are an inextricable part. This is the aim of externally valid studies like the present one. However, it is desirable to pinpoint depression's influence, not only on interpretations and perceptions, but also on reactivity per se. This is the aim of highly internally valid studies and experimental methods. Previous laboratory studies have used noninteractive stimuli (e.g., positive and negative films or facial expressions) rather than actual, in vivo social interactions to assess information perception and reactivity among more depressed people. One solution to the problem of intermingled perceptions and reactivity might be to expose people with different levels of depressive symptoms to standardized, in vivo social interactions in a laboratory setting and to test whether people with higher levels of depressive symptoms interpret positive social stimuli similarly and whether they react more strongly than less depressed people. For example, during a staged collaborative project, a confederate could provide either positive or negative feedback to participants. We would expect that people with higher levels of depressive symptoms would report more

strongly enhanced well-being following the receipt of positive feedback and more strongly degraded well-being following the receipt of negative feedback in comparison with people with lower levels of depressive symptoms (although self-verification theories of depression might predict the opposite; see Swann et al., 1992).

There are a number of other limitations related to the measures we used in the present study. First, two of the five positive social interaction items we used in Study 1 focus on romantic interactions (flirting or having good interactions with a steady date). This may further limit how well Study 1 represents the typical and important social interactions of college student samples. Second, our measure of CWB focused on meaning in life and life satisfaction. There are undoubtedly other indicators of CWB that should be included in future research (e.g., self-regulation, optimism). Third, our measure of belonging focused on people's appraisals of specific social interactions and does not capture the full content of this important construct. Future research should consider using broader measures of global belonging (e.g., positive relationships; Ryff, 1989).

Although our sample of people with subthreshold depressive symptoms is appropriate for our extension of recent socioevolutionary models of depression (Allen & Badcock, 2003), it should be noted that most people in both studies did not meet the criterion of having mild-to-severe depressive symptoms. One strength of the model we presented here is that it regards depressive symptoms as occurring on a continuum; it predicts that sensitivity to social cues should increase in proportion to depressive symptoms, regardless of where they are on the continuum of impairment. Nonetheless, the presence of many people who are not manifesting any significant level of depressive symptoms reduces the degree to which the present studies directly test our proposed model of depression. To explore whether depressive symptoms have a social tuning function even at low levels, it would be valuable to replicate this research in stratified samples of unimpaired, mildly depressed, moderately depressed, and severely depressed people.

Finally, the generalizability of the results of the present investigation is limited by our use of nonclinical samples. Although our findings generally support previous research (e.g., Nezlek & Gable, 2001; O'Neill et al., 2004; Peeters et al., 2003; Segrin & Abramson, 1994), it is unclear whether our findings would extend to clinically depressed samples. Rottenberg's (2005) hypothesis of flattened reactions to positive and negative stimuli may be more accurate for clinically depressed samples than for nonclinical samples (although Must et al., 2006, found results more in line with our model). For example, if depressive symptoms accumulate to the degree that they interfere with basic cognitive and perceptual processes, then people with severe depression may not be able to monitor the social cues they receive from others. Daily process studies in clinical samples are needed to clarify the boundary conditions of sensitizing versus dulling effects posited by these alternative models.

#### Conclusions

By focusing on people's reactivity in their ongoing social environments, we gain a more reliable picture of life as it is lived. The present results suggest that people with higher levels of depressive symptoms appear to find greater satisfaction and meaning in their lives when they meet their need to belong, suggesting an important role for positive social relationships in buttressing these important cognitive perspectives on life. Thus, the full spectrum of social interactions may provide especially fertile ground for continued research on etiology, maintenance, recovery, and relapse in depression.

# References

- Allen, N. B., & Badcock, P. B. T. (2003). The social risk hypothesis of depressed mood: Evolutionary, psychosocial, and neurobiological perspectives. *Psychological Bulletin*, 129, 887–913.
- Allen, N. B., Gilbert, P., & Semedar, A. (2004). Depressed mood as an interpersonal strategy: The importance of relational models. In N. Haslam (Ed.), *Relational models theory: A contemporary overview* (pp. 309–334). Mahwah, NJ: Erlbaum.
- Backenstrass, M., Frank, A., Joest, K., Hingmann, S., Mundt, C., & Kronmüller, K.-T. (2006). A comparative study of nonspecific depressive symptoms and minor depression regarding functional impairment and associated characteristics in primary care. *Comprehensive Psychiatry*, 47, 35–41.
- Barnett, P. A., & Gotlib, I. H. (1988). Psychosocial functioning and depression: Distinguishing among antecedents, concomitants, and consequences. *Psychological Bulletin*, 104, 97–126.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497–529.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). Cognitive therapy of depression. New York: Wiley.
- Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of metaanalyses. *Clinical Psychology Review*, 26, 17–31.
- Butler, A. C., Hokanson, J. E., & Flynn, H. A. (1994). A comparison of self-esteem lability and low trait self-esteem as vulnerability factors for depression. *Journal of Personality and Social Psychology*, 66, 166–177.
- Coyne, J. C. (1976a). Depression and the response of others. *Journal of Abnormal Psychology*, 85, 186–193.
- Coyne, J. C. (1976b). Toward an interactional description of depression. *Psychiatry*, *39*, 28–40.
- Cuijpers, P., Smit, F., & van Straten, A. (2007). Psychological treatments of subthreshold depression: A meta-analytic review. *Acta Psychiatrica Scandinavica*, 115, 434–441.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuit: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227–268.
- Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist*, 55, 34–43.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, 49, 71–75.
- Fergusson, D. M., Horwood, L. J., Ridder, E. M., & Beautrais, A. L. (2005). Subthreshold depression in adolescence and mental health outcomes in adulthood. *Archives of General Psychiatry*, 62, 66–72.
- Fogel, J., Eaton, W. W., & Ford, D. E. (2006). Minor depression as a predictor of the first onset of major depressive disorder over a 15-year follow-up. *Acta Psychiatrica Scandinavica*, 113, 36–43.
- Fournier, M. A., Zuroff, D. C., & Moskowitz, D. S. (2007). The social competition theory of depression: Gaining from an evolutionary approach to losing. *Journal of Social and Clinical Psychology*, 26, 786– 790.
- Frech, A., & Williams, K. (2007). Depression and the psychological benefits of entering marriage. *Journal of Health and Social Behavior*, 48, 149–163.

Gable, S. L., & Nezlek, J. B. (1998). Level and instability of day-to-day

psychological well-being and risk for depression. *Journal of Personality* and Social Psychology, 74, 129–138.

- Gable, S. L., & Reis, H. T. (1999). Now and then, them and us, this and that: Studying relationships across time, partner, context, and person. *Personal Relationships*, 6, 415–432.
- Gable, S. L., Reis, H. T., Impett, E. A., & Asher, E. R. (2004). To whom do you turn when things go right? The intrapersonal and interpersonal benefits of sharing positive events. *Journal of Personality and Social Psychology*, 87, 228–245.
- Gilbert, P. (1992). Depression: The evolution of powerlessness. Hillsdale, NJ: Erlbaum.
- Gilbert, P. (1997). The evolution of social attractiveness and its role in shame, humiliation, guilt, and therapy. *British Journal of Medical Psychology*, 70, 113–147.
- Gilbert, P. (2006). Evolution and depression: Issues and implications. *Psychological Medicine*, *36*, 287–297.
- Gotlib, I. H. (1992). Interpersonal and cognitive aspects of depression. Current Directions in Psychological Science, 1, 149–154.
- Gotlib, I. H., Kasch, K. L., Traill, S. K., Joormann, J., Arnow, B. A., & Johnson, S. L. (2004). Coherence and specificity of informationprocessing biases in depression and social phobia. *Journal of Abnormal Psychology*, 113, 386–398.
- Gotlib, I. H., Krasnoperova, E., Yue, D. N., & Joormann, J. (2004). Attentional bias for negative interpersonal stimuli in clinical depression. *Journal of Abnormal Psychology*, 113, 127–133.
- Hagerty, B. M., Williams, R. A., Coyne, J. C., & Early, M. R. (1996). Sense of belonging and indicators of social and psychological functioning. *Archives of Psychiatric Nursing*, 10, 235–244.
- Henriques, J. B., & Davidson, R. J. (1990). Regional brain electrical asymmetries discriminate between previously depressed and healthy control subjects. *Journal of Abnormal Psychology*, 99, 22–31.
- Henriques, J. B., & Davidson, R. J. (1991). Left frontal hypoactivation in depression. *Journal of Abnormal Psychology*, 100, 535–545.
- Henriques, J. B., & Davidson, R. J. (2000). Decreased responsiveness to reward in depression. *Cognition & Emotion*, 14, 711–724.
- Hollon, S. D., Thase, M. E., & Markowitz, J. C. (2002). Treatment and prevention of depression. *Psychological Science in the Public Interest*, 3, 39–77.
- Hopko, D. R., Lejuez, C. W., Ruggiero, K. J., & Eifert, G. H. (2003). Contemporary behavioral activation treatments for depression: Procedures, principles, and progress. *Clinical Psychology Review*, 23, 699– 717.
- Joiner, T. E., Jr., & Coyne, J. C. (1999). The interactional nature of depression. Washington, DC: American Psychological Association.
- Joiner, T. E., & Katz, J. (1999). Contagion of depressive symptoms and mood: Meta-analytic review and explanations from cognitive, behavioral, and interpersonal viewpoints. *Clinical Psychology: Science and Practice*, 6, 149–164.
- Kashdan, T. B., & Steger, M. F. (2006). Expanding the topography of social anxiety: An experience sampling assessment of positive emotions and events, and emotion suppression. *Psychological Science*, 17, 120– 128.
- Laurenceau, J.-P., Barrett, L. F., & Rovine, M. L. (2005). The interpersonal process model of intimacy in marriage: A daily-diary and multilevel modeling approach. *Journal of Family Psychology*, 19, 314–323.
- Leary, M. R. (1990). Responses to social exclusion: Social anxiety, jealousy, loneliness, depression, and low self-esteem. *Journal of Social and Clinical Psychology*, 9, 221–229.
- Lyubomirsky, S., King, L. A., & Diener, E. (2005). The benefits of frequent positive affect. *Psychological Bulletin*, 131, 803–855.
- Mogg, K., & Bradley, B. P. (2005). Attentional bias in generalized anxiety disorder versus depressive disorder. *Cognitive Therapy and Research*, 29, 29–45.
- Must, A., Juhá, A., Rimanóczy, Á., Szabó, Z., Janka, Z., & Kéri, S. (2006).

Major depressive disorder, serotonin transporter, and personality traits: Why patients use suboptimal decision-making strategies? *Journal of Affective Disorders*, *103*, 273–276.

- Needles, D. J., & Abramson, L. Y. (1990). Positive life events, attributional style, and hopefulness: Testing a model of recovery from depression. *Journal of Abnormal Psychology*, 99, 156–165.
- Nezlek, J. B., & Gable, S. L. (2001). Depression as a moderator of relationships between positive daily events and day-to-day psychological adjustment. *Personality and Social Psychology Bulletin*, 27, 1692– 1704.
- Nezlek, J. B., Hampton, C. P., & Shean, G. D. (2000). Clinical depression and day-to-day social interaction in a community sample. *Journal of Abnormal Psychology*, 109, 11–19.
- Nezlek, J. B., Imbrie, M., & Shean, G. D. (1994). Depression and everyday social interaction. *Journal of Personality and Social Psychology*, 67, 1101–1111.
- Nolen-Hoeksema, S., & Davis, C. D. (1999). "Thanks for sharing that": Ruminators and their social support networks. *Journal of Personality* and Social Psychology, 77, 801–814.
- O'Neill, S. C., Cohen, L. H., Tolpin, L. H., & Gunthert, K. C. (2004). Affective reactivity to daily interpersonal stressors as a prospective predictor of depressive symptoms. *Journal of Social and Clinical Psychology*, 23, 172–194.
- Peeters, F., Nicolson, N. A., Berkhof, J., Delespaul, P., & deVries, M. (2003). Effects of daily events on mood states in major depressive disorder. *Journal of Abnormal Psychology*, *112*, 203–211.
- Priciandaro, J. J., & Roberts, J. E. (2005). A taxometric investigation of unipolar depression in the National Comorbidity Survey. *Journal of Abnormal Psychology*, 114, 718–728.
- Radloff, L. S. (1977). The CES–D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Raudenbush, S., & Bryk, A. (2002). Hierarchical linear models: Applications and data analysis methods. (2nd ed.). Thousand Oaks, CA: Sage.
- Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., & Congdon, R. (2004). Hierarchical linear and nonlinear modeling (Version 6.01a) [Computer software]. Lincolnwood, IL: Scientific Software International.
- Regeer, E. J., Krabbendam, L., De Graaf, R., Ten Have, M., Nolen, W. A., & Van Os, J. (2006). A prospective study of the transition rates of subthreshold (hypo)mania and depression in the general population. *Psychological Medicine*, *36*, 619–627.
- Reis, H. T., & Shaver, P. (1988). Intimacy as an interpersonal process. In S. W. Duck (Ed.), *Handbook of personal relationships* (pp. 367–389). New York: Wiley.
- Roberts, J. E., & Monroe, S. M. (1994). A multidimensional model of self-esteem in depression. *Clinical Psychology Review*, 14, 161–181.
- Rottenberg, J. (2005). Mood and emotion in major depression. *Current Directions in Psychological Science*, 14, 167–170.

- Rottenberg, J., Kasch, K. L., Gross, J. J., & Gotlib, I. H. (2002). Sadness and amusement reactivity differentially predict concurrent and prospective functioning in major depressive disorder. *Emotion*, 2, 135–146.
- Ruscio, A. M., & Ruscio, J. (2002). The latent structure of analogue depression: Should the Beck Depression Inventory be used to classify groups? *Psychological Assessment*, 14, 135–145.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57, 1069–1081.
- Sato, T., & McCann, D. (2007). Sociotropy-autonomy and interpersonal problems. *Depression and Anxiety*, 24, 153–162.
- Schimmack, U., & Diener, E. (1997). Affect intensity: Separating intensity and frequency in repeatedly measured affect. *Journal of Personality and Social Psychology*, 73, 1313–1329.
- Segrin, C., & Abramson, L. Y. (1994). Negative reactions to depressive behaviors: A communication theories analysis. *Journal of Abnormal Psychology*, 103, 655–668.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. American Psychologist, 55, 5–14.
- Sherbourne, C. D., Wells, K. B., Hays, R. D., Rogers, W., Burnam, M. A., & Judd, L. L. (1994). Subthreshold depression and depressive disorder: Clinical characteristics of general medical and mental health specialty outpatients. *American Journal of Psychiatry*, 151, 1777–1784.
- Sloan, D. M., Strauss, M. E., & Wisner, K. L. (2001). Diminished response to pleasant stimuli by depressed women. *Journal of Abnormal Psychol*ogy, 110, 488–493.
- Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The Meaning in Life Questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology*, 53, 80–93.
- Steger, M. F., Kashdan, T. B., & Oishi, S. (2008). Being good by doing good: Eudaimonic activity and daily well-being correlates, mediators, and temporal relations. *Journal of Research in Personality*, 42, 22–42.
- Steger, M. F., Kashdan, T. B., Sullivan, B. A., & Lorentz, D. (2008). Understanding the search for meaning in life: Personality, cognitive style, and the dynamic between seeking and experiencing meaning. *Journal of Personality*, 76, 199–228.
- Swann, W. B., Wenzlaff, R. M., Krull, D. S., & Pelham, B. W. (1992). Allure of negative feedback: Self-verification strivings among depressed persons. *Journal of Abnormal Psychology*, 101, 293–306.
- Zautra, A. J., & Smith, B. W. (2001). Depression and reactivity to stress in older women with rheumatoid arthritis and osteoarthritis. *Psychosomatic Medicine*, 63, 687–696.

Received September 4, 2008 Revision received January 28, 2009 Accepted January 29, 2009

# Correction to Szymanski and Gupta (2009)

In the article "Examining the Relationship Between Multiple Internalized Oppressions and African American Lesbian, Gay, Bisexual, and Questioning Persons' Self-Esteem and Psychological Distress" by Dawn M. Szymanski and Arpana Gupta (*Journal of Counseling Psychology*, 2009, Vol. 56, No. 1, pp. 110–118), the DOI was incorrect. The correct DOI is 10.1037/a0013317

DOI: 10.1037/a0015407