

They heard a cry: Psychosocial resources moderate perception of others' distress[†]

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Abstract

Two studies tested whether psychosocial resources affect perception of another's distress. Participants had their resources depleted, left unchanged, or boosted by elaborately recalling either someone who had betrayed them, a neutral person, or a close and trusted other, respectively. Participants then listened to disturbing baby cries, and rated how much distress the cries conveyed. As predicted, participants who recalled a betrayal subsequently heard the cries as conveying more distress than did other participants (Study 1). However, recalling a betrayal did not amplify cry ratings if, prior to cry rating, betrayal-related thoughts and feelings were disclosed (Study 2). The moderating effect of disclosure on cry ratings indicates that boosting resources (disclosure) can counteract the effects of resource depletion (betrayal). Results in both studies remained significant even after controlling for mood. This research is the first to show that social contexts, and emotional disclosure, each affects perception of others' distress. Copyright © 2007 John Wiley & Sons, Ltd.

Psychosocial resources often determine how people respond to negative events (Aspinwall, 1998; Hobfoll, 1989, 2002). Resources include interpersonal assets, such as social networks and social support (Cohen, Gottlieb, & Underwood, 2000); intra-personal attributes such as self-worth (Steele, 1988), personal control (Seligman, 1975), and optimism (Scheier & Carver, 1985); belief systems that give life a sense of meaning, order, and fairness (Furnham, 2003; Janoff-Bulman, 1989); and transitory affective states such as positive mood and feelings of well being (Aspinwall, 1998; Deiner & Fujita, 1995). All these resources fortify people against adversity and promote their adaptive response to challenge. Thus, people with greater social support, greater feelings of agency, more robust belief systems, and other resources cope better with physical illness, job loss, bereavement, depression, daily

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hassles, and other kinds of stressors (S. Cohen et al., 2000; Furnham, 2003; Hobfoll, 2002; Holahan & Moos, 1990).

Research regarding psychosocial resources has primarily shown how resources help people manage negative events. For example, resources promote adaptive behaviors and inhibit maladaptive behaviors in response to stressors, and buffer the body's reaction to stressful situations (Aspinwall, 1998; S. Cohen et al., 2000). However, very little research examines how or whether resources influence the way people *perceive* negative events. For example, do momentary feelings of belongingness, support, or social acceptance affect how extremely disturbing events or stimuli are heard, seen, or felt? This is important, because the perceived magnitude of negative events may guide the nature and intensity of responses to them.

PSYCHOSOCIAL RESOURCES AND ATTENTION TO NEGATIVE INFORMATION

Although the relation between resources and the perception of negative events is not well established, there is a related body of research showing that resources do determine people's willingness to attend to negative information (see Aspinwall, 1998, for a detailed summary). When resources are scant or have been depleted, people tend to avert their attention from information that is subjectively disturbing. Thus, people with diminished psychosocial resources are more likely to avoid, or to discredit, subjectively threatening information about personal health risks (Reed & Aspinwall, 1998), negative feedback about their own performances (Trope & Neter, 1994; Trope & Pomerantz, 1998), and arguments that counter their own strongly held political beliefs (Cohen, Aronson, & Steele, 2000).

Cumulatively, this research indicates that the fewer resources people have, the less likely they are to 'face the music.' What has yet to be shown is whether resources also determine how dire a tune people hear. That is, people with lower resources may avoid disturbing events because they register such events as more severe or more extreme than do people with greater resources. The current research addresses this issue. Specifically, we propose that people with depleted resources will perceive another person's distress as more extreme than will people whose resources have not been depleted.

The Amplified Perception of Negative Stimuli

The New Look in social psychology (circa 1948–1964) proposed that arousal, especially under stress, would lead to exaggerated perception of disturbing things (see Easterbrook, 1959). The New Look studies were often plagued by methodological and conceptual criticisms (see Erdelyi, 1974, for a review), and research on arousal and perception diminished as the New Look receded. However, there is resurgent interest in the connection between arousal states and perception, and recent research across diverse domains confirms that negative arousal amplifies perception of disturbing stimuli. For example, people with a heightened fear of spiders are more likely to see spiders as looming toward them, and to perceive spiders as having hostile intentions (Riskind, Moore, & Bowley, 1995). Newly abstinent smokers (for whom nicotine cravings are the most intense) exaggerate the perception of time compared to non-abstaining smokers and non-smokers (Klein, Corwin, & Stine, 2003). Anxious people experience pain as more intense than do non-anxious people (Rhudy & Meagher, 2000). People are more likely to reduce the recalled visual boundary of objects they experience as negative and arousing (thereby reconstructing such objects as closer to them) compared to neutral objects, and trait anxious people are more prone to exhibiting this 'boundary reduction' for disturbing visual stimuli than are non-anxious people (Mathews & Mackintosh, 2004).

Across these studies, people who are experienced more negative arousal perceived noxious stimuli as more extreme (e.g., larger, of greater duration, more imposing, and more intense) than did those who were less negatively aroused. A central feature of psychosocial resources is that they reduce negative arousal, especially stress (Holahan & Moos, 1990). Thus, if stress amplifies the perception of negative events, and if resources reduce stress, then the perception of negative events is likely to be amplified when resources are depleted. However, when depleted resources have been restored, the amplification of negative events should be reduced. The present research tested both of these predictions.

Resources and Social Contacts

Social contacts constitute one of the most important sources of both resource enhancement and also resource depletion. The psychological and physiological benefits of positive social contact (or positive social support) are well documented (see S. Cohen et al., 2000; Sarason, Sarason, & Pierce, 1990, for reviews). More recently, however, the resource-depleting nature of negative social contacts has also been demonstrated. Morale is sapped and coping is impeded by inept or intrusive helping (Coyne, Wortman, & Lehman, 1988; Harber, Schneider, Everard, & Fisher, 2005), betrayal (Freyd, 1996), ostracism and rejection (Williams, 2001), social undermining (Ruehlman & Wolchik, 1988), and hostility (Quan et al., 2001). Indeed, there is evidence that the harmful effects of negative social contacts may exceed the beneficial effects of positive social contacts (see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001).

Because social contacts have this dual-edged capacity to boost as well as deplete resources, they may be especially valuable for investigating the relation between resource status and perception of negative events. Also, the extensive research on social support has not yet shown how social contacts affect the perception of external, discrete stressors. Therefore, testing whether social contacts affect perception is itself valuable. For these reasons social contacts were employed in the present studies as the means to moderate psychosocial resources.

Research Overview

The present research tested two complementary hypotheses. When resources are depleted (i.e., by recalling a negative social contact) disturbing stimuli (baby cries) will be perceived in an amplified manner (Study 1). However, such amplification will not occur when depleted resources have been restored (i.e., through emotional disclosure; Study 2).

STUDY 1

Study 1 provided the first test of whether depleted resources affect the perception of others' distress. Participants' resources were depleted, left unchanged, or boosted by mentally imaging a person who had betrayed them, a neutral acquaintance, or a positive support source, respectively. Next, participants listened to a set of baby cries of varying intensities, and rated how much distress babies conveyed through these cries. Participants then reported their emotional reactions to the cries, their current mood states, and demographic information about themselves. Cry ratings were expected to be highest among those who thought about a past betrayal (resource depletion) and lowest among participants who recalled a positive support source (resource enhancement).

Betrayal as a Means to Deplete Resources

Betrayal by a close and trusted other is arguably one of the most aversive and demoralizing kinds of social contacts. People place an especially strong negative cache on betrayal compared to other kinds of harmful or noxious attributes (Koehler & Gershoff, 2003). Betrayal may be a particularly potent source of chronic, event-related depression (Stoppard & McMullen, 2003). And traumatic events that involve betrayal appear to have more dire psychological and psychosomatic repercussions than do those that are free of betrayal (Freyd, Klest, & Allard, 2005). Finally, betrayal is a negative social encounter that most college-age students have experienced (Feldman & Cauffman, 1999). Because betrayal is at once so potent and common, it was used to deplete psychosocial resources in the present study.

Baby Cries as Arousing Stimulus and Target of Social Judgment

Baby cries are particularly apt stimuli to test the effects of psychosocial resources on the perception of negative stimuli. The intensity of baby cries corresponds to the degree of physical distress that babies experience (Porter, Miller, & Marshall, 1986), indicating that cries are meaningful and interpretable. Most people are able to determine babies' distress from the acoustic properties of cries (Irwin, 2003; Porter et al., 1986). However, because infant cries are not explicit articulations of underlying states, they provide the interpretive space within which psychological states can shape judgment. Indeed, people use their own emotional reactions to infant cries in order to decipher infants' experience (Bachorowski & Owren, 2002).

Finally, psychosocial resources appear to moderate the ways cries are rated. Lester et al. (1995) found that mothers who lacked social support rated low-distress cries as more negative than did mothers with sufficient support. However, this finding was correlational and did not directly test whether resources moderate cry perception. The present research did so.

Method

Participants

One hundred female undergraduates participated in this study for partial course credit. This study (and Study 2) included only females because women tend to be more sensitive to other's emotions, and may be more empathically inclined, than men (Ciarrochi, Chan, & Bajgar, 2001; Klein & Hodges, 2001). These qualities would make women more responsive to the baby cries, which was the central stimulus in this research. Participants' ages ranged from 17 to 43, $M = 20.72$, $SD = 3.77$. They included African Americans (17%), Asians (19%), Hispanics (21%), Middle Easterners (11%), Whites (20%), others (6%), and no response (6%). Participants were run individually in sessions lasting approximately 45 minutes.

Procedure

Participants were brought to an experiment room and informed that the study examined the relationship between mental imagery and social perception. They were given a Walkman-style tape player with headphones and told that the information needed to complete the study would be supplied through that device. The tape player contained the social contact imaging exercise followed by the series of baby

cries. Participants were also given a survey packet containing a cry-rating form, a mood measure, manipulation checks, and a set of background questions. The participants completed most of the study on their own, with no experimenter contact other than the initial instructions and the debriefing. Supplying instructions via tape player greatly increases the consistency with which these instructions are presented (Aronson, Ellsworth, Carlsmith, & Gonzales, 1990). Additionally, because participants completed the study in solitude their reactions to stimuli could not be affected by experimenter contact.

Imaging Exercise Three audiotapes were prepared to guide participants through the imaging task. Participants in the *negative contact* condition were instructed by their tape to retrieve images of someone who had once been important to them, but who had profoundly disappointed them during a time of need and about whom they now felt negatively. Participants in the *neutral contact* condition were instructed to recall someone they encounter regularly but whom they neither liked nor disliked, such as a store clerk. Participants in the *positive contact* were instructed to retrieve images of someone who is currently very important to them, and who they could reliably turn to for support and understanding.

The 5-minute guided imagery tasks presented on the tapes all followed the same general format, consisting first of a 60-second relaxation phase (designed to reduce the influence of participants' transitory concerns), followed by a series of four 30-second imaging phases designed to produce rich, differentiated, and (in the case of the support and disappointment conditions) emotionally charged recollections about their assigned social target. These phases involved: (1) selecting a specific negative, neutral, or positive social contact as an imaging target (depending on condition) and evoking general recollections and images about this person, (2) recalling an experience with the assigned target which, for participants in the negative contact condition, involved a dramatic betrayal of trust or failure to provide expected care and support, for participants in the neutral contact condition involved a routine interaction, and for participants in the positive contact condition involved a specific incidence when the target displayed exceptional caring at a crucial time, (3) focusing on how the target behaved during the recalled encounter, and (4) focusing on the images associated with the most salient thoughts and feelings regarding the target.

Rating of Baby Cry Distress Following the imaging exercise the tape presented the cry-rating task. This consisted of a series of eight baby cries sampled from male infants undergoing surgical circumcision. Each cry sample lasted about 12 seconds and was followed by a 5 second pause during which time participants rated the distress conveyed by the cry on a 7-point Likert scale with response options ranging from 1 = 'Not at All Distressed' to 7 = 'Extremely Distressed.' The three mild intensity cries and five moderate intensity cries used in this study were interspersed in a non-sequential order.¹

Before the cry samples were delivered, the male narrator on the tape informed participants of the nature and source of the baby cries, and graphically detailed the surgical procedures that the babies underwent including the fact that the procedure was conducted without anesthesia. This description was provided to heighten participants' own levels of personal upset. In addition, informing participants that the cries arose from a surgical procedure would likely deter participants from attributing the babies' distress to the babies' temperament (e.g., 'an overly fussy baby').

¹Four high intensity cries, presented on the tape, were not included in analyses because there was very little variability in how these cries were rated, as indicated by pilot testing.

Background Survey After the final cry sample was delivered and rated, the narrator on the tape directed the participant to stop the tape player and proceed to the *Background Survey*. The *Background Survey* consisted of several measures. The first of these included six questions regarding participants' reactions to hearing the cries (based on Harber, 2005), which included: the presence of disturbing images, efforts to block out the cries, physical reactions (i.e., sweaty palms and upset stomach), the likelihood of ruminating about the cries, efforts to avoid being bothered by the cries, and efforts to suppress thinking about the cries. Participants also completed the *Inclusion of Other in the Self* (IOS; Aron, Melinat, Vallone, & Bator, 1997), a single-item measure of interpersonal closeness with sound psychometric properties (Agnew, Loving, Le, & Goodfriend, 2004). The IOS served as a manipulation check on the degree of closeness participants felt toward their assigned targets.

The *Background Survey* also included a mood measure in which participants rated their current levels of happiness, sadness, anger, calm, nervousness, and excitement on 5-point Likert scales. Mood was measured in order to help distinguish discrete affective reactions to the cries from more global mood that might arise from the imaging task or from transitory circumstances outside the experiment. The mood measure was supplied at this point, rather than immediately after imaging, in order to preserve the potency of the imaging task. Measuring mood just after the imaging task may have caused participants to regard the imaging task as a manipulation, leading them to correct (as per Zillman, 1978) for actual or surmised aftereffects during the cry-rating task. The *Background Survey* also included questions regarding participants' experience with child rearing, which might moderate reactions to the baby cries (Irwin, 2003).

Results and Discussion

Data Reduction

Ratings of Baby Cry Distress The eight ratings of how much distress babies conveyed in their cries were summed and averaged to create a single score ($\alpha = .80$), with higher scores representing greater perceived distress.

Reaction to Hearing Baby Cries The six items of how upsetting it was to hear the baby cries were summed into a composite upset score ($\alpha = .82$), such that higher scores reflected greater amounts of upset arising from exposure to the baby cries.

Mood Reliability analyses of the six mood items indicated that the composite mood score would be improved by excluding two items, happiness and excitement. The remaining four items, sadness, nervousness, anger, and calm (reverse coded) were summed into a composite negative mood score ($\alpha = .75$).

Manipulation Checks and Preliminary Analyses

Demographic Factors Cry ratings did not differ due to age, $r(98) = -.01$, $p = .90$, or ethnic background, $F(6, 91) = 1.17$, $p = .33$. These variables were therefore not included in subsequent analyses.

Prior Experience With Infants The correlation between the number of infants that participants had attended (i.e., as parents, baby-sitters, etc.) was unrelated to cry ratings, $r(98) = -.08, p = .46$. Also, the few participants who were themselves parents ($n = 6$) rated the cries no differently ($M = 5.29, SD = 0.70$) than did those who were not parents ($n = 92; M = 5.22, SD = 0.65$), $F(1, 96) = 0.06, p = .80$. For these reasons previous experience tending infants was not included in subsequent analyses.

Responses to Social Targets The imaging task, wherein participants elaborately recalled a negative, neutral, or positive social contact, constituted the principal independent variable in this study. The IOS closeness measure indicated that participants generated imaging targets consistent with the social contact condition to which they had been assigned. Positive contact participants indicated greater closeness toward their imaging targets ($M = 4.87, SD = 1.96$), followed by negative contact participants ($M = 2.88, SD = 1.65$), and neutral contact participants ($M = 2.00, SD = 1.41$), $F(2, 94) = 24.20, p < .001, \eta^2 = .33$. *Post hoc* tests² showed that positive contact participants felt closer to their targets than did either negative contact participants ($p < .001$) or neutral contact participants ($p < .001$). Negative contact participants supplied marginally higher closeness ratings to their targets than did neutral contact participants ($p < .10$), which probably occurred because participants in the negative contact condition were instructed to consider a person to whom they had at one time felt close. It is likely that many of these participants felt residual closeness toward their targets as well as hurt and betrayal.

The task pleasantness question showed that participants not only imaged targets appropriate to instructions, but that the process of doing so evoked feelings consistent with their assigned targets. Negative contact participants rated the task as less pleasant ($M = 2.16, SD = 1.05$), and positive contact participants rated the task as more pleasant ($M = 3.65, SD = 1.20$) than did neutral contact participants ($M = 3.00, SD = 1.02$), $F(2, 95) = 15.32, p < .001, \eta^2 = .26$. *Post hoc* analyses showed that all between-condition differences were significant.³

Response to Cry-rating Task Exposure to the infant cries was predicted to be disturbing for participants, and the degree to which participants were disturbed was predicted to correspond to their cry ratings as per cue amplification theory (see Easterbrook, 1959). Both predictions were supported. Overall, participants' reactions to the cries were moderate ($M = 2.76, SD = 0.68$) on a range of 1 = low upset and 5 = high upset, and greater degrees of upset were correlated to higher cry ratings, $r(95) = .43, p < .001$.

Main Analyses

The principle prediction of Study 1 was that social contact (negative, neutral, or positive) would affect perception of baby cries. This prediction was supported, $F(2, 95) = 3.78, p < .05$. As Figure 1 shows, negative contact participants rated the cries as conveying the most distress relative to the other two groups, and the difference between participants in the negative condition and those in the positive condition was itself significant ($p < .05$). Apparently negative social contacts amplify perception of other's distress more than positive contacts attenuate such perceptions, a pattern that is consistent with

²All *Post hoc* tests reported in this paper are Tukey Tests of Multiple Comparisons.

³Two negative context participants supplied target closeness ratings and task pleasantness ratings that exceeded their group mean (+2 SD), indicating a failure to comply with instructions. Their data were excluded from further analyses.

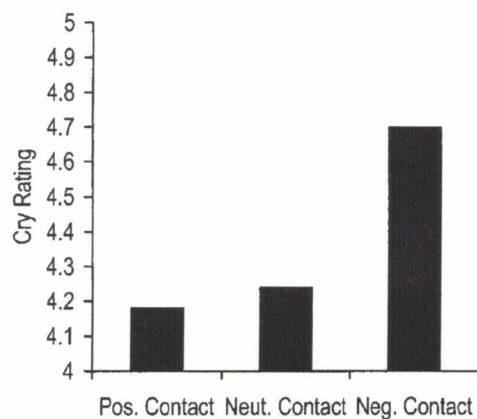


Figure 1. Ratings of infant cry distress as a function of psychosocial resource condition

negative events more powerfully affecting psychological states than do positive events (Baumeister et al., 2001).

Mood Effects A prominent alternative explanation for these results is that mood effects arising from the imaging task caused the differences in baby cry judgments (e.g., Bower, 1981). For example, participants in the betrayal condition may have experienced lower moods, leading to more extreme cry ratings. Two analyses indicated that mood did not have this effect. A one-way ANOVA showed that there was no between-group difference in mood ratings, $F(2, 94) = 0.27, p = .76$. An analyses of covariance (ANCOVA), with mood entered as the covariate, indicated that mood did have an overall effect on cry ratings, $F(1, 93) = 6.51, p < .02$, such that across all three conditions participants with more negative moods rated cries more extremely. However, lower mood did not selectively affect cry ratings among participants in the negative contact condition, and the effect of social contact on cry ratings remained significant even after controlling for mood, $F(2, 93) = 3.87, p < .05, \eta^2 = .07$.

In sum, Study 1 supported the predicted effect of social contact upon judgments of infant cries; participants who thought about a negative person in their lives rated disturbing baby cries as conveying more distress than did participants who thought about a neutral or positive person in their lives. Mood-related artifacts do not appear to explain these results.

STUDY 2

Study 1 provided initial evidence that changes in psychosocial resources affect the perception of other's distress. However, there are competing explanations for this outcome, such as mood (Bower, 1981) and priming (Bargh, 1989). One important way to distinguish the resource model from these alternative explanations would be to show that the amplifying effects of reduced resources are neutralized when resources are restored. An important aspect of psychosocial resources is that they are fungible, such that provision of one resource can compensate for the depletion of another, different resource (Hobfoll, 1989). Thus, resources depleted by a negative social encounter can be supplemented by increased

self-worth, self-efficacy, or sense of perspective or control. This transferable quality of resources leads to the following predictions: (1) a depleted *social* resource will lead to more extreme judgments of others' distress (as shown in Study 1), but (2) this amplification will not occur if resources are immediately restored, even if the restored resources were not social in nature. If this could be shown then the resource explanation would be greatly strengthened. This is because neither mood nor priming could account for such effects. Study 2 attempted to accomplish this kind of demonstration, using emotional disclosure as the means to restore the resources depleted by recalling a past betrayal.

Restoring Resources Through Disclosure

James Pennebaker has demonstrated that emotional disclosure has potent health benefits, leading to reduced rates of physical illness (Pennebaker, 1989, 1997). Pennebaker claims these benefits are rooted in the psychosocial bolstering that disclosure affords, such as increasing people's feelings of control over disturbing events. Similarly Keough and Markus (1998) suggest that through disclosure people '(gain) confidence in their coping strengths, (feel) greater personal coherence, and experience a heightened sense of control' (p. 52). These benefits of disclosure are realized in several ways (Harber & Pennebaker, 1992). Writing (or talking) freely and fully about negative past events allows people to confront their problems, rather than avoid them or be ambushed by unbidden memories and images related to their problems.

When people confront their problems, they see themselves as active problem-solvers rather than passive problem-sufferers. In addition to boosting self-perception, disclosure affords important cognitive benefits, such as providing insight into problems and perspective on them, which in turn enhances feelings of control and meaning. The linguistic constraints of writing and talking also prevents 'flooding,' giving disclosers an added experience of control over unpleasant memories. These manifold benefits—feelings of control, positive self-image, and insight and meaning—all constitute important psychosocial resources (Hobfoll, 1989).

Hemenover (2003) directly tested whether disclosure bolsters psychosocial resources. He found that disclosure led to more resilient self-perceptions as indexed by increased feelings of mastery, personal growth, self-acceptance and decreased depression, anxiety, and somaticizing. Because disclosure augments this range of resources, it seemed an apt way to restore the resources that imaging a past betrayal would deplete. In addition, the beneficial effects of disclosure appear to be quite immediate, as evidenced by lowered skin conductance, reduced heart rate, and even increased antibody production (Pennebaker, 1990).

The benefits of disclosure are not likely due to priming or to mood. Pennebaker's disclosure paradigm (which we employed) involves delving deeply into both the thoughts and feelings surrounding a negative past event. As such, it should make negative primes more vivid and more deeply processed than would otherwise occur. Thus, if the imaging task only served to prime positive (or negative) thoughts or memories, then disclosure should have either no effect on cry ratings, or perhaps might even lead to greater amplification of cries. Disclosure about past negative events is also not likely to moderate the imaging task by boosting mood. This is because disclosure tends to depress rather than improve short-term mood (Pennebaker, 1990).

In sum, emotional disclosure does not reduce the salience of primes, and does not immediately elevate moods, but does lead to augmented resources. For these reasons, if emotional disclosure regarding a past betrayal leads to more moderate baby cry ratings than occurs without disclosure, then the resource explanation advanced here will be bolstered over alternative explanations involving priming or mood.

Demonstrating these benefits of disclosure would also advance disclosure theory. To date, nearly all research regarding disclosure has focused on its health benefits. None have examined how disclosure affects the way threatening events are perceived.

Method

Overview

Participants mentally imaged a negative, a neutral, or a positive social contact, as done in Study 1. Half the participants then disclosed their thoughts and feelings toward their assigned social target (disclosers) and the remaining participants described only the physical appearance of their assigned targets (non-disclosers). All participants then completed the cry-rating task and the *Background Survey*, as per Study 1. Participants in the negative social contact condition were again expected to supply the most extreme cry ratings, but only if they were in the non-disclose condition. In contrast, negative social contact participants who disclosed their thoughts and feelings about this social contact were expected to not amplify their cry ratings.

Participants

One hundred twenty one female undergraduates participated in this study for course credit. Respondents ages ranged from 16 to 63, $M = 21.97$, $SD = 4.72$. They included African Americans (15%), Asians (23%), Hispanics (20%), Middle Easterners (5%), Whites (23%), others (12%), and no response (2%). Participants were run individually in 45 minutes sessions.

Procedure

Study 2 followed the procedures used in Study 1, except for the addition of the disclosure exercise, described below. Participants were supplied the same cover story regarding imagery and social perception, generated elaborate images of either a negative, neutral, or positive social contact, and then rated a series of baby cries and completed a set of follow up measures.

Disclosure Exercise Following the imaging task but before the cry-rating task, participants were instructed to spend 10–15 minutes writing about the person whom they had just imaged. Half the participants were assigned to the *disclosure* condition and half were assigned to the *non-disclosure* condition.⁴ Participants in the disclosure condition wrote about their thoughts and feelings regarding their respective targets, following disclosure instructions per Pennebaker (1994). Participants in the non-disclosure condition were instructed to write only about the physical appearance and attributes of their assigned target, focusing on such characteristics as height, weight, and manner of dress. The non-disclosure participants were explicitly informed to withhold any opinions or feelings about the target person, but to strictly focus on supplying a physical description of this person. All participants

⁴The non-disclosure instructions may have induced active suppression. If so, then non-disclosure participants may have experienced a hyper-arousal of the thoughts and feelings associated with their respective imaging targets (as per Wegner, 1994). However, the label 'non-disclosure' was used because it is more agnostic, encompassing both non-disclosure as well as active suppression.

were supplied a sheet of lined paper on which to complete the writing task, and were informed that they should not worry about spelling, grammar, or otherwise being graded for their writing.

Results and Discussion

Data Reduction

Ratings of Baby Cry Distress The eight cry ratings were summed and averaged to create a single score ($\alpha = .73$), with higher scores representing greater perceived distress.

Reactions to Hearing Baby Cries The six baby-cry reaction items were summed and averaged into a composite upset score ($\alpha = .80$), such that higher scores reflected greater amounts of personal upset arising from exposure to the baby cries.

Mood The four negative mood items used in Study 1 (sadness, nervousness, anger, and calm) were summed and averaged into a composite negative mood score ($\alpha = .78$).

Manipulation Checks and Preliminary Analyses

Demographic Factors Cry ratings did not differ due to age, $r(120) = -.03$, $p = .68$, or ethnic background, $F(5, 114) = 0.12$, $p = .79$. These variables were therefore not included in subsequent analyses.

Prior Experience With Infants As found in Study 1, reactions to the baby cries were unrelated to the number of infants that participants had ever attended, $r(120) = .04$, $p = .69$, and participants who were themselves parents ($n = 11$) rated the cries about the same ($M = 4.38$, $SD = 0.64$) as did those who were not parents ($n = 109$; $M = 4.45$, $SD = 0.67$), $F(1, 118) = 0.15$, $p = .70$. These variables were therefore not included in subsequent analyses.

Responses to Social Targets Participants in the negative, neutral, and positive social contact conditions reported levels of closeness appropriate to their assigned targets. Participants in the positive condition reported greater closeness to their targets ($M = 5.21$, $SD = 1.91$) compared to participants in the neutral condition ($M = 1.45$, $SD = 0.92$) or in the negative condition ($M = 2.07$, $SD = 1.54$), $F(2, 118) = 71.30$, $p < .001$, $\eta^2 = .55$. *Post hoc* tests indicated that positive condition participants reported greater closeness than did either neutral condition ($p < .001$) or negative condition participants ($p < .001$), while the neutral condition and negative condition groups did not differ from each other ($p = .17$).

Positive contact participants also rated the imaging task as more pleasant ($M = 3.81$, $SD = 0.99$) than did neutral contact participants ($M = 2.82$, $SD = 0.93$) or negative contact participants ($M = 2.45$, $SD = 1.16$), $F(2, 118) = 18.33$, $p < .001$, $\eta^2 = .24$. *Post hoc* tests indicated that positive condition participants rated the task as more pleasant than did either neutral participants ($p < .001$) or negative participants ($p < .001$), but that the neutral and negative groups did not differ from each other ($p = .34$).

Disclosure Exercise A word count of participants' disclosures revealed an interaction between the nature of imaged target (positive, neutral, and negative) and disclosure condition (disclose vs. non-disclose), $F(5, 114) = 8.33$, $p < .001$, $\eta^2 = .19$. *Post hoc* tests indicated that the interaction reflected the high volume of words produced by the negative/disclose participants ($M = 241.95$), which significantly exceeded those of all other participants (pos. non-disclose, $M = 132.19$; neutral disclose, $M = 136.42$; neutral non-disclose, $M = 154.94$; neg. non-disclose, $M = 107.55$) except for those in the positive/disclose condition ($M = 191.05$). The amount of words generated by the negative/disclose participants is consistent with disclosure research (e.g., Pennebaker, 1990), wherein strong negative thoughts and feelings prompt expansive disclosure.

Response to Cry Ratings Participants reported that hearing the infant cries made them moderately upset ($M = 2.92$, $SD = 0.91$), and higher rates of personal upset correlated to hearing more distress in the cries, $r(121) = .34$, $p < .001$. These results mirror those of Study 1, and support the general prediction that upsetting things are perceived in an amplified manner (Easterbrook, 1959). Collapsing across social contact conditions, participants who disclosed their thoughts and feelings about the person they imaged experienced the baby cries as marginally less upsetting ($M = 2.75$, $SD = 0.94$) than did those who suppressed their thoughts and feelings ($M = 3.05$, $SD = 0.86$), $F(1, 115) = 3.72$, $p < .06$, $\eta^2 = .03$. This result supports the predicted buffering effect of disclosure on exposure to disturbing stimuli.

Main Analyses

The central prediction of Study 2 was that the amplifying effect of a past betrayal upon ratings of infant cries would be moderated by the opportunity to disclose thoughts and feelings associated with the betrayal. This prediction was tested in a two-way ANOVA, which revealed the expected interaction between social contact and disclosure, $F(2, 115) = 3.74$, $p < .03$, $\eta^2 = .06$ (see Figure 2).

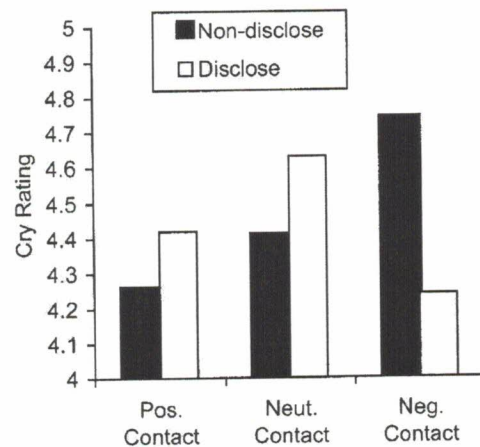


Figure 2. Ratings of infant cry distress as a function of psychosocial resource condition and disclosure condition

There are several important aspects of this interaction. First, among participants in the non-disclose condition, for whom the experiment was conceptually the same as Study 1, the effect of social contact on cry ratings was also nearly the same as in Study 1. A simple effects test (controlling for negative mood) confirmed that among the non-disclose participants, those who imaged a negative social contact rated the cries as conveying more distress than did those who imaged a positive social contact, $t(39) = 2.05, p < .05$.⁵ For participants in the disclose condition, however, the pattern differed dramatically from Study 1. Negative contact participants who disclosed their betrayal-related thoughts and feelings did not amplify their cry ratings. Rather, these negative/disclose participants rated cries at levels comparable to all other participants, except for their negative/non-disclose counterparts, who judged the cries as conveying more distress. The difference between the negative/disclose and the negative/non-disclose conditions was significant, $t(39) = 2.20, p < .04$. There were no other simple effects differences. It therefore appears that disclosure had the predicted buffering effect, counteracting the cry-amplification that recalling a negative contact otherwise produced.⁶

Mood Effects As in Study 1, mood did not account for the predicted effects of social contact on cry ratings. The three social contact conditions did not differ in mood, $F(2, 117) = 0.17, p = .85$, and the interaction between social contact and disclosure remained significant even after controlling for mood, $F(2, 113) = 4.93, p < .01, \eta^2 = .07$.

Disclosure and Responses to Imaging Target Internal analyses were conducted to locate ways that disclosure moderated cry rating. One analysis examined the relation between cry ratings and how unpleasant it was to think about social contacts, and the other examined the relation between cry ratings and between how unpleasant it was to write about social contacts. The correlations, conducted separately for each of the six experimental conditions, controlled for amounts of words written which, as previously discussed, differed by experimental condition.

The results of these correlations, presented in Table 1, reveal an intriguing pattern consistent with the predicted buffering role of disclosure. For negative/non-disclose participants, the more unpleasant

Table 1. Partial correlations between reactions to imaging target and cry intensity ratings, by Experimental Condition, Controlling for Amount of Words Written

	Positive disclose, $n = 18$	Positive non-disclose, $n = 18$	Neutral disclose, $n = 16$	Neutral non-disclose, $n = 15$	Negative disclose, $n = 18$	Negative non-disclose, $n = 17$
Unpleasant to imagine target	.04	-.28	-.01	.18	.07	.44*
Unpleasant to write about target	-.32	-.37	.11	-.18	.12	.51**

Note: * $p < .10$; ** $p < .05$.

⁵ t -tests were used in this analysis, and in the subsequent comparison between negative/disclose and negative/express conditions, because these differences were explicitly predicted and also to control for mood effects.

⁶We conducted two additional analyses to confirm that this interaction was mainly due to the difference between negative/disclose and negative/non-disclose conditions. The first was a planned contrast, weighting every condition other than negative/non-disclose as -1 , and negative/non-disclose as $+5$. This contrast, modeling the predicted pattern, was significant, $t(115) = 2.17, p < .05$. A subsequent test of residual variance was not significant, $F(4, 115) = 1.03, p > .25$, indicating that our contrast model fit the data well (i.e., there was relatively little unexplained variance).

it was to think or write about a past betrayal, the more extremely baby cries were rated. This is as expected, focusing on a past betrayal was predicted to deplete resources, leading to more extreme reactions to the baby cries. However, the correlation between target unpleasantness and cry ratings was non-significant among participants who disclosed their thoughts and feelings related to the person who betrayed them. Note that the negative/non-disclose and the negative/disclose participants did not differ in how unpleasant it was for them to recall or write about a person who had betrayed them. Instead, they differed only in how this unpleasantness affected their subsequent judgments of infant cries.

GENERAL DISCUSSION

This research tested whether psychosocial resources moderate the perception of negative stimuli, especially stimuli of a social nature. The two experiments reported here confirmed that resources do have this moderating effect. Study 1 showed that participants who recalled a betrayal (resource depletion) subsequently heard baby cries as conveying more distress than did participants who recalled either a positive or a neutral social contact.

Study 2 tested whether restored resources (via disclosure) would counteract the amplifying effect of resource depletion on social perception. This prediction was also supported. Participants who recalled a past betrayal but who could not disclose betrayal-related thoughts and feelings subsequently heard the baby cries as conveying more distress than did other participants. This result basically replicated Study 1, where no disclosure opportunity was supplied. However, participants in the negative contact condition who could disclose their betrayal-related thoughts and feelings did not amplify their cry ratings. In fact, the simple effect difference in cry ratings between the negative/disclose and the negative/non-disclose participants was itself significant.

Internal analyses further indicated that disclosure moderated perception by restoring resources. For participants who recalled a betrayal but did not disclose their betrayal-related thoughts and feelings, cry ratings were related to the unpleasantness of recalling being betrayed. That is, the more these negative contact participants found it unpleasant to recollect a person who betrayed them, the more distress they heard in the baby cries. This pattern fits the basic resource and perception model, in that more severe betrayals depleted resources more, and thereby amplify the perception of negative cues.

However, for negative contact participants who disclosed their betrayal-related thoughts and feelings, a different pattern emerged. These participants also found recalling past betrayal highly unpleasant. However, for them the unpleasantness of recalling a past betrayal had no effect on how extremely they rated the baby cries. Thus, while both disclosers and non-disclosers found it highly unpleasant to recall a past betrayal, this unpleasantness only affected cry ratings among non-disclosers. In sum, for non-disclosers the unpleasantness aroused by recalling a past betrayal amplified their perception of another's distress, but for disclosers it did not.

In tandem, Studies 1 and 2 make a strong case for the resource and perception hypothesis. When resources are depleted, as in Study 1, perception of another's distress becomes more amplified. However, when resources have been restored, as in Study 2, this amplification ceases to occur.

Social Contacts, Disclosure, and Coping

The present research may help explain how social contacts and disclosure each have such potent effects on coping. If positive social contacts, disclosure, and other resources cause negative events to appear less extreme, then the world that people with sufficient resources occupy may be subjectively more

benign than that occupied by people with insufficient resources. Over time, the experience of living in a subjectively less disturbing world may reduce chronic stress, and supply coping benefits that way. In addition, by making disturbing events appear less noxious, resources may increase people's willingness to attend to and address threats (as per Aspinwall, 1998; Trope & Pomerantz, 1998). This, in turn, would advance the 'active coping' that is itself crucial for long-term adjustment (Holahan & Moos, 1987).

A corresponding benefit of resources on perception may accrue to those who are perceived. It can be deeply satisfying to have one's own inner states correctly assessed by others (Rogers, 1961). Conversely, it can be demoralizing when others respond to one's trials with disproportionate alarm, as reported in research on over-protective and intrusive social support (Coyne et al., 1988). Such mismatched responding can also disrupt early parent/child bonding, and make children feel less socially secure (Stern, 2002). Many psychotherapists—who rely on their own emotions to understand clients—monitor their own basic psychosocial needs, so that these needs do not bias their perception (McWilliams, 2004).

In sum, psychosocial resources may promote adjustment among both observers and the observed; the former perceive others with greater equanimity, and the latter experience the satisfaction of being more accurately perceived.

Alternative Explanations and Caveats

The present research proposed that psychosocial resources moderate how observers understand other people's psychological states. Both studies support this linkage. However, there are important alternative explanations and caveats, which are discussed in this section.

Mood Effects

One alternative explanation to the present findings is that mentally imaging a negative, neutral, or positive social contact altered mood, and it was therefore mood rather than resources which affected cry ratings. Results indicated that no such mood-related confounds occurred. First, the imaging conditions did not differ in post-treatment mood. Second, although mood was negatively related to cry ratings (i.e., lowered mood correlated with more extreme ratings), the influence of mood on cry ratings did not differ between the imaging conditions. Finally, in both studies the effect of social contact on cry ratings remained significant even after statistically controlling for mood.

Although these results help account for mood effects, they themselves may have been compromised by the delayed administration of the mood measure. The mood measure was presented late in the study, to prevent participants from surmising the true purpose of this research and to prevent them from discounting the affective and motivational aspects of the imaging task. Participants therefore did not report their moods immediately after the imaging task—when imaging-related moods would be most robust—but instead after hearing the baby cries. The cries were generally disturbing, and may have overridden mood effects generated by the imaging task. It should be noted, however, that related research has shown that the benefits of psychosocial resources on judgment are not due to mood (G. Cohen et al., 2000; Reed & Aspinwall, 1998; Trope & Pomerantz, 1998).

However, the most powerful demonstration that our results were not due to mood was provided by the imaging-by-disclosure interaction reported in Study 2. Recall that the critical groups in Study 2 were negative/non-disclose (recall a past betrayal and do not disclose associated thoughts and feelings) and negative/disclose (recall a past betrayal and disclose associated thoughts and feelings). The

negative/non-disclose condition neatly replicated the negative condition in Study 1—these participants rated the cries higher than did other participants. However, the negative/disclose participants, who also thought of a negative social contact but disclosed the associated thoughts and feelings, did not produce amplified cry ratings.

Mood effects do not square with this outcome. This is because both negative/disclose and negative/non-disclose participants were subject to the same negative mood states following the imaging task. According to Pennebaker (1990), emotional disclosure does not lead to improved mood in the short term; if anything it depresses mood. Therefore, if mood was driving our results, then the negative/disclose participants should have supplied cry ratings equal to, if not more extreme than, the negative/non-disclose participants. Instead they did the exact opposite; they supplied markedly lower cry ratings.

Priming

Priming (Bargh, 1989) provides another explanation for the present results. For example, thinking elaborately about a past betrayal may have made negative events salient, and thereby facilitated attention to newly presented ones (i.e., baby cries) that immediately followed. This primed attention to the cries may, in turn, have led to their more extreme evaluation. The disclosure condition in Study 2 addressed the priming explanation. This is because disclosing thoughts and feelings associated with a past betrayal should have made the negative prime even more salient and therefore a more potent source of amplification. Yet, as Study 2 showed, disclosing betrayal-related thoughts and feelings did not sustain the amplification of baby cries, but instead tempered them. Priming is therefore an unlikely source of the present results.

Resource Moderation

The present research did not measure changes in resources. Such a measure would permit direct tests of our mediational model, i.e., that disclosing betrayal-related thoughts and feelings restored resources, and thereby prevented the subjective amplification of baby cries that betrayal would have otherwise induced. However, the interaction of disclosure and social target provides evidence of moderation, which suggests underlying causation (e.g., Baron & Kenny, 1986). This moderation was also demonstrated by the selective pattern of correlations between task unpleasantness ratings and baby cry ratings, as previously discussed.

The Operationalization of Social Contact

Social contact was not manipulated through an actual, *in vivo* social interaction. Instead participants generated images of negative, neutral, or positive persons in their own lives. One might therefore ask whether the imaging task represents social contacts. There are reasons to believe that it did. Manipulation checks showed that the degree of closeness felt toward the imaging target, and the pleasantness thoughts of this person evoked, corresponded to whether the target was negative, neutral, or positive. Informal review of Study 2 disclosure protocols shows that participants were thinking not only of appropriate targets, but that the encounters they recalled were generally quite significant and intense.

The Selective Effect of Negative Social Contact on Cry Ratings

Cries were rated as more extreme by participants who imaged a negative social contact, but they were not rated as less extreme (compared to controls) by participants who imaged a positive social contact. One explanation is that the positive contact condition was simply not as strong as the negative contact condition. This is unlikely. Participants in the positive condition, relative to other participants and in absolute terms, indicated that they felt very close to their assigned imaging targets, and found it pleasant to recollect and write about them. Informal inspections of disclosure protocols in Study 2 indicated that the positive disclosures were no less detailed or emotionally intense than were the negative disclosures. A more likely explanation is supplied by research showing that negative social contacts often deplete resources more than positive contact augment them (Fiore, Becker, & Coppel, 1983; Rook, 1984; Vinokur & van Ryn, 1993).⁷ The selective effect of negative contexts in the present research is consistent with this general trend.

CONCLUSION

This research indicated that the status of one's own psychosocial resources may shape the perception of other's distress. When resources are sufficient, other's distress is perceived more moderately, but when resources are depleted other's distress is seen as more extreme. Social relations are built on social perception. The present results therefore suggest that the quality of interpersonal relations may be shaped by the nature of intra-personal needs.

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⁷The greater potency of negative social contacts may be due to the fact that most people probably enjoy near sufficient psychosocial resources, and so events that depress their coping will have greater effects than events that enhance coping. However, when resources have been diminished, as was the case with the negative contact participants, things that bolster resources—such as an opportunity to disclose—can have noticeably tonic effects.

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