Talking Facilitates Cognitive–Emotional Processes of Adaptation to an Acute Stressor

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The authors examined the influence of talking and the social context of talking on cognitive–emotional processes of adjustment to stressors. Two hundred fifty-six undergraduates viewed a stressful stimulus and were then assigned to a no-talk control condition or 1 of 3 talk conditions: talk alone, talk to a validating confederate, or talk to an invalidating confederate. Two days later, they were reexposed to the stressor. Compared with individuals in the no-talk condition, those in the talk alone and validate conditions had a lower level of intrusive thoughts in the 2-day interim, and they had lower perceived stress when reexposed to the stressor. The effects of talking and validation on perceived stress appeared to be mediated by lowered intrusions. The benefits of talking were diluted when disclosures were invalidated. These findings suggest that talking about acute stressors can facilitate adjustment to stressors through cognitive resolution.

A timely utterance gave that thought relief, and I again am strong
—William Wordsworth, "Ode: Intimations of Immortality from Recollections of Early Childhood"

Poets, laypersons, and psychologists alike believe that there are benefits of talking about negative emotional experiences. There is a strong tendency for people to talk about aversive events (Rime, 1995), and disclosure of stressful experiences is the cornerstone of many psychotherapeutic interventions (Stiles, 1995). Empirical evidence suggests that "opening up" and expressing stress-related thoughts and feelings is associated with improved physical and mental health (Pennebaker, 1989; Pennebaker, 1993; Smyth, 1998). For instance, studies have indicated that talking and writing about stressors have been related to decreased distress (Donnelly & Murray, 1991; Lepore, 1997), fewer reports of illness and physician visits (Pennebaker & Beall, 1986; Pennebaker, Colder, & Sharp, 1990), better role and physical functioning (Kelley, Lumley, & Leisen, 1997; Pennebaker et al., 1990; Smyth, Stone, Hurewitz, & Kaell, 1999; Spera, Buhrfeind, & Pennebaker, 1994), enhanced immune system functioning (Esterling, Antoni, Fletcher, Margulies, & Schneiderman, 1994; Pennebaker & Kiecolt-Glaser, 1988; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995), decreased autonomic arousal (Pennebaker, Hughes, & O’Heeron, 1987), and increased positive affect (Mendolia & Kleck, 1993).

Despite the growing evidence linking expression to adjustment, we know little about the mechanisms that underlie this phenomenon. Recently, investigators have attempted to connect expression-based benefits to cognitive processes implicated in adjustment (Clark, 1993; Gold & Wegner, 1995; Greenberg, Wortman, & Stone, 1996; Lepore, 1997; Major & Gramzow, 1999; Pennebaker, 1993; Pennebaker, 1995; Tait & Silver, 1989). In several articles, Lepore and colleagues have argued that examining the effects of expression—or constraints on expression—on intrusive thought processes may elucidate how expression influences adjustment (Kliwer, Lepore, Oskin, & Johnson, 1998; Lepore, 1997; Lepore, in press; Lepore & Helgeson, 1998; Lepore, Silver, Wortman, & Wayment, 1996). Intrusive thoughts can prolong negative emotional and physiological responses to stressors. More importantly, they appear to be a marker of the extent to which individuals have cognitively integrated or resolved stressful experiences. In the present study, we test whether talking about stress-related thoughts and feelings facilitates adjustment through cognitive resolution processes (i.e., reducing the frequency of intrusive thoughts) and by desensitizing individuals to intrusive thoughts (i.e., reducing the impact of intrusive thoughts).

In addition to exploring how talking facilitates adjustment to stressors, we examine whether social responses to talking alter adjustment processes. Disclosure of stressful life events to others appears to be a normative and important coping response (Rime, 1995; Silver & Wortman, 1980; Tait & Silver, 1989). However,
disclosure is not always associated with positive psychological adjustment (see, e.g., Cutrona, 1986). Furthermore, disclosure seldom occurs in a social vacuum, and its effects may be contingent on the social context. We believe that adjustment to stressors is likely to be facilitated by disclosure in a supportive social context, but not in an unsupportive context. Indeed, numerous investigators have found that whereas supportive social networks tend to reduce distress in individuals under stress, unsupportive or critical social networks can actually increase distress (e.g., Abbey, Abrams, & Caplan, 1985; Holahan, Moos, Holahan, & Brennan, 1997; Lepore, 1992; Major et al., 1990; Major, Zubek, Cooper, Cozzarelli, & Richards, 1997; Manne, Taylor, Dougherty, & Kemeny, 1997; Rook, 1984; Vinokur & van Ryn, 1993). In the present study, we test whether supportive and unsupportive responses to disclosures about a stressor have differential effects on adjustment and on cognitive-processing variables implicated in adjustment.

Cognitive Processing

Intrusive thoughts are repeated, unbidden memories, thoughts, and images of a stressor. They are commonplace among survivors of traumatic events, such as bereavement (McIntosh, Silver, & Wortman, 1993), incest (Silver, Boon, & Stones, 1983), disasters (Baum, Cohen, & Hall, 1993; Dougall, Craig, & Baum, 1999), cancer (Cordova et al., 1995; Lutgendorf, Antoni, Ironson, Schniderman, & Fletcher, 1997), and exposure to violence (Kliewer et al., 1998). Intrusive thoughts are a hallmark of clinical disorders, such as posttraumatic stress disorder (American Psychiatric Association, 1994), but they also are a normal response to stressors in nonclinical populations and can be induced experimentally (Horowitz, 1986, 1993). In the aftermath of stressful events, frequent intrusive thoughts are associated with emotional, behavioral, and physiological disturbances (Baum et al., 1993; Lutgendorf et al., 1997; Silver et al., 1983; Tait & Silver, 1989), which suggests that they play a role in the development or maintenance of adjustment problems.

Cognitive-processing theorists hypothesize that stressors can cause emotional disturbance by challenging people's basic and often optimistic beliefs about the self and the world, such as a sense of control, self-worth, and coherence (Epstein, 1985, 1991; Horowitz, 1986; Janoff-Bulman, 1992; Marris, 1975; McCann & Pearlman, 1990; Parkes, 1975). Further, to the extent that people cannot resolve or cognitively integrate aspects of a stressful experience into their mental models, the stressor will be maintained in active memory through intrusive thoughts (Horowitz, 1986). Presumably, intrusive thoughts and associated adjustment problems will subside once individuals successfully integrate stressful information into their mental models. Cognitive integration may require repeated examination, contemplation, and evaluation of a stressful event and its implications. By engaging in these cognitive processes, individuals may be able to interpret stressors in personally meaningful terms, integrate threatening or confusing aspects of the experience into a coherent and nonthreatening conceptual framework, and reach a state of emotional acceptance.

Confronting stress-related intrusive thoughts and concerns also can facilitate emotional adjustment through desensitization, or habituation, processes (Bootzin, 1997; Foa & Kozak, 1991; Lepore, 1997; Lepore, in press; Rachman, 1980). Creamer, Burgess, and Pattison (1992) have argued that exposure to stressful material, including intrusive thoughts, can be adaptive because it "allows stimulus-response connections to be weakened and prompts modification of the meaning associated with the incident" (p. 454). Thus, actively processing (i.e., contemplating, reevaluating) stress-related thoughts and stimuli may facilitate emotional adjustment by extinguishing negative emotional responses or by creating more benign or neutral emotional associations with memories or reminders of the stressor.

Extremely negative emotional reactions to intrusive thoughts and other reminders of a stressor can impede cognitive integration and habituation. When reexperiencing a stressor evokes strong emotional responses, individuals sometimes adopt avoidant coping styles. That is, they suppress thoughts of the stressor, inhibit themselves from talking about it, and divert their attention away from any reminders of the stressor. People also can cycle between engaging and disengaging in cognitive processing of stressful material to keep from becoming emotionally overwhelmed. Indeed, intrusive thoughts and avoidant thinking and behavior often go hand-in-hand (Horowitz, Wilner, & Alvarez, 1979). When avoidance is excessive, it might prevent deep processing, or opportunities for cognitive restructuring, stressor reappraisal, and desensitization.

The precise role of avoidance in cognitive processing of stressors is not clear. Typically, avoidance is conceptualized as a defense mechanism used to contain intense negative affect associated with external or internal reminders of a stressor. It appears that after stressful events, symptoms of avoidance are less common than symptoms of intrusions (Graham-Bermann & Levendosky, 1998; Maercker & Schuetzwohl, 1997), but little else is known about the interrelationship between these two variables or their relative impact on adjustment to stressors. Some investigators have shown that both factors are associated with poorer adjustment (e.g., Brewin, Watson, McCarthy, Hyman, & Dayson, 1998; Davis, De-Nour, Shouval, & Melmed, 1998). However, others have shown that level of intrusions is a stronger predictor of distress than is avoidance (e.g., Baider & De-Nour, 1997; Kowalsky, Solomon, Bleich, & Laor, 1996), and still others have shown that level of intrusions is associated with distress, whereas avoidance is not (e.g., McFarlane, 1992). There is also some controversy over the temporal ordering of avoidance and intrusive thoughts. For some theorists, intrusions represent a breakdown in defense responses of avoidance, so intrusions are presumed to occur after avoidance (Horowitz, 1986; also see Gold & Wegner, 1995). For others, avoidance represents a mechanism of coping with aversive, intrusive thoughts about stressors, so intrusions are presumed to occur before avoidance (Creamer et al., 1992). It is possible that the truth lies in between and that intrusions and avoidance are reciprocally related.

In the present study, we do not attempt to disentangle the causal ordering of intrusions and avoidance, nor do we have firm predictions about the role of avoidance in adjustment. Instead, we aim to explore the impact of talking on both intrusions and avoidance and examine the relative contribution of these two cognitive processing variables on adjustment to a stressor.
Cognitive–Emotional Benefits of Expression

There are at least two ways that expressive tasks might influence adjustment processes via intrusive thoughts (Lepore, 1997). These mechanisms are tied to the integration, or completion, hypothesis and the desensitization, or habituation, hypothesis described above.

From the completion perspective, expressive tasks help people to resolve stressful experiences. Expressive acts, such as talking or writing about stressors, help people to impose a cognitive structure on stressful experiences (Harber & Pennebaker, 1992; Pennebaker, 1989). By putting one’s experience into language, individuals attempt to construct a coherent narrative, which can make a stressor understandable to them and to others (Clark, 1993; Meichenbaum & Fitzpatrick, 1993). The narrative becomes part of individuals’ cognitive representation of the experience, thereby broadening their perspective. Thus, expressive tasks can potentially change the content of trauma-related thoughts and memories. Supportive responses from social network members may further aid cognitive restructuring by suggesting ways of coping or positively reframing a stressful situation. If expression facilitates cognitive restructuring, or resolution, then it should diminish the frequency of intrusive thoughts and associated adjustment problems.

From the desensitization perspective, expressive acts enable people to form new, nonthreatening associations with trauma-related stimuli. This is particularly so if the context of expression is nonthreatening or supportive. By changing the meaning, or appraisals, of trauma-related thoughts and memories, expressive tasks can diminish the emotional fallout of intrusive thoughts. This desensitization process would be evident if emotional expression attenuates the association between intrusive thoughts and adjustment problems.

There is empirical evidence that expression of stress-related thoughts and feelings influences both the frequency and emotional impact of intrusive thoughts. Lutgendorf and Antoni (1999) found that individuals who disclosed a traumatic experience to an experimenter showed decreases in intrusive thoughts over time, whereas individuals in an assessment-only control group had stable levels of intrusive thoughts. In two studies, Lepore and colleagues have observed significant positive correlations between social constraints on expression of stress-related experiences and the frequency of intrusive thoughts (Kliewer et al., 1998; Lepore et al., 1996). These findings are consistent with the theory that being able to faithfully disclose stress-related thoughts and feelings to others can facilitate cognitive integration or resolution, whereas constraints on disclosure can impede these processes.

Results of several other studies suggest that disclosure can moderate the relation between intrusive thoughts and emotional adjustment to stressors. Specifically, we have found that intrusive thoughts are more strongly associated with psychological distress in people who feel constrained in talking with network members about stressful experiences than in people who feel relatively unconstrained in talking (Kliewer et al., 1998; Lepore & Helgeson, 1998; Lepore et al., 1996). Major and Gramzow (1999) found that women who disclosed their feelings about an abortion to others were less distressed by intrusive thoughts than those who did not disclose. These findings are consistent with the theory that being able to talk freely about stress-related thoughts and feelings can dampen negative emotional responses to intrusive thoughts, whereas constraints on disclosure can impede these processes.

Hypotheses

The present study extends previous research by testing both the completion and the desensitization hypotheses in an experiment and by examining the effects of talking about stressful experiences in diverse social contexts. We predicted that disclosing thoughts and feelings about a stressor would reduce negative psychological and physiological responses during reexposure to a stressor by facilitating cognitive resolution (i.e., reducing the frequency of intrusive thoughts) and desensitization (i.e., reducing the emotional and physiological impact of intrusive thoughts). If resolution processes are occurring, we should find evidence that talking reduces intrusive thoughts, which in turn reduces negative psychological and physiological responses to a stressor. If desensitization processes are occurring, we should find evidence that talking reduces the association between intrusive thoughts and negative psychological and physiological responses to a stressor.

For exploratory purposes, we also examined the potential mediating role of avoidance. We tested whether talking reduces avoidance of thoughts about a stressor, as well as the relation of avoidance to negative psychological and physiological responses.

Finally, we predicted that disclosing stress-related thoughts and feelings in a supportive social context would result in better adjustment than would disclosing in an unsupportive social context. On the basis of findings from previous studies (e.g., Major et al., 1990), we also expected that individuals who receive an unsupportive response to their disclosure might exhibit worse adjustment than their peers who do not disclose at all.

Method

Overview

We used a randomized, four-group (no talk, talk alone, validate, invalidate) repeated measures (Session 1, Session 2) design. In Session 1, participants came to the laboratory individually and watched a relaxing nature video, followed by a stressful slide and video presentation on the Nazi Holocaust. For 2 min after viewing the Holocaust stimuli, participants randomized to a talk alone condition remained alone while they discussed their thoughts and feelings related to the Holocaust. Participants randomized to a validate condition disclosed their thoughts and feelings on the Holocaust to a female confederate who acted as if she had a similar reaction. Participants randomized to an invalidate condition disclosed their thoughts and feelings on the Holocaust to a female confederate who acted as if she had a dissimilar reaction. Participants randomized to the no-talk control condition remained alone and did not disclose. In Session 2, 48 hr later, participants returned to the lab and were reexposed to the nature video and Holocaust stimuli. In Sessions 1 and 2, data were collected on physiological responses (blood pressure and pulse rate) and psychological responses (perceived stress and arousal) to the stimuli. In Session 2, participants completed measures related to cognitive processing (intrusive thoughts, avoidance).

Participants

We recruited men (n = 128) and women (n = 128) through a college research participant pool and by advertisements on electronic bulletin boards. Participants were compensated with $10 and course credit. The average age of the participants was 19.41 years (SD = 1.42); 65% were
European American, 22% were Asian American, 4% were African American, and 9% were of other ethnic origins.

**Procedure**

**Session 1.** On arrival at the laboratory, participants were told that the study was designed to examine college students’ reactions to war. We then collected data on demographics and knowledge about the Nazi Holocaust. Next, participants were left alone throughout a 5-min adaptation period, a 6-min relaxing nature video, and a 14-min stress-inducing Holocaust slide and video presentation. Four blood-pressure and pulse-rate measures were taken during the nature video and 10 were taken during the Holocaust presentation. Participants then completed a subjective stress and arousal checklist.

Next, participants in the talk alone, validate, and invalidate conditions talked for 2 min about their thoughts and feelings on the Holocaust presentation. Participants in the no-talk control condition were not given an opportunity to talk. Participants in the talk alone condition did not have an audience, other than the implied audience of the experimenter in the control room. Before participants in the validate and invalidate conditions disclosed, the experimenter introduced them to a female confederate. She was described as another study participant who had seen the film 2 days earlier and was summoned back to share her reactions to war.

The validating confederate nodded, maintained mutual eye contact, and smiled approvingly while the participant disclosed. When it was her turn to disclose, she identified and agreed with several thoughts and feelings that were expressed by the participant (e.g., “In terms of what I felt, it was mostly what you said, like feeling upset and disturbed by the images”). She also shared some scripted responses (e.g., “I was surprised by how graphic some of the slides were”). The invalidating confederate maintained a neutral countenance and avoided eye contact while the participant disclosed. When it was her turn to disclose, she identified and disagreed with several thoughts and feelings expressed by the participant (e.g., “In terms of what I felt, it wasn’t like what you said. I didn’t really feel upset and disturbed by the images”), and shared some scripted responses (e.g., “I expected that this is what I would see, so I wasn’t surprised by how graphic some of the slides were”). Multiple confederates were trained and used in both the validate and invalidate roles.

Before the experimenter dismissed participants, they were asked to confirm that they would not talk to anyone about the study before returning for Session 2, 48 hr later.

**Session 2.** Participants first completed a questionnaire that measured the frequency with which they had intrusive thoughts about the Holocaust and avoided thinking about the Holocaust in the 2-day interim. Next, the experimenter repeated the procedures from Session 1 to assess psychological and physiological responses to the Holocaust stimuli. Participants were also asked whether they had talked to anyone about the experiment. At the end of Session 2, participants in the validate and invalidate conditions completed questionnaires designed to test the confederate manipulation. The experimenter debriefed participants and again attempted to ascertain whether they had talked about the experiment.

**Measures**

**Manipulation checks.** We developed two questionnaires to assess whether the validation and invalidation manipulation worked as intended. One consisted of 4 items that assessed the degree to which the participant felt that the confederate’s thoughts and feelings about the Holocaust were similar or dissimilar. These items were rated on a 5-point scale ranging from 1 (completely disagree) to 5 (completely agree), and had good reliability (Cronbach’s $\alpha = .94$). The other scale consisted of 21 items that the participant used to rate, on a 6-point scale ranging from 0 (strongly disagree) to 5 (strongly agree), the confederate’s interpersonal qualities and knowledge of the Holocaust. A principal-components analysis revealed four unique factors, which we labeled **Friendliness** (e.g., friendly, warm), **Empathy** (e.g., accepting, compassionate), **Appeal** (e.g., interesting, boring), and **Knowledge** (e.g., informed, uninformed). All factors had acceptable reliability (Cronbach’s alphas ranged from .76 to .95).

**Physiological stress responses.** Cardiovascular responses (blood pressure and pulse rate) were measured from the participant’s nondominant arm using a DinaMap XL (Model 9300; Johnson & Johnson Medical Inc., Tampa, FL) vital signs monitor. The monitor was operated from a control room adjacent to the laboratory. Participants’ readings taken during the nature video were used to calculate an average resting response, and the readings taken during the Holocaust presentation were used to calculate an average stress response.

**Perceived stress and arousal.** We used the Stress/Arousal Adjective Checklist (SACL; King, Burrows, & Stanley, 1983) to examine the psychological impact of the Holocaust presentation. The SACL comprises two 10-item subscales: Perceived Stress (e.g., uneasy, distressed; $\alpha = .89$) and Perceived Arousal (e.g., alert, aroused; $\alpha = .73$). Items were rated on a 4-point scale ranging from 0 (definitely no) to 3 (definitely yes). King and colleagues have confirmed the factorial independence and validity of the two subscales.

**Cognitive processing.** We used a 9-item scale to assess the frequency of intrusive thoughts and avoidance of thoughts and feelings about the Holocaust in the intersession period. All items were rated on a 6-point scale ranging from 0 (not at all) to 5 (very often). We used five high-loading items from the Intrusive Thought subscale of the Impact of Events Scale (IES; Horowitz et al., 1979) to assess intrusive thoughts (e.g., “had thoughts about the Holocaust or the Holocaust images when you didn’t mean to”). We used four high-loading items from the Avoidance subscale of the IES to assess level of avoidance of thoughts and feelings concerning the Holocaust (e.g., “tried not to think about the Holocaust”). The intrusions and avoidance scales had adequate reliability (as $=.83$ and .82, respectively). Although these variables were highly intercorrelated ($r = .76$, $p < .001$), we chose to analyze them separately for theoretical reasons.

**Results**

**Manipulation Checks and Gender Differences**

All confederate rating scales were analyzed using $t$ tests (validate vs. invalidate). Relative to the invalidating confederates, the validating confederates were rated as more similar, friendly, empathic, appealing, and knowledgeable (all $p < .001$; see Table 1). These findings indicate that the manipulation was successful. However, the group differences in ratings of confederate appeal and knowledge suggest that participants might have discounted the...
No other groups differed significantly from one another in level of talking manipulation influenced psychological and physiological intrusions or avoidance. Participants in the no-talk condition had a significantly higher level of intrusive thoughts than did participants in the talk alone condition. There were no significant differences between means. Participants in the no-talk condition had a significantly higher level of intrusive thoughts than did participants in both the talk alone and validate conditions. No other groups differed significantly from one another in level of perceived stress. On perceived arousal, there was a significant effect of period, F(1, 252) = 22.92, p < .001, but no main effect of condition or Condition × Period interactive effect. Participants reported less perceived arousal on Day 2 than they did on Day 1.

There were no significant main or interactive effects of period and condition on blood pressure or pulse rate. Thus, participants' physiological response to the stimulus did not change as a function of the reexposure or talking condition. We used a multiple regression approach to test the possibility that intrusive thoughts mediated the effects of condition on perceived stress. Recall that participants in the no-talk group had a higher level of perceived stress and a higher level of intrusive thoughts than did participants in the talk alone and validate groups, whereas those in the invalidate group fell somewhere in between. Thus, we were interested in whether intrusive thoughts accounted for the differences in perceived stress over time in the talk conditions relative to the no-talk condition.

Following the recommendations of Baron and Kenny (1986; also Kenny, Kashy, & Bolger, 1998), we used regression analyses to establish if the following conditions for mediation were met: (a) The predictor (condition) is associated with the outcome (change in perceived stress from Day 1 to Day 2); (b) the predictor is associated with the mediator (intrusions); (c) the mediator is associated with the outcome, controlling for the predictor; and (d) the predictor has zero association with the outcome after controlling for the mediator. If all four steps were met, then the data would be

### Table 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>No talk</th>
<th>Talk</th>
<th>Validate</th>
<th>Invalidate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrusive thoughts</td>
<td>1.80a</td>
<td>1.06</td>
<td>1.23b</td>
<td>.89b</td>
</tr>
<tr>
<td>Avoidance</td>
<td>1.83b</td>
<td>1.22</td>
<td>1.23b</td>
<td>1.05b</td>
</tr>
</tbody>
</table>

**Note.** For each dependent variable, pairs of means sharing a lettered subscript are not significantly (p < .05) different from one another. Scales ranged from 0 (not at all) to 5 (very often).

* p < .05. ** p < .01.
consistent with the hypothesis that intrusions completely mediate the relation between condition and changes in perceived stress. If just the first three steps were met, then the data would be consistent with the hypothesis that intrusions partially mediate the effects of condition on changes in perceived stress. We used the modified Sobel (1982) test discussed in Kenny et al. (1998) to evaluate the null hypothesis that the indirect effect of condition on perceived stress via intrusions equals zero.

In the regression analyses, the dependent measure was change in perceived stress (Day 2 − Day 1). Lower scores indicate lower perceived stress on Day 2 than on Day 1. Condition was dummy coded to examine the effects of interest. We created two dummy variables: The first contrasted the effects of talk alone (coded 1) against no talk (0); the second contrasted validate (1) against no talk (0). For exploratory purposes, we also created a dummy code to contrast invalidate (1) and no talk (0). However, preliminary analyses of this variable revealed no effects of invalidation on intrusions or change in perceived stress. Therefore, we did not run further mediation analyses of the invalidate condition.

All criteria for mediation were satisfied in the regression analyses. First, the talk alone condition was associated with declines in perceived stress (B = −.21, p < .05), and the validate condition was associated with declines in perceived stress (B = −.22, p < .05). Second, the talk alone condition was associated with a lower level of intrusions (B = −.57, p < .001), and the validate condition was associated with a lower level of intrusions (B = −.42, p < .05). Third, independent of the effect of talk alone, level of intrusions was associated with higher perceived stress (B = .12, p < .01). Similarly, independent of the effect of validate, level of intrusions was associated with higher perceived stress (B = .10, p < .05). Finally, after controlling for level of intrusions, the talk alone condition was no longer associated with changes in perceived stress (B = −.15, p > .05), and the validate condition was no longer associated with changes in perceived stress (B = −.17, p > .05). The modified Sobel test revealed that the reduction in perceived stress due to lower intrusions in the talk alone versus the no-talk group was significant (Z = 2.06, p < .05). Similarly, the reduction in perceived stress due to lower intrusions in the validate versus the no-talk group was significant (Z = 1.97, p < .05). These results are consistent with the hypothesis that intrusive thoughts fully mediated the effects of talk alone and validate on declines in perceived stress.

For exploratory purposes, we also evaluated whether avoidance could account for the condition effects on changes in perceived stress. These analyses were limited to testing whether avoidance accounted for the effects of the talk alone condition on changes in perceived stress, because only the talk alone group had a lower level of avoidance than the no-talk group. Preliminary analyses revealed that avoidance was not associated with changes in perceived stress after controlling for the condition effect. Therefore, it is not possible that avoidance mediated the effects of condition on perceived stress.

**Moderation Analyses**

We used regression analyses to examine whether the talking condition moderated the association between Holocaust-related intrusive thoughts and emotional and physiological responses to the Holocaust stimuli. These analyses addressed the question of whether talking alone or in particular social contexts reduces the impact of intrusive thoughts on emotional and physiological outcomes. We followed the procedures outlined by Aiken and West (1991) for testing interactions between categorical and continuous variables. The psychological outcomes were changes in perceived stress and perceived arousal from Day 1 to Day 2. The physiological outcomes were changes in blood pressure and pulse rate response from Day 1 to Day 2. Results revealed no significant interactive effects of condition and intrusive thoughts on any of the outcomes.

**Discussion**

While many investigators have shown that expressive tasks, such as writing or talking, facilitate adjustment to stressors, relatively few have identified processes that mediate or moderate these effects. The first aim of this study was to identify cognitive–emotional processes that mediate the effects of talking on adjustment to a stressor. Our central hypothesis was that talking would enhance adjustment by facilitating cognitive integration (completion hypothesis) or habituation (desensitization hypothesis). Results were largely consistent with the completion hypothesis. In comparison with participants who did not talk about the stressor, those who talked alone or to a supportive, validating confederate had fewer residual intrusive thoughts about the stressor and reported lower subjective stress when re-exposed to the stressor. Results from the mediation analyses were consistent with the hypothesis that reductions in intrusive thoughts explained the

### Table 3

Mean Level of Perceived Arousal and Perceived Stress After Exposure to Holocaust Stimuli as a Function of Talking Condition and Exposure Period (n = 256)

<table>
<thead>
<tr>
<th>Variable</th>
<th>No talk</th>
<th>Talk</th>
<th>Validate</th>
<th>Invalidate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Arousal* Day 1</td>
<td>1.08</td>
<td>0.46</td>
<td>1.18</td>
<td>0.48</td>
</tr>
<tr>
<td>Arousal Day 2</td>
<td>0.95</td>
<td>0.51</td>
<td>0.98</td>
<td>0.51</td>
</tr>
<tr>
<td>Stress* Day 1</td>
<td>2.08</td>
<td>0.59</td>
<td>1.98</td>
<td>0.67</td>
</tr>
<tr>
<td>Stress Day 2</td>
<td>1.98</td>
<td>0.72</td>
<td>1.67</td>
<td>0.74</td>
</tr>
</tbody>
</table>

* Scale ranged from 0 (definitely no) to 3 (definitely yes).

*p < .05.
reductions in subjective stress in participants who talked alone or with a validating confederate.

The mediating effects of intrusive thoughts are consistent with the theory that disclosing stress-related thoughts can help people to make sense of stressful events or achieve cognitive and emotional resolution (Meichenbaum & Fitzpatrick, 1993; Pennebaker, 1995). According to the completion hypothesis, the decline in intrusions associated with talking is a result of successful cognitive integration of stress-related information. However, intrusive thoughts are just indirect markers of cognitive processing. Changes in the frequency of intrusions reveal little about the quality of individuals’ thoughts. Future research should be directed at examining how talking influences qualitative aspects of stress-related thought patterns. For instance, does disclosure in a benign social context stimulate assimilation processes (i.e., reinterpretation of external events) or accommodation processes (i.e., changes in basic beliefs about a stimulus, worldviews, or self-views), as suggested by some theorists? Future investigations might address these questions by in-depth, qualitative, and quantitative analyses of individuals’ descriptions of traumatic experiences (e.g., appraisals of threat and harm), self-perceptions (e.g., self-esteem, self-efficacy), and beliefs about the world (e.g., controllability of negative outcomes, trust in others) before and after disclosing in different social contexts.

Contrary to our expectations, there was no evidence of desensitization to intrusive thoughts. This is inconsistent with some previous correlational and experimental studies on disclosure and adjustment. For instance, in correlational studies investigators have found that being able to talk about stressors with supportive others reduces the emotional impact of intrusive thoughts (e.g., Lepore & Helgeson, 1998; Lepore et al., 1996; Major & Gramzow, 1999). In an experimental study, we found that individuals who wrote their deepest thoughts and feelings about an impending graduate school entrance examination were less distressed by exam-related intrusive thoughts than individuals in a control group who wrote about trivial topics (Lepore, 1997). It is possible that disclosure in the present study resulted in cognitive resolution rather than desensitization because the stressor was relatively minor and short-lived. Unlike the present study, those studies in which desensitization effects were found involved populations facing highly personal and ongoing stressors (e.g., abortion, bereavement, cancer). In situations involving emotionally significant stressors, disclosure may have palliative effects, thus reducing the emotional impact of intrusive thoughts, but may not have sufficient power to fully eradicate intrusive thoughts. In contrast, when stressors are not so emotionally significant and are limited by time, disclosure may be powerful enough to eradicate intrusive thoughts.

The null effect of the manipulation on arousal also was contrary to our expectations. We attribute this to a poor choice of arousal measures. In previous studies, investigators found null effects of disclosure on cardiovascular measures, such as heart rate (e.g., Mendolia & Kleck, 1993; Pennebaker et al., 1987), but significant effects on skin conductance levels (Pennebaker et al., 1987). Citing work by Fowles (1980), Pennebaker, Barger, and Tiebout (1989) have argued that skin conductance level is a more sensitive and appropriate indicator of the autonomic arousal processes affected by disclosure than is cardiovascular response. It appears that skin conductance activity is linked to behavioral inhibition, whereas cardiovascular activity is linked to behavioral activation (Obrist, 1981). In the present study, the video stimulus did not require participants to engage in active coping behaviors, so behavioral activation was limited. However, it is possible that inhibition was increased in those participants who were prohibited from expressing their thoughts and feelings about the stimulus, or who were censured for their thoughts and feelings. In these conditions, we might have observed elevations in autonomic arousal using a measure of skin conductance, even though participants in these conditions did not exhibit elevations on the cardiovascular measures.

A second major aim of this study was to describe how social responses to talking about stressful events influences adjustment processes. We hypothesized that unsupportive, or invalidating, responses to participants’ talking about a stressor would undermine the benefits of talking. The result partially supported this prediction. Participants in the invalidate condition appeared to be neither better nor worse than those in the other three conditions on measures of cognitive processing and psychological stress.

One interpretation of these findings is that invalidation diluted the benefits of talking (i.e., the effects of talking were not as strong in the invalidate condition as in the talk alone and validate condition). This interpretation is consistent with the theory that talking is most beneficial in a supportive context. Another interpretation is that some participants benefited from the invalidation manipulation, whereas others did not. Hypothetically, invalidation could reduce perceived stress by changing the way individuals think about a stressor. Most participants who talked about the Holocaust stimuli had negative responses, stating that it was upsetting, horrific, and disturbing. In the invalidating condition, confederates provided an alternative and less distressing perspective, which might have been sufficient to shift some participants’ perspectives on the situation. Of course, not all participants accepted the position of the invalidating confederate. As shown in Table 1, the invalidating confederate was rated as less interesting and knowledgeable about the Holocaust than was the validating confederate.

It is interesting that participants in the invalidate condition were not worse off than those in the no-talk condition on measures of cognitive processing and perceived stress. Major et al. (1990) found that women who felt less than fully supported when they told a significant other about their abortion were more distressed than women who kept their abortion a secret. It is possible that invalidating responses are most damaging when they originate from significant others, such as family members and friends. In the present study, the confederate was a peer, but one who did not have an emotionally significant bond with the participant. And, as noted above, when the confederate challenged how the participant responded to the Holocaust stimuli, oftentimes the participant simply discounted or discredited the confederate.

A final and more exploratory aim of this study was to examine the role of avoidance in cognitive–emotional processes of adjustment. Although avoidance and intrusions were highly correlated, they did not play the same role in adjustment. Unlike intrusions, avoidance was unrelated to changes in perceived stress, and did not mediate the effects of talking on perceived stress. These findings are consistent with those from a study on the effects of HIV on emotional distress in HIV-infected women (Moneyham et al., 1997). In that study, the relation between HIV-related stressors and emotional distress appeared to be mediated by intrusive thoughts, but avoidance was unrelated to distress and did not mediate the...
relation between HIV-related stressors and distress. Of course, other investigators have found negative associations between avoidance and emotional distress. Because of these mixed findings, much more research is needed to clarify the role of avoidance in cognitive–emotional processes of adjustment to stressors.

Although many of the present findings were consistent with our expectations, we should note that the ecological validity of the study is somewhat limited. It is not clear to what extent the study informs us about real-world stress and coping processes. As noted above, the stressor in this experiment probably did not have high personal significance for many of the participants. The stimulus is stressful to the extent that it elicits sympathy and concern for another's suffering, but it does not directly threaten participants. Further, the stressor in the present study was very brief. It is possible that emotional expression may influence adjustment to personal and ongoing stressors in a different manner than we observed.

A related problem of ecological validity stems from the brief and scripted interaction between the research participants and the confederates. The disclosure process in this social context is likely to be a pale version of what happens in the real world among friends discussing a stressful experience. On the one hand, it is remarkable that we achieved such robust effects of disclosure and validation on adjustment given the artificiality and brevity of the manipulation. On the other hand, we must ask whether similar results would be observed if the disclosure were longer, repeated, or made to significant others. Validation might be highly beneficial when it is from a significant other, but, as suggested by the present findings, validation from a stranger may not confer benefits beyond those reaped from simply talking to nobody in particular (i.e., ventilating). Validation did not have strong effects on outcomes in the experiment. However, invalidation from a significant other might be distressing or it might reduce distress by causing victims to adopt a different perspective on their situation.

In summary, the present findings further our understanding of how and under what conditions expression of stress-related thoughts and feelings facilitates adjustment to stressors. More generally, this line of research points to potential mechanisms to explain the benefits of emotional support, “talk therapies,” and psychosocial support groups, as well as the costs of failed support and social constraints on disclosure. It appears that sharing one's thoughts and feelings about an acute stressor shortly after it occurs can reduce the frequency of distressing, intrusive thoughts about the stressor and reduce psychological stress when reexposed to the stressor. However, when individuals' disclosures about stressors are invalidated, the benefits of talking may be diluted. This is important to consider in group therapy situations, where it is sometimes difficult to control how members will react to one another’s disclosures. It is also important to consider when advising friends or family members on how to be most supportive to individuals in crisis. Indeed, sometimes it may be necessary for victims to avoid people who are critical of how they cope with life stressors.

References


Received August 31, 1998
Revision received September 23, 1999
Accepted September 28, 1999

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