



15 Emotional Processing of Traumatic Events*

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Traumatic experiences and other emotional upheavals, by definition, are profoundly stressful. Divorce, death of a loved one, loss of a job, chronic disease — these are but a few of the many emotional upheavals that can shake one’s world in the course of a lifetime. Uncovering the psychological and social factors that underlie the processing of traumatic events has been a central goal in much of our research for almost two decades.

Individuals cope with traumatic experiences in varying ways. While some are able to quickly process their traumatic experiences and move on with relative ease, others might sink into periods of depression and anxiety that can last months or even years. Traumatic events negatively affect health and psychological well-being, but they also have the ability to transform one’s social world.

A critical dimension of coping with trauma is the degree to which individuals discuss or psychologically confront emotional upheavals after their occurrence. People have an inherent need to disclose the details of their upsetting experiences

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with others (Derlega, 1984; Jourard, 1971). In fact, one study has found that people share over 95% of all emotional experiences on the day that those experiences occur, usually within just a few hours of the experience (Rimé, 1995). Although a great majority of emotional experiences are shared, there are certain emotional experiences that individuals find difficult to share with others — sexual abuse, including rape, being fired from one's job, having a stigmatizing disease such as prostate or breast cancer, marital infidelity, and so on. Under such circumstances, individuals often try to inhibit thoughts and feelings about their experience to put them out of their mind. Ironically, such concerted attempts at thought suppression can lead to greater rumination and increased thoughts about the very experience that they are trying to erase from memory (Wegner, 1984). Such rumination, especially if it continues for extended periods, can consume large stores of cognitive and emotional resources, increase stress, and reduce immune system functioning.

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Multiple laboratories, including our own, have found that writing or talking about emotional experiences is associated with improvements in mental and physical health and a host of other positive outcomes. Dating back to the work of Franz Alexander (1950), psychologists and other psychosomatic researchers have been intrigued by the salutatory benefits of self-disclosure. Since the original writing study (Pennebaker & Beall, 1986), research surrounding the effects of writing about emotional experiences has progressed at a remarkable rate. Of particular importance are a number of studies that have begun to shed light on the cognitive, linguistic, and social bases of the benefits of writing (Lepore & Smyth, 2002; Smyth, 1998).

Despite the rapid growth of writing studies, a large number of questions remain unanswered. To what extent does writing about an emotional event bring about changes in people's psychological and social worlds? Are some people more likely than others to benefit from emotional writing? What are the cognitive, linguistic, and social mechanisms that contribute to the positive outcomes derived from writing about emotional topics? In this chapter, we will briefly discuss our writing paradigm and give an overview of some of the relevant findings of other researchers. The chapter will conclude with a discussion of some of the underlying processes that might help to explain some of the powerful effects of self-disclosure.

THE WRITING PARADIGM

BACKGROUND

Our first writing studies were based on the premise that giving people the opportunity to write about previously undisclosed traumatic experiences might improve physical health. The procedure was relatively simple and straightforward (Pennebaker, 1997). Participants were brought into the lab and told that they would be taking part in an experiment wherein they would write about an assigned topic for three or four consecutive days, for 15 to 20 min each day. Those in the experiment were assured that their writing would be anonymous and that they would not receive any feedback from the researchers of the study. Those in the experimental condition were asked to write about their deepest thoughts and feelings about the most traumatic event of



their lives. Participants assigned to the control condition were asked to write about superficial topics, such as how they use their time (Pennebaker, 1989).

The writing studies have yielded astonishing results. Most surprising is the content of the writing itself. Participants — from children to the elderly, from honor students to maximum security prisoners — disclose a remarkable range and depth of traumatic experiences. Rape, family violence, lost loves, deaths, and tragic failures have been common themes in all of the studies, with approximately half of all participants writing about experiences that most people would agree are truly traumatic. If nothing else, the writing paradigm illustrates people's readiness to disclose deeply personal aspects of their lives when given the opportunity. Even though a large number of participants report crying or being deeply upset by the experience, the overwhelming majority report that the process of writing is both valuable and meaningful. In fact, 98% of experimental participants have said that, given the choice, they would participate in a writing study again (Pennebaker, 1989).

While the nature of the writing itself is interesting, the real value of expressive writing is its influence on physical health. In our first writing study (Pennebaker & Beall, 1986), we followed the students' illness visits to the university health center in the months before and after the experiment. Compared to controls, those who wrote about emotional upheavals reduced their number of health center visits by half in the 2 months after writing.

Later writing studies from multiple labs supported the initial findings. Not only did those who wrote about traumatic experiences visit their doctor less often, but they also reported fewer physical symptoms and exhibited enhanced immune system functioning (as measured by various objective physiological measures). Joshua Smyth (1998), in a meta-analysis of 13 experimental writing studies from five labs, reported that disclosive writing was associated with improved physical and mental health, including drops in doctor visits ($d = .42$), changes in physiological functioning, including improved immune and hormonal function ($d = .68$), and reports of better psychological well-being ($d = .66$).

More recently, dozens of additional studies have been published, accepted for publication, or submitted that further demonstrate the effects of writing. Although the majority of replications and extensions have been conducted with college students, an increasing number are finding that writing about emotional topics is associated with reductions in pain behavior and medication use among chronic pain sufferers (Kelley et al., 1997; Smyth et al., 1999), fewer health visits to the infirmary of maximum security psychiatric prisoners (Richards et al., 2000), reduction of the number of days cystic fibrosis patients spend in the hospital (Taylor et al., *in press*), fewer doctor appointments and self-reported symptoms among women with breast cancer (Stanton et al., 2002), fewer doctor visits and lower levels of depression among persons with type 1 diabetes (Bodor, 2003), fewer doctor visits, improved cardiac status, and greater adherence to rehabilitation activities for those recovering from a myocardial infarction (Wilmott et al., 2003), and reduced rates of depression among victims of crime (Schoutrop et al., 1997).

Research also indicates that the health benefits of emotional writing might not be confined to writing about traumatic experiences. Studies by Laura King and colleagues have examined how writing about positive experiences can improve

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physical health. In one study (King, 2001), participants were randomly assigned to write about their most traumatic life event, their best possible future self, both of these topics, or a nonemotional control topic. Those who wrote about their best possible selves had an increase in subjective well-being. At the 5-month follow-up, those who wrote about their best possible selves as well as those who wrote only about their traumas were both significantly lower in illness than participants in the control groups. In another study (Burton & King, in *press*), people who wrote about intensely positive experiences had enhanced positive mood and fewer health center visits than controls. While more confirming evidence in this area is still needed, these studies demonstrate that perhaps one can enjoy the health benefits of writing without the emotional costs associated with writing about trauma.

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Additional Outcomes of Writing

In the late 1980s and 1990s, most writing studies focused on objective health measures, such as health center visits, medication use, medical costs, and various biological markers. An increasing number of experiments soon began to demonstrate that writing about emotional topics could potentially affect nonhealth outcomes. For example, studies found that students who write about coming to college subsequently evidenced improved grades (Cameron & Nicholls, 1998; Pennebaker & Francis, 1996). Men laid off from their jobs who wrote about their experiences found jobs more quickly than those who did not write or who wrote about time management (Spera et al., 1994).

Emotional writing can bring about positive changes in close relationships as well. In one recent study from our lab (Slatcher & Pennebaker, 2003), individuals in committed romantic relationships were asked to write about their deepest thoughts and feelings about their relationship. Those in the control condition were asked to write about time management. Two months later, those who wrote about their relationship were much more likely to still be with their romantic partner. Similarly, Lepore and Greenberg (2002) found that students assigned to expressively write about a recent relationship breakup were more likely to reunite with their ex-partner than were control participants who wrote about nonemotional topics.

Having demonstrated that simply expressing one's thoughts and emotions in writing is a powerful therapeutic tool, many researchers are now investigating the mediators, moderators, and overall parameters of this relationship. The explanations for the experimental success of the writing paradigm are still in dispute (e.g., Sloan & Marx, in *press*). Furthermore, the writing–health link appears to influence individuals along multiple levels. The following section of this chapter will discuss some of the intriguing and oftentimes unexpected findings emerging from various labs that have begun to address the underlying mechanisms of emotional writing.

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Underlying Mechanisms

While there is now solid evidence that translating emotional experiences into language can be healthy, one of the more intriguing aspects of this phenomenon has been trying to develop theories that best explain it. Over the years, theoretical views in this area have evolved tremendously. Originally, our theories were based primarily



on a model of inhibition. While the inhibition model continues to provide a number of valuable insights, many labs, including our own, are investigating the importance of cognitive and linguistic processes. Most recently, we have begun to explore the active role that writing plays on the social dynamics of people who write. Each of these theoretical positions is briefly outlined below.

Inhibitory Processes

One of the first theories to explain the effectiveness of disclosure dealt with inhibition. Specifically, it was proposed that not talking about emotional upheavals was a form of inhibition. That is, actively holding back thoughts, emotions, or behaviors was a form of stress that exacerbated a number of adverse biological processes, such as increased cortisol production and immune suppression (Traue & Deighton, 1999). According to the inhibition model, writing about an emotional topic should allow individuals to organize and assimilate previously inhibited thoughts and feelings, thus bypassing the need for further inhibition (Pennebaker, 1989). Indeed, several correlational studies have hinted that such processes can be at work (Cole et al., 1996; Gross & Levenson, 1997; Major & Gramzow, 1999). These ideas also are consistent with Wegner's (1994) work on thought suppression and ironic processing. By actively attempting to control ongoing thoughts, individuals actually end up monitoring more information at higher rates.

Despite the promise of inhibition models, direct tests of changes in inhibition among people who write about emotional topics have yielded disappointing results. For example, participants who claim that they have not previously disclosed their traumas have not differed in health outcomes vs. those who have disclosed their traumas (Greenberg & Stone, 1992). In addition, individuals have great difficulty answering (or even understanding) questions that ask them the degree to which they are actively inhibiting their thoughts, emotions, or behaviors (Pennebaker et al., 1988). Thus, at this point, the inhibition model should be considered unproven and still not adequately tested.

Cognitive Processes

Another explanation for the effects of writing is that the act of converting emotions and images into words changes the way a person organizes and thinks about an emotional experience. During an emotional upheaval, part of the distress caused by the trauma results not just from the events themselves but in the person's reaction to them. By integrating thoughts and feelings, one can then construct more easily a coherent narrative of an experience. Once this integration takes place, the event can be summarized, stored, and forgotten more efficiently.

The various explicit and implicit cognitive models have focused on different facets of cognitive construction and narrative construction. Smyth and his colleagues (1999), for example, have assumed that writing fundamentally organizes an upsetting experience. As an indirect test of this, the authors had people write about a trauma in either an organized or unstructured way. Only the organized writing resulted in health and mood improvements.



Using a different analysis strategy of looking directly at the ways individuals write about emotional topics, several researchers are now finding support for the idea that constructing a narrative over the course of writing helps individuals to better integrate the experience. Specifically, by looking at word usage (e.g., an increasing use of cognitive words over the days of writing), health improvements are efficiently predicted. These word patterns have now been reported in multiple studies (Campbell & Pennebaker, 2003; Keough et al., 1998; Klein & Boals, 2001; Pennebaker & Francis, 1996; Pennebaker et al., 1997; Petrie et al., 1998).

Social Integration

Self-disclosure, by nature, is an inherently social activity. The ultimate purpose of language is to communicate ideas and thoughts with other people. The fact that writing about emotional topics can improve health suggests that talking about emotional topics with other people serves the same purpose (Pennebaker & Graybeal, 2001; Mehl & Pennebaker, 2003). When someone talks to other people about his or her experiences, it alerts them to the person's psychological state and ultimately allows him or her to remain socially tied to them. Conversely, people who have traumatic experiences and do not tell their friends are more likely to live in a detached, isolated state. Consistent with this approach, Rimé (1995) argues that disclosure in the first days or weeks after a trauma has the power to change the quality of a person's social network by bringing people closer together. Disclosure, then, serves as a force of social integration. Rimé suggests that even private disclosure (as well as with writing) helps free a person from the stress of a nondisclosed event, which ultimately allows for greater social integration.

Rimé's work, as well as some of our own, is consistent with many of the social integration ideas first suggested by Durkheim (1951) wherein mental health was viewed as the result of the relationship between individuals and their social worlds. Durkheim and, more recently, a growing number of social support researchers (e.g., Cohen et al., 2000; Cutrona, 1989; Pierce et al., 1991) have argued that individuals' relations with others must be viewed from both the individuals' needs and those of their potential social network. But with a few notable exceptions (e.g., Bradbury & Fincham, 1992; Dunkel-Schetter et al., 1992), most work that attempts to look at social support and integration has relied exclusively on self-reports rather than on objective changes in peoples' social interactions or relationships.

Social integration remains a somewhat ambiguous concept in psychology — we are yet unable to precisely label or measure its causes and constituents. Commonly, social integration is conceptualized as a sense of belonging, cohesion, confidence, and security with others (e.g., Antonovsky, 1993). The problem is that most attempts to tap this construct have relied on people's self-reports. There is good reason to believe that more objective indicators of social integration are needed — measures that tap the degree to which people are fluidly talking with one another. This could include measures of linguistic synchrony between people (e.g., Niederhoffer & Pennebaker, 2002), general interaction patterns, and the ways people naturally approach their social worlds (Mehl & Pennebaker, 2003). Future research on social

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integration and writing must thus explore the obvious and subtle ways that social behaviors shift in the days and weeks after expressive writing.

Other Explanatory Models

While the inhibitory, cognitive, and social integration models have been the dominant theories of the last few years, other explanations for the effectiveness of emotional writing have been examined. One problem is that many of these approaches are examining the disclosure–health relationship from different levels of analysis. Thus, several models could all be true. In addition to the inhibitory and cognitive approaches, some additional explanations for the writing paradigm have been suggested (see also a recent review by Sloan & Marx, in *press*).

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Habituation

Greenberg et al. (1996) reported the results of a fascinating project wherein previously traumatized students wrote about either their own personal trauma or someone else's trauma as though it were their own or, in a third group, superficial topics. The authors found that writing about an imaginary trauma was as effective as writing about one's own trauma. They argue that the mere writing of an emotional topic helps to habituate the person to the emotions aroused by the topic (cf. Mendolia & Kleck, 1993).

Individual Differences

An ongoing debate in the writing–health research area concerns the degree to which individual differences might moderate the benefits of translating experiences into words. Most studies drawing on normal populations have failed to find consistent personality markers. However, studies drawing extreme samples of high and low hostility (Christensen & Smith, 1993) and alexithymia (Paez et al., 1999; Solano et al., 2003) suggest that those naturally more hostile and unable to verbalize their feelings might benefit more than low hostile or alexithymic individuals (for a review, see Lumley et al., 2002). Similarly, Smyth's (1998) meta-analysis indicates that males might benefit more from writing than females.

Explorations into Language

Language, by its very nature, is a social tool. Many of the behavioral effects associated with writing — better grades, fewer illnesses, ability to get better jobs, etc. — are indirectly and directly social. What several studies are now indicating is that the cognitive changes that can result from writing change the writers' relationships with others in their social worlds. Whereas the immediate effect of writing is to change how an individual thinks about trauma, the salutary effects are likely to be linked to the social changes that result from these cognitive changes.

In postexperiment interviews with participants from our first writing studies, it was clear that they were gaining more through the writing than simply disclosing would suggest. In listening to the language that participants used to recount their experiences — such as “realize,” “understand,” “come to terms,” “getting past,” and so forth — writing was fostering a better understanding of both themselves and the



situations about which they wrote. On an intuitive level, an individual's cognitive reorganization was crucial for the positive outcomes that were emerging. To further investigate this idea, we wanted to find an empirical way to examine the writers' essays more closely to see if language use could predict improvements in health among those who had written about emotional topics.

DEVELOPMENT OF TOOLS TO ANALYZE LANGUAGE

To develop a standardized way of measuring the ways people use words that express emotions and thoughts, we developed a computer program called the Linguistic Inquiry and Word Count (LIWC) that could analyze essays in text format. LIWC was developed by having groups of judges evaluate the degree to which over 2000 words or word stems were related to each of several dozen categories. Although there are now over 70 word categories in the most recent version of the LIWC program (LIWC2001, Pennebaker et al., 2001), only 4 were of primary interest to us. Two of the categories were emotion dimensions and the other two were cognitive. The emotion categories included negative emotion words (e.g., sad, angry) and positive emotion words (e.g., happy, laugh). The two cognitive categories, causal words (e.g., because, reason) and insight words (e.g., understand, realize), were intended to capture the degree to which participants were actively thinking in their writing. For each essay that a person wrote, we were able to quickly compute the percentage of total words that these and other linguistic categories represented.

LIWC allowed us to go back to previous writing studies and link word usage among individuals in the experimental conditions with various health and behavioral outcomes. Analyzing the use of negative and positive emotion words, two important findings were revealed (Pennebaker et al., 1997). First, the more that people used positive emotion words, the more their health improved. Negative emotion word use also predicted health changes but in an unexpected way. Individuals who used a moderate number of negative emotions in their writing about upsetting topics evidenced the greatest drops in physician visits in the months after writing. That is, those people who used a very high rate of negative emotion words and those who used very few were the most likely to have continuing health problems after participating in the study. In many ways, these findings are consistent with others in the literature. Individuals who tend to use very few negative emotion words are undoubtedly most likely to be characterized as repressive copers — people who Weinberger et al. (1979) have defined as poor at being able to identify and label their emotional states. Those who overuse negative emotion words might well be the classic high neurotic or high negative affect (Watson & Clark, 1984) individuals. These individuals are people who ponder their negative emotions in exhaustive detail and who might simply be in a recursive loop of complaining without attaining closure. Indeed, this can be exacerbated by the inability of these individuals to develop a story or narrative.

Although the findings concerning emotion words use were intriguing, the results surrounding the cognitive word categories were even more robust. Recall that in our studies, people wrote for 3 to 5 days, 15 to 30 min per day. As they wrote, they

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gradually changed what they said and how they said it. The LIWC analyses showed strong and consistent effects for changes in insight and causal words over the course of writing. Specifically, people whose health improved, who got higher grades, and who found jobs after writing went from using relatively few causal and insight words to using a high rate of them by the last day of writing. In reading the essays of people who showed this pattern of language use, it became apparent that they were constructing a story over time. Building a narrative, then, seemed to be critical in reaching understanding. Interestingly, those people who started the study with a coherent story that explained some past experience did not benefit from writing (see Gergen & Gergen, 1988; Mahoney, 1995; Meichenbaum & Fong, 1993).

An alternative computer-based approach to linguistic analysis relies on more inductive ways of establishing the pattern of word use. One particularly promising strategy is latent semantic analysis (LSA) (e.g., Landauer & Dumais, 1997). A technique such as LSA is akin to a factor analysis of individual words. By establishing the factor structure of a large number of writing samples, it is possible to learn how any new writing samples are similar to one another.

Across a series of style-based LSA analyses, we have discovered that particles or function words are related to a variety of social and psychological processes (Pennebaker et al., 2003). Particles include pronouns, prepositions, articles, conjunctions, and auxiliary verbs. These words are markers of people's linguistic styles and tell us how people talk rather than the content of what they are saying. Overall, the use of particles in general and pronouns in particular has been found to correlate highly with health improvements. In essence, the more that individuals shift in their use of pronouns from day to day in writing, the more their health improves. Indeed, across three separate studies, pronoun shifts among trauma writers correlated between .3 and .5 with changes in physician visits (Campbell & Pennebaker, 2003).

Closer inspection of these data suggest that healthy writing is associated with a relatively high number of self-references on some days but not others. Alternatively, people who always write in a particular voice — such as first-person singular — simply do not improve. Although our LSA studies are still in the early stages, they are suggesting that the ability to change perspective in dealing with an emotional upheaval might be critically important. The data also indicate that pronouns can be an overlooked linguistic dimension that could have an important meaning for researchers in health and social psychology.

Exploring Language and Emotional Expression in the Real World

In our most recent studies, we are investigating whether writing could facilitate social integration, whether one of the health benefits of writing enables individuals to better connect with their social group. Do people begin to interact differently with others, or perhaps see themselves in a new light after writing about an emotional topic? To explore these ideas, we have attempted to capture how people naturally talk and interact with others by developing the electronically activated recorder (EAR) — a simple tape recorder with an attached computer chip that records for 30 seconds every 12 min. The EAR is a lightweight and nonintrusive device worn by participants for two consecutive days. A small external microphone allows



researchers to hear pieces of conversations, as well as determine where participants are and what they are doing (Mehl et al., 2000).

In the first study (Mehl & Pennebaker, 2003), participants wore the EAR for two consecutive days, 2 weeks prior to as well as 2 weeks after having participated in a routine writing study. Transcriptions of the conversations yielded promising results in terms of participants' physical behaviors, as well as their language as analyzed by LIWC. Compared to participants in the control condition, where they were asked to write about time management, trauma writers began talking to their friends more, laughing more, and using significantly more positive emotions in their daily language. Trauma writers also demonstrated significant drops in their resting levels of both diastolic and systolic blood pressure. Similarly, writing about emotion appears to have encouraged participants to use more present-tense words and less past tense. Interestingly, these effects were far stronger for men, who are naturally less socially integrated than women.

More recently, EAR was used to analyze social interactions during the days surrounding the terrorist attacks of September 11, 2001 (Mehl & Pennebaker, in press). In this study, participants wore the EAR for 10 days, from September 11 to 21. Prebaseline data were available for all participants. In examining participants' interactions, an intriguing trend emerged. While participants did not change in their overall amount of interactions after 9/11, they gradually shifted from group conversations to dyadic interactions. In a set of exploratory analyses, this natural shift toward dyadic encounters tended to predict better subsequent psychological adjustment in the form of fewer 9/11 intrusions and avoidance behaviors. Consistent with our previous discussion of social integration, this suggests that dyadic interactions can facilitate psychological coping during traumatic events. Following an emotional upheaval, one-on-one encounters can provide the intimacy needed to reaffirm one's shaken worldviews, reevaluate and calibrate one's beliefs and opinions, and help come to terms with what happened by gradually developing a personal narrative.

In addition to the EAR system, we have found instant messaging (IM) to be an effective tool in examining social interactions outside of the lab. For many, IM is quickly replacing e-mail as their preferred mode of online dyadic communication (Pew Internet and American Life Project, 2003). Unlike e-mail, IM allows its users to chat with each other in real time so that a conversation can unfold much in the same way that spoken conversation does. In a recent study (Slatcher & Pennebaker, 2003), we collected 10 days of instant messages from undergraduate couples. On days 4 to 6 of the study, one person from each couple either wrote about their deepest thoughts and feelings about their relationship or completed a time management exercise. In the instant messages that followed the writing assignments, those who wrote about their relationships used significantly more positive emotion words than those who wrote about time management. Further, the partners of those in the relationship writing condition used significantly more positive emotion words as well. Two months later, those couples who wrote about their relationship were more likely to still be dating each other. These findings lend strong support to the idea that the effects of emotional expression extend to people's interpersonal relationships, thus helping them to become more integrated into their social networks.

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CONCLUSIONS

Traumatic events have the ability to negatively affect nearly every aspect of one's life. In addition to making us depressed, anxious, and sick, they change the ways in which we interact with friends, loved ones, and others with whom we come into contact on a daily basis. As we have discovered through our own research, the social impact of emotional upheavals is profound. By choosing to share or inhibit our thoughts and feelings about a traumatic event, we have the power not only to determine how we cognitively and emotionally process the event, but also to shape the ways in which we interact with others and how others perceive us. If, for example, one chooses to retreat into himself after the death of a loved one, various social consequences might follow. Not only is this person giving up an opportunity for social support, but by not talking with people about the event, he might cause others to misconstrue the reasons for his retreat.

On the other hand, if people choose to disclose a traumatic event to others, they might strengthen personal relationships with others and help them to better cognitively process the event. It is becoming clear that this process of social integration is key to moving past trauma and developing a more coherent social world. Further, it suggests that we should be focusing on models of integration and coherence in far greater detail. By social integration, we propose that people are able to talk more openly about their thoughts and feelings, spend more time with others, use more emotion words, and laugh more with one another on a daily basis.

The benefits of social integration extend beyond interpersonal relationships. The more socially integrated people are, the more they should be able to remain focused on various daily tasks and goals and spend less time ruminating about emotional events. This process seems to occur not only in the case of personal trauma, but during shared trauma as well — such as the terrorist attacks of September 11 — during which social sharing can help to maintain our shared beliefs and perceptions of the world. This approach to social integration is much more active and dynamic than traditional views of social support. In line with Durkeim (1951) and others, we assume that traumatized individuals are active in selecting and taking part in their social worlds.

Recent research suggests that looking at language in a real-world context will help us to clarify the role that social integration plays in helping people to process and move past traumatic events. Using computer-aided technology such as the EAR system, instant messaging, and LIWC, it is now possible to measure social and linguistic behaviors among individuals for several weeks or even months. In doing so, we hope to gain more insight into how emotional upheavals alter our social worlds. Tracking how people naturally talk and interact should help us to refine and better understand the underlying processes that account for the now well-established psychological and health benefits of self-disclosure.

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