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Expressive Writing, Emotional Upheavals, and Health

There is a long history in psychology and medicine linking the occurrence of traumatic experiences with subsequent physical and mental health problems. What is it about a trauma that influences health? Several candidates immediately come to mind. Psychologically, personal upheavals provoke intense and long-lasting emotional changes. The unexpected events are generally associated with cognitive disruption including rumination and attempts to understand what happened and why. Socially, traumas are known to cause wholesale disruptions in people's social networks. Behaviorally, and perhaps because of the social and psychological changes, traumas are often associated with lifestyle changes such as unhealthy smoking, drinking, exercise, sleeping, and eating patterns. Each of these psychological, social, and behavioral effects is associated with a host of biological changes including elevations in cortisol, immune disruption, cardiovascular changes, and a cascade of neurotransmitter changes.

Individuals who are highly reactive to novel stimuli (Vaidya & Garfield, 2003), are highly anxious (Miller, 2003), avoidant, and self-blaming (Sutker, Davis, Uddo, & Ditta, 1995), and high in hypnotic ability (Bower & Sivers, 1998) may be particularly susceptible to traumatic experiences. Similarly, the more extreme the trauma and the longer time over which it lasts are predictors of Post-Traumatic Stress Disorder (PTSD) incidence (e.g., Breslau, Chilcoat, Kessler, & Davis, 1999). It is also generally agreed that people most prone to PTSD have had a history of depression, trauma, and other PTSD episodes in the past even prior to their most recent traumatic experience (cf., Miller, 2003).

Perhaps more surprising than the discovery of the trauma-illness link is in realizing that most people don't become sick after a trauma. There is another group of perhaps 30% who do not evidence PTSD symptoms but are still upset by the experience several weeks and months

after. In a classic article, Wortman and Silver (1989) summarized several studies showing that at least half of people who have faced the death of a spouse or child did not experience intense anxiety, depression, or grief. Numerous studies report that at least 65 percent of male and female soldiers who have lived through horrific battles or war-zone stress never show any evidence of PTSD (Keane, 1998; Murray, 1992). Multiple studies with individuals who have survived major motor vehicle accidents (Brom, Kleber, & Hofman, 1993) or witnessed tragic airplane accidents (Carlier & Gersons, 1997) find that the majority of research participants did not experience depression or PTSD in the weeks or months after their experiences. Across studies, 40-80 percent of rape survivors did not evidence symptoms of PTSD (Kilpatrick, Resnick, Saunders, & Best, 1998; Resnick, Kilpatrick, & Lipovsky, 1991).

Why is it that some people seem to deal with major upheavals better than others? What is the profile of healthy coping? This, of course, is a central question among trauma researchers. We know, for example, that people with an intact social support group weather upheavals better than others (e.g., Murray, 1992). Beyond basic genetic predispositions, do some people adopt certain coping strategies that allow them to move past an upheaval more efficiently? If such coping strategies exist, can they be trained? If such techniques are available, how do they work?

Given that as many as 30% of people who face massive traumatic experiences will experience PTSD, what can we, as researchers and clinicians, do to reduce this rate? It is likely that many (perhaps most) PTSD-prone individuals will not benefit from any simple interventions. The nature of their trauma, their genetic, biological, and/or personality predispositions, or pre-trauma life experiences will override social or psychological therapies. Nevertheless, some PTSD-prone individuals as well as the majority of distressed but sub-clinical

cases may benefit by focusing on their psychological and social worlds in the wake of their traumatic experiences.

As we lay out in this chapter, there is reason to believe that when people transform their feelings and thoughts about personally upsetting experiences into language, their physical and mental health often improve. The links to PTSD are still tenuous. However, an increasing number of studies indicate that having people write about traumas can result in healthy improvements in social, psychological, behavioral, and biological measures. As with the trauma-illness link, however, there is probably not a single mediator that can explain the power of writing. One promising candidate that is proposed concerns the effects of translating emotions into language format, or as we suggest, a metaphorical translation of an analog experience into a digital one.

Emotional Upheavals, Disclosure, and Health

Not all traumatic events are equally toxic. By the 1960s, Holmes and Rahe (1967) suggested that the health impact of a trauma varied with the degree that the trauma disrupted a person's life. Interestingly, the original scales tapping the health risks of traumas generally measured socially acceptable traumas – death of spouse, loss of job. No items asked if the participant had been raped, had a sexual affair, or had caused the death of another. By the mid-1980s, investigators started to notice that upheavals that were kept secret were more likely to result in health problems than those that could be spoken about more openly. For example, individuals who were victims of violence and who had kept this experience silent were significantly more likely to have adverse health effects than those who openly talked with others (Pennebaker & Susman, 1988). In short, having any type of traumatic experience is associated with elevated illness rates; having any trauma and not talking about it further elevates the risk.

These effects actually are stronger when controlling for age, sex, and social support. Apparently, keeping a trauma secret from an intact social network is more unhealthy than not having a social network to begin with (cf., Cole, Kemeny, Taylor, & Visscher, 1996).

If keeping a powerful secret about an upsetting experience is unhealthy, can talking about it – or in some way, putting it into words be beneficial? This is a question we asked two decades ago. Going on the untested assumption that most people would have had at least one emotional upheaval that they had not disclosed in great detail, we began a series of studies that involved people writing and, in some cases, talking about these events.

In the first study, people were asked to write about a trauma or about superficial topics for four days, 15 minutes per day. We found that confronting the emotions and thoughts surrounding deeply personal issues promoted physical health, as measured by reductions in physician visits in the months following the study, fewer reports of aspirin usage, and overall more positive longterm evaluations of the effect of the experiment (Pennebaker & Beall, 1986). The results of that initial study have led to a number of similar disclosure studies, in our laboratory and by others, with a wide array of intriguing results. Next we briefly review the paradigm and basic findings.

The basic writing paradigm. The standard laboratory writing technique has involved randomly assigning participants to one of two or more groups. All writing groups are asked to write about assigned topics for one to five consecutive days, for 15 to 30 minutes each day. Writing is generally done in the laboratory with no feedback given. Those assigned to the control conditions are typically asked to write about superficial topics, such as how they use their time. The standard instructions for those assigned to the experimental group are a variation on the following:

> For the next three days, I would like for you to write about your very deepest thoughts and feeling about the most traumatic experience of your entire life. In your writing, I'd like you to really let go and explore your very deepest emotions and thoughts. You might tie this trauma to your childhood, your relationships with others, including parents, lovers, friends, or relatives. You may also link this event to your past, your present, or your future, or to who you have been, who you would like to be, or who you are now. You may write about the same general issues or experiences on all days of writing or on different topics each day. Not everyone has had a single trauma but all of us have had major conflicts or stressors – and you can write about these as well. All of your writing will be completely confidential. Don't worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.

Whereas the original writing studies asked people to write about traumatic experiences, later studies expanded the scope of writing topics to general emotional events or to specific experiences shared by other participants (e.g., diagnosis of cancer, losing a job, coming to college). The amount of time people have been asked to write has also varied tremendously from 10 minutes to 30 minutes for 3, 4, or 5 days – sometimes within the same day to once per week for up to 4 weeks.

The writing paradigm is exceptionally powerful. Participants--from children to the elderly, from honor students to maximum security prisoners--disclose a remarkable range and depth of human experiences. Lost loves, deaths, sexual and physical abuse incidents, and tragic failures are common themes in all of our studies. If nothing else, the paradigm demonstrates that when individuals are given the opportunity to disclose deeply personal aspects of their lives, they

readily do so. Even though a large number of participants report crying or being deeply upset by the experience, the overwhelming majority report that the writing experience was valuable and meaningful in their lives.

The interest in the expressive writing method has grown over the years. The first study was published in 1986. By 1996, approximately 20 studies had been published. By 2006, well over 150 have been published in English language journals. Although many studies have examined physical health and biological outcomes, an increasing number of explored writing's effects on attitude change, stereotyping, creativity, working memory, motivation, life satisfaction, school performance, and a variety of health-related behaviors. It is beyond the scope of this chapter to provide a detailed review of the findings of the writing paradigm. Rather, we briefly summarize some of the more promising findings before focusing on the underlying mechanisms that may be at work.

Effects of disclosure on health-related outcomes. Researchers have relied on a variety of physical and mental health measures to evaluate the effect of writing. Writing or talking about emotional experiences relative to writing about superficial control topics has been found to be associated with significant drops in physician visits from before to after writing among relatively healthy samples. Over the last decade, as the number of expressive writing studies has increased, several meta-analyses either have been conducted or are being conducted as of this writing.

The original expressive writing meta-analysis was published by Joshua Smyth (1998) as was based on 14 studies using healthy participants. His primary conclusions were that the writing paradigm is associated with positive outcomes with a weighted mean effect size of d=.47 ($r=.23$, $p<.0001$), noting that this effect size is similar to or larger than those produced by other psychological interventions. The highest significant effect sizes ($p<.0001$) were for

psychological (d=.66) and physiological outcomes (d=.68), which were greater than those for health (d=.42) and general functioning outcomes (d=.33). A non-significant effect size was found for health behaviors. He also found that longer intervals between writing sessions produced larger overall effect sizes, and that males benefited more from writing than did females.

Almost seven years after the Smyth article was published, another meta-analysis by Meads (2003) was released by the Cochran Commission. In an analysis of dozens of studies, the author concluded that there was not sufficient evidence to warrant adopting the writing method as part of clinical practice. One problem that the report underscored was the lack of any large randomized clinical trials (RCTs) that were based on large, clearly identified samples. Coming from a medical background, the Meads article was befuddled by the fact that most of the experimental studies of expressive writing were more theory-oriented and not aimed at clinical application. Since the release of the Meads paper, a new wave of RCTs are now being conducted with a diverse group of patient populations.

Most recently, Frisina, Borod, and Lepore (2004) performed a similar meta-analysis on 9 writings studies using clinical populations. They found that expressive writing significantly improved health outcomes (d=.19, $p<.05$). However, the effect was stronger for physical (d=.21, p=.01) than for psychological (d=.07, p=.17) health outcomes. The authors suggested that a possible reason for these small effect sizes were due to the heterogeneity of the samples. Writing was less effective for psychiatric than physical illness populations.

Researchers have relied on a variety of physical and mental health measures to evaluate the effect of writing. Across multiple studies in laboratories around the world, writing or talking about emotional experiences relative to writing about superficial control topics has been found to

be associated with significant drops in physician visits from before to after writing among relatively healthy samples. Writing and/or talking about emotional topics has also been found to influence immune function in beneficial ways, including t-helper cell growth (using a blastogenesis procedure with the mitogen PHA), antibody response to Epstein-Barr virus, and antibody response to hepatitis B vaccinations (for reviews, see Lepore & Smyth, 2002; Pennebaker & Graybeal, 2001; Sloan & Marx, 2004a).

Activity of the autonomic nervous system is also influenced by the disclosure paradigm. Among those participants who disclose their thoughts and emotions to a particularly high degree, skin conductance levels are significantly lower during the trauma disclosures than when describing superficial topics. Systolic blood pressure and heart rate drops to levels below baseline following the disclosure of traumatic topics but not superficial ones (Pennebaker, Hughes, & O'Heeron, 1987). In short, when individuals talk or write about deeply personal topics, their immediate biological responses are congruent with those seen among people attempting to relax. McGuire, Greenberg, and Gevirtz (2005) have shown that these effects can carry over to the longterm in participants with elevated blood pressure. One month after writing, those who participated in the emotional disclosure condition exhibited lower systolic and diastolic blood pressure (DBP) than before writing. Four months after writing, DBP remained lower than baseline levels.

Similarly, Sloan and Marx (2004b) found that participants in a disclosure condition exhibited greater physiological activation, as indexed by elevated cortisol levels, during their first writing session, relative to controls. Physiological activation then decreased, and was similar to that of controls in subsequent writing sessions. The initial elevation in cortisol from the first writing session predicted improved psychological but not physical health at one month

follow-up. It is possible that confronting a traumatic or distressing experience led to reactions aimed for in exposure-based treatments (e.g. Foa & Rothbaum, 1988).

Behavioral changes have also been found. Students who write about emotional topics evidence improvements in grades in the months following the study (e.g., Lumley & Provenzano, 2003). Senior professionals who have been laid off from their jobs get new jobs more quickly after writing (Spera, Buhrfeind & Pennebaker, 1994). Consistent with the direct health measures, university staff members who write about emotional topics are subsequently absent from their work at lower rates than controls. Interestingly, relatively few reliable changes emerge using self-reports of health-related behaviors. That is, in the weeks after writing, experimental participants do not exercise more or smoke less. The one exception is that the study with laid off professionals found that writing reduced self-reported alcohol intake.

Self reports also suggest that writing about upsetting experiences, although painful in the days of writing, produces long-term improvements in mood and indicators of well-being compared to controls. Although some studies have failed to find clear mood or self-reported distress effects, Smyth's (1998) meta-analysis on written disclosure studies indicates that, in general, writing about emotional topics is associated with significant reductions in distress.

Procedural differences that affect the expressive writing. Writing about emotional experiences clearly influences measures of physical and mental health. In recent years, several investigators have attempted to define the boundary conditions of the disclosure effect. Some of the most important findings are as follows:

Topic of disclosure. Although two studies have found that health effects only occur among individuals who write about particularly traumatic experiences (Greenberg & Stone, 1992; Lutgendorf et al., 1994), most studies have found that disclosure is more broadly

beneficial. Choice of topic, however, may selectively influence outcomes. Although virtually all studies find that writing about emotional topics has positive effects on physical health, only certain assigned topics appear to be related to changes in grades. For beginning college students, for example, when asked to write specifically about emotional issues related to coming to college, both health and college grades improve. However, when other students are asked to write about emotional issues related to traumatic experiences in general, only health improvements – and not academic performance – are found (see Pennebaker, 1995; Pennebaker & Keough, 1999).

Over the last decade, an increasing number of studies have experimented with more focused writing topics. Individuals diagnosed with breast cancer, lung cancer, or HIV, have been asked to write specifically about their living with the particular disease (e.g., de Moor, et al, 2002; Mann, 2002; Petrie, et al., 2004; Stanton & Danoff-Burg, 2002). Similarly, people who have lost their job have been asked to write about that experience (Spera et al., 1994). In each case, however, participants are asked to write about this topic in a very broad way and are encouraged to write about other topics that may be only remotely related. For example, in the job layoff project, participants in the experimental conditions were asked to explore their thoughts and feeling about losing their jobs. Fewer than half of the essays dealt directly with the layoff. Others dealt with marital problems, issues with children, money, and health.

It has been our experience that traumatic experiences often bring to the fore other important issues in people's lives. As researchers, we assume that, say, the diagnosis of a life-threatening disease is the most important issue for a person to write about in a cancer-related study. However, for many, this can be secondary to a cheating husband, an abusive parent, or some other trauma that may have occurred years earlier. We recommend that writing researchers

and practitioners provide sufficiently open instructions to allow people to deal with whatever important topics they want to write about. As described in greater detail below, the more that the topic or writing assignment is constrained, the less successful it usually is.

Topic orientation: focusing on the good, the bad, or the benefits. There are a number of theoretical and practical reasons to assume that some strategies for approaching emotional upheavals might be better than others. With the growth of the field of Positive Psychology, several researchers have reported on the benefits of having a positive or optimistic approach to life (Carver & Scheier, 2002; Diener, Lucas, & Oishi, 2002; Seligman, 2000). Particularly persuasive have been a series of correlational studies on benefit finding – that is, people who are able to find benefits to negative experiences generally report less negative affect, milder distress, fewer disruptive thoughts, and greater meaningfulness in life. People who engage in benefit-finding fare better on objective physical and mental health outcomes (e.g. children's developmental test scores, recurrence of heart attacks) even after controlling for a host of possible confounding factors (for a review, see Affleck and Tennen, 1996). Being able to see things in a positive light, then, might be a critical component to successful adjustment.

In one study examining adjustment to college, Cameron and Nicholls (1998) had participants previously classified as dispositional optimists or pessimists write in one of three conditions: a self-regulation condition (writing about thoughts and feelings towards coming to college and then formulating coping strategies), a disclosure condition (writing about thoughts and feelings only), or a control task (writing about trivial topics). Overall, participants in the disclosure task had higher GPA scores at follow-up, but only those in the self-regulation task experienced less negative affect and better adjustment to college over the control participants. Optimists visited their doctors less in the following month if they had participated in either of the

experimental writing conditions. On the other hand, only pessimists in the self-regulation condition had significantly fewer visits to the doctor after the study. With the added encouragement of formulating coping strategies, pessimists may be able to reap the same health benefits from writing about their thoughts and feelings as optimists naturally might do.

When confronting traumatic experiences, is it best to ask people to simply write about them or to write about the positive sides of the experiences? Several studies have addressed this question. Particularly interesting has been a series of studies by Laura King and her colleagues. When asked to write about intensely positive experiences (IPE) or control topics, participants who wrote about IPEs reported significantly better mood, and fewer illness-related health center visits than did those who wrote about trivial topics (Burton & King, 2004). In another study, students were asked to write about traumas in the standard way (King & Miner, 2000). In the benefit-finding condition, participants were encouraged to focus on the benefits that have come from the trauma. Finally, in the mixed condition, participants were first asked to write about the trauma, and then to switch to the perceived benefits arising from the trauma experience. Counter to predictions, the trauma only and benefits only participants evidenced health improvements whereas the mixed group did not. It could be that writing about the perceived benefits is enough to organize thoughts and feelings about a trauma, and to cope effectively. However, as evidenced from the mixed condition, if people aren't able to integrate their perceived benefits into their trauma story in their own way, writing may be ineffective.

Several unpublished studies from our own lab paint a similar picture about the problems of constraining participants' orientations. For her dissertation, Cheryl Hughes (1994) asked students to write either about the positive or the negative aspects of their coming to college for 3 days. Neither group evidenced any benefits of writing compared to a non-emotional control

condition. Indeed, both groups complained that there were some real negative (in the positive condition) and positive (in the negative condition) aspects of coming to college that they also wanted to write about. Similarly, in an unpublished project by Lori Stone (2002), students were asked to write about their thoughts and feelings about the September 11 attacks. In one condition, they received the standard unconstrained instructions. In a second condition, participants were asked to focus on their own feelings on one day and on other perspectives on alternating days. The perspective-switching instructions proved to be less beneficial than the unconstrained methods.

Although several variations on the expressive writing method have been tested, none have been found to be consistently superior to the original trauma writing or other methods that encourage the participants' freely choosing their writing topic. Forcing individuals to write about a particular topic or in a particular way may cause them to focus on the writing itself rather than the topic and the role of their emotions in the overall story.

Writing versus talking alone versus talking to others. Most studies comparing writing alone to talking either into a tape recorder (Esterling, et al., 1994) or to a therapist in a one-way interaction (Murray, Lamnin, & Carver, 1989; Donnelly & Murray, 1991) find comparable biological, mood, and cognitive effects. Talking and writing about emotional experiences are both superior to writing about superficial topics.

A striking exception to this was a study by Gidron, Peri, Connolly, and Shalev (1996) where a group of 14 Israeli PTSD patients were randomly assigned to either write about traumas (N = 8) or about superficial topics (N = 6) on three occasions. After writing, experimental participants were asked to discuss their most traumatic events to a group whereas controls were asked to describe a daily routine. Unlike all other published writing studies, this one found that

experimental participants were significantly more distressed with poorer health at 5-week followup. Because other studies have been conducted with participants coping with PTSD, the findings are not solely due to the nature of the participants or disorder. Rather, reading or discussing one's traumas in a group format after writing may pose unexpected problems. Clearly, additional research is needed to help understand this process.

Actual or implied social factors. Unlike psychotherapy and everyday discussions about traumas, the writing paradigm does not employ feedback to the participant. Rather, after individuals write about their own experiences, they are asked to place their essays into an anonymous-looking box with the promise that their writing will not be linked to their name. In one study comparing the effects of having students either write on paper that would be handed in to the experimenter or on a magic pad (wherein the writing disappears when the person lifts the plastic writing cover), no autonomic or self-report differences were found (Czajka, 1987). The benefits of writing, then, occur without explicit social feedback. Nevertheless, the degree to which people write holding the belief that some symbolic other person may "magically" read their essays can never be easily determined.

Typing, handwriting, and finger-writing. Although no studies have compared ways of writing on health outcomes, a few have explored if mode of writing can influence people's ratings of the expressive writing procedure itself. Brewin and Lennard (1999), for example, reported that writing by hand produced more negative affect, and led to more self-rated disclosure than did typing. One possibility is that writing by hand is slower and encourages individuals to process their thoughts and feelings more deeply. Recently, the first author has tested the idea of finger writing. In finger writing exercises, people are asked to use their finger and to "write" about a trauma as if they were holding a pen. Over the last two years, six

expressive writing workshops have been given in Wisconsin, Sweden, Australia, England, The Netherlands, and England that involved a total of 227 participants (mean age = 44.5, SD =12.3; 73% female) in groups ranging from 28 to 71 people.

In each workshop, participants have been asked to write for 5-10 minutes about an emotional topic on three occasions. For two of the three times, people are asked to write using a pen and one time with their finger. At the conclusion of the 4-6 hour workshop, individuals are asked to rate "how valuable and meaningful" each of the writing exercises had been. Along a 7-point unipolar scale, where 7 = a great deal, the mean rating for the finger writing has been 5.81 (SD=2.30) and the mean for the two pen-writing occasions has been 5.84. Interestingly, women significantly prefer the finger writing to men. When queried about their preference for finger writing, many women reported that finger writing allowed them to freely express some of their most secret thoughts. Indeed, in every workshop, several people reported that they used more swear words when finger writing compared to writing with a pen.

Timing: How long after a trauma. In the last 30 years, advances in emergency medicine have been astounding. Although we know how to treat people medically in the first hours and days after a trauma, our knowledge about psychological interventions during the same time period has grown very little. Without the guidance of any research, several groups have created immediate crisis intervention businesses. Perhaps the most successful, now called Critical Incident Stress Management (CISM, e.g., Mitchell & Everly, 1996), argues that people victimized by trauma should be attended to within the first 72 hours after a trauma. Although the CISM system has many components, the most interesting and controversial encourages individuals to openly acknowledge their emotions and thoughts within a group concerning the trauma. The CISM system has now been adopted by thousands of businesses, governmental

organizations, and other groups around the world. Despite the intuitive appeal of CISM, there is very little evidence that it works. Indeed, most studies suggest that it is more likely to cause harm than benefits (McNally, Byrant, & Ehlers, 2003; Wessley, Rose, & Bison, 1999).

The CISM findings as well as other projects interested in self-disclosure immediately have an upheaval have relevance for the timing for an expressive writing intervention. For example, one study asked women who had recently given birth to talk about their deepest thoughts, feelings, and fears to their midwives. These women were actually more likely to subsequently experience depression than women not asked to talk about these topics (Small, Lumley, Donohue, Potter, & Waldenstrom, 2000). Women who were asked to write about the treatment they were undergoing for breast cancer during the last week of radiation treatment evidenced no benefits for any measures compared to controls (Walker, Nail, & Croyle, 1999).

Is there an optimal time after a trauma that expressive writing would most likely work? Unfortunately, no parametric studies have been conducted on this. Over the years, we have been involved in several projects that have attempted to tap people's natural disclosure patterns in the days and weeks after upheavals. For example, using a random digit dialing in the weeks and months after the 1989 Loma Prieta Earthquake in the San Francisco Bay area, we asked different groups of people the number of times that they had thought about and talked about the earthquake in the previous 24 hours. We used a similar method a year later to tap people's responses to the declaration of war with Iraq during the first Persian Gulf War. In both cases, we found that people talked with one another at very high rates in the first 2-3 weeks. By the 4th week, however, talking rates were extremely low. Rates of thinking about the earthquake and war showed a different pattern: it took considerably longer (about 8 weeks) before people reported thinking about them at low rates (from Pennebaker & Harber, 1993).

More recently, we have analyzed the blogs of almost 1100 frequent users of an internet site in the two months before and two months after the September 11 attacks. Rates of writing increased dramatically for about two weeks after the attacks. More striking was the analysis of word usage. Use of 1st person singular (I, me, and my), dropped almost 15% within 24 hours of the attacks and remained low for about a week. However, over the next two months, I-word usage remained below baseline (Cohn, Mehl, & Pennebaker, 2004). Usage of 1st person singular is significant because it correlates with depression (Rude, Gortner, & Pennebaker, 2004). What was striking was that these bloggers – who expressed an elevated rate of negative moods in the days after 9/11 – were generally quite healthy. They were psychologically distancing themselves from the emotional turmoil of the event.

Considering the current evidence, it is likely that defenses such as denial, detachment, distraction, and distancing may, in fact, be quite healthy in the hours and days after an upheaval. A technique such as expressive writing may be inappropriate until several weeks or months later. Indeed, we now encourage clinicians to delay their use of expressive writing until at least 1-2 months after an upheaval or until they think their patient is thinking "too much" about the event. Obsessing and ruminating about a trauma a few weeks after it has occurred is probably not too much. Thinking about it at the same high rate six months later might in fact signal that expressive writing might be beneficial.

Timing between writing sessions. Different experiments have variously asked participants to write for one to five days, ranging from consecutive days to sessions separated by a week, ranging from 10 to 45 minutes for each writing session, for anywhere from 1 to 7 sessions. In Smyth's (1998) meta-analysis, he found a trend suggesting that the more days over

which the experiment takes place, the stronger the impact on outcomes. Two subsequent studies that actually manipulated the times between writing failed to support Smyth's findings.

The first, by Sheese, Brown, and Graziano (2004), asked students to write either once per week for three weeks or for three continuous days about traumatic experiences or superficial topics. Although the experimental-control difference was significant for health center differences, no trend emerged concerning the relative benefits of once a week versus daily writing. More recently, the authors randomly assigned 100 students to write either about major life transitions or about superficial topics. Participants wrote three times, 15 minutes each time, either once a day for three days, once an hour for three hours, or three times in a little more than an hour (Pennebaker & Chung, 2005). Immediately after the last writing session and again at one month follow-up, no differences were found between the daily versus 3-times-in-one-hour condition. Indeed, at follow-up, the three experimental groups evidenced lower symptom reports ($p = .05$, one-tailed test) than the controls after controlling for the pre-writing symptom levels.

Time until follow-up. Another suspect for inconsistent or null results across writing studies is the varied duration between the final writing session and the follow-up assessment. Expressive writing outcomes have been measured up to about 6 months after the writing sessions are completed. While some psychological and physical health changes may be immediately apparent, they may be fleeting. On the other hand, some effects may take days, weeks, months, or even years to emerge as significant changes on various health measures, if at all. The timing of improvements may also vary as a function of sampling characteristics. In an expressive writing study examining those suffering from asthma or rheumatoid arthritis (RA), health benefits were seen in asthmatics in the experimental writing condition as early as 2 weeks after writing. However, the health profile of RAs in the experimental writing condition did not differ

from those in the control condition until the 4-month assessment period (Smyth, Stone, Hurewitz, & Kaell, 1999).

Considering all the other variants on the writing method already mentioned, it would be difficult to come up with some standard time for follow-up. Instead, knowing the general time-course of proposed underlying mechanisms, and providing multiple convergent measures to validate specific outcomes may be a more practical approach in thinking about follow-up assessments.

Individual differences. No consistent personality measures have distinguished who does versus who does not benefit from writing. A number of variables have been unrelated to outcomes, including age, anxiety (or Negative Affectivity), and inhibition or constraint. A small number of studies that have either preselected participants or performed a median split on a particular variable have reported some effects. However, given the large number of studies, these effects should probably be viewed as promising rather than definitive.

Christensen et al. (1996) preselected students on hostility and found that those high in hostility benefited more from writing than those low in hostility. A couple studies have found that individuals high on alexithymia (a trait that taps the inability of people to label or feel particular negative emotions) tended to benefit from writing more than those low on alexithymia (Paez, Velasco, & Gonzalez, 1999; Solano et al., 2003). However, later research by Lumley (2004) suggests that unlike the participants in the aforementioned studies, alexithymics suffering from chronic illnesses or elevated stress may not reap the same benefits after writing.

Finally, there has been a great deal of interest in knowing if sex differences exist in the potential benefits of expressive writing. Smyth's (1998) meta-analysis revealed that males tend to benefit more from the writing paradigm than females. Several studies have explored this with

reasonably large samples – usually with college students – and have not replicated the meta-analytic results. Clearly, more studies are needed with more diverse samples.

Educational, linguistic, or cultural effects. Within the United States, the disclosure paradigm has benefited senior professionals with advanced degrees at rates comparable to rates of benefit in maximum security prisoners with 6th grade educations (Spera, Buhrfeind, & Pennebaker, 1994; Richards, Beal, Seagal, & Pennebaker, 2000). Among college students, we have not found differences as a function of the students' ethnicity or native language. The disclosure paradigm has produced positive results among French-speaking Belgians (Rimé, 1995), Spanish-speaking residents of Mexico City (Dominguez, et al., 1995), multiple samples of adults and students in The Netherlands (Schoutrop, Lange, Brosschot, & Everaerd, 1997), and English-speaking New Zealand medical students (Petrie, et al., 1995).

Summary. When individuals write or talk about personally upsetting experiences in the laboratory, consistent and significant health improvements are found. The effects include both subjective and objective markers of health and well-being. The disclosure phenomenon appears to generalize across settings, many individual difference factors, and several Western cultures, and is independent of social feedback.

Why Does Expressive Writing Work?

Psychology, like most sciences, is dedicated to understanding how things work. We are also driven by the law of parsimony and assume that, ideally, a single explanatory mechanism for a phenomenon should exist. If you are expecting a clean and simple explanatory world, we have some very bad news: There is no single reason that explains the effectiveness of writing. Over the last two decades, a daunting number of explanations have been put forward and many have been found to be partially correct. Ultimately, there is no such thing as a single cause for a

complex phenomenon. The reason is two-fold. First, any causal explanation can be dissected at multiple levels of analysis ranging from social explanations to changes in neurotransmitter levels. Second, an event that takes weeks or even months to unfold will necessarily have multiple determinants that can inhibit or facilitate the process over time.

In this section, we briefly summarize some of the more compelling explanations for the expressive writing-health relationship. Keep in mind that many of these processes occur simultaneously or may influence one another.

Individual and social inhibition. The first expressive writing projects were guided by a general theory of inhibition (cf., Pennebaker & Beall, 1986; Pennebaker, 1989). Earlier studies had discovered that people who had experienced one or more traumas in their lives were more likely to report health problems if they did not confide in others about their traumas than if they had done so (e.g., Pennebaker & Susman, 1988). The inhibition idea was that the act of inhibiting or in some way holding back thoughts, emotions, or behaviors is associated with low level physiological work – much the way that Sapolsky (2004) or Selye (1978) thought about stress. Further, people were especially likely to inhibit their thoughts and feelings about traumatic experiences that were socially threatening. Hence, individuals who had experienced a sexual trauma would be far less likely to talk about it with others than if they had experienced the death of a grandparent.

Following the logic of inhibition, it was assumed that if people were encouraged to talk or write about a previously inhibited event, health improvements would be seen. Perhaps, we reasoned, once people put the experience into words, they would no longer have the need to inhibit. Despite the helpfulness of the theory in generating interesting and testable hypotheses, the supporting evidence has been decidedly mixed. Several studies attempted to evaluate the

degree to which people wrote about secret versus more public traumas and previously disclosed versus not previously disclosed events. In no case did these factors differentially predict improvements in health (e.g., Greenberg & Stone, 1992; Pennebaker, Kiecolt-Glaser, & Glaser, 1988).

Promising research in this vein has been conducted by Steve Lepore and his colleagues (e.g., Lepore, Fernandez-Berrocal, Ragan, & Ramos, 2004; Lepore & Ragan, 2000). Across several studies, they find that people who are encouraged to talk about an emotional experience – such as a movie – are less reactive to the movie if what they say is validated. That is, if their comments about seeing the movie on the first occasion are supported by another person, they find the movie less aversive on a second screening on another day. However, if another person disagrees with their thoughts and feelings about the movie, the participants are more biologically around on a second screening – even though they are watching the movie alone.

Ultimately, real-world inhibitory processes are almost impossible to measure. For example, people have great difficulty in evaluating the degree to which they have been actively holding back in telling others about an emotional experience. Some people who don't tell others about an upsetting experience may never think about the event and others do. Of those who think about it, some may want to tell others; others may not. Of these various cases, it is not clear which people are inhibiting or even who might benefit most from writing. Although experimental studies may be effective in demonstrating the potential dangers of inhibition, the task of isolating these psychological processes in the real world will be a far more difficult enterprise. As described in a later section on the social dynamics of expressive writing, one potential strategy is to simply track changes in people's social behaviors after expressive writing in order to infer the possibility of inhibition.

Emotions and emotional expression. Emotional reactions are part of all important psychological experiences. From the time of Breuer and Freud (1957/1895), most therapists have explicitly or tacitly believed that the activation of emotion is necessary for therapeutic change. The very first expressive writing study found that if people just wrote about the facts of a trauma, they did not evidence any improvement (Pennebaker & Beall, 1986). Consistent with an experiential approach to psychotherapeutic change, emotional acknowledgement ultimately fosters important cognitive changes (Ullrich & Lutgendorf, 2002).

Although experiencing emotions while writing is clearly a necessary component of the expressive writing effects, cognitive work is required as well. As an example, students were randomly assigned to either express a traumatic experience using bodily movement, or to express an experience using movement and then write about it, or to exercise in a prescribed manner for 3 days, 10 minutes per day (Krantz & Pennebaker, 1995). Whereas the two movement expression groups reported that they felt happier and mentally healthier in the months after the study, only the movement plus write group evidenced significant improvements in physical health and grade point average. The mere emotional expression of a trauma is not sufficient. Health gains appear to require translating experiences into language.

Habituation to emotional stimuli. A variation on the emotional expression idea is that the benefits of writing accrue because individuals habituate to the aversive emotions associated with the trauma they are confronting. The role of habituation to emotional stimuli has a long and rich history in classical conditioning and a variety of behavioral therapies (e.g., Wolpe, 1968). More nuanced approaches have been proposed by Edna Foa and her colleagues (e.g., Foa & Kozak, 1986; Meadows & Foa, 1999). Repeated exposure to emotional stimuli can help to extinguish

the classically conditioned link between an event and people's reactions to it. At the same time, these authors note, people change in their understanding and/or representation of it.

Another test of a habituation model would be to see if people who wrote about the same topic in the same general way from essay to essay would benefit more than people who changed topics. In earlier studies (e.g., Pennebaker & Francis, 1996), judges evaluated the number of different topics people wrote about across a 3-day writing study. Number of topics was unrelated to health improvements. A more elegant strategy involved the use of Latent Semantic Analysis (LSA, Landauer, Foltz, & Laham, 1998). LSA, a technique developed by experts in Artificial Intelligence, is able to mathematically evaluate the similarity of content of any sets of text, such as essays. Using LSA, we attempted to learn if the content similarity of essays written by people in the experimental conditions in three previous writing studies was related to health improvements. The answer is no. If anything, the more similar the writing content was from day to day, the less likely people's health was to improve (Campbell & Pennebaker, 2002).

A pure habituation argument is probably insufficient in explaining the expressive writing effects. The findings from the emotion-only condition in the Pennebaker and Beall (1986) study together with the expressive movement-only condition in the Krantz and Pennebaker (1995) experiment both suggest that the mere activation of emotions associated with a trauma can provide only limited benefits. Beyond any habituation processes, some form of cognitive change is also important.

Language and emotions: Towards an A-to-D theory of emotional processing. What happens when emotions or emotional experiences are put into words? Research has shown that verbally labeling an emotion may itself influence the emotional experience. Keltner, Locke, and Audrain (1993) found that after reading a depressing story, participants who were given the

opportunity to label their emotions subsequently reported higher life satisfaction than those who did not label them. Berkowitz and Troccoli (1990) found that after labeling their own emotions, participants were more magnanimous in evaluating others than if not given the emotion labeling opportunity. These approaches are consistent with Schwarz (1990) who has demonstrated that defining and making attributions for internal feelings can affect the feelings themselves. Similarly, Wilson (2002) summarized several studies indicating that when individuals focus on their feelings, the correspondence between attitudes and behaviors increases, whereas attending to the reasons for one's attitudes reduces attitude-behavior consistency.

Indeed, changing any sensory experience into language affects the experience. In an important study on language's effects on sensory experience, Schooler and Engstler-Schooler (1990) suggested that once an individual attempts to translate a picture into words, it changes the memory of the picture. Most experiences are like pictures. Sights, sounds, smells, and feelings are often vague, complicated, and dynamic. To provide a detailed image of any experience would require more than the presumed one thousand word limit. However, because language is flexible, relatively few words or even several thousand words can be used to describe a single experience.

The problem of capturing an experience with language is comparable to the engineering difficulty of defining an analog signal using digital technology. In the world of measuring skin conductance, for example, a person's fingers will change in their sweatiness almost continuously. As can be seen in Figure 1a, skin conductance level (SCL), as measured by an old-fashioned polygraph, initially increases after the person hears a loud tone and then gradually returns to normal. For this signal to be computer analyzed, the analog line must be converted

into numbers using an analog-to-digital (A-to-D) converter. To convert the line to numbers, however, one needs to decide how frequently the numbers should be sampled.

Insert Figure 1 about here

Assume the tick marks on the x-axis refer to seconds, meaning that the entire graph encompasses 15 seconds. Should one sample SCL 200 times per second, once per second, once every 5 seconds? Obviously, the more times one samples, the truer the representation of the line will be (see Figure 1b). However, sampling at such a high frequency can be a tremendous waste of time and computer space since most of the adjacent readings will be redundant. Similarly, if the sampling rate is once every 5 seconds, most of the information of the change in SCL will be lost (see Figure 1c).

Verbally labeling an emotion is much like applying a digital technology (language) to an analog signal (emotion and the emotional experience). Assume that novel or emotion-provoking experiences tend to remain in awareness until they are either cognitively understood or they extinguish with time. It is hypothesized that if an emotion or experience remains in analog form, it cannot be understood or conceptually tied to the meaning of an event. The only way by which an emotion or experience in non-linguistic form can leave awareness is through habituation, extinction, or the introduction of a new or competing emotion. Once an experience is translated into language, however, it can be processed in a conceptual manner. In language format, the individual can assign meaning, coherence, and structure. This would allow for the event to be assimilated and, ultimately, resolved and/or forgotten, thereby alleviating the maladaptive effects of incomplete emotional processing on health.

Following from the above reasoning, if an experience and its emotions are described too briefly, the experience will not adequately capture or represent the event (hereafter referred to as verbal underrepresentation). In this case, it would be predicted that the many parts of the experience that were not represented in the brief linguistic description would continue to be processed until they gradually extinguished over time. If a moderate number of words are used to describe the experience (moderate representation), its representation should adequately mirror the event. This should reduce the degree to which the event takes up cognitive capacity, and, at the same time, enhance self-regulation, coping, and health. On the other hand, if the emotional event is described in exhaustive detail (overrepresentation), the experience is essentially reconfigured in its entirety, but in a new format.

The argument, based on the A-to-D Emotion Theory, is that once an event is adequately represented in language format, the verbal/conceptual processing takes over. In theory, one could argue that the ideal way to talk about an emotional event is to employ language in the form of moderate representation. The moderate representation view is that the most efficient way to process an event is to use as few words as possible that adequately capture the entire emotional experience. The event, then, would be summarized in a relatively tight way that would allow for later leveling and sharpening. Alternatively, the overrepresentation view would argue that representing the event in detailed linguistic form would lessen the possibility for reappraisal or assimilation into broader knowledge structures and identity.

In recent years, Lisa Feldman Barrett has distinguished between individuals who describe their emotion experience using highly differentiated emotion terms, and those who more or less categorize their emotion experience using like-valenced terms interchangeably (Feldman, 1995; Feldman Barrett, 1998). In her studies, participants are asked to keep a daily diary for two weeks

to rate their most intense emotional experience each day on several affect terms using a Likert scale. Emotional differentiation is reflected by a small correlation between positive emotions words (e.g. happiness, joy, enthusiasm, and amusement), and a small correlation between negative emotions words (e.g. nervous, angry, sad, ashamed, guilty). Feldman Barrett, Gross, Conner, Christensen, and Benvenuto (2001) showed that the more individuals differentiated their negative emotions, the more they endorsed engaging in various emotion regulation strategies (situation selection, situation modification, attentional deployment, cognitive change, and response modulation) over the course of the study, especially for more intense negative emotion experiences. These findings provide support for the A to D theory. That is, individuals who more precisely identify a verbal label representing their actual emotion experience are more likely to make attributions and effectively plan for future actions.

Use of emotion words in writing. The A-to-D approach is a valuable working model by which to understand the connection between emotional experience and its translation into words. A complementary approach to the understanding of emotional processes in the expressive writing paradigm is to look at the words people use while describing traumatic experience. If we merely counted the ways people use emotion words in natural text, could we begin to capture the underlying emotional processes that occur during writing?

Although a number of computerized text analysis programs have been developed (for a review, see Pennebaker, Mehl, & Niederhoffer, 2003), we are most familiar with Linguistic Inquiry and Word Count (LIWC) which was initially created to analyze essays from emotional writing studies. LIWC was developed by having groups of judges evaluate the degree to which about 2,000 words or word stems were related to each of several dozen categories (for a full description, see Pennebaker, Francis, & Booth, 2001). The categories include negative emotion

words (sad, angry), positive emotion words (happy, laugh), causal words (because, reason), and insight words (understand, realize). For each essay, LIWC computes the percentage of total words that these and other linguistic categories represent.

The LIWC program enabled language explorations into previous writing studies, linking word usage among individuals in the experimental conditions with various health and behavioral outcomes (Pennebaker, Mayne, & Francis, 1997). One re-analysis of data was based on 6 writing studies: two studies involving college students writing about traumas where blood immune measures were collected (Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995), two studies included first year college students who wrote about their deepest thoughts and feelings about coming to college (Pennebaker, Colder, & Sharp, 1990; Pennebaker & Francis, 1996), one study by maximum security prisoners in a state penitentiary (Richards, Beal, Segal, & Pennebaker, 2000), and one study using professional men who had unexpectedly been laid off from their jobs after over 20 years of employment (Spera et al., 1994).

Analyzing the use of negative and positive emotion word use yielded two important findings. First, the more that people used positive emotion words, the more their health improved. Negative emotion word use, however, was curvilinearly and not linearly related to health change after writing. 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. The curvilinear emotion indices were computed using the absolute value of the difference between each person's emotion word use and the means of the sample. The simple correlations between change in physician visits with the curvilinear negative emotion index was r (152) = .27, $p < .05$ whereas the positive words were unrelated, r = -.14, *ns*.

Individuals who use very few negative emotion words or who use a very high rate of them are the ones most likely to remain sick after writing, compared with those who use a moderate number of negative emotion words. The findings support the A to D theory, and, in many ways, also square with other literatures. Individuals who maintain verbal underrepresentation and tend to use very few negative emotion words are most likely to be characterized as repressive copers (cf., Schwartz & Kline, 1995) or alexithymics (Lumley, Tojek, & Macklem, 2002). Those who overuse negative emotion words may well be the classic high Negative Affect individuals described by Watson and Clark (1984). That is, those individuals who describe their negative conditions in such detail may simply be in a recursive loop of complaining without attaining closure (overrepresentation). Indeed, as discussed below, this may be exacerbated by the inability of these individuals to develop a story or narrative (Nolen-Hoeksema, 2000).

Beyond emotions: The construction of a story. One of the basic functions of language and conversation is to communicate coherently and understandably. By extension, writing about an emotional experience in an organized way is healthier than in a chaotic way. Indeed, growing evidence from several labs suggest that people are most likely to benefit if they can write a coherent story (e.g., Smyth, True, & Sotto, 2001). Any technique that disrupts the telling of the story or the organization of the story is undoubtedly detrimental.

Unfortunately, we are not yet at the point of being able to precisely define what is meant by coherent, understandable, or meaningful when it comes to writing about emotional upheavals (cf., Graybeal, Seagal, & Pennebaker, 2002). One person's meaning may be another's rumination. Many times in our own research we have been struck how a person appears to be writing in a way that avoids dealing with what we see as a central issue. Nevertheless, the

person's health improves and he or she exclaims how beneficial the study was. Meaning, then, may ultimately be in the eye of the writer.

Although talking about the upsetting experience will help to organize and give it structure, talking about such a monumental experience may not always be possible. Others may not want to or even be able to hear about it. Within the discourse literature, particular attention has been paid to the role of written language in demanding more integration and structure than spoken language (Redeker, 1984; see also Brewin & Lennard, 1999). It would follow that writing -- and to a lesser degree talking -- about traumatic experiences would require a structure that would become apparent in the ways people wrote or talked about the events.

The components of a story: The analysis of cognitive words. It is beyond the bounds of this chapter to explore the philosophical definitions of knowledge, narrative, or meaning. For current purposes, knowledge of an event can encompass a causal explanation of it or the ability to understand the event within a broader context. The degree to which individuals are able to cognitively organize the event into a coherent narrative is a marker that the event has achieved knowledge status. In many ways, it is possible to determine the degree to which people have come to know their emotions and experiences by the language they use. Words or phrases such as, "I now realize that..." or "I understand why..." suggest that people are able to identify when they have achieved a knowing state about an event.

The LIWC analyses find promising effects for changes in insight and causal words over the course of emotional writing (see also Klein & Boals, 2001; Petrie et al., 1998). Specifically, people whose health improves, who get higher grades, and who find jobs after writing go 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 show this pattern of language use, judges often

perceive the construction of a story over time (Graybeal, Sexton, & Pennebaker, 2002). Building a narrative, then, may be critical in reaching understanding or knowledge. Interestingly, those people who start the study with a coherent story that explained some past experience generally do not benefit from writing.

Those who use more insight and causal words in their emotional writing tend to gain the most improvements in working memory, and, at the same time, report drops in intrusive thinking about negative events (Klein & Boals, 2001). Consistent with the A-to-D Emotion Theory, for those in the experimental condition, the writing experience packages the event in a way that frees their minds for other cognitive tasks. Another way to interpret the salutary effects of using insight and causal words is that, together with the use of positive emotion words, this type of language reflects a positive reappraisal of events, which fuels cognitive broadening (Fredrickson, 1998; 2001). Narrating an emotional event into the bigger picture might help to integrate the experience into one's greater knowledge structures and personal identity.

Either way, the findings are consistent with current views on narrative and psychotherapy (e.g., Mahoney, 1995) in suggesting that it is critical for the client to create and come to terms with a story to explain and understand behavioral or mental problems and their history. Merely having a story may not be sufficient since the quality of stories as well as the people themselves change over time. A story, then, is a type of knowledge. Further, a narrative that provides knowledge must label and organize the emotional effects of an experience as well as the experience itself.

Writing as a way to change perspective. A central tenet of all insight-oriented therapies is that through psychotherapy people are able to develop a better understanding of their problems and reactions to them (e.g., Rogers, 1980). Inherent in this understanding is the ability to stand

back and look at oneself from different perspectives. Although most therapists would agree with the importance of shifting perspectives, the difficulty for a researcher is in devising a way to track this shift. Some recent linguistic analyses offer some promising new strategies.

As described earlier, latent semantic analysis or LSA is a powerful mathematical tool that allows investigators to determine the similarity of any sets of essays. LSA was originally designed to look at the linguistic content of text samples. Consequently, most LSA applications routinely delete all non-content words. These non-content or "junk" words include pronouns, prepositions, conjunctions, articles, and auxiliary verbs. A more formal designation of junk words would be function words or particles. Function words can be thought of as the glue that hold content words together. Rather than reflecting what people are saying, these function words connote how they are speaking. In short, function words reflect linguistic style (cf., Pennebaker & King, 1999; Pennebaker, Mehl, & Niederhoffer, 2003).

Is it possible that peoples' linguistic styles can predict who benefits from writing? Using LSA, we discovered that the answer is yes. Analyzing three previous expressive writing studies, we discovered that the more that people change in their use of function words from day to day in their writing, the more their health improved (Campbell & Pennebaker, 2003). Closer analyses revealed that these effects were entirely due to changes in pronoun use. Specifically, the more that people oscillated in their use of 1st person singular pronouns (I, me, my) and all other personal pronouns (e.g., we, you, she, they), the more people's health improved. If individuals wrote about emotional upheavals across the 3-4 days of writing but they approached the topic in a consistent way – as measured by pronoun use, they were least likely to show health improvements. The findings suggest that the switching of pronouns reflect a change in perspective from one writing day to the next. Interestingly, it doesn't matter if people oscillate

between an I-focus to a we- or them-focus or vice versa. Rather, health improvements merely reflect a change in the orientation and personal attention of the writer.

A note on causality is in order. The various studies that have examined the relationship between word use and health outcomes in the emotional writing conditions imply a causal arrow: people who change perspectives, use positive emotion words, and people who construct a story ultimately evidence better health. Be cautious in interpreting these findings. The use of these word patterns may simply be reflecting some underlying cognitive and emotional changes occurring in the person. As noted earlier, some studies have attempted to get people to write with more positive emotion words, changing perspectives, and even constructing a story. These manipulations have not been particularly successful. The issues of mediation, moderation, and emergent properties of word use, cognitive and emotional activity, and longterm health will provide fertile grounds for research in the years to come.

Expressive writing and social dynamics. One of the popular appeals of the expressive writing paradigm is that is sounds almost magical. Write for 15 minutes a day for three days (a total of 45 minutes) and your health will improve for months. You may also get a job, fall in love, and make better grades. This is a bit of an overstatement. When people write about emotional upheavals for three or four days, they report thinking about the topics quite frequently. Many spontaneously tell us that they have been dreaming about the topics. Expressive writing's effects exist beyond the walls of the experiment.

Even more striking have been some of the social changes that occur as a result of expressive writing. Across multiple studies, individuals report that they talk to others about their writing topics. Many years ago, we conducted a study with Holocaust survivors and asked them to tell their stories orally. Prior to the study, approximately 70% reported that they had not

talked about their experiences during World War II in any detail to anyone. After the interview, all participants were given a copy of their videotaped testimony. A month later, the average person reported watching the videotape 2.3 times and showing it to 2.5 other people (Pennebaker, Barger, & Tiebout, 1989). Disclosure begets disclosure.

Recently, we have developed a digital recording device called the Electronically Activated Recorder, or the EAR (Mehl & Pennebaker, 2003). The EAR has been engineered to record for 30 seconds every 12-13 minutes. The recordings are then transcribed and rated by judges concerning where the participant is and what he or she is doing. Recently, Youngsuk Kim (2005) had 95 bilingual students either write about traumatic experiences or participate in control tasks for 4 days, 15 minutes each day. Prior to writing and assignment to condition, individuals wore the EAR for two days. Approximately one month after writing, they wore the EAR again for two days. Overall, those who wrote about emotional upheavals talked more with others after writing than before writing. An earlier pilot study of approximately 50 students had found a similar effect (Pennebaker & Graybeal, 2001).

Across the various studies, we are now becoming convinced that one of the powers of expressive writing is that it brings about changes in people's social lives. Consider that writing has been shown to increase working memory and that these effects apparently last several weeks (Klein & Boals, 2001). After people write about troubling events, they devote less cognitive effort on them. This allows them to be better listeners, better friends. They writing may also encourage people to talk more openly with others about the secrets that they have been keeping.

The big picture: Life course correction. Part of the human experience is that we all deal with a variety of major and minor life issues. Often, we are taken off guard by an upheaval and don't have sufficient time to think about it or to explore the broader implications the event might

have on us and those around us. One reason that we believe that expressive writing has been effective is that it serves as a life course correction. Occasionally, most of us benefit from standing back and examining our lives. This requires a perspective shift and the ability to detach ourselves from our surroundings. If we are still in the midst of a massive upheaval, it is virtually impossible to make these corrections.

The idea of expressive writing as a life course correction has not been tested empirically. The idea is certainly consistent with McAdam's (2001) life story approach. It is also relevant to work in autobiographical memory (e.g., Neisser & Fivush, 1994; Conway, 1990). There are times when we are forced to stop and look back at our lives and evaluate what issues and events have shaped who we are, what we are doing, and why.

Summary and Conclusions

The purpose of this chapter has been to provide a broad overview of the expressive writing paradigm. Since its first use in the 1980s, dozens of studies have been exploring the parameters and boundary conditions of its effectiveness. Perhaps most interesting has been the growing awareness that its value cannot be explained by a single cause or theory. Expressive writing ultimately sets off a cascade of effects. For this chapter and certainly for this book, one of the more important effects is an improvement in physical health.

There is a certain irony that the original explanation for the writing phenomenon was inhibition. In the 1980s, our belief was that when people didn't talk about emotional upheavals, the work of inhibition ultimately led to stress and illness. The explanation was partially correct. Now, however, we are all beginning to appreciate the nuances of the problem. Not talking about a traumatic experience is also associated with a breakdown of one's social network, a decrease in working memory, sleep disruptions, alcohol and drug abuse, and an increased risk for additional

traumatic experiences. Expressive writing or the unfettered talking about a trauma can often short circuit this process.

Writing forces people to stop and reevaluate their life circumstance. The mere act of writing also demands a certain degree of structure as well as the basic labeling or acknowledging of their emotions. A particularly rich feature of the process is that these inchoate emotions and emotional experiences are translated into words. This analog-to-digital process demands a different representation of the events in the brain, in memory, and in the ways people think on a daily basis.

All of these cognitive changes have the potential for people to come to a different understanding of their circumstances. The cognitive changes themselves now allow the individuals to begin to think about and use their social worlds differently. They talk more; they connect with others differently. They are now better able to take advantage of social support. And with these cognitive and social changes, many of their unhealthy behaviors abate. As recent data suggest, expressive writing promotes sleep, enhanced immune function, reduced alcohol consumption, etc.

Despite the large number of promising studies, expressive writing is not a panacea. The overall effect size of writing is modest at best. We still don't know for whom it works best, when it should be used, or when other techniques should be used in its place. One of the difficulties of studying expressive writing is that the best studies have found that writing influences slow moving but important outcome measures such as physician visits, illness episodes, and other real world behaviors that may take months to see. Self-report outcomes, although common and easy to use, generally do not bring about extremely strong findings.

Future researchers would be wise to try to agree on one or more outcome measures that are sufficiently robust and also easy to measure.

After two decades of research on expressive writing, two strategies must continue to grow. The first is applying the method to large samples of people with differing diagnoses using rigorous RCT designs. This “big science, big medicine” approach is essential. At the same time, we should continue to nurture innovative smaller science. It will be the individual labs around the world that will ultimately tell us the boundary conditions of the phenomenon and the underlying mechanisms that explain its effectiveness.

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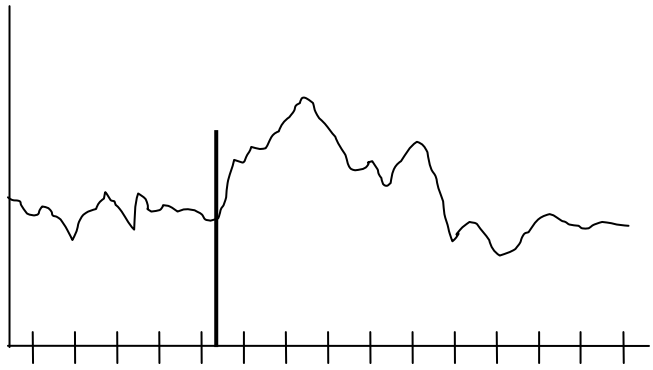
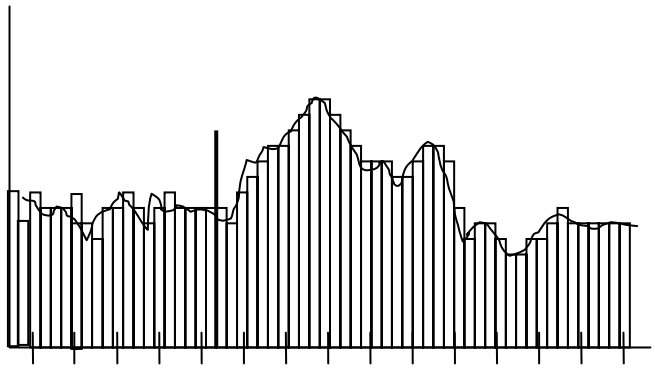
Figure Captions

Figure 1. Skin conductance level in response to a loud tone (a) measured with a polygraph, and digitally sampled (b) at a high frequency and (c) at a low frequency.

1 (a)



1 (b)



1 (c)