

This is an expanded version of the article published as:

Páez, D., Velasco, C. & Gonzales, J. L. (1999) Expressive writing, alexythimia as a dispositional deficit in self-disclosure and psychological health. *Journal of Personality and Social Psychology*, 77, 3, 630-641

Expressive writing, alexythimia as a dispositional deficit in self-disclosure and psychological health

Abstract

Psychology students were randomly assigned to a condition in which they had to write for twenty minutes three days or write one day a three minutes factual description of disclosed traumas, undisclosed traumas or recent social events. In the case of undisclosed traumatic events, intensive writing about these events showed a beneficial effect on affect, and on the affective impact of remembering the event and appraisal. Subjects who wrote briefly about an undisclosed traumatic event showed a more negative appraisal, and no positive effect on self-reported measures of affect. Subjects who wrote intensively about a traumatic event and had a dispositional deficit in self-disclosure, measured by an alexythimia TAS-subscale, showed a positive effect on self-reported measures of affect. Difficulty in describing feelings, an alexythimia dimension, correlated with psychological health problems, emotional inhibition and with a less introspective content of written essays about the emotional events.

Expressive writing, deficit in self-disclosure and psychological health

Confronting traumatic and stressful life events by means of writing produces a higher level of reported physical health (i.e. fewer visits to health facilities), higher physiological functioning (i.e. a better immunological reaction) and higher psychological well-being (i.e. lower negative affect and higher positive affect). The overall effect size has been estimated at $r=.23$, based on 13 studies reviewed by Smyth (1998; see also Pennebaker, Kiecolt-Glaser and Glaser, 1988; Pennebaker, 1989; Greenberg, Wortman & Stone, 1996). With regard to affect, the effects of confrontation are negative on a short term, and there was no relation between short term distress and long term benefits (Smyth, 1998). Usually, negative and positive affect are unrelated to changes in physical health (Pennebaker, Colder & Sharp, 1990; Pennebaker and Beall, 1986). Results suggest that affect and health are not related linearly with confrontation. However, because they are psychological processes, changes in the schematic and representational memories of the emotional event should be more associated with changes in mood. This study aims to replicate the positive effects of writing on mood and also to examine the relationships between changes in mood, appraisal of the event, rumination and avoidance on event memories, and the affective impact of remembering emotional episodes. This positive effect on affect and memories is supposed to appear both in extreme and normal emotional events, and should be strongly visible in the case of subjects who show a deficit in the quality of their self-disclosure of those affective events. This study aims to replicate the positive effects of writing on mood, and to examine these effects in the case of less disclosed traumatic events, and with people with a dispositional deficit in self-disclosure. To examine the effects of expressive writing in undisclosed trauma events, using as a sample people who disclose less by disposition is an important issue because in both cases inhibition of emotional processing is supposed to be higher. Disinhibition has been proposed as the explanatory mechanism for the beneficial effects which writing or talking have on health (Pennebaker, 1989). Inhibition is potentially unhealthy due to two reasons: first of all, the work of inhibition serves as a cumulative stressor. Secondly, failure to talk about, and to account for, the stressful event impedes cognitive-affective assimilation processes (Pennebaker, 1989). In line with the classic Zeigarnik effect, individuals tend to remember "unfinished tasks" (Karniol & Ross, 1996). Stressful events that are not assimilated are more likely to remain in one's consciousness as unwanted and ruminative thoughts. Usually, traumatic and extreme negative events produce rumination (intrusive memories or thoughts) and at the same time, cognitive and behavioral avoidance of cues related to the negative episode (Janoff-Bulman, 1992). Confirming the fact that inhibition provokes a rebound effect, subjects who suppress repetitive and intrusive thoughts or rumination about stressful events (i.e. an earthquake in California) dwell on them at greater length. On the other hand, rumination of stressful events reinforces negative affect (Nolen-Hoeksema & Morrow,

1991). Suppression of these thoughts is associated with increased physiological arousal (Wegner, Shortt, Blake and Page, 1990).

Briefly, inhibition impedes cognitive assimilation, unfinished completion of an account of a traumatic or stressful event provokes rumination, and rumination is related to lower positive and higher negative mood, avoidance and physiological stress.

However, Greenberg & Stone (1992) found that the positive impact of confrontation was not stronger for those events which previously were more inhibited (Greenberg & Stone, 1992). Pennebaker, Colder & Sharp (1990) confirm that disclosing feelings about stressful events, not so severe and probably not subject to strong inhibition, also provokes positive affective and health effects. Positive effects of confrontation in the case of normal stressful events not submitted to inhibition like traumatic events, suggest that disinhibition is not the only process underlying those results.

Cognitive assimilation of the emotional event has been proposed as a complementary mechanism explaining the beneficial effects of confrontation (Pennebaker et al. 1990; Greenberg, Wortman and Stone, 1996). Congruently with these results and approaches, Rime et al.'s approach suggests that social sharing or interpersonal confrontation of normal emotional events is a very frequent phenomena, and that it might improve the cognitive assimilation of the affective experience (Rimé, Philippot, Boca and Mesquita, 1991). Rimé, Philippot, Boca and Mesquita's research shows that most of the emotional events (90%) are talked about. Similar results were found for traumatic events: most of the traumatic events (94%) are talked about (Greenberg, Wortman & Stone, 1996).

Confrontation or emotional self-disclosure may have a positive effect on traumatic and emotional events due to different causes:

a) Confrontation can act as a source of habituation, or diminishing arousal and affective reactions following exposure to a threatening stimulus (i.e. memories of the event). Mendolia and Kleck (1993) confirm that in the short term (two days later), subjects who talk about one's emotional reaction were less reactive while speaking again about their emotional reactions, a fact consistent with a habituation explanation. With respect to extreme negative events, talking about a trauma allows a less emotionally laden assessment of its impact (Pennebaker, 1989).

b) Confrontation can break the pathological feedback loop of avoidance and rumination, and in this way diminish rumination and negative affect. Previous explanatory mechanisms are related to perceptual-motor theories of emotion (Leventhal, 1984). Confrontation by means of written or spoken words cue mental images and expressive-motor reactions and changes the schematic emotional memory. Thus, writing about an affective event alters the subject's perception and felt emotion in response to it. These processes might be reflected in changes on self-reported arousal and valence when remembering the event, and also on a decrease in the accessibility of automatic images, memories and

correlated avoidant coping.

c) Finally, confronting a traumatic experience helps to make sense of it and to reframe this event. Confrontation allows subjects to change the original appraisal of the negative event in a more benign evaluation: the event is reconstructed as being more controllable, more meaningful, and an account emerges (Brewin, 1996; Greenberg, Wortman & Stone, 1996). Confrontation allows the individual to understand the event. This hypothesis is related to appraisal theories of emotions (Frijda, 1986; Folkman & Lazarus, 1988). Writing or talking about an event affects the subject's representation or construal of the event, which then alters the emotional reaction.

This study will replicate previous findings which state that confronting traumatic and stressful events improves the affective state (Smyth, 1998). Specifically, it will show that confrontation improves the understanding and remembering of emotional events. At the same time we will address another question: Are there differences in the effect of writing on disclosed and undisclosed traumatic events?. This study will examine the relationship between confrontation on one hand, and the potential beneficial effects of writing about an event for those participants with a deficit in confrontation on the other. Another related question was also posited in the second study: is the cognitive work which is related to intensive expressive writing essential in order to provoke psychological benefits?. What would happen if individuals were asked to engage in confrontation and not in intensive writing? Recollection of traumatic events usually provokes an affective effect and writing a "confession" in a non evaluative setting is a form of objectifying and gaining distance from an event, and in fact both could be effective in the assimilation of emotional events. On the opposite hand, brief writing can be conceived of as a form of sensitization and as having deleterious effects. Finally, the interaction between intensive versus brief writing with dispositional deficit in self-disclosure is examined. Dispositional deficit in self-disclosure is partly related to the alexythymia construct. Alexythymia is defined as a deficit in the cognitive processing and regulation of emotion. Deficit in self-disclosure, difficulty in describing feelings to others or poor emotional verbalization is not only a sequel of the difficulty of processing affects, but in fact is one of the conceptual dimensions and empirical factors in the most well known alexythymia scale: the Toronto Alexythymia Scale (TAS-26 and TAS-20) (Parker, Bagby, Taylor, Endler & Schmitz, 1993). In the third study, pooling together subjects who wrote about traumatic events in the first and second study and splitting them by the median on the TAS subscale of difficulty in describing feelings we address a final question: What would happen if individuals were asked to engage in intensive writing compared with brief writing, particularly in the case of those high in the alexythymia dimension which refers to one's difficulty in describing feelings?. Alexithymia is particularly relevant to the lack of ability for being self-reflective, and the inhibition of emotion. Alexythymia, particularly the dimension of difficulty in describing feelings, was negatively

associated to the proportion of emotional words used by participants when watching an emotional movie (Luminet & Rimé, 1997). Alexythimia is also associated with a certain coping style, including cognitive-behavioral avoidance and emotional repression (Paez, Velasco, Basabe & Valdoseda, 1995). Alexythimics should show strong inhibition and also a deficit in how in-depth, and how frequently, they confront emotional experiences. Probably alexythimics should show higher improvement after confrontation, because of alexythimia being associated with a lower level of emotional self-disclosure. The third study will examine the relationship between alexythimia on the one hand, and the potential positive effects of intensive writing about a traumatic event for participants with a dispositional deficit in self-disclosure.

STUDY 1: PSYCHOLOGICAL HEALTH AND EXPRESSIVE WRITING ABOUT UNDISCLOSED TRAUMA, DISCLOSED TRAUMA AND A SOCIAL EVENT

Method

Overview. A total of 52 first and second year psychology students participated in a 3 (type of event: undisclosed trauma, disclosed trauma and social event) between subjects design. On 3 consecutive days participants wrote for 20 minutes (writing condition of confrontation). Participants wrote about a traumatic disclosed event, about a traumatic undisclosed event or about the most recent social event (condition social event). Subjects were run in two waves: First, pre-tests in a series of four sessions (writing). Second, measures were collected in a two month follow-up. Sixty-six percent of the participants were women and mean age of subjects was 19.2. Subjects were given a social psychology book in return for their participation. All subjects completed a pretest questionnaire. Two participants dropped out the study or filled incomplete questionnaires. Final N was 50.

Effect size for self-report changes was estimated, on the basis of previous research as medium, approximately a d of 0.50 or an r of .30 for psychological well-being (see Smyth, 1998). With this expected effect size, sample size required (for an anova F $df=3$, two tail) to detect the effect at .05 with a power analysis of .80 is $N=52$ and to detect the effect at .10 is $N=41$ (Cohen, 1992).

Procedure

Participants. Subjects were informed that they would have to write about traumatic and personal events, in order to understand how people cope with these events. All subjects were told that their questionnaires and materials would be kept confidential. Subjects were randomly assigned to an undisclosed trauma condition ($N=14$), to a disclosed trauma condition ($N=20$) or a normal social event condition ($N=17$). The sample was composed of spanish speaking people, who belong to a more collectivistic and expressive culture (Spain) than participants in previous studies (usually students from the USA) (Hofstede, 1991).

Participants' Instructions. The instructions given to the trauma subjects were taken from Pennebaker et al. (1988) and from Greenberg & Stone (1992).

Subjects assigned to the confrontation or writing undisclosed trauma condition were given the following instructions:

Each of the writing days and for twenty minutes, please write about the most traumatic and upsetting experiences of your entire life that you have not talked with others in detail. You can write on different topics each day or on the same topic during the three days. The important thing is that you write about your deepest thoughts and feelings.

Subjects assigned to the confrontation or writing disclosed trauma condition were given the following instructions:

Each of the writing days and for twenty minutes, please write about the most traumatic and upsetting experiences of your entire life which you have discussed with others rather than something that you have kept to yourself. You can write on different topics each day or on the same topic during the three days. The important thing is that you write about your deepest thoughts and feelings.

Subjects assigned to the confrontation or writing social event condition were given the following instructions:

Each of the writing days and for twenty minutes, please write about the most recent social event that you have attended. You can write on different topics each day or on the same topic during the three days. You should describe the specific event and the thoughts or feelings related to the social event.

All subjects were told that their essays would be kept confidential, and each subject had a secret code. Two experimenters individually handed out the instructions and materials to the subjects in four sessions on sequential days. During the initial session, common to the experimental and control groups, subjects completed the SMU-HQ and PANAS.

The following day, prior to the experimental manipulation, subjects were taken in groups of three, although they were seated in independent tables, and read the instructions appropriate to their condition. First, they answered PANAS and PSS, which assessed current momentary mood and physical symptoms. Subjects in the undisclosed and disclosed trauma condition answered the same measures and wrote their essays on trauma for 20 minutes. Subjects in the control condition answered same measures and wrote their essays on social events for 20 minutes. Event evaluation, social sharing, impact of the re-evocation scale and post-test questionnaire (immediate version of the PANAS and PSS) were completed by all subjects. Subjects came in for two more sequential days. The same procedure was followed during the two writing sessions. First, pre test immediate PANAS and PSS, then 20 writing session, finally, post test immediate PANAS and PSS.

Follow-Up Procedure and Debriefing. All subjects, in groups of three, completed a two month follow-up, including the PANAS, rumination, avoidance, event appraisal and impact of re-evocation scales. When the final follow-up was filled, subjects received an oral debriefing explaining the research. Psychotherapeutical support was offered - no subject requested it. Then subjects received a gift (a social psychology book) for their participation.

Measures.

All the measures used in this study, with the exception of the Horowitz modified scale on rumination and avoidance, and

Rimé et al.'s. measures of arousal and evaluation of remembering, were the same as those used in Pennebaker et al.'s (1988) and Greenberg and Stone's (1992) studies.

Cognitive-affective evaluation of the event

Subjective evaluation of the event. This questionnaire was adapted from Greenberg and Stone's (1992) questionnaire. It requested subjects to report in an 8-point scale (1=not at all, 8= a great deal), on the extent in which the event was personally relevant, meaningful, severe, affected today's life, was emotionally laden, how much they had wanted to talk to others, had actually talked to others and had actively held back from talking to others about the event.

Appraisal of the event. Subjects were asked to rate the event in relation to perceived control (low control=1, high control=9), difficulty to understand what had happened (high difficulty=1, low difficulty=9) and difficulty to give an account of the event (easy to give an account=1, difficult to give an account=9). The last item was recoded and items were summed to obtain a global benign evaluation of the event. Previous studies confirm the discriminant validity of the scale and reported a Cronbach Alpha of .57. This scale also showed concurrent validity with Greenberg & Stone's (1992) items of severity and the extent to which an event was still affecting the person's life, $r(110)=-.39, p<.001$ and $r=-.36, p<.001$ respectively (Paez & Velasco, 1995).

Avoidance and intrusion or rumination. This scale is a modified version of Horowitz, Wilner and Alvarez's (1979) Impact of Event Scale (IES). The IES taps two categories of responses to a specific past trauma: **intrusion** (five items on intrusively experienced ideas, images, feelings, or bad dreams) and **avoidance** (three items on consciously recognized avoidance of certain ideas, feelings, or situations). IES was modified to fit better into the general questionnaire and so that it could be possible to answer it not only with respect to traumatic events but also more banal social events. The IES's modification consists of a list with 8 questions and 5-point Likert scales with anchors ranging from **Never (1) to Always (5)**. Subjects were asked to report how often in the last month they had experienced unwanted thoughts, intrusive images, re-experienced feelings related to the event and had sleeping problems because of thinking about the event. Subjects were also asked to report how often they had tried to erase the event from their memory, avoid talking and thinking about the event. In this version the Cronbach Alpha was .89 for rumination and .90 for avoidance (Paez & Velasco, 1995).

Social sharing and inhibition. Social sharing questionnaire. Derived from Rimé et al.'s studies (1991, 1992), this questionnaire asked subjects for the number of people with whom they had talked about the event (subjects wrote the exact number in a box). They were also asked if they had inhibited themselves in order to avoid talking about the event (Yes=1, No=0).

Impact of remembering. Impact of remembering scale derived from Rime et al.'s studies (1991, 1992). This measure taps the immediate affective impact of the remembering task with respect

to valence and arousal. Subjects were asked (three items) the extent in which they experienced images, bodily sensations and subjective feelings (from 0=not at all to 4=a lot) while completing the questionnaire and remembering the event. An index of self-reported **affective arousal** was created by summing these three questions (previous studies reported a .57 Cronbach Alpha). Affective reaction to event re-evocation was assessed by two questions: 1) was completing the questionnaire a very pleasant=1 to 7=very unpleasant experience?; 2) After answering the questionnaire, do you feel worse=1 to 7=better? (Rimé et al., 1991a). The last item was recoded (1=better, 7=worse) and an index of **affective valence** was constructed by adding the questions (previous studies have reported a .67 Cronbach Alpha).

An affective arousal index measured after subjects had written about an emotional event showed concurrent validity with a score change (post-pre) in Pennebaker's Physical Symptoms scale (see below) and with PSS post-test score ($r(109)=.33, p<.001$ and $r(110)=.40, p<.001$ respectively). The affective valence index also showed concurrent validity with a change score of the Positive and Negative Affect Scale PANAS (post-pre) and with post-test PANAS PA (positive) and PANAS NA (negative); $r(110)=.43, p<.001$ for PANAS NA change score; $r=-.26, p<.004$ for PANAS PA change score; $r=.36, p<.001$ for PANAS post and $r=-.27, p<.003$ for PANAS PA post (Velasco & Paez, 1996).

Psychological measures

The Toronto Alexythymia Scale: subscale difficulty in describing feelings (TAS-26 and TAS-20)(Taylor, Ryan & Bagby, 1997). These scales consist of 26 and 20 items. TAS items are answered using a 5-point scale to indicate the extent in which the respondent agrees with each statement. The TAS-26 scale has an internal consistency reliability of .67 in the current version (Velasco & Paez, 1996). The difficulty in describing feelings TAS-26 sub-scale shared four items with the five items TAS-20 sub-scale of poor emotional verbalization. These items are: I am able to describe my feelings easily (reversed item); It is difficult for me to find the right words for my feelings; I find it hard to describe how I feel about people; People tell me to describe my feelings more. This subscale has satisfactory alpha coefficients and structural validity (by means of confirmatory factor analysis) in the USA, canadian, german, spanish and mexican versions (range alpha=.61 to .78 - Parker, Bagby, Taylor, Endler & Schmitz, 1993; Velasco & Paez, 1996). Cronbach's alpha was .70 in this study.

Positive and Negative Affect Scale (PANAS PA and PANAS NA) (Watson et al., 1988). This scale contains 20 mood descriptors (e.g. active, excited, hostile...) which are relatively pure markers of either high negative affect (NA) or high positive affect(PA). In the Spanish version the Cronbach alphas for NA was .80 and .68 for PA (Velasco & Paez, 1996). The 10 PANAS items assessing positive mood and 10 items about negative mood were summed to yield separate PA and NA scale scores for each subject. Items are answered using a 5-point scale.

Health Measures

Physical Symptom Scale PSS (Pennebaker, 1982). This questionnaire is a modification of the Pennebaker Physical

Symptoms Scale and asks subjects to rate, along unipolar 3-point scales from **Nothing (1) to a lot (3)**, the degree in which they are currently experiencing each of a series of 14 physical symptoms (e.g. racing heart, headache, stomach-ache...). Average internal consistencies across several studies have been approximately .75 (Pennebaker, 1982). Previous studies with this version presented a satisfactory reliability (Cronbach's Alpha .74, Paez & Velasco, 1995).

Southern Methodist University-Health Questionnaire SMU-HQ. This questionnaire lists 63 health problems, including acute (i.e. flu) and chronic health problems (asthma) and also more serious illnesses (i.e. ulcers).

Results

Event characteristics and manipulation checks. The participants' essays of events were classified by two raters. Disagreements were resolved by mutual discussion. 29% of the social events subjects (N=17) described stressful events (i.e. subjects described interpersonal conflicts or ongoing stressful events). 36% were ambivalent social events, having both negative and positive aspects (i.e. a social meeting perceived as a challenge and inducing anxiety) and 35% were positive social events (i.e. going with friends to a party or out to dance and enjoying it). Percentage of trauma events (N=34) falling into each category were: death of a close one (14% in disclosed and 15% in undisclosed), boyfriend/girlfriend problems (14% and 15%), important problems with relatives and family (14% and 40%), fights among or with friends (7% and 5%), physical assault including rape and sexual abuse (6% and 15%), public humiliation or confession of negative events (7% and 0%), important problems at school or work (14% and 5%). Other unique or unclassifiable events were 21% in disclosed and 5% in undisclosed condition. Chi square was non significant.

A series of one-way analyses of variances (ANOVAs: see Table 1) assessed differences between the undisclosed trauma, disclosed trauma and social event groups. Trauma participants rated the events as significantly more personal, more revealing of their emotions and more meaningful, compared with social event subjects. Trauma subjects had held back from talking to other people more than control subjects and reported a lower number of persons with which they shared the event. Furthermore, a significant higher percentage of trauma subjects agreed that they had inhibited themselves in order to avoid talking about the event in comparison to the social events subjects (respectively 65%, 65% and 18%, Chi square (2, N=51)=10.04, $p < .01$). Results confirm that traumatic events are more associated with inhibition. Congruent with expectations, trauma subjects rated the event as less controllable, more difficult to understand and as being more difficult to give an account of these events (appraisal) than social event subjects. Trauma participants reported more avoidance. However, there were no differences in arousal (images, sensations and activation) or valence (felt worse after remembering and evaluated the task as being more unpleasant) induced by remembering, or in rumination or intrusion and also in the extent to which they had wanted to tell other people. Comparisons of the two traumatic conditions

show that, congruent with expectations, subjects told others less and spoke with less people in the undisclosed condition, confirming the intended effect of manipulation. However, there were no significant differences between disclosed and undisclosed trauma with respect to inhibition. No differences were found between trauma and social event subjects in the level of intrusion, arousal and valence of remembering. This suggests that most of the social events evoked were emotionally laden and that two thirds were negative or ambivalent (general mean for rated emotionality of the social event was above the neutral scale midpoint).

INSERT HERE TABLE 1

Checking equivalence between groups. A one way Anova on the first session measures revealed no significant main effects for type of event (all F's 2,47, < 1, n.s.). As expected, there were no differences between groups in the TAS-sub-scale nor in general (during the last month) positive mood or negative mood (PANAS PA and PANAS NA respectively - see table 3 for pretest means) and health (SMU-HQ). Gender was also similarly distributed by condition (Chi square, 3, N=51, >1, n.s.).

Immediate effect of writing. Between groups differences in pre and post session measures were submitted to a type of event (traumatic versus social event) by measures (pre versus post) Manova in which the first factor was between subjects and the second was within subjects. Main effect was significant for the pre/post essay on positive mood (Hotellings=.32, Approx.F 3,46=4.92, p<.005). No other main effects were significant for positive mood. A comparable analysis on the negative mood and physical symptoms index yielded no main effect (all F's 3,46 < 1, n.s.). However, this analysis showed the expected interaction for type of event x pre versus post essay for positive mood (Hotellings=.49, Approx.F 6,90=3.64, p<.003) and a marginally significant effect for negative mood (Hotellings=.25, Approx. F 6,90=1.81, p<.10). In order to undergo the planned comparisons, pretest and posttest scores on PANAS NA and PANAS PA were averaged across the three writing days for the experimental condition (see table 2).

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The pattern of means showing immediate increase in negative mood and decrease in positive mood in the trauma group with respect to the social event group replicated effects found in previous laboratory experiences. Planned comparisons showed (t 49=1,91, p<.05, one tailed) that subjects in the trauma condition reported more immediate negative mood (M=21.21, SD=9.08) after writing the essay than control subjects (M=15.41 SD=7.21). Planned comparisons also showed that subjects had a lower level of positive mood immediately after writing than before (t 51=3.40, p<.01 one tail, respectively M=27.14 and M=25.33). No significant differences were found for positive and negative mood between disclosed and undisclosed trauma groups after writing the essay. Subjects in the undisclosed trauma conditions showed a significant decrease in positive mood (t 20=3.74, p<0.01), and an increase in physical symptoms (t 20=-2.04, p<.03) after writing the essay in comparison to the pretest. Participants in the disclosed trauma condition also

showed a more moderate but similar profile ($t_{14}=1.37, p<.09$ for positive mood; $t_{14}=-1.32, p<.10$ for negative mood and $t_{14}=-2.59, p<.01$ for physical symptoms).

Longer Term effects of Writing by Type of Event. Longer term self-reported measures of mood, intrusion, avoidance, impact of remembering task and evaluation of the event were analyzed to test that participants in the trauma writing condition, and particularly in the undisclosed writing trauma condition, should improve the cognitive-affective assimilation of the event (see Table 3). A Mancova was performed, using pre-test measures as covariates. Results of the analysis were significant (Hotellings=.93, Approxim. $F(8,78)=4.5, p<.001$). With pre-test differences controlled, significant effects of group were found for appraisal, valence induced by remembering the event and positive mood. A group effect was found on affective valence of the re-evocation, appraisal and positive mood. Writing about a traumatic event increases positive mood and decreases negative affect valence induced by remembering, a fact which is in line with what was expected. Planned contrast confirms that the undisclosed trauma ($t(34)=1.41, p<.09$) and the disclosed trauma conditions ($t(29)=1.29, p<.10$) show a higher score on positive affect than the control group. Comparing pre-post measures valence induced by remembering was lower after writing the essay ($t(19)=1.36, p<.09$) in the undisclosed condition.

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Discussion

Results referred to short term effects of expressive writing were similar (effect size $r=.31$ for trauma pooled condition versus social event condition) to those found in Smyth's research synthesis ($r=.39$ was the effect size for post writing distress) and confirm that writing about a traumatic event provokes distress. Results also show that confrontation (subjects who wrote for three days about a traumatic event) improved longer term mood. Participants who wrote about an undisclosed traumatic event also showed a better cognitive-affective assimilation of the event: a decrease in the emotional activation induced by the re-evocation of the event, an increase in the perceived controllability and accountability of the event, and at the same time a change towards a higher positive mood. In order to compare the results of the study with Smyth's synthesis, we created an affect balance score, subtracting the follow-up negative mood from positive mood. Estimated effect size for this index of psychological well-being was $.22$ for pooled trauma versus control condition (control group were weighted with 1 and experimental group with two so that we could perform this point biserial correlation). Estimated effect size was similar but lower than the Smyth research synthesis ($r=.31$) for long term psychological benefits. Probably writing about recent social events, most of them with emotional connotations, provokes more emotional disclosure than writing about trivial and emotionally neutral events and this fact may explain why the effect size is lower.

STUDY 2: PSYCHOLOGICAL HEALTH AND BRIEFLY WRITING ABOUT

DISCLOSED, UNDISCLOSED TRAUMA AND SOCIAL EVENTS

Results from the first study confirm that writing about traumatic events had positive effects when compared with writing about social events. However one question still troubled us: was the cognitive work related to intensive writing actually important?. Another possibility could be that the recollection of trauma, related affective distress and the "confession" in a neutral setting of a past "sin" is enough to produce psychological benefits. Historical research suggests that although catholic confession was done with certain difficulties and limitations during the XIV and XVth centuries, in general recognizing one's sins produced a "considerable relief and brought great peace to one's spirit" (Delumeau, 1990, p.41). In a meta-analytic synthesis on expressive writing (Smyth, 1998) the number of writing days and the length of these sessions were unrelated to psychological health and physiological functioning. Moreover, a brief session (one day and 15 minutes session) had a similar effect to more intensive writing (five days and 30 minutes session). The next issue examined was whether subjects who confront briefly about traumatic or social events, showed beneficial changes. Our hypothesis was that the recollection by means of a brief factual description of traumatic events, particularly of those undisclosed, should be unrelated to psychological health, because of the central role of cognitive work in the assimilation of the event. Brief writing can be conceived of as a form of sensitization and as having deleterious effects.

Method

Participants

A total of 58 second year Psychology students participated in a 3 (type of event) between subjects design. Participants wrote on one day for three minutes about a traumatic personal disclosed event, about a traumatic undisclosed event or about the most recent social event (conditions). Subjects were run in two waves: First, pre-tests in a series of two sessions. Second, measures were collected in a two month follow-up.

Procedure and Measures Procedure and measures were the same as those used in the previous study, with some differences in the instructions (see method section, study 1).

Fifty-eight undergraduate psychology volunteers (first and second year students) served as subjects. Sixty-five percent were women. Mean age of subjects was 19.7. Subjects were given a social psychology book in return for their participation. All subjects completed a pretest questionnaire. Five participants dropped out of the study or filled incomplete questionnaires. Final N was 53.

Participants Instructions. The instructions given to the trauma subjects were taken from Pennebaker et al. (1988) and from Greenberg & Stone (1992).

Subjects assigned to the brief writing disclosed trauma condition were given the following instructions:

During three minutes, please write about the most traumatic and upsetting experiences of your entire life that you have discussed with others rather than something that you have kept to yourself. You should describe the specific event. Write a brief outline of the event.

Subjects assigned to the brief writing undisclosed trauma condition were given the following instructions:

During three minutes, please write about the most traumatic and upsetting experiences of your entire life that you have not talked with others in detail about. You should describe the specific event. Write a brief outline of the event.

Subjects assigned to the brief writing control social event condition were given the following instructions:

During three minutes, please write about the most recent social event that you have attended. You should describe the specific event. Write a brief outline of the event.

All subjects were told that their essays would be kept confidential, and each subject had a secret code. Subjects were debriefed as in the previous study.

Dependent Measures: Dependent variables were the same as those used in the previous study.

Results

Event characteristics and manipulation checks. The participants' essay and brief factual descriptions of events were classified by two raters. Disagreements were resolved by mutual discussion. 26% of the social events subjects described stressful events. 48% were ambivalent social events, having negative and positive aspects and 26% were positive events.

Proportions of trauma events (N=39) falling into each category were: death of a close one (5% in disclosed and 15% in undisclosed condition), parental divorce (0 and 5%), boyfriend/girlfriend problems (10% and 0%), important problems with relatives and family (11% and 5%), fights among or with friends (21 and 15%), life-threatening events (0 and 10%), public humiliation or confession of negative events (5% and 0%), important problems at school or work (32% and 10%). Other unique or unclassifiable events made up for 10% of the total. All Chi square comparing presence/absence of a category by the disclosed versus undisclosed condition were non significant.

A series of one-way analyses of variances assessed differences between the trauma and social event groups. Trauma participants rated the events as significantly more personal, more revealing of their emotions and more meaningful, compared with social event subjects. Trauma subjects had held back from talking to other people more than control subjects. Furthermore, a significant higher percentage of trauma disclosed and undisclosed subjects agreed that they had inhibited themselves in order to avoid talking about the event than did the social events subjects (respectively 29%, 53% and 5%, Chi square (2, N=55)=4.95, $p < .01$). Results confirm that undisclosed traumatic events are more associated with inhibition. However, there were no significant differences between trauma and social event subjects in the extent to which they had wanted to tell other people, or in the number of people with whom they had talked about the event. As in the previous study, trauma subjects rated the event as less controllable, more difficult to understand and being more difficult to give an account about these events (appraisal) than social event subjects. Trauma participants felt worse after remembering and evaluated the task as more unpleasant (valence). As in the first study, there were no

differences in arousal (images, sensations and activation) induced by remembering or in rumination or intrusion. No differences were found in this study concerning avoidance. Similar to the first study, most of the social events were emotional and most of them were negative or ambivalent (because of similarity of mean profiles, no table results are presented).

Checking equivalence between groups. A three way Anova on first session measures revealed no significant main effects or interaction of the type of event (all F's 2,52, < 1, n.s.). There were no differences between groups in the TAS-20 sub scale, in general (during the last month) positive mood or negative mood (PANAS PA and PANAS NA respectively) and health (SMU-HQ). Gender was also similarly distributed by condition (Chi square,3, N=55, >1,n.s.).

Immediate effect of writing: comparing intensive and brief writing. Ancovas were conducted, using pre-test measures as covariates, to contrast the immediate effect of brief writing. With pre-test differences controlled, significant effects of group were found for negative mood (F 2,49=3.30,p<.05). Similar to the first study, participants in the trauma conditions show higher negative affect after the brief writing task.

Between groups differences in post-test mood and physical symptoms in the second common session to participants in the first and second study were examined by means of a 2-way Mancova (pre-tests scores were used as covariables) intensive versus brief writing by type of event in order to contrast the immediate effects of intensive writing versus brief writing. Type of event main effect was significant (Hotellings=.16, F 6,192=2.53, p<.03). The intensive versus brief writing main effect was non significant (Hotellings=.026, F 6,192=.84,n.s.). The multivariate interaction between confrontation x type of event was non significant (Hotellings=.58, F 6,192=.57,n.s.). Thus results suggest that subjects in the brief writing-trauma condition show more immediate distress than in the control condition, similar to the intensive writing trauma condition. The univariate type of event effect was significant for current negative mood (F 2,99=7.82,p<.002). Showing that brief and intensive writing have a similar affect impact, means of current negative mood after the writing task were as follows: PANAS NA post for disclosed trauma intensive writing M= 21.71 SD 8.51, for disclosed trauma brief writing M=18.10 SD 9.0, for undisclosed trauma intensive writing M= 20.85 SD 8.52, for undisclosed trauma brief writing M= 20.84 SD 7.58, for social event intensive writing M=15.41 SD 7.21 and for social event brief writing M=16.63 SD 7.22. Planned comparisons revealed higher levels of negative mood immediately after answering the questionnaire about the event for subjects in the trauma condition (pooled disclosed and undisclosed) compared with participants in the social event condition (respectively M=20.29 SD=8.78, M=16.06 SD=7.14, t 106=2.51,p<.05) with no effect stemming from the type of writing task.

Longer Term effects of Writing by Type of Event. Longer term self-reported measures of mood, intrusion, avoidance, impact of task re-evocation and evaluation of the event were analyzed to test that participants in the brief writing

condition, and particularly in the brief writing undisclosed group, would show an improvement in the cognitive-affective assimilation of the event. We conducted a Mancova, using pre-test measures as covariates. The multivariate type of event main effect was marginally significant ($\eta^2=.41$, Approx. $F(8,78)=1.91, p<.07$). An univariate significant effect was found for appraisal ($F(2,49)=5.68, p<.008$). No other univariate effects were significant. Inspection of mean patterns suggest that appraisal of control and accountability of the event shows a sharp decrease in the trauma writing condition (Pre-test Disclosed Trauma Mean=14.40 SD=5.14, Follow-up Mean=16.42 SD=5.83; Pre-test Undisclosed Trauma Mean=14.30 SD=5.14, Follow-up Mean=12.90 SD=5.46; Pre-test Control Mean=19.44 SD=4.81, Follow-up Mean=18.70 SD=5.29). A planned comparison confirms that in the undisclosed trauma brief writing condition mean is lower (Adjusted Mean=13.73) than in the disclosed group (Adjusted Mean=17.40, $t(2.27), p<.03$) or in the control group (Adjusted Mean=16.92, $t(3.47), p<.001$).

Discussion

Subjects showed a higher increase in negative mood in the trauma event condition in relation to the social event condition. This suggests that a brief session of remembering (writing for three minutes about a traumatic event) provokes a negative impact similar to a more intensive remembering session. This result was important, because it excluded lower affective activation as an explanation for the absence of a beneficial effect of the brief writing task. Congruent with expectations of the central role which cognitive work has in the confrontation benefits, brief writing-trauma subjects versus brief writing social events subjects did not differ on measures of longer term mood, intrusive thoughts and images associated to the event, or on self-reported imagery and physiological arousal induced by remembering the event. No changes on affect or in the remembering of the event were induced by confrontation. Moreover, brief writing undisclosed trauma was related to an increase in the negative appraisal of the event, suggesting that the recollection of trauma in the absence of cognitive work provokes psychological problems. The idea that brief writing about a low disclosed traumatic event "sensitizes" subjects and has negative effects received some support.

STUDY 3: PSYCHOLOGICAL HEALTH, INTENSIVE VERSUS BRIEF WRITING ABOUT TRAUMA AND DISPOSITIONAL DEFICIT IN SELF-DISCLOSURE

Previous results show that intensive expressive writing, but not brief writing, had an effect in longer term mood and cognitive-affective assimilation of the event, particularly in the case of undisclosed traumatic events. The next issue examined was whether subjects who wrote intensively versus briefly about traumatic events, having a dispositional deficit in emotional disclosure, would show beneficial changes. Smyth (1998) reported in his meta-analysis that the effect-size of expressive writing was related to the percentage of men in the studies, or that men benefit more than women from disclosure writing. Dindia & Allen's (1992) meta-analysis confirms that men disclose less than women and narrative reviews suggest that

women disclose more on emotional topics than men (Derlega, Metts, Petronio & Margulis, 1993). This suggests that people who are less emotionally open seem to benefit more from expressive writing. Some subjects, alexythimics, show a deficit in the cognitive processing of emotions and affect. Alexithymia or "lack of words for emotion" is particularly relevant to the lack of emotional disclosure. Studies confirm that alexythimia, measured by the best known and more recent self-report scale (the Toronto Alexythymia Scale-20) can be conceived of as a general dimension with three intercorrelated facets: a) difficulty in describing feelings to others, b) difficulty in distinguishing between feelings and bodily sensations, and c) an externally oriented thought pattern (Parker et al., 1993). Alexythimics should show strong inhibition and also a deficit in how in-depth and how frequently they confront emotional experiences. Subjects high in dispositional difficulty to describe feelings should show a stronger improvement after intensive writing, because of this facet of alexythymia being associated with a lower level of self-disclosure about traumatic events.

Participants and Measures

A total of 70 scores from second year Psychology students who participated in the previous studies writing intensively or briefly about traumatic events were re-analyzed in this study. Subjects assigned to trauma conditions in the first and second study were pooled in order to test the effect of dispositional deficit in self-disclosure. We may recall that participants wrote for three days during twenty minutes or on one day for three minutes about a traumatic personal event. Subjects were run in two waves: First, pre-tests in a series of two sessions. Second, measures were collected in a two month follow-up. Measures were those already mentioned above, with one additional checking variable. Participants in the trauma condition were asked to rate the severity of the trauma they had wrote about in an 8-point scale (1=not at all, 8= a great deal) as in the Greenberg and Stone (1992) questionnaire.

A median split was performed on all the subjects scores on the TAS difficulty in describing feelings sub-scale to create a high and a low dispositional deficit in self-disclosure group (scale range was 4-20 and median was 12).

Results

Event characteristics and manipulation checks. The participants' essay and brief factual descriptions of events were classified by two raters. Disagreements were resolved by mutual discussion. 26% of the social events subjects (N=37) described stressful events (i.e. subjects described interpersonal conflicts or ongoing stressful events). 40% were ambivalent social events, having negative and positive aspects (i.e. a social meeting perceived as a challenge and inducing anxiety) and 33% were positive social events (i.e. going with friends to a party or to dance and enjoying it).

Proportions of trauma events (N=71) falling into each category were: death of a close one (12%), parental divorce (1.3%), boyfriend/girlfriend problems (9.3%), important problems with relatives and family (20%), fights among or with friends

(12%), physical assault including rape and sexual abuses (16%), life-threatening events (5.3%), public humiliation or confession of negative events (4%), important problems at school or work (13%). Other unique or unclassifiable events were a 6.6% of the total.

Distribution of events by writing and control condition was equivalent. All Chi square comparing presence/absence of a category by writing versus control condition were non significant (Chi square,1, N=37, for social events, all's >1,n.s.: Chi square,1, N=71, for traumatic events, all's >1,n.s.).

INSERT HERE TABLE 4

A series of one-way analyses of variances (ANOVAs:see Table 4) assessed differences between the trauma and social event groups. Trauma participants rated the events as significantly more personal, more revealing of their emotions and more meaningful, compared with social event subjects (see table 4). Trauma subjects had held back from talking to other people more than control subjects, reported a lower level of talking to others about the event, and also a lower number of persons with which they shared the event. Furthermore, a significant higher percentage of trauma subjects agreed that they had inhibited themselves to avoid talking about the event than did the social events subjects (respectively 53% and 11%, Chi square (2, N=106)=17.47, $p<.001$), and that they were unsatisfied with sharing about the event (respectively 58% and 33%, Chi square(2, N=106)=6.05, $p<.05$). Results confirm that traumatic events are more associated with inhibition. However, there were no significant differences between trauma and social event subjects in the extent to which they had wanted to tell other people and in how often they talked about the event. This suggests that the quantitative level of social sharing is not related to traumatic events.

Congruent with expectations, trauma subjects rated the event as less controllable, more difficult to understand and being more difficult to give an account about these events (appraisal) than social event subjects. Trauma participants reported more avoidance, felt worst after remembering and evaluated the task as more unpleasant (valence). However, there were no differences in arousal (images, sensations and activation) induced by remembering or in rumination or intrusion.

It is important to notice that most of the social events evoked were emotional laden and two thirds were negative or ambivalent (general mean for rated emotionality of the social event was above the neutral scale mid point).

No association was found between level of difficulty in describing feelings and having been assigned to disclosed or undisclosed trauma conditions. No differences were found on the alexythimia sub-scale between intensive and brief writing groups: 47% and 41% were above median in the alexythimia sub-scale in the intensive and brief writing condition (Chi square,1, N=70, .77, n.s.). The above alexythimia group did not

show higher percentage of undisclosed trauma (Chi square, 1, $N=70$, $.34$, n.s.). Gender was also similarly distributed in the high/low difficulty in describing feelings groups: 46% males and 43% females were above median (Chi square, 1, $N=70$, >1 , n.s.). No differences were found between type of traumatic events and high/low level of alexythimia (Chi square, 9, $N=70= 5.46$, n.s.) nor between the four composed conditions (High vs Low by Intensive versus Brief Writing, Chi square (27)=28.59, $p=n.s.$). Ratings of severity of the written trauma essay did not differentiate between the four groups, ($F(3,66)=1.55$, n.s.).

Difficulty in describing feelings to others, Psychological Health Problems and deficit in self-disclosure. To check that this alexythimia dimension was associated to mood and health problems, correlations were computed on the first and second studies total sample ($N=108$) between the TAS difficulty in describing feelings sub-scale and the PANAS and PSS. The alexythimia sub-scale score was associated to lower positive mood ($r=-.36$, $p<.001$ PANAS PA last month), higher negative mood ($r=.29$, $p<.001$ with PANAS NA last month) and more perceived physical symptoms ($r=.16$, $p<.01$ with PSS).

To confirm that alexythimia was associated to emotional inhibition of traumatic events, correlations were computed on the total trauma sample ($N=70$) between the TAS difficulty in describing feelings subscale and the social sharing scale, event evaluation and IES. The difficulty in describing feelings score was associated to a lower social sharing: high scorers had wanted less to tell other people about the event, $r=-.26$, $p<.01$; had actually talked less about the event, $r=-.19$, $p<.05$; and had held back more the event, $r=0.21$, $p<0.04$. Difficulty in describing feelings was associated to a higher effort to hold back (point biserial correlation, effort yes=1; no effort=0, $r=.19$, $p<0.05$). The alexythimia subscale was also related to higher avoidance ($r=0.25$, $p<0.02$ with IES avoidance scale) and a more negative appraisal of the emotional event evoked ($r=-.31$, $p<.005$). The alexythimia subscale correlated negatively, but not significantly, with the number of people with which one disclosed; $r=-.12$, n.s.) and with rumination ($r=-.14$, n.s.).

Difficulty in describing feelings and essay contents. Two independent judges, blind with respect to the participants' alexythimia scores, coded a subset of 35 randomly chosen written essays about emotional events. Four ratios were coded for each report: total number of words, positive emotion words, negative emotion words and self-references (first person references). A set of emotional words in spanish were used as a dictionary. Interjudge agreement averaged .87 in the four ratios. Two blind judges evaluated if the essay was self-reflective and showed introspection (No=1, Yes=2). Interjudge agreement was 89%. Final subjects' score was constructed by agreement of the two judges after discussing the few cases where important differences appeared. Difficulty in describing feelings scale was related negatively to the proportion of self-references in the total number of words ($r=-.34$, $p<.025$), to the judges' introspection rating ($r=-.32$, $p<.03$) and to the proportion of positive emotion words in the total of essay words ($r=-.22$, $p<.10$). Correlation

with total number of words was as expected but not significant ($r=-.11, n.s.$). No association was found between the TAS subscale and the proportion of negative emotion words ($r=-.01$). Judges' evaluation showed concurrent validity with the proportion of positive and negative emotion words in the essay (both $r's=.31, p<.04$).

Longer Term effects of Writing by Type of Event. Longer term self-reported measures of mood, intrusion, avoidance, impact of task re-evocation and evaluation of the event were analyzed to test that participants in the intensive writing condition, and particularly in the intensive writing high alexythimia group, would improve the cognitive-affective assimilation of the event (see Table 4). A Mancova was conducted, using pre-test measures as covariates, and Intensive versus Brief Writing and Low versus High Difficulty in describing feelings as between subject factors. A significant multivariate group effect was found for intensive versus brief writing condition, $Hotellings=.37$, Approx. $F_{7,51}=3.73, p<.02$. Univariate intensive versus brief writing F 's were significant for negative mood and for affect induced by remembering. These results are important because they confirm that intensive writing about a traumatic event decreases negative long term mood (Adjusted Follow-up Mean for Intensive Writing Condition=20.77 and Adjusted Follow-up Mean for Brief Writing Condition=24.82) and decreases the emotional activation induced by remembering the traumatic event (Adjusted Follow-up Mean for Intensive Writing Condition=5.94 and Adjusted Follow-up Mean for Brief Writing Condition=6.47). Expected interaction was marginally significant, $Hotellings=.25$, Approx. $F_{7,51}=1.84, p<.10$. Univariate interaction F 's were significant for negative mood ($F_{1,57}=3.78, p<.05$). Planned comparisons showed that subjects above median in the alexythimia sub-scale who wrote intensively had a lower level of negative mood in the follow-up than members of the high alexythimia brief writing condition before ($t_{28}=-2.43, p<.03$). High alexythimic subjects who wrote briefly had a higher negative mood score than low alexythimic subjects who wrote briefly ($t_{37}=-2.10, p<.03$).

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Internal analysis of the follow-up and changes scores on arousal induced by remembering, negative mood and appraisal. The primary reason that a high number of subjects were assigned to the trauma condition was to evaluate the relationship between the individual processes of confrontation.

In order to assess changes we constructed a series of difference scores. Change scores were constructed by subtracting the follow-up from the pretest. Higher positive change score means positive evolution (i.e. that arousal and negative mood were higher at the pretest than at the follow-up). For appraisal, negative change score means positive evolution (i.e. that event appraisal was more positive or benign at Follow-up). Correlations were computed for individuals in the intensive writing high alexythimia condition ($N=27$). No clear pattern of association appears between changes scores in arousal and changes score in appraisal ($r=.04, n.s.$). Self-reported positive change of negative mood was associated with a

negative change of appraisal ($r=.29, p<.07$). Results suggest that changes in appraisal and negative mood are negatively associated (see Table 6). They appear as complementary: subjects who show a higher decrease in negative affect, also show a lower change to a more benign appraisal of the event, than subjects who show lower decrease or increase in negative long term mood. Participants who show an important increase in the perceived controllability and accountability of the event, at the same time change slowly to a lower negative mood (Pre-test Negative Mood=29.56, Follow-up Negative Mood=22.89), than subjects who show a lower or decrease in the appraisal of the event (Pre-test Negative Mood=27.11, Follow-up Negative Mood=17.22). Relationships between changes in negative mood and arousal show a similar non significant patterns ($r=-.17, n.s.$): higher positive changes in negative mood were associated with lower changes in arousal.

Correlations were computed dividing the writing-high alexythimia condition between traumatic events ($N=17$) and social events ($N=10$). Correlations were not significantly stronger in the trauma condition (all z's comparison between r's for social event and trauma group non significant).

An effect size of writing and alexythimia (computed using weights previously exposed) estimated on those changes scores were medium for change in negative affect $r=(108).32, p<.001$; and medium-small for change in arousal, $r=.24, p<.01$, and for change in appraisal, $r=-.20, p<.03$. These last results mean that other conditions show positive and higher score changes on appraisal, meaning that pre-test appraisal was more positive than follow-up. The opposite occurs in the writing-high alexythimia condition. Finally, the effect size of writing and alexythimia was estimated for participants evoking a traumatic event ($N=71$). Effect sizes were higher in the traumatic condition than in the general sample for change in negative affect $r=.43, p<.001$; and lower for change in arousal, $r=.14, p<.11$, and for change in appraisal, $r=-.12, p<.03$. These results suggest that positive affective effects are strong in the case of more extreme and inhibited events, and cognitive-affective assimilation impact is more difficult to obtain with more serious events.

INSERT HERE TABLE 6

Discussion

When compared with subjects who did not write intensively about a trauma, those who did so reported lower longer term negative mood and emotional activation induced by remembering the event. These results support the hypothesis that intensive writing about a traumatic event provokes beneficial effects with regard to brief writing. Moreover, brief writing reinforces distress in subjects with dispositional deficits in self-disclosure. The deleterious effect of brief writing appears specifically in subjects who show a dispositional deficit in emotional social sharing or self-disclosure. Results reaffirm the importance of qualitative self-disclosure: what is important for the assimilation of an emotional event is not the raw frequency of talk, but the in-depth revelation and understanding of feelings (e.g. intensive confrontation) (Rimé, Philippot,

Boca and Mesquita, 1992).

General Discussion and Conclusion

Replication of previous studies

The present studies replicated the finding that writing about emotions related to past traumatic events is associated with benefits in long term mood or affect. Results also confirm that intensive writing about a traumatic event compared with brief writing decreases negative long term mood and emotional activation induced by remembering the traumatic event. In order to address the deficit in confrontation as a risk factor for the cognitive assimilation of emotional events the first study employed an experimental strategy: subjects were randomly assigned to conditions in which they had to write about disclosed and undisclosed traumatic events. Subjects assigned to the undisclosed condition confirm having a deficit in the social sharing of emotions concerning this event. Analyses confirm the beneficial effects on positive mood, reappraisal and lower arousal in a two month follow-up, particularly in the case of undisclosed trauma. Writing provokes in the undisclosed trauma condition a group improvement in mood, in the event's appraisal and a reduction in self-reported affect when remembering the event. With respect to processes mediating the positive mood impact of writing, this study shows that the beneficial effects of confrontation, in the case of subjects in the undisclosed condition, can be integrated simultaneously in the perceptual-motor theory of emotion and in the appraisal theories. Results showed that writing or confrontation acts partly by means of habituation, reducing the valence induced by remembering because of repeated exposures "in the mind" to the event, and simultaneously by means of reappraisal, or by a better cognitive reframing and organizing of the event. Discussion on the recovery of traumatic events also suggests that it involves different processes: a reduction of negative affect through a process of reappraisal (reasserting perceived control), and prevention of continued automatic reactivation of representations about the event, by means of an habituation to traumatic images (Brewin, 1996). Results are also congruent with Lepore's (1997) study: confrontation by writing did not affect the number of intrusive thoughts related to a stressful event. Confrontation reduces mood problems by minimizing the negative impact of rumination (i.e. lowering the negative valence) rather than by reducing intrusive thoughts.

Negative effects of brief disclosure

The second study contrasts the effect of a brief disclosure on disclosed, undisclosed and social events. Congruent with expectations related to an appraisal theory of emotion and to the importance of cognitive work in the assimilation of emotional events, brief writing trauma subjects versus brief writing social events subjects, did not differ on measures of longer term mood, intrusive thoughts and images associated to the event, and on self-reported imagery and physiological arousal induced by remembering the event. No changes on affect or in the remembering of the event were induced by confrontation. Moreover, brief writing undisclosed trauma was related to an increase in the negative appraisal of the event,

suggesting that the absence of cognitive work induced psychological problems in traumatic events not "worked through" by means of social sharing of emotions.

Dispositional deficit in self-disclosure and positive effects of expressive writing

The third study showed that subjects with a dispositional deficit in self-disclosure who wrote intensively about a traumatic event showed psychological benefits in comparison to similar people who wrote briefly. Results also confirm that the poor emotional verbalization dimension of alexythimia was associated to mood problems and higher perception of physical symptoms. In order to address the deficit in qualitative confrontation as risk factor for the cognitive assimilation of emotional events this study use a dispositional strategy: subjects were classified as low or high self-disclosers in the basis of the TAS scale. Subjects with higher score on alexythimia were supposed to have a qualitative deficit in the social sharing of emotions. Dispositional research strategies have been criticized because sometimes they can be atheoretical: there is no explanation of how and why the disposition produces an effect. This study's correlational results shows that alexythimia limits the assimilation of emotional events because it is related to avoidance and higher active inhibition and to lower social sharing. Congruently, alexythimia was related to a lower understanding of personal experience: the alexythimia score was associated to a more negative appraisal of emotional events. Luminet, Zech, Rimé and Wagner (1997) also observed that alexythimic spoke less about an emotional event and they revealed less personal feelings when sharing the event. Results also confirm that alexythimia is a risk factor for health and affect: negative affect, physical symptoms and health problems were associated with the TAS score. More important is the fact that it was associated to a lower level of self-disclosure about emotional events, and to higher inhibition efforts. The difficulty in describing feelings dimension of alexythimia was also associated with an inhibited emotion written style: the TAS subscale correlated with less introspective written essays about emotional events, with a lower proportion of self-references and positive emotional words. In sum, this dimension of alexythimia was a psychological health risk factor, was associated with inhibition and a deficit in self-disclosure about emotional events, reflected in a less introspective and emotional tone of the induced disclosure about traumatic events.

Dispositional deficit in self-disclosure as a risk factor for health problems

It has been hypothesized that alexythimia is a risk factor for health due to the limited interpersonal and cognitive processing of affects. Lower levels of intra and interpersonal processing of affect lead to a focusing on, and amplification of, the somatic component of emotional arousal. This tendency might explain the proneness to "functional" somatic complaints of individuals described as alexithymic, and an increased susceptibility to physical disease (Taylor, 1984). Different studies have examined autonomic activity associated with alexythimia using stressful tasks and emotional stimuli as main

paradigms and physiological reactivity (heart rate, skin conductance level) as main dependent variable. Five studies found that persons high in alexithymia were less physiologically reactive (e.g. low cardiovascular activity) than subjects low in alexithymia during stressful tasks, like to talk about an emotional event or a speech test (Newton & Contrada, 1994, Linden et al, 1993, Wehmer et al, 1995, quoted in Luminet, 1997 and Nemiah et al.,1977, Hyer et al.,1990, quoted in Codispotti, Mazzetti, Felisatti, Baldaro & Ricci Bitti, 1999) and three found no differences (Papciak et al.,1985, Martin & Phil, 1986 quoted in Codispotti et al.,1999, and Codispotti et al.,1999). One of these studies found that alexythimics reported higher emotional activity and the others found no differences. One study found that alexythimics were less physiologically reactive to emotional stimuli like an emotional movie (Roedema & Simmons, 1997, quoted in Codispotti et al.,1999), eight found no differences (Linden et al,1996, Newton & Contrada, 1994, Friedlander et al,1997, quoted in Luminet, 1997; Wehmer et al.,1995, Nielson & Stone, 1997, Vanman, Brennan & Dawsson, 1997, quoted in Codispotti et al,1999, and Codispotti et al.,1999 study a and b) and one study by Luminet and Rime's (1997) study found that subjects scoring high on alexythimia evidenced a faster heart rate when exposed to an emotional movie. Three studies found that alexithymics reported lower levels of physiological reaction (Nielson & Stone, 1997, Vanman et al, 1997 and Roedema & Simmons, 1997, quoted in Codispotti et al,1999). Briefly, evidence suggest that alexythimics are less reactive during stressful tasks even if one study they perceived higher physiological reaction and evidence is mixed by respect to physiological reactivity in induced emotional states. Heterogeinity of findings is probably due to the limitations of measures and methods. Some of these studies used flawed psychometrics scales to measure alexithymia. On the other hand, emotional states were induced by imagery and due to the deficit of fantasy and imagination related to alexythimia probably emotional imagery as independent variable was of limited validity. Finally, lower degrees of freedom in each study (usually N's by condition were around 20) and the absence of a meta-analysis impedes a clear conclusion. Nevertheless, some studies found that alexithymics show a higher level of baseline physiological reactivity (heart rate) and at the same time three studies found that alexythimics reported lower level of physiological reactivity than non alexythimics when objective physiological measures showed no differences or higher reactivity. Luminet & Rimé (1997) study found that one dimension of the Bermond et al. Alexithymia scale was related to lower subjective emotional intensity and the poor verbalization scale, similar to the difficulty in describing feelins TAS scale, was related to higher physiological reactivity. This data suggest a decoupling between physiological and subjective components of emotional experience. As Luminet & Rimé (1997,p.27) concludes, quoting Martin & Phil on repression, "the cognitive difficulty people scoring high in alexythimia have in regulating distressing emotions might result in exacerbated physiological responses to stressful situations. This could in turn generate

disturbance in the autonomic balance and lead to the development of somatic disease, in the long run". Of course, more evidence is needed to support this hypothesis. In any case, longitudinal evidence that shows that alexythimia predicts inadaptation to somatic disease (e.g. breast cancer) confirms that alexythimia is a risk factor for health problems.

Content of traumatic events and comparison with previous studies

Some potential confounding variables which could explain these findings may be excluded: groups did not differ in dispositional health status, previous affect and in dispositional deficit in self-disclosure (in the first two studies). Evidence indicates that the manipulation with regard to the evocation of traumatic versus social events was successful. First, the content of traumatic events was similar to those found in previous studies (Pennebaker, 1989; Greenberg & Stone, 1992). Although the contents of the traumatic events may seem "normal", the descriptive contents were rather extreme and their distribution was similar to that found in Pennebaker's (1989) studies. However, two differences appeared: parental divorce was lower in our sample and sexual problems were absent. Those differences are related to real characteristics of the reference population: lower level of divorce in the population and 44% of people aged 18-25 do not have sexual experiences as showed by surveys carried out on this population.

Second, results confirm that the trauma event was related to strong inhibition: traumatic events had been held back from talking to other people more, had been inhibited more, and subjects avoided more talking about those events than social events, and they were more unsatisfied with the level of social sharing. Results also confirm that extreme inhibition (absolutely undisclosed events) were rare. Furthermore, no differences were found in the extent and how often people talked about traumatic and social events, confirming that simple quantitative social sharing does not differentiate extreme negative emotional events from normal ones.

Third, evoked traumatic events were associated with predicted differences with respect to appraisal, avoidant coping and affect activation induced by remembering the event. Traumatic events received a more negative appraisal: subjects rated those events as more personal, more revealing of their emotions, more meaningful, less controllable, more difficult to understand and being more difficult to give an account about, relative to social event subjects. Traumatic events were also more submitted to avoidant coping of memories and remembering those events induced more negative affect than social events. However, no differences were found in intrusion or ruminative thoughts and in arousal induced by the re-evocation task. An inspection of trauma contents shows that most of them were approximately five years old (similar to Greenberg, Wortman & Stone, 1996). It is possible to speculate that five-years old trauma have been overcome and that this distance explains why self-reported physiological arousal and intrusive imagery were similar to recent normal emotional events (an inspection of social events reveal that most of them were one week old).

Short term effects of the experimental induction of emotional self-disclosure

With respect to the experimental induction of emotional self-disclosure, the effects of writing partly support the fact that the confrontation manipulation worked as proposed. Results comparing subjects writing for three days 20 minutes about a trauma with respect to the social event group replicated effects found in previous laboratory experiences: immediate elevation in negative mood. Another important aspect was the similarity in the short term of writing intensively (for twenty minutes) and writing a brief description. In this study writing for three minutes about a traumatic event provoked a negative impact similar to a more intensive session of 20 minute writing. This suggests that remembering a traumatic event for only minutes implies an affective effort. This is congruent with the induction of negative mood changes following a brief recall task (Karniol & Ross, 1996).

Mediational processes related to the positive effect of expressive writing in subjects with high dispositional deficit in self disclosure

Our most interesting result was that subjects above a non alexythimic cutting point who write about an emotional event show beneficial health and memory effects. Experimental results show how confrontation adds to alexythimics overcoming personal deficits in emotional processing. Writing provokes in the above median alexythima score a group improvement in mood, in the event's appraisal and a reduction in self-reported arousal when remembering the event, relative to other conditions - intensive writing subjects, non alexythimics, and brief writing subjects. In other words, results confirm that alexythimia acts as a moderator of the confrontation process, specifically by means of changes from a more negative to a more benign appraisal - alexythimia was associated to a more negative appraisal in the pre-test. The predicted mediator role of automatic processes of memories and of valence of affect induced by remembering the event were disconfirmed. Rumination and avoidance, valence of event re-evocation, does not change by confrontation. These results cast a doubt on the central role assigned to rumination or intrusion and consequent active avoidance of intrusive thoughts, in the processes of assimilation of emotional events. Why intrusion and avoidance did not change with the confrontation manipulation is difficult to understand, because at least avoidance was related both to alexythimia and to traumatic, strongly inhibited, events. Rumination was not associated to trauma events nor to alexythimia, suggesting that the role of intrusive automatic thoughts have been overstated - at least in the long term.

With respect to processes mediating the positive mood impact of writing, this study shows that the beneficial effects of confrontation, in the case of subjects with deficits in self-disclosure, can be integrated simultaneously in the perceptual-motor theory of emotion and in the appraisal theories. Results showed that writing or confrontation acts partially by means of habituation, reduced arousal because of repeated exposures "in the mind" to the event, and simultaneously by means of

reappraisal, or by a better cognitive reframing and organizing of the event. Discussion on the recovery of traumatic events also suggests that it involves different processes: a reduction of negative affect through a process of reappraisal (reasserting perceived control), and prevention of continued automatic reactivation of representations about the event, by means of an habituation to traumatic images (Brewin, 1996).

The analysis of changes scores shows that the evolution in appraisal, arousal and negative mood was not associated in a linear manner. They appear as opposites: subjects that show an important decreases of negative affect also show a low rate of change in the perceived controllability and accountability of the event. Thus, positive affect changes and appraisal changes were inversely associated.

Arousal and appraisal changes were unrelated. A linear model of simultaneous decreases in negative affect, in arousal and an improvement of appraisal is incongruent with the data. A multidimensional process approach to emotions, as for example Leventhal's perceptual-motor model, is more coherent with the general pattern of findings. Following the results found in this study, recovery of traumatic events involves different processes: a) a reduction of negative affect complementary with the process of reappraisal, b) a reduction of continued automatic reactivation of representations about the event, by means of habituation, which is independent of reappraisal changes and shows a negative association with the rate of negative mood changes.

The pattern of association was similar for traumatic and normal emotional events. These results imply that the processes of cognitive assimilation are the same, independent of the severity of the event.

Effect size estimated on changes scores suggest that positive affective effects are strong in the case of more extreme and inhibited events, and cognitive-affective assimilation impact is more difficult to obtain with more serious events. This study is congruent with Greenberg & Stone's (1992) data which shows that health effects were strong in the case of most severe events.

Implications and limitations of the studies

These preliminary findings are important, because they suggest that confrontation of emotional memories may be a valid intervention for those with dispositional or situational limitations in self-disclosure. Of course, our participants were young and healthy adults, and our "undisclosed" group was in fact "a non highly shared traumatic event group" and the "alexithimic group" was the above median difficulty in describing feelings scale group. Implications for clinical intervention with patients must be cautious. A conservative conclusion is that expressive writing about emotional events might benefit people with modest problems of self-disclosure and not those with "true" problems of emotional expression. Finally, it is important to mention another important limitation of this study: the absence of objective health measures and physiological indexes. Our results rely on self-report measures - in any case with medium or satisfactory reliabilities. Results

appear more noteworthy when they converge with more objective data - for instance the importance of habituation as a mechanism for explaining the assimilation of emotional events by means of confrontation is reinforced by physiological experimental data from Mendolia & Kleck (1993). The present authors are aware that other conclusions are open to debate and supported only by measures of subjective distress and memories.

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Table 1.-

Evaluation of Traumatic and Social Events

Event Evaluation	Disclosed Trauma		Undisclosed Trauma		Social Event		
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>F</u>
Personal	7.46	0.78	7.37	0.89	3.84	2.27	31.49***
Told others	3.69	2.02	2.26	1.52	4.06	1.91	4.95*
Emotional	6.46	1.91	6.79	1.61	5.05	1.85	5.11**
Wanted to Tell	3.92	1.80	3.79	1.58	3.76	1.64	.04
Held back	5.23	2.38	4.89	2.44	2.70	1.86	6.05**
Meaningful	6.08	2.39	6.94	1.39	4.18	2.50	7.96***
Number of persons	3.69	2.86	1.58	1.71	4.35	2.47	6.93**
Appraisal	14.14	6.51	12.00	4.52	19.24	5.89	7.95***
Avoidance	7.57	4.47	6.60	4.21	3.88	1.76	4.38*
Intrusion	12.00	4.72	11.40	5.18	10.47	4.29	.40
Remembering:							
Arousal	8.14	2.44	8.90	2.36	7.94	2.36	.83
Valence	5.86	2.14	6.05	1.67	5.18	1.33	1.26

Note. Ns were 14,20 and 17 for the disclosed trauma, undisclosed trauma and social event groups respectively. First six variables were assessed on a 8-point scale ranging from 1 (not at all) to 8 (a great deal, extreme). Range appraisal scale 3-27, range intrusion scale 5-25, range avoidance and arousal scale 3-15, range valence 2-10. Higher scores mean higher mood, intrusion, avoidance, arousal, a more negative valence induced by re-evocation of the event, and a more benign appraisal of the episode (higher perceived control, easy to understand and to account for).

*** $p < .001$; ** $p < .01$; * $p < .05$.

Table 2.-

Immediate Mood and Physical Symptoms by Type of Event (Averaged Mean for Three days).

	Disclosed Trauma		Undisclosed Trauma		Social Event	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Pre PANAS NA	17.97	6.07	18.32	8.72	15.88	4.95
Post PANAS NA	20.23	8.37	19.28	8.21	15.60	6.48
Adjusted Post	19.65		18.44		17.04	
Pre PANAS PA	27.90	6.57	27.53	6.85	26.06	6.11
Post PANAS PA	26.05	6.37	24.91	7.30	25.25	6.19
Adjusted Post	25.26		24.52		26.43	
Pre PSS	16.40	1.56	16.60	2.76	16.57	2.04
Post PSS	17.57	2.46	17.20	2.48	16.67	2.41
Adjusted Post	17.72		17.17		16.55	

Note. Ns were 14, 20, and 17 for disclosed-trauma, undisclosed-trauma-control, and social event control respectively. PANAS NA= Immediate (current) Negative Affect schedule; PANAS PA= Immediate (current) Positive Affect schedule, PSS = Immediate (current) Pennebaker's Physical Symptoms scale. Higher scores mean higher mood and physical symptoms. Pretest dependent variable scores were used as covariates.

Table 3.-
Longer Term effects of Confrontation by Type of Events.
Intensive Writing.

Measure	<u>n</u>	Pretest <u>M</u>	<u>SD</u>	Follow-up <u>M</u>	<u>SD</u>	Adjusted Follow-up	<u>F</u>
PANAS positive							3.49*
Disclosed	14	31.92	6.47	29.71	7.80	29.52	
Undisclosed	19	29.89	4.46	29.21	5.22	30.77	
Control	17	32.00	4.89	26.35	6.71	24.98	
PANAS negative							.13
Disclosed	14	26.64	7.90	20.50	7.24	20.50	
Undisclosed	19	24.95	9.16	21.32	8.25	21.64	
Control	17	27.00	8.57	21.59	7.33	21.53	
IES Avoidance							.16
Disclosed	14	7.57	4.46	6.42	4.96	5.63	
Undisclosed	19	6.68	4.31	6.68	3.87	6.16	
Control	16	3.94	1.81	4.38	2.41	4.29	
IES Intrusion							.56
Disclosed	14	12.00	4.72	11.37	5.15	10.87	
Undisclosed	19	11.53	5.28	10.21	4.56	9.97	
Control	16	10.38	4.41	8.81	4.83	9.54	
Remembering							Valence
5.06***							
Disclosed	14	5.86	2.14	6.07	1.54	5.96	
Undisclosed	19	6.05	1.71	5.63	1.16	5.33	
Control	17	5.18	1.33	6.00	0.87	6.14	
Remembering Arousal							1.09
Disclosed	14	8.14	2.44	6.64	2.84	6.62	
Undisclosed	19	8.79	2.37	6.15	2.59	5.87	
Control	17	7.94	2.36	5.41	1.62	5.62	
Event							Appraisal
9.55***							
Disclosed	14	14.14	6.51	13.21	5.83	13.78	
Undisclosed	19	11.84	4.59	12.26	3.59	13.92	
Control	17	18.94	5.95	21.31	4.60	19.12	

Note. PANAS NA= Last month Negative Affect schedule; PANAS PA= Last month Positive Affect schedule, IES= Horowitz's Impact of Event Scale. Higher scores mean higher mood, intrusion, avoidance, arousal, a more negative valence induced by re-evocation of the event, and a more benign appraisal of the episode (higher perceived control, easy to understand and to account for). F's are ancova estimates using pre-test dependent variables scores as covariates. Degrees of freedom were 2,45 for

IES scores and 2,46 for the other variables.

Table 4.-
Evaluation of Traumatic and Social Events

Event Evaluation	Trauma		Social Event		F
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Personal	6.57	1.98	3.53	2.08	55.36***
Told others	3.18	2.02	4.69	1.89	14.18***
Emotional	6.39	1.91	4.69	1.99	18.65***
Wanted to Tell	3.97	1.99	4.36	1.91	.94
Held back	4.83	2.24	2.54	1.82	27.89***
Meaningful	6.04	2.21	4.11	2.46	16.73***
Number of persons	3.24	3.11	5.67	5.30	7.42**
Appraisal	13.55	5.25	19.33	5.31	27.11***
Avoidance	5.96	3.71	3.67	1.43	11.71***
Intrusion	10.83	5.04	9.93	4.01	.69
Re-evocation:					
Arousal	7.87	2.66	7.34	2.51	.96
Valence	6.28	1.55	5.39	1.23	9.04**

Note.- Ns were 71 and 37 for the trauma and social event groups, respectively. Variables were assessed on a 8-point scale ranging from 1 (not at all) to 8 (a great deal extreme). *** p<.001; ** p<.01; *p<.05. Higher scores means higher mood, intrusion, avoidance, arousal, a more negative valence induced by re-evocation of the event, and a more benign appraisal of the episode (higher perceived control, easy to understand and to account for).

Table 5.
Longer Term effects of Type of Writing by Alexythimia.

	Intensive Writing Alexythimia		Brief Writing Alexythimia		<u>F</u>
	Low	High	Low	High	
	<u>M</u>	<u>M</u>	<u>M</u>	<u>M</u>	
PANAS PA					
Pre test	32.78 (5.09)	28.33 (4.87)	32.82 (4.45)	30.07 (7.11)	
Follow-up Two months	30.28 (7.73)	28.40 (7.72)	31.14 (7.73)	28.27 (8.51)	a) .09 b) .87 c) .54
Adjusted Follow-up	28.56	29.21	31.44	29.62	
PANAS NA					
Pre test	22.61 (6.46)	29.33 (9.51)	22.14 (6.83)	27.40 (8.58)	
Follow-up Two months	21.89 (6.24)	19.86 (6.69)	21.50 (6.69)	26.60 (7.88)	a) .03 b) 5.43* c) 3.78*
Adjusted Follow-up	22.19	19.26	23.03	26.60	
IES Avoidance					
Pre test	6.06 (3.68)	8.23 (4.85)	4.43 (2.33)	5.93 (3.29)	
Follow-up Two months	6.61 (3.88)	6.53 (3.85)	4.52 (2.89)	5.93 (3.29)	a) 1.84 b) .13 c) 1.32
Adjusted Follow-up	6.95	5.11	5.89	5.64	
IES Intrusion					
Pre test	11.72 (4.06)	11.73 (6.07)	9.81 (5.39)	10.71 (4.81)	
Follow-up Two months	10.17 (4.53)	11.33 (5.15)	8.23 (3.39)	9.64 (4.10)	a) 1.28 b) 2.95 c) .19
Adjusted Follow-up	9.88	11.16	8.86	9.48	
Remembering Valence					
Pre test	5.66 (1.94)	6.33 (1.78)	6.46 (1.01)	6.73 (1.39)	
Follow-up Two months	5.72 (1.12)	5.93 (1.58)	6.36 (0.73)	6.73 (1.10)	a) 1.02 b) 6.02* c) 2.39
Adjusted Follow-up	6.22	5.66	6.43	6.51	
Remembering Arousal					
Pre test	8.94 (1.89)	8.00 (2.85)	6.63 (2.40)	8.07 (3.10)	
Follow-up Two months	6.50 (2.67)	6.20 (2.73)	5.41 (2.37)	6.23 (2.12)	a) 1.21 b) .01 c) .02
Adjusted					

Follow-up	5.79	6.48	5.87	6.42	
Event Appraisal					
Pre test	14.50	10.80	15.24	12.00	
	(4.44)	(6.12)	(4.97)	(4.76)	
Follow-up	13.11	12.13	16.09	11.57	a) .52
Two months	(4.74)	(4.57)	(4.46)	(4.93)	b) .51
Adjusted					c) 3.09
Follow-up	12.38	13.33	14.89	12.32	

Note. Ns were 18, 15, 22 and 15 for low alexythimia intensive writing, higher alexythimia intensive writing, low alexythimia brief writing, and higher alexythimia brief writing respectively. PANAS NA= Last month Negative Affect schedule; PANAS PA= Last month Positive Affect schedule, IES= Horowitz's Impact of Event Scale. Standard deviations are in brackets. F's are ancova estimates using pre-test dependent variable scores as covariates. a) F Low versus High Alexythimia sub-scale main effect, b) F Intensive versus Brief writing main effect and c) interaction F. Degrees of Freedom=1,66.

Table 6.

Appraisal and Remembering Arousal by Change in Negative Long Term Mood: Intensive Writing High Alexythimia Condition

	Change in Negative Long Term Mood			
	Negative or lower Positive Change		High Positive Change	
	<u>M</u>	<u>SD</u> (N=16)	<u>M</u>	<u>SD</u> (N=11)
Event Appraisal Pre-test	14.5	7.76	13.64	6.8
Follow-up Two months	16.94	7.56	14.55	6.2
Remembering Arousal Pre-test	7.69	2.63	8.46	2.62
Follow-up Two months	4.94	1.88	6.09	2.47

A median split was performed on high alexythimia-intensive writing condition subject's scores change on negative long term mood (median was 6). 63% show positive change score above three points.

We thank J. Pennebaker, B. Rimé, R. Larsen and four anonymous reviewers for their comments on a preliminary draft of this chapter. We would also like to thank Sophie Van Bellingen for her help in the data collection.