

What is the Nature of the Self-defining Memories of Repression-prone Individuals?

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The present study investigates the ability to predict various self-defining memory dimensions from individual differences in repressiveness, operationalized by high levels of defensiveness and low levels of trait anxiety. Three self-defining memories from 83 participants (aged between 27 and 43 years) recruited from the general population were analyzed with multilevel models. The main results showed that repression-prone individuals, relative to more adjusted individuals, retrieved more specific self-defining memories and were less likely to extract meanings from their personal memories. Moreover, self-threatening, self-defining memories of repression-prone individuals contained fewer negative emotional words than did those of more adjusted individuals. These results are discussed in light of a recent affect-regulation view of emotional autobiographical memories.

Keywords: Self-defining memories; Repression; Memory specificity; Memory integration; Affect regulation.

Past studies have already shown differences between individuals in the autobiographical memory function of their proneness to repression. Thus, personal

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memories of repression-prone individuals seem to provide core information on their psychological functioning. Nevertheless, only one study has specifically explored the most significant personal memories supporting the sense of self and identity, the so-called self-defining memories (SDMs; Singer & Salovey, 1993), relative to an individual's level of repression. Starting from some limitations of Blagov and Singer's (2004) methodology, the aim of the present study was to pursue the characterization of the SDMs of repression-prone individuals.

Repression has been defined as a psychological process in which individuals tend to avoid the experience of anxiety and other negative affect when confronted with threatening information (Davis, 1990; Myers & Derakshan, 2004; Weinberger, 1990). Several scales have been created to measure repression. The most influential approach to the operationalization of repression, proposed by Weinberger, Schwartz, and Davidson (1979), helps to identify "repressors," the category of individuals who are believed to possess a repressive coping style. This framework was developed to explain the discrepancy observed between self-reported trait anxiety and physiological and behavioral responses to stress. In fact, as Weinberger (1990) stated, "repressors (1) are motivated to maintain self-perceptions of little subjective experience of negative emotion despite (2) tendencies to respond physiologically and behaviorally in a manner indicative of high levels of perceived threat" (p. 343). Therefore, Weinberger et al. (1979) identified repressors by using two self-report questionnaires: a measure of trait anxiety and a measure of defensiveness. Repressors are then defined as simultaneously having low scores on the trait anxiety scale and high scores on the defensiveness scale. According to Weinberger et al., the three other patterns that can be obtained by using the two measures are low anxious (individuals who report low levels of trait anxiety as repressors but also have low defensiveness scores), high anxious (individuals who score high in trait anxiety and low in defensiveness), and defensive high anxious (individuals who score high on both measures). Various scales have been used in the literature to assess trait anxiety (e.g., the Taylor Manifest Anxiety Scale, Bendig, 1956; or the Trait Anxiety Inventory, Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), whereas defensiveness is typically assessed with the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960). The latter scale has in fact been identified as measuring defensiveness, protection of self-esteem, and affect inhibition more than social desirability as such (Crowne & Marlowe, 1964; Weinberger, 1990). Because no consensus exists, the cut-offs for the group selections were chosen by the researchers on different bases, such as quartile splits, median splits, or particular scoring criteria (Myers, 2010). In order to overcome the concerns related to categorical approaches (e.g., heterogeneity of individuals in the same group, arbitrary cut-offs; Maxwell & Delaney, 1993) and to interpret results from a posteriori extreme-group designs (e.g., regression toward the mean; Shadish, Cook, & Campbell, 2002), we adopted a dimensional approach in the present study. Therefore, in accordance with the work of Dickson, Moberly, Hannon, and Bates (2009) and Raes, Hermans, Williams, and Eelen (2006), we considered trait anxiety and defensiveness as continuous variables and investigated autobiographical memory characteristics as a function of individual levels of repressiveness (operationalized by the interaction of trait anxiety and defensiveness and suggesting proneness to repression). The advantage of this method is that all available data are used and a more accurate understanding is provided of the relationships between autobiographical memory characteristics and repressiveness and of the independent contribution of trait anxiety and defensiveness.

Many studies in which participants have been categorized into distinct groups have suggested that repressors avoid negative information, particularly regarding the self, and information that is incompatible with their self-image (e.g., Myers, 2000; Newman, Caldwell, & Griffin, 2008; Weinberger, 1990). Mendolia (2002) stated that both situational and dispositional parameters are necessary to promote repression. More specifically, psychological distancing from an emotional event is observed when this event is perceived as threatening the self-concept, but only in individuals who manifest a hypersensitivity to negative and positive events. Moreover, Derakshan, Eysenck, and Myers (2007) proposed that repressors' vigilant responses to self-relevant threats emerge from the activation of negative self-relevant schemas and related autobiographical memories. Thus, it seems that repression-prone individuals modulate the accessibility and the characteristics of their autobiographical memories in order to regulate their emotions.

Autobiographical Memory and Repression

The relationships between repression and autobiographical memory have been explored in past studies, which have emphasized two main individual differences on autobiographical memory characteristics, depending on proneness to repression: the accessibility of negative events and memory specificity. Davis (1987, 1990) and Davis and Schwartz (1987) conducted the first studies of repressors' recall of autobiographical memories (from exclusively female samples). In their studies, they adopted Weinberger et al.'s (1979) approach to the classification of repressors and tested autobiographical memory mainly with free- and cued-recall tasks. Overall, Davis and Schwartz found that repressors recalled significantly fewer negative autobiographical memories and took longer to recall them than the other three groups. This result was confirmed particularly strongly for memories associated with specific negative affect (i.e., for fearful and self-conscious experiences) and for negative affect experienced by the self (and not by others). Moreover, repressors were older than other participants at the time of the earliest negative experience retrieved. Repressors' biased recall of negative self-relevant memories was later similarly found in several studies using different methodologies (e.g., Holtgraves & Hall, 1995; Myers & Brewin, 1994; Newman & Hedberg, 1999). In addition, Myers and Brewin (1994) found in their study that repressors reported more negative interactions with their parents (more paternal antipathy and indifference, and less closeness to their father), suggesting that they might have experienced more negative events during childhood. Together, these findings on the limited accessibility of unpleasant memories support the theoretical definition of repression as a defensive process, specifically invoked in response to ego-threatening situations. Repressors' reduced recall was not only observed for negative autobiographical memories, but even for negative material in intentional and incidental learning paradigms (e.g., Myers, Brewin, & Power, 1998; Myers & Derakshan, 2004). Finally, in a study using a thought-suppression paradigm, Geraerts, Merckelbach, Jelicic, and Smeets (2006) showed, using the fourfold classification of Weinberger et al. (1979), that the repressor group reported globally less intrusive thoughts about negative autobiographical memories compared with the other three groups, suggesting a habitual avoidant style for negative autobiographical thoughts. Moreover, although repressors were better at suppressing negative thoughts immediately after the task, Geraerts et al. (2006) showed that repressors were more prone to presenting intrusive thoughts about their negative autobiographical memories over a period of seven days than were the other individuals.

The second interesting finding regarding autobiographical memories and repression concerns specificity. Raes et al. (2006) explored the specificity of autobiographical memories (using the Autobiographical Memory Test cue word procedure; Williams & Broadbent, 1986) and found an association between repressiveness (assessed with the interaction of trait anxiety scale and a defensiveness measure) and less specific memories. They concluded that this finding was in agreement with Williams's (1996) affect regulation hypothesis, which postulates that individuals who have experienced adversity during childhood develop an over generalized mode of autobiographical retrieval in order to regulate affect (protecting themselves from negative affect attached to specific stressful events). Dickson et al. (2009) partially replicated this finding. Specifically, they found that only high levels of defensiveness (and not trait anxiety) were associated with reduced levels of specificity for negative self-relevant material (personal memories and personal future events).

Self-defining Memories (SDMs) and Repression

Most of the studies on autobiographical memory and repression have been interested in memories of common personal life experiences. Nevertheless, it seems important to pursue the investigation of autobiographical memories that are more directly related to the self: SDMs (Singer & Salovey, 1993). An SDM is a memory from one's life that is remembered very clearly and that still feels important to oneself. Moreover, an SDM should help to explain who one is as an individual and is a memory one would tell someone else if one wanted that person to really understand oneself (Singer, 2005). SDMs are usually accessed to inform about advancement in goal pursuit and when an obstacle threatens the attainment of a goal that is particularly relevant to self-concept and to the integrity of self-coherence (Singer, 2006). Considering that repression-prone individuals are particularly sensitive to self-relevant threats (Derakshan et al., 2007), an investigation of memories related to the self that contain fundamental cognitive-affective-motivational information is very relevant. SDMs are defined by several characteristics, such as vividness, affective intensity, high levels of rehearsal, linkage to thematically similar memories, and connection to enduring concerns or unresolved conflicts in the individual's life (Singer & Salovey, 1993).

Only one previous study has been conducted with the explicit aim of exploring relationships between SDMs and repression (Blagov & Singer, 2004). That study focused on four main dimensions along which individual SDMs may vary: memory structure (which reflects the level of narrative specificity), autobiographical reasoning (i.e., the cognitive process associated with self-reflective thinking about past experiences), the affective responses to memory retrieval, and memory content (which reflects one of the person's primary concerns; Thorne & McLean, 2001). However, preliminary findings had been described earlier by Singer and Salovey (1993), who collected 10 SDMs from each subject. They found that the repressor group—individuals high on the restraint scale and low on the distress scale of the Weinberger Adjustment Inventory (WAI; Weinberger & Schwartz, 1990)—retrieved more summarized memories than the self-assured group—individuals low on the restraint and distress scales of the WAI, suggesting a possible difference in the two groups' memory narrative styles. Surprisingly, they did not find a clear difference between the two groups' affective responses following memory retrieval.

In the Blagov and Singer (2004) study, 104 undergraduate students (80 women, aged 17 to 22 years) retrieved 10 SDMs and filled out a short form of the WAI. This scale contains three subscales: self-restraint (intrapersonal, interpersonal, and

communal aspects of socialization, such as impulse control and responsibility); subjective experience of distress (proneness to negative affect and lack of positive affect, such as anxiety, depression, or low self-esteem); and repressive defensiveness (tendency to avoid negative evaluation and promotion of positive self-perception, independent of levels of distress). Blagov and Singer studied the relationships between these three subscales and SDM specificity, meaning, affect, and content. Their main findings on repression (taking the repressive defensiveness scale as a measure of repression) replicated the previous results described by Singer and Salovey (1993), notably an association between high scores for repressive defensiveness and low memory specificity and an absence of association between repressive defensiveness and the affective responses related to memory retrieval (as rated by the participants). The authors also found a positive correlation between repressive defensiveness and the number of memories containing meanings (i.e., integrated memories), but this association became nonsignificant in regression analyses controlling for the levels of specificity and the number of words in the memories. In addition, they found that individuals high in repressive defensiveness reported longer memory narratives. Regarding the distress subscale, Blagov and Singer did not find an association with memory specificity, but they did find that individuals high in distress reported more disrupted relationships and threats in their SDMs and fewer achievement events. The self-restraint scale was not found to be related to any memory dimension, despite memory integration. More specifically, the authors found that individuals with moderate self-restraint reported more integrative memories than did individuals with low self-restraint, reflecting high levels of emotional maturity and personal adjustment. Finally, they did not find any differences between men and women on the memory dimensions or WAI subscales.

Nevertheless, this study presents some limitations. First, the way in which Blagov and Singer assessed repression did not follow Weinberger's (1990) guidelines. In fact, the WAI was created to account for the complexity of the repressive coping style. In particular, Weinberger recommended identifying repressors as those individuals who have a high score on the repressive defensiveness scale but, at the same time, a low score on the distress scale and a moderate to high score on the self-restraint scale. Therefore, when one uses the WAI, all three scales (representing different components of repression) are necessary for the identification of repressors (whereas Blagov & Singer, 2004, used only the repressive defensiveness scale). Second, the data structure was composed of 10 SDMs per person. However, Blagov and Singer collapsed the 10 SDMs to obtain single scores representing the absolute frequency of each dimension in all SDMs (e.g., the specificity score represents the number of specific SDMs of 10). This approach supposes that characteristics about SDMs are constant across all SDMs, independently of the nature of these SDMs. In other words, all SDMs share similar properties, such that averaging across multiple SDMs to obtain a unique score would be justified. However, this approach oversimplifies the highly complex nature of different SDMs. We argue that variations of SDM dimensions across multiple SDMs do not reflect error that must be averaged out. Rather, such variations capture fundamental characteristics of SDMs that deserve to be explored. Hence, rather than averaging out variations across multiple SDMs to apply traditional statistical models, we analyzed our data at the level of single SDMs and, at the same time, considered that each individual reports multiple SDMs. This type of data structure is called multilevel in that repeated measures constitute the first level and individuals the second level of analysis. Multilevel models (MLMs) specifically analyze this kind of data, whereas multiple SDMs (level 1) have been measured on the same individuals

(level 2). As well as implementing the appropriate statistical tests for all effects, multilevel modeling also allows one to test for interactive effects between variables at different levels, such as between individual characteristics (e.g., trait anxiety or defensiveness) and SDM dimensions (Goldstein, 2011).

The Present Study

Taking these limitations into account, the present study aimed to further explore the SDM characteristics of repression-prone individuals. Derakshan and Eysenck (1997) obtained evidence that the WAI and the Weinberger et al. (1979) method are comparable. Thus, considering that the Weinberger et al. method is still the most influential approach in the literature for the measurement of repression and that it is well validated, we adopted this method for the identification of repression-prone individuals, using a dimensional approach. Therefore, our first objective was to reexamine the SDM dimensions explored by Blagov and Singer (2004)—specificity, meaning, content, and affect—using a more appropriate statistical method (i.e., multilevel modeling). Recall that Blagov and Singer found that repression was positively associated only with memory specificity and that no significant association was found with memory integration, memory content, and affective responses to memory retrieval. In the present study, however, we expected to find two associations that did not emerge in Blagov and Singer's study. Specifically, considering the repressors' defense against negative affect (Myers, 2000; Weinberger, 1990), we hypothesized that SDMs of repression-prone individuals should be related to fewer changes in negative affect levels compared with those of more adjusted individuals (i.e., individuals with low trait anxiety and low defensiveness scores). Moreover, because repressors are characterized by limited accessibility of unpleasant memories (e.g., Davis & Schwartz, 1987), a reappraisal of those negative events may be difficult. Consequently, their poor autobiographical reasoning should impede the integration of the memory in the self-structure. Therefore, we hypothesized that SDMs of repression-prone individuals should be less integrated compared with the SDMs of more adjusted individuals.

The second aim of the study was to extend Blagov and Singer's study. Starting with the richness of the information contained in the repeated measures of SDMs, we chose some additional memory characteristics to be explored. Considering that repressors seem to act to protect themselves against negative affect (e.g., Myers, 2010; Weinberger, 1990) and tend to recall few negative memories (e.g., Davis & Schwartz, 1987; Myers & Brewin, 1994; Newman & Hedberg, 1999), it seems important to focus on negative SDMs, notably on SDMs that contain a self-threat. Consequently, it would be interesting to explore whether, relative to more adjusted individuals, repression-prone individuals retrieve fewer self-threatening SDMs. As Thorne, McLean, and Lawrence (2004) stated, a memory that refers to a conflicting goal, such as a disrupted relationship or an academic failure, is stressful and contains tension (i.e., an explicit reference to discomfort, disagreement, or unease in one of the characters in the memory narrative). Thus, in the present study, tension was considered as an index of self-threat, and we hypothesized that repression-prone individuals in particular should retrieve fewer SDMs containing tension than should more adjusted individuals. Thereafter, a more specific exploration of only the SDMs that were self-threatening would be conducted. McAdams, Reynolds, Lewis, Patten, and Bowman (2001) observed that some individuals adopted a coping strategy in their narratives leading to a transformation of the negative affect state into a more positive outcome. This kind of narrative transformation has been called a

redemption sequence. Therefore, we decided that it would be interesting to explore whether redemption is a coping strategy that repression-prone individuals use to avoid negative affect. We hypothesized that self-threatening SDMs (i.e., SDMs with tension) of repression-prone individuals should contain more redemption sequences than should the SDMs of more adjusted individuals.

Moreover, in this study, we aimed to conduct a lexical analysis of the self-threatening SDM narratives of repression-prone individuals. Sutin and Robins (2008) proposed a model of the relationships between self, memory, and visual perspective that emphasizes the impact of the use of the first-person or third-person perspective in memories of feelings, thoughts, and goals. In this context, they argued that a reduced use of the first person may occur during the retrieval of a self-threatening memory, in which case it serves a distancing function. This memory characteristic helps to reduce emotional reliving and to distance the current self from the self in the memory. According to this model, we expected to observe fewer self-referring pronouns (such as “I” and “me”) in self-threatening SDMs of repression-prone individuals compared with more adjusted individuals. Finally, another lexical analysis that we proposed to perform concerned the use of emotional words. Kahn, Tobin, Massey, and Anderson (2007) found differences in the numbers of emotional words in healthy young adults’ autobiographical narratives, depending on memory content: Narratives describing a sad event contained more negative emotional words than positive words, whereas narratives describing an amusement contained more positive emotional words. Thus, narratives of SDMs with tension of repression-prone individuals should contain many negative emotional words. However, because of the tendency of these individuals to avoid negative affect, we expected to observe fewer negative emotional words in SDMs with tension in repression-prone individuals than in more adjusted individuals.

In summary, our hypotheses were that repression-prone individuals (compared with more adjusted individuals) should retrieve SDMs associated with fewer changes of negative affect levels, SDMs that are less integrated, and fewer self-threatening SDMs. These self-threatening SDMs (i.e., SDMs with tension) should contain more redemption sequences, fewer self-referring pronouns, and fewer negative emotional words.

Method

Participants

The sample was composed of 83 participants (51.8% female) recruited from the general population living in Geneva (Switzerland) by means of advertisements and personal contacts. Participants were volunteer native French or fluent French speakers and received no compensation for their participation. Their mean age was 34.63 years ($SD = 4.14$, range = 27–43) and mean years of education was 17.11 ($SD = 2.58$, range = 11–23).

Material

SDMs. Three SDMs were collected from each participant with the Self-Defining Memory Task (Singer & Blagov, 2000–2001; Thorne & McLean, 2001). Participants were given an oral definition of SDMs, in which it was explained that SDMs are personal memories with specific attributes. An SDM must be at least one year old, be a memory from their life that they remember very clearly and that still feels important to

them, be a memory that helps them to explain who they are as an individual, and be the memory they would tell someone else if they wanted that person to really understand them. In addition, an SDM is a memory about an important and enduring theme, issue, conflict, or concern from their life and is linked to other memories sharing the same theme. The memory may be positive or negative; the only important aspect is that it generates strong feelings. It is a memory that participants have thought about many times and that should be as familiar to them as a picture or a song. While listening to this description, each participant had a sheet of paper in front of them summing up the principal points. After this definition, participants had to imagine a situation where they met someone they liked very much and, during a walk, each one agreed to help the other get to know the “Real Me.” In the course of the conversation, several memories were evoked, memories that convey powerfully how one has become the person one currently is. Participants were told that these memories constitute SDMs. Then, they were given three sheets of paper on which they had to write down, for each memory, a title or a one-sentence summary, a description of the event with enough details to help the imagined friend to see and feel as they did, and an estimate of how long ago the event had occurred (in years and months). This latter point was a measure of the time frame (months passed between the event described in the memory and the retrieval day) for each SDM. The SDM task instructions were translated into French and then back-translated into English by a bilingual person. The back-translation was then compared with the original version.

Before the participants received their instructions for the SDM task and after each memory was retrieved, the participant’s affective state was assessed with the International Positive and Negative Affect Schedule—Short Form (I-PANAS-SF, Thompson, 2007; original form, Watson, Clark, & Tellegen, 1988). Participants were asked to rate the extent to which they were experiencing five positive and five negative affects at that specific moment, using 5-point rating scales that ranged from 1 (*very slightly or not at all*) to 5 (*very much*). The French short version was adapted from the French validated long version of the PANAS proposed by Gaudreau, Sanchez, and Blondin (2006).

Repressiveness. Following the method recommended by Weinberger et al. (1979), repressiveness was assessed with a trait anxiety and a defensiveness measure. Participants’ trait anxiety was evaluated with the Trait Anxiety Inventory (STAI-T; Spielberger et al., 1983). The 20 statements are rated on a 4-point scale that ranges from 1 (*almost never*) to 4 (*almost always*), and 9 items have a reverse score. The French version of the STAI-T was validated by Bruchon-Schweitzer and Paulhan (1993). Defensiveness was assessed with the Marlowe–Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960). In this 33-item questionnaire, participants are asked to select the most appropriate response for each item using a true–false format (15 items have a reverse score). High scores on the STAI-T and the MCSDS represent high trait anxiety and high defensiveness, respectively. Repressiveness refers to simultaneously low scores on the STAI-T and high scores on the MCSDS.

Procedure

Participants were interviewed individually in a quiet setting. The experiment was introduced orally by informing participants that they would have to retrieve some important personal memories and that they would be asked to fill out some written questionnaires. Thereafter, each participant provided informed consent to participate.

The order of the questionnaires was counterbalanced. Data were collected by two interviewers. Each one collected half of the data and performed memory transcription and memory coding for the other half of the data. Participants were informed that the events generated would be coded and the data would be analyzed by a researcher who had access only to personal identification codes. This procedure was designed to minimize the possible bias that an individual may have chosen to report more impersonal memories because of a personal relationship with the interviewer.

Scoring

Specificity. Singer and Blagov's (2000–2001) manual was used to assess memory specificity. A memory narrative was considered to be specific (coded as 1) if it contained at least one single event statement with a unique occurrence and the event duration was less than 1 day. Specific memory narratives could describe a single event, contain generalizations, or describe multiple single events. On the other hand, memory narratives that did not contain at least one single event statement were considered nonspecific (coded as 0). A nonspecific memory could be a generalized narrative of sequential events forming a story or could be composed of many similar events that occurred many times over a long time frame.

Memory integration. Following Singer and Blagov's (2000–2001) manual, memory integration analyses consisted of an assessment of the presence of a statement about what the memory taught the participant about himself or herself, someone else, or life in general. A memory narrative was considered to be integrated (coded as 1) if the individual stepped back from the event description and added a statement about a lesson or an insight extracted from the memory. These memories are also called memories with meanings. If the narrative contained only an event description (without a lesson or insight), it was considered as a nonintegrative memory (coded as 0), that is, a memory without meanings.

Content. The narrative content of memories was evaluated with Thorne and McLean's (2001) manual. According to this classification, we retained four mutually exclusive categories: life-threatening, leisure, relationship, and achievement events (for each category, we coded 1 = *presence* or 0 = *absence*). Events were coded in the life-threatening category if themes of basic safety or mortality emerged, in the leisure category if they described exploration and fun, in the relationship category if they concerned positive and negative interpersonal relationships, and in the achievement category if they described effortful mastery or attempts to achieve goals. Events that did not fit into one of these categories were considered as nonclassifiable events.

Tension. Following Thorne et al. (2004), narratives were also coded for presence (coded as 1) or absence (coded as 0) of tension. Tension was defined as an explicit reference to the discomfort, disagreement, or unease of one of the characters. In the present study, tension was considered as an index of self-threat.

Redemption. The presence (coded as 1) or absence (coded as 0) of redemption sequences was coded by using the manual provided by the Foley Center for the Study of Lives (1999). A redemption sequence was defined as an explicit transformation in the memory narrative from a demonstrably negative affective state to a demonstrably positive affective state.

Narrative lexical analysis. The ratio of the number of self-referring pronouns (“I” and “me,” in French: *je, me, moi*) to the total number of words produced was measured for each SDM. The emotional lexicon was analyzed with the EMOTAIX dictionary (Piolat & Bannour, 2009), driven by Tropes V7 software. EMOTAIX identified the emotional lexicon of the SDM narratives and categorized words in positive and negative valences. Two measures were obtained for each SDM: the ratio of positive words and of negative words to the total number of words.

Affect. The I-PANAS-SF was administered four times (once at baseline and three measurements after each memory retrieval). Affective changes were obtained by subtracting the score of the immediately preceding measurement from that of the following measurement after the memory retrieval. Affective changes were calculated for the positive affect (PA) scale and the negative affect (NA) scales. Moreover, the intensity of the affective changes on the PA and the NA scales was measured by taking the absolute values of PA and NA changes.

Reliability. The first author of this study and an independent rater blind to the hypotheses scored all 249 SDMs. Inter-rater reliability was calculated by using percentage agreement and Cohen’s κ (Cohen, 1960). Reliability was very good for specificity (% agreement = 94, $\kappa = .85$) and good for memory integration (% agreement = 83, $\kappa = .63$), content (% agreement = 77, $\kappa = .69$), tension (% agreement = 86, $\kappa = .67$), and redemption (% agreement = 91, $\kappa = .72$). The reliability coefficients (Cronbach’s α) of the I-PANAS-SF questionnaires ranged from .64 to .83 for the PA scale and from .63 to .83 for the NA scale. Moreover, Cronbach’s α was .90 for the STAI-T and .72 for the MCSDS.

Analyses

In this study, scores on the STAI-T and the MCSDS scales were considered as continuous variables. The impact of these two measures and their interaction on SDM dimensions was tested in several MLMs. To account for the data structure (249 repeated memories at level 1 nested within 83 persons at level 2, with exactly three SDMs per person), we performed MLMs. Analyses were performed with the lme4 statistical package of the R program (R Development Core Team, 2009, version 2.11.1). For continuous dependent variables, we specified a linear MLM as shown in Equation 1:

$$Y_{i,j} = \beta_{0,j} + \beta_{1,j} \cdot X_{1,j} + \beta_{2,j} \cdot X_{2,j} + \beta_{3,j} \cdot (X_{1,j} \cdot X_{2,j}) + \varepsilon_{i,j} \quad (1)$$

where $Y_{i,j}$ is the predicted dimension of the i th SDM of individual j , $\beta_{0,j}$ is the predicted score for an individual j with a score of zero on all predictors, $\beta_{1,j}$ estimates the effect of the trait anxiety score ($X_{1,j}$) of individual j , $\beta_{2,j}$ estimates the effect of the defensiveness score ($X_{2,j}$) of individual j , and $\beta_{3,j}$ estimates the interactive (multiplicative) effect of trait anxiety and defensiveness of individual j . The model assumes that the level-1 residuals $\varepsilon_{i,j}$ are normally distributed. For dichotomous dependent variables, we specified a logistic MLM with the logit link function and level-1 residuals distributed according to the binomial distribution (Pinheiro & Bates, 2000). Referring to Equation 1, this model does not directly predict the score of $Y_{i,j}$ (which now has only two values, 0 or 1), but it predicts the so-called log-odds, that is, the log of the ratio of the probability of obtaining $Y_{i,j} = 1$ to the probability

of predicting $Y_{i,j} = 0$ ($\log\{\Pr(Y_{i,j} = 1)/[1 - \Pr(Y_{i,j} = 1)]\}$). We also checked for under- or over dispersion of the logistic function, neither of which occurred.

In order to avoid biased estimations of the hypothesized relationships and multicollinearity issues, we centered the predictor variables (i.e., trait anxiety and defensiveness) on their means (Aiken & West, 1991). This also allows a direct interpretation of the intercept estimate $\beta_{0,j}$. To test for interdependence among the memories of a single person, we first computed the so-called empty model for each dependent variable (Snijders & Bosker, 1999). This model constitutes the first step of any MLM-type analysis and simply provides separate estimates of variability at each level of the data hierarchy. The results showed that MLMs were necessary for our data given that significant amounts of the total variance in SDMs were attributed to the individuals. Consequently, we computed MLMs on all dependent variables.

Results

Descriptive Analysis

Table 1 shows the descriptive statistics on all the dimensions of the SDMs (using memories—level 1—as the unit of analysis). Globally, the main memory characteristics (i.e., frequencies, mean, and *SD* for specificity, memory integration, content, affect, and tension) are comparable to those found in previous studies (e.g., Blagov & Singer, 2004; Lardi, D'Argembeau, Chanal, Ghisletta, & Van der Linden, 2010).

In addition, descriptive analyses showed that both independent variables at the participant level before mean centering were normally distributed (centering a variable does not alter the shape of its distribution): for the STAI-T ($M = 42.78$, $SD = 10.20$, range = 24–68, skewness = .6, kurtosis = $-.2$) and for the MCSDS ($M = 15.51$, $SD = 4.83$, range = 3–26, skewness = $-.2$, kurtosis = 0).

Relationships Between SDMs and Repressiveness

In order to test the relationships between the different SDM dimensions and repressiveness on the entire sample of SDMs, we tested several MLMs, given that the preliminary empty models showed within-person, across-memory dependencies. We tested the main effect of mean centered trait anxiety (STAI-T) and defensiveness (MCSDS), as well as their interaction. Preliminary analyses also considered participants' age and gender. However, the inclusion of age and gender virtually did not change the effects of trait anxiety and defensiveness and their interaction. Moreover, a likelihood ratio test comparing the two models (with vs. without age and gender) indicated no significant improvement in statistical fit. For simplicity and brevity, therefore, we will present only the results without age and gender. One participant presented too much missing data for the MCSDS. Consequently, the models with predictors were conducted on 82 participants and 246 SDMs.

Specificity and memory integration. We predicted specificity and memory integration, each separately, from repressiveness. The results of these two models are presented in Table 2 (Models 2a and 2b).

The interaction between trait anxiety and defensiveness was significant for both memory specificity and memory integration. Main effects, however, were not

TABLE 1 Descriptive Analyses—Frequency (%) or Mean (*M*) and Standard Deviation (*SD*)—of Self-defining Memories (SDMs; Level 1)

Variable	<i>N</i>	%
Specific SDMs	249	71
Integrative SDMs	249	37
SDM content with:		
life-threatening events	249	16
relationship events	249	34
achievement events	249	24
leisure events	249	15
non-classifiable events	249	11
SDMs with tension	249	67
SDMs with redemption	249	24

Variable	<i>N</i>	<i>M</i> (<i>SD</i>)
PA changes	247	−0.15 (2.75)
NA changes	247	−0.12 (3.09)
PA intensity changes	247	2.02 (1.88)
NA intensity changes	247	1.99 (2.36)
Time frame (months)	248	143.44 (109.63)
No. of words	249	144.35 (73.60)
I–Me ^a /no. of words	249	0.07 (0.04)
Negative emotional words/no. of words	249	0.03 (0.03)
Positive emotional words/no. of words	249	0.03 (0.03)
Emotional words/no. of words	249	0.06 (0.03)

Note: NA = negative affect; PA = positive affect. ^aNumber of instances of “I” and “me.”

significant. To depict these results, we plotted the interactive effect in Figures 1 and 2, which show how the effect of trait anxiety on the probability of recalling a specific or integrated memory is modified by the degree of defensiveness (high amounts = 1 *SD* above the mean, low amounts = 1 *SD* below the mean). These plots indicate that individuals with low scores for trait anxiety and high scores for defensiveness (i.e., repression-prone individuals) have a greater probability of retrieving more specific and less integrated memories than do individuals who score low on both measures (i.e., well-adjusted individuals).

Affect and content. Two models with the affective changes (PA changes and NA changes) and two models with the affective intensity changes (PA intensity changes and NA intensity changes) as outcome variables were tested. Interesting results emerged only from the model with NA intensity changes as the outcome variable. More specifically, the analysis showed a significant simple effect of trait anxiety and a tendency to significance for the interaction (see Table 2, Model 2c, for more details). Figure 3 shows that, globally, higher levels of trait anxiety predict more intense negative affect changes after memory retrieval. On the other hand, individuals with low trait anxiety do not report experiencing big changes in negative affect after memory retrieval. This effect tends to be greater for individuals with high defensiveness (i.e., repression-prone individuals).

TABLE 2 Predicting Specificity, Memory Integration, and Negative Affect Intensity Changes from Trait Anxiety, Defensiveness, and Their Interaction ($N_1 = 246$ SDMs, $N_2 = 82$ participants)

Terms	Model 2a: Specificity			Model 2b: Memory integration			Model 2c: NA intensity changes		
	Estimate	SE	z	Estimate	SE	z	Estimate	SE	t
Intercept($\beta_{0,j}$)	0.894	0.170	5.251***	-0.540	0.207	-2.609**	2.160	0.198	10.921***
Trait anxiety($\beta_{1,j}$)	0.023	0.018	1.238	-0.001	0.022	-0.032	0.065	0.020	3.198**
Defensiveness($\beta_{2,j}$)	0.038	0.037	1.012	-0.062	0.045	-1.362	0.009	0.041	0.222
Trait anxiety \times defensiveness($\beta_{3,j}$)	-0.009	0.004	-2.058*	0.011	0.005	2.260*	0.007	0.004	1.680 [†]
Variance at SDM level	nd	nd	nd	nd	nd	nd	1.403	1.185	
Variance at participant level	0.334	0.578		1.343	1.159		3.898	1.974	

Note: The terms refer to equation (1). For logit multilevel models, the variance at the self-defining memory (SDM) level follows a binomial distribution, in which case the variance is not estimated (under- or over dispersion did not occur). nd = not defined. *** $p < .001$; ** $p < .01$; * $p < .05$; [†] $p < .10$.

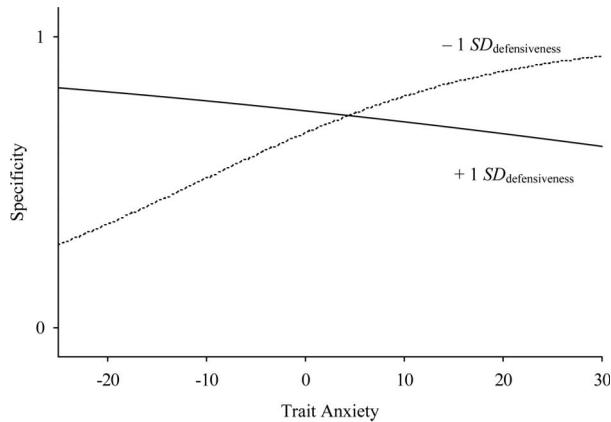


Figure 1 Predicting specificity from the interaction of trait anxiety and defensiveness. Solid probability curve = 1 *SD* above the mean for defensiveness; dotted probability curve = 1 *SD* under the mean for defensiveness.

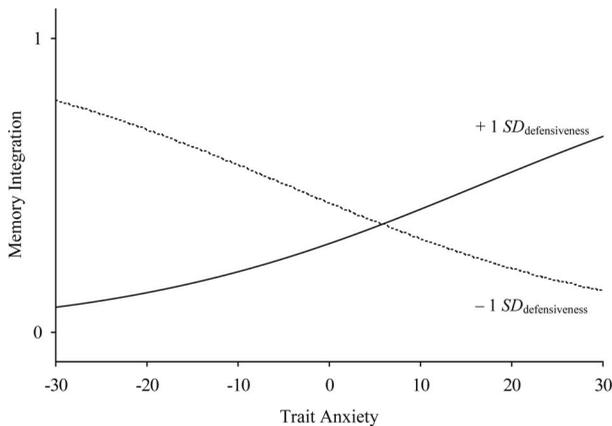


Figure 2 Predicting memory integration from the interaction of trait anxiety and defensiveness. Solid probability curve = 1 *SD* above the mean for defensiveness; dotted probability curve = 1 *SD* under the mean for defensiveness.

To determine whether the content of SDMs was predicted by repressiveness, we tested four MLMs. The results showed that the interaction of trait anxiety and defensiveness was not significant for any of the memory content in the SDMs. More specifically, repressiveness did not predict the number of life-threatening events (estimate = 0.003, $SE = 0.004$, $z = 0.76$, $p = .45$), of relationship events (estimate = 0.004, $SE = 0.004$, $z = 1.03$, $p = .31$), of achievement events (estimate = 0.004, $SE = 0.004$, $z = 1.22$, $p = .22$), or of leisure events (estimate = -0.01 , $SE = 0.004$, $z = -1.57$, $p = .12$) in the SDMs. These results suggest that it is not possible to identify a specific core concern in the SDMs of repression-prone individuals by using Thorne and McLean's (2001) classification.

Tension and time frame. A model that tests whether repressiveness predicts a reduced presence of tension in the SDMs did not show a significant result (estimate = 0.002, $SE = 0.003$, $z = 0.53$, $p = .60$). Contrary to our expectations, this

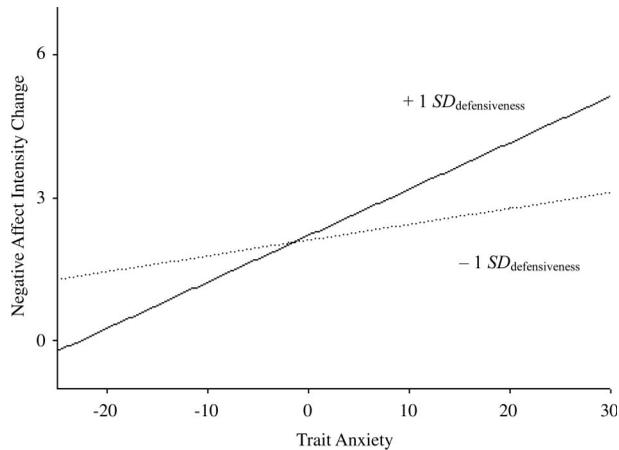


Figure 3 Predicting negative affect intensity changes from the interaction of trait anxiety and defensiveness. Solid slope = 1 *SD* above the mean for defensiveness; dotted slope = 1 *SD* under the mean for defensiveness.

result suggests that repression-prone individuals did not retrieve fewer self-threatening SDMs than the other individuals. A model with time frame as the outcome variable showed that the interaction of trait anxiety and defensiveness was significant (estimate = -0.41 , $SE = 0.20$, $t = -2.06$, $p < .05$), suggesting that individuals with low trait anxiety and high defensiveness preferentially retrieved older memories compared with those retrieved by more adjusted individuals. Nevertheless, this result became nonsignificant when the participants' age was controlled for. In this latter model, age is the only significant predictor of time frame (estimate = 4.43 , $SE = 2.23$, $t = 1.98$, $p < .05$); in other words, older participants retrieved older memories. A question that emerges at this point is whether repression-prone individuals differ in age at the time when their SDMs occurred. In order to define the participants' age at the time of the events described in the SDMs, we subtracted from their current age their estimate of the months elapsed between the event described in the memory and the retrieval day. The mean age at the time when they experienced their self-defining events ($M = 22.65$, $SD = 9.23$) was located in what Rubin, Rahhal, and Poon (1998) call the "reminiscence bump" and was normally distributed. The reminiscence bump refers to the period of life (between the ages of 10 and 30 years) in which, in a free-recall task, people over the age of 40 produce the most autobiographical memories. A model with the participant's age when the event occurred as the outcome variable did not show significant results (estimate = 0.01 , $SE = 0.02$, $t = 0.84$, $p = ns$), meaning that the repression-prone individuals and the other participants did not differ regarding their age when they experienced the events described in their SDMs.

Relationships Between Self-threatening SDMs and Repressiveness

Further analyses were performed on a specific subset of data, namely SDMs containing tension (67% of the SDMs). We had expected that, relative to the self-threatening SDMs of more adjusted individuals, those of repression-prone individuals would contain more redemption sequences, fewer self-referring

pronouns, and fewer negative emotional words. A model with the presence of a redemption sequence as the outcome variable did not show significant results (estimate = 0.003, $SE = 0.005$, $z = 0.58$, $p = .56$), suggesting that repression-prone individuals use redemption in SDMs with tension similarly to other individuals. In contrast, the results showed a significant interaction effect in the model with the number of negative emotional words over the number of words as the outcome variable (estimate = 1×10^{-4} , $SE = 5 \times 10^{-5}$, $t = 1.97$, $p < .05$). This result suggests that compared with more adjusted individuals, repression-prone individuals retrieved SDMs with tension that contained fewer negative emotional words, supporting our expectation. In order to test whether the number of instances of “I” and of “me” over the number of words retrieved for each memory containing tension was lower for repression-prone individuals, we tested another model. Somewhat in agreement with our expectations, only a significant simple effect of defensiveness was observed (estimate = -0.002 , $SE = 1 \times 10^{-4}$, $t = -2.12$, $p < .05$), suggesting that individuals with high defensiveness scores retrieved self-threatening SDMs containing fewer self-referring pronouns than did individuals with low defensiveness scores.

Finally, complementary analyses on self-threatening SDMs showed that high levels of trait anxiety predicted more intense changes in NA (estimate = 0.07, $SE = 0.02$, $t = 2.95$, $p < .01$) compared with low levels of trait anxiety. Moreover, three additional results at a trend level of significance emerged: Repression-prone individuals tended to retrieve less integrated (estimate = 0.01, $SE = 0.005$, $z = 1.75$, $p = .08$) and more specific (estimate = -0.01 , $SE = 0.005$, $z = -1.64$, $p = .10$) SDMs containing tension than did more adjusted individuals; and individuals high in defensiveness tended to retrieve fewer failure events (i.e., achievement events with tension) in their SDMs (estimate = -0.09 , $SE = 0.05$, $z = -1.91$, $p = .057$) than did individuals low in defensiveness.

Discussion

According to Derakshan et al. (2007), repressors manifest a vigilant response to self-threats because of the activation of negative self-relevant memories stored as schemas in the long-term memory. The autobiographical memories of repression-prone individuals have been investigated in earlier studies, but the characteristics of memories that are particularly related to the self (i.e., SDMs) were less explored. Therefore, the general aim of the present study was to pursue the investigation of SDMs of repression-prone individuals by using the method developed by Weinberger et al. (1979) to define repressiveness. We reexamined the dimensions already studied by Blagov and Singer (2004), namely, specificity, meaning, content, and affect. Moreover, considering that the effects of repression are more pronounced when the self is threatened, the focus was particularly on self-threatening SDMs (i.e., SDMs containing tension). Some additional characteristics of memory were also explored, notably the presence of redemption, the emotional lexicon, and the number of self-referring pronouns. The main results of several MLMs performed showed that, relative to more adjusted individuals, repression-prone individuals retrieved specific and nonintegrated SDMs and tended to retrieve SDMs that produced few changes in the intensity of negative affect. Self-threatening SDMs presented similar characteristics for memory specificity and memory integration, but only on a trend level for significance. However, compared with more adjusted individuals, repression-prone individuals retrieved self-threatening SDMs that contained fewer negative words. Finally, individuals with high levels of defensiveness retrieved

self-threatening SDMs containing fewer self-referring pronouns and tended to describe fewer failure events than did individuals with low levels of defensiveness. No association was found between the presence of redemption sequences and self-threatening SDMs.

Comparison with Prior Studies

As mentioned earlier, only one previous study had examined the relationships between repression and SDMs. However, the present study did not replicate Blagov and Singer's (2004) findings. In fact, we found that SDMs of repression-prone individuals were specific, not integrated, and tended to be associated with few changes in the intensity of negative affect after memory retrieval. The divergence from Blagov and Singer's findings can be partially attributed to the different method that we used to identify repressiveness and to differences in the sample characteristics. First, the present study used a trait anxiety scale and a defensiveness measure, whereas Blagov and Singer limited their assessment to a defensiveness measure (the repressive defensiveness scale of the short form of the WAI). Defensiveness is only one aspect of the complexity of repression. In fact, as Weinberger et al. (1979) stated, low levels of self-reported trait anxiety are a core aspect of repression, underscoring the importance of assessing this dimension. Moreover, in the present study, participants were asked to produce only three SDMs (Blagov & Singer, 2004, asked for 10 memories). Our experience with the SDM task leads us to consider this task as cognitively and affectively effortful. Thus, it is possible that, when asked for many SDMs in a single session, individuals do not invest themselves completely in the task and thus provide less-specific narratives. Hence, the lower number of SDMs requested in the present study may contribute to the difference that we found in memory specificity. In addition, our result regarding memory specificity also presents a discrepancy from the Raes et al. (2006) and Dickson et al. (2009) studies, in which the authors found that repression-prone individuals retrieved less-specific general autobiographical memories than did the other individuals. Nevertheless, our finding is in accord with the study conducted by Geraerts, Merckelbach, Jelicic, and Habets (2007), which found, using Weinberger et al.'s (1979) method, that a repressor group had a better working memory capacity than the other three groups. This finding indicates that repression-prone individuals should be able to retrieve specific memories (unlike people with other emotional disorders such as depression; see Williams et al., 2007, for a review). Second, regarding the differences in sample characteristics, the participants in our study differed from those in Blagov and Singer's (2004) study for age, culture, general population representation, and incentive. More precisely, our participants were older (mean age of 35 vs. 19 years in Blagov & Singer's study), culturally slightly different (Swiss vs. North American), represented the general population (not only psychology students), and were volunteers (who did not receive class credits). Of note is that the few studies providing evidence for age and cultural differences in SDM characteristics suggested decreased memory specificity and increased memory integration with age (e.g., Singer, Rexhaj, & Baddeley, 2007), as well as more integrated memories in Swiss participants (e.g., Lardi et al., 2010). Considering that some findings highlighted in our study tend in the opposite direction to those in Blagov and Singer's (2004) study, age and culture do not seem to explain our results. In the same vein, our participants, who were volunteers, could have been expected to be more motivated, leading to more elaborate narratives (i.e., providing more

meanings). However, the opposite was observed. Only a possible difference in socioeconomic status could tentatively contribute to the differences observed. However, our participants had a mean of 17 years of education (similar to Blagov & Singer's participants).

SDMs of Repression-prone Individuals and Affect Regulation Strategies

A framework that may possibly explain the enhanced specificity of SDMs observed in repression-prone individuals is the recent affect regulation view proposed by Philippot and colleagues (Philippot, Baeyens, Douilliez, & Francart, 2004; Philippot, Schaefer, & Herbet, 2003). The central prediction of this view, known as the strategic inhibition hypothesis, is that when an individual is engaged in the strategic retrieval of an emotional autobiographical memory, there is a parallel activation of the emotion related to the event, which may disrupt the controlled and effortful hierarchical retrieval process. In order to avoid this interference in the memory retrieval, the emotional features of the event are inhibited. Thus, the controlled process of memory specification will not be prematurely truncated and a specific memory can be accessed. In contrast, if strategic inhibition of the emotion related to the event does not take place, the memory retrieved will remain at a more general level and be more emotionally intense. In a recent study, Neumann and Philippot (2007) noted that the intensity of the emotions felt during the retrieval of specific emotional autobiographical memories can vary depending on the kind of memory retrieved. More specifically, they compared the emotional arousal related to the retrieval of two kinds of memories: memories that emphasize information concerning what makes the event unique (i.e., details of the specific time and place) and memories that emphasize information related to the core emotional feature of the event (i.e., what is relevant to an emotional schema). The results showed a decrease in emotion intensity only when the individual engaged in a specific kind of information processing not related to a schema (i.e., when the focus is more on what makes the event unique than on what it shares in common with other events). In summary, Philippot et al. (2004) proposed that voluntarily processing of emotional information at a specific level should result in less emotional intensity at the time of memory retrieval. Neumann and Philippot (2007) specified that this decrease in emotional intensity emerges only when a specific mode of processing is applied to information unrelated to emotional schemas.

This conception of affect regulation can account for our finding on memory specificity, as well as for the other memory characteristics highlighted in the present study. In fact, the SDMs of the repression-prone individuals, compared with those of more adjusted individuals, were more specific, contained fewer emotional features (either SDMs that tended to produce fewer changes in negative affect intensity or self-threatening SDMs that contained fewer negative words), and were less integrated. Considering that the SDM task requires the retrieval of vivid memories and the involvement of the self (retrieval of important memories related to personal beliefs and schema), we suggest that repression-prone individuals make their memories specific by focusing on the uniqueness of the event instead of the schema-relevant features. Thus, repression-prone individuals do not reflect on the possible connections between the events and self-knowledge, contributing to the impairment in autobiographical reasoning, that is, in extracting meanings from their personal experiences and integrating them into the self-structure. This hypothesis that repression-prone individuals focus more on the uniqueness of their memories rather than on other schema-relevant features of them should be specifically tested in

further studies. In summary, repression-prone individuals retrieved more specific and less integrated SDMs as a self-protection mechanism in order to regulate the affective responses related to SDM retrieval. This coping strategy results in fewer changes in negative affect after memory retrieval and a lesser use of negative emotional words in self-threatening SDMs.

Regarding the specificity and memory integration dimensions jointly, two opposite patterns were found. On one hand, repression-prone individuals retrieved more specific but less integrated memories, whereas individuals with low levels of trait anxiety and defensiveness (i.e., well-adjusted individuals) presented less specific but more integrated SDMs. This negative association between specificity and memory integration is consistent with previous studies (see Lardi et al., 2010, for a study of the relationships between SDM dimensions). By specifying the narration of the event and not linking the event to other thematically similar experiences (providing a summarized memory), repression-prone individuals may not draw the maximal affective and cognitive value from the event described. This impairs self-understanding and personal growth (Blagov & Singer, 2004).

Another result of the present study concerns the fact that relative to individuals with low levels of defensiveness, individuals with high levels of defensiveness retrieved self-threatening SDMs containing fewer self-referring pronouns. The scale used to assess defensiveness (the MCSDS) has been identified as measuring protection of self-esteem and affect inhibition (Crowne & Marlowe, 1964; Weinberger, 1990). In order to protect their self-esteem and to reduce the emotional reliving of information that threatens their self-concept, individuals with high levels of defensiveness may control the use of self-referring pronouns. In fact, the reduced use of self-referring pronouns helps the current self to put some distance between the self and the self-threatening memory (Sutin & Robins, 2008). Moreover, by using fewer self-referring pronouns and more collective pronouns, high-defensive individuals can weaken what they are saying in the narrative and share with others the responsibility for the event that occurred. Surprisingly, trait anxiety did not modulate the association between defensiveness and the use of self-referring pronouns. Consequently, only defensiveness, and not repressiveness in particular, seems to influence the use of self-referring pronouns in self-threatening SDM narratives.

Moreover, concerning memory content, our findings, like those of Blagov and Singer (2004), did not show a relationship between repressiveness and SDM content in general. In fact, trait anxiety and defensiveness scores appear not to be related to the number of life-threatening, relationship, achievement, or leisure events described in the SDMs. These results could mean that repression-prone individuals do not differ from other individuals in terms of their core concerns and unresolved conflicts. However, this absence of association may also be attributed to three possible biases: the reduced number of SDMs requested (Singer, 2005), a poor sensitivity of Thorne and McLean's (2001) manual for the appreciation of repression-prone individuals' core concerns, and the heterogeneity of the events classified in a single category. Recall that, in the present study, we categorized the events into four categories (or into a nonclassifiable event category). These categories are broad and may contain a wide variety of events; thus, it can be difficult to observe a recurrent theme within only three SDMs. Nevertheless, the present study found that high-defensive individuals tended to retrieve fewer failure events in their self-threatening SDMs than did low-defensive individuals. A failure event threatens an individual's self-esteem, and so the self-protection mechanism of high-defensive individuals could act by avoiding the retrieval of failure events.

In addition, considering repressors' difficulty in retrieving more self-threatening memories, which several researchers had highlighted in studies of general autobiographical memories (e.g., Davis, 1990; Davis & Schwartz, 1987), we expected to observe fewer SDMs containing tension in the output of repression-prone individuals compared with more adjusted individuals. This association did not emerge, however. A possible explanation of this result is that repression-prone individuals retrieved older memories relative to those retrieved by more adjusted individuals. An old memory is more distant from the current self and consequently is less self-threatening. However, our post hoc analysis did not support this association. Rather, we found that all of the individuals retrieved self-defining events from the same period of life, referred to as the reminiscence bump. Self-protection therefore seems to be manifested in a different manner. In summary, it seems that, in the SDM task, the effects of repressiveness are more pronounced for memory characteristics (the qualitative dimension, such as enhanced memory specificity and reduced memory integration) than for the number of self-threatening events recalled (quantitative dimension).

Self-threatening SDMs of Repression-prone Individuals

The second aim of the present study was to focus on self-threatening SDMs (i.e., SDMs with tension). We hypothesized that those SDMs of repression-prone individuals should contain more redemption sequences than should the self-threatening SDMs of more adjusted individuals, but this association was not supported by our analysis. Recall that redemption is a narrative strategy that consists of transforming affectively negative experiences into positive outcomes. Considering that this narrative form helps to make sense of personal experiences and to elaborate the life story (McAdams et al., 2001), individuals need good autobiographical reasoning abilities. Yet the present study found that repression-prone individuals are not engaged in thinking about past experiences. This finding may partially account for the absence of an enhanced presence of redemption sequences in the self-threatening SDMs. Finally, the poor autobiographical reasoning manifested by repression-prone individuals, as well as the increased memory specificity, also emerged in their self-threatening SDMs (but only at a trend level of significance), confirming the importance of pursuing the investigation of self-threatening memories in repression studies. Moreover, other results (particularly concerning the smaller changes in negative affect intensity and reduced retrieval of failure SDMs) were not clearly significant but showed a tendency. It is possible that the use of only three SDMs rather than five (or more) has restricted some effects. Consequently, further studies need to be conducted to replicate and confirm our findings (e.g., by asking for a few more SDMs).

In summary, regarding our findings as a whole, the SDMs of repression-prone individuals are compatible with the definition of repression. In fact, individuals retrieve SDMs that seem to protect them from negative affect, suggesting a good affect regulation. It is possible that repression-prone individuals try to protect themselves by avoiding tapping into their core self-concepts or unresolved conflicts. In fact, individuals normally possess more than three SDMs (as required by the SDM task) and it is possible that repression-prone individuals strategically retrieve only memories that correspond to the instructions but that also provide a positive self-image. When accessing self-threatening SDMs, repression-prone individuals need to protect themselves from emotional arousal by describing many episodic details related to the

uniqueness of the event (rather than focusing on schema-relevant features). By keeping control over the structure and the lexicon used, related to poor autobiographical reasoning, repression-prone individuals can regulate the affective responses associated with memory retrieval. This is compatible with the strategic inhibition hypothesis proposed by Philippot and colleagues (Philippot et al., 2003, 2004).

However, even if our findings seem to be compatible with Philippot et al.'s affect-regulation view, the interpretations advanced from our findings were based on cross-sectional data. Consequently, it is not possible to exclude Williams's (1996) affect-regulation hypothesis, and longitudinal studies on SDMs of repression-prone individuals are necessary. Another limitation of the present study is the number of dimensions chosen for the operationalization of repression. In fact, even though we added a trait anxiety measure in order to overcome the limitation of Blagov and Singer's (2004) assessment of repression, Weinberger (1990) states that a self-restraint measure should also be included. Another limitation is in the use of self-reported measures for assessing repressiveness. In further studies with SDMs, it would be interesting to use other approaches for the operationalization of repression, such as laboratory emotion-provocation tasks or psychophysiological measures of emotional arousal. These other methods have the advantage of reducing deception tendencies (i.e., participants who experience much more anxiety than is reported in the questionnaire). Moreover, it is possible that, in administering the PANAS four times, we introduced measurement error with reactivity that could have obscured any affect changes that may have been occurring. Finally, it should be noted that our operationalization of repressiveness could present similarities to the operationalization of the avoidant/dismissing attachment style. Thus, further studies should be conducted to better characterize SDMs (in particular SDMs describing relationships) for individuals adopting these two coping strategies.

In conclusion, the most important findings of the present study are that, relative to more adjusted individuals, repression-prone individuals retrieved more specific and less integrated SDMs. According to Philippot et al. (2004), this SDM profile could be related to an affect regulation strategy, leading to the production of fewer changes in the intensity of negative affect associated to memory retrieval.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interaction*. Newbury Park, CA: Sage.
- Bendig, A. W. (1956). The development of a short form of the Manifest Anxiety Scale. *Journal of Consulting Psychology, 20*, 384.
- Blagov, P. S., & Singer, J. A. (2004). Four dimensions of self-defining memories (specificity, meaning, content, and affect) and their relationships to self-restraint, distress, and repressive defensiveness. *Journal of Personality, 72*, 481–511.
- Bruchon-Schweitzer, M., & Paulhan, I. (1993). *Manuel de l'Inventaire d'anxiété état-trait. Forme Y (STAI-Y)*. Paris, France: ECPA.
- Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20*, 37–46.
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*, 349–354.
- Crowne, D. P., & Marlowe, D. (1964). *The approval motive: Studies in evaluative dependence*. New York, NY: Wiley.
- Davis, P. J. (1987). Repression and the inaccessibility of affective memories. *Journal of Personality and Social Psychology, 53*, 585–593.

- Davis, P. J. (1990). Repression and the inaccessibility of emotional memories. In J. L. Singer (Ed.), *Repression and dissociation: Implications for personality, theory, psychopathology, and health* (pp. 387–403). Chicago, IL: University of Chicago Press.
- Davis, P. J., & Schwartz, G. E. (1987). Repression and the inaccessibility of affective memories. *Journal of Personality and Social Psychology*, *52*, 155–162.
- Derakshan, N., & Eysenck, M. W. (1997). Interpretive biases for one's own behavior and physiology in high-trait-anxious individuals and repressors. *Journal of Personality and Social Psychology*, *73*, 816–825.
- Derakshan, N., Eysenck, M. W., & Myers, L. B. (2007). Emotional information processing in repressors: The vigilance–avoidance theory. *Cognition and Emotion*, *21*, 1585–1614.
- Dickson, J. M., Moberly, N., Hannon, E. M., & Bates, G. W. (2009). Are repressors so special after all? Specificity of negative personal events as a function of anxiety and defensiveness. *Journal of Research in Personality*, *43*, 386–391.
- Foley Center for the Study of Lives. (1999). *Coding narrative accounts of autobiographical scenes for redemption sequences*. Unpublished manuscript, Northwestern University, Evanston, IL.
- Gaudreau, P., Sanchez, X., & Blondin, J. (2006). Positive and negative affective states in a performance-related setting: Testing the factorial structure of the PANAS across two samples of French-Canadian participants. *European Journal of Psychological Assessment*, *22*, 240–249.
- Geraerts, E., Merckelbach, H., Jelicic, M., & Habets, P. (2007). Suppression of intrusive thoughts and working memory capacity in repressive coping. *American Journal of Psychology*, *120*, 205–218.
- Geraerts, E., Merckelbach, H., Jelicic, M., & Smeets, E. (2006). Long term consequences of suppression of intrusive anxious thoughts and repressive coping. *Behaviour Research and Therapy*, *44*, 1451–1460.
- Goldstein, H. (2011). *Multilevel statistical models* (4th ed.). Chichester, UK: Wiley.
- Holtgraves, T., & Hall, R. (1995). Repressors: What do they repress and how do they repress it? *Journal of Research in Personality*, *29*, 306–317.
- Kahn, J. H., Tobin, R. M., Massey, A. E., & Anderson, J. A. (2007). Measuring emotional expression with the linguistic inquiry and word count. *The American Journal of Psychology*, *120*, 263–286.
- Lardi, C., D'Argembeau, A., Chanal, J., Ghisletta, P., & Van der Linden, M. (2010). Further characterization of self-defining memories in young adults: A study of a Swiss sample. *Memory*, *18*, 293–309.
- Maxwell, S. E., & Delaney, H. D. (1993). Bivariate median splits and spurious statistical significance. *Psychological Bulletin*, *113*, 181–190.
- McAdams, D. P., Reynolds, J., Lewis, M., Patten, A. H., & Bowman, P. J. (2001). When bad things turn good and good things turn bad: Sequences of redemption and contamination in life narrative and their relation to psychosocial adaptation in midlife adults and in students. *Personality and Social Psychology Bulletin*, *27*, 474–485.
- Mendolia, M. (2002). An index of self-regulation of emotion and the study of repression in social contexts that threaten or do not threaten self-concept. *Emotion*, *2*, 215–232.
- Myers, L. B. (2000). Identifying repressors: A methodological issue for health psychology. *Psychology and Health*, *15*, 205–214.
- Myers, L. B. (2010). The importance of the repressive coping style: Findings from 30 years of research. *Anxiety, Stress and Coping*, *23*, 3–17.
- Myers, L. B., & Brewin, C. R. (1994). Recall of early experience and the repressive coping style. *Journal of Abnormal Psychology*, *103*, 288–292.
- Myers, L. B., Brewin, C. R., & Power, M. J. (1998). Repressive coping and the directed forgetting of emotional material. *Journal of Abnormal Psychology*, *107*, 141–148.
- Myers, L. B., & Derakshan, N. (2004). To forget or not to forget: What do repressors forget and when do they forget? *Cognition and Emotion*, *18*, 495–511.
- Neumann, A., & Philippot, P. (2007). Specifying what makes a personal memory unique enhances emotion regulation. *Emotion*, *7*, 566–578.

- Newman, L. S., Caldwell, T. L., & Griffin, T. D. (2008). The undesired selves of repressors. *Cognition and Emotion, 22*, 709–719.
- Newman, L. S., & Hedberg, D. A. (1999). Repressive coping and the inaccessibility of negative autobiographical memories: Converging evidence. *Personality and Individual Differences, 27*, 45–53.
- Philippot, P., Baeyens, C., Douilliez, C., & Francart, B. (2004). Cognitive regulation of emotion: Application to clinical disorders. In P. Philippot & R. S. Feldman (Eds.), *The regulation of emotion* (pp. 71–97). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Philippot, P., Schaefer, A., & Herbette, G. (2003). Consequences of specific processing of emotional information: Impact of general versus specific autobiographical memory priming on emotion elicitation. *Emotion, 3*, 270–283.
- Pinhoiro, J. C., & Bates, D. M. (2000). *Mixed-effect models in S and S-PLUS*. New York, NY: Springer.
- Piolat, A., & Bannour, R. (2009). EMOTAIX: Un scénario de Tropes pour l'identification automatisée du lexique émotionnel et affectif. *L'Année Psychologique, 109*, 655–698.
- R Development Core Team. (2009). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.
- Raes, F., Hermans, D., Williams, J. M. G., & Eelen, P. (2006). Reduced autobiographical memory specificity and affect regulation. *Cognition and Emotion, 20*, 402–429.
- Rubin, D. C., Rahhal, T. A., & Poon, L. W. (1998). Things learned in early adulthood are remembered best. *Memory and Cognition, 26*, 3–19.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton-Mifflin.
- Singer, J. A. (2005). *Memories that matter: How to use self-defining memories to understand and change your life*. Oakland, CA: New Harbinger.
- Singer, J. A. (2006). Memory, emotion and psychotherapy: Maximizing the positive functions of self-defining memories. In B. Uttl, N. Ohta, & A. L. Siegenthaler (Eds.), *Memory and emotion: Interdisciplinary perspectives* (pp. 211–232). Singapore: Blackwell Publishing.
- Singer, J. A., & Blagov, P. S. (2000–2001). *Classification system and scoring manual for self-defining autobiographical memories*. Unpublished manuscript, Connecticut College, New London, CT.
- Singer, J. A., Rexhaj, B., & Baddeley, J. (2007). Older, wiser, and happier? Comparing older adults' and college students' self-defining memories. *Memory, 15*, 886–898.
- Singer, J. A., & Salovey, P. (1993). *The remembered self: Emotion and memory in personality*. New York, NY: Free Press.
- Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London, UK: Sage.
- Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory (Form Y)*. Palo Alto, CA: Consulting Psychologists Press.
- Sutin, A. R., & Robins, R. W. (2008). When the “I” looks at the “me”: Autobiographical memory, visual perspective, and the self. *Consciousness and Cognition, 17*, 1386–1397.
- Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*, 227–242.
- Thorne, A., & McLean, K. C. (2001). *Manual for coding events in self-defining memories*. Unpublished manuscript, University of California, Santa Cruz, CA.
- Thorne, A., McLean, K. C., & Lawrence, A. M. (2004). When remembering is not enough: Reflecting on self-defining memories in late adolescence. *Journal of Personality, 72*, 513–542.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063–1070.

- Weinberger, D. A. (1990). The construct validity of the repressive coping style. In J. L. Singer (Ed.), *Repression and dissociation: Implications for personality, theory, psychopathology, and health* (pp. 337–386). Chicago, IL: Chicago University Press.
- Weinberger, D. A., & Schwartz, G. E. (1990). Distress and restraint as superordinate dimensions of self-reported adjustment: A typological perspective. *Journal of Personality*, *58*, 381–417.
- Weinberger, D. A., Schwartz, G. E., & Davidson, R. J. (1979). Low-anxious, high-anxious, and repressive coping styles: Psychometric patterns and behavioral and physiological responses to stress. *Journal of Abnormal Psychology*, *88*, 369–380.
- Williams, J. M. G. (1996). Depression and the specificity of autobiographical memory. In D. Rubin (Ed.), *Remembering our past: Studies in autobiographical memory* (pp. 244–267). New York, NY: Cambridge University Press.
- Williams, J. M. G., Barnhofer, T., Crane, C., Herman, D., Raes, F., Watkins, E., et al. (2007). Autobiographical memory specificity and emotional disorder. *Psychological Bulletin*, *133*, 122–148.
- Williams, J. M. G., & Broadbent, K. (1986). Autobiographical memory in suicide attempters. *Journal of Abnormal Psychology*, *95*, 144–149.

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