Sense of meaning in context: A study of meaning for past events in relation to future goals, and in relation to intrusions and personality over time.

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ABSTRACT

Sense of Meaning in Context: A study of meaning for past events in relation to future goals, and in relation to intrusions and personality over time.

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Meaning making is a common response to many types of important life events, which individuals use to try to make sense of and gain benefits from difficult experiences. It has been traditionally associated with positive psychological and physiological outcomes (Affleck & Tennen, 1996). Nevertheless, the circumstances and mechanisms by which it becomes beneficial are less well understood. This thesis consists of three studies. The goal of Study 1 was to establish whether meaning and affect for a specific event reflect unique constructs and are independent of more global individual characteristics such as purpose and meaning in life. Study 2 then sought to identify the possible mechanisms by which sense of meaning for self-defining memories is associated with positive outcomes. This was accomplished by specifically focusing on the mediating effect of positive affect on self-efficacy and importance of goals. Lastly, to expand on the current understanding of the role of meaning making, Study 3 examined how sense of meaning changes over time, its relation to intrusions and avoidance, and its relation to personality factors.

Individuals reported a self-defining event, the affect and sense of meaning associated with that event, as well as general indices of purpose and affectivity (Study 1). In addition, individuals rated a number of current goals and their sense of self-efficacy

and importance for those goals (Study 2). Finally, individuals reported a traumatic event, their sense of meaning for that event as well as their affect, and their experience of intrusions and avoidance at three different points in time (Study 3). Individuals also completed a personality questionnaire.

Positive affect and meaning for self-defining events were correlated with one another, but not with more general indices of affectivity and purposefulness. Sense of meaning for memories was associated with more positive affect, which, in turn, was associated with more self-efficacy and importance of current life goals. Finally, sense of meaning tended to be stable over time and was associated both with more intrusions, and extraversion and conscientiousness. Intrusions and avoidance tended to decrease over time and were associated with neuroticism. This thesis clarifies some of the functions of having a sense of meaning with regard to self-defining or negative life events, in a broader context than previously considered.

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Chapter 1

General Introduction

Meaning making is a cognitive process by which individuals try to make sense of and gain benefits from difficult experiences (Janoff-Bulman & Frieze, 1983; Taylor, 1983). Meaning making and having a sense of meaning have been shown in many studies to be beneficial for both psychological well-being and physical health (Affleck & Tennen, 1996). Although the link between meaning making and beneficial outcomes is well established, the ways in which sense of meaning brings about such benefits remain unclear. In addition, prolonged and unsuccessful attempts to understand the cause and meaning of difficult events can result in rumination and excessive preoccupation, without necessarily achieving a sense of resolution (Steger, Kashdan, Sullivan, & Lorentz, 2008). Rumination and intrusive thinking have been associated with maladjustment and poor outcomes, including depression (Nolen-Hoeksema 2000; 1991; Nolen-Hoeksema, Parker, & Larson, 1994) and even PTSD (Ehlers, Mayou, & Bryant, 1998).

Three studies were designed to examine the nature of having a sense of meaning both in a broad context and in relation to other important affective and cognitive processes and aspects of the self. Sense of meaning was defined as a positive transformation characterized by growth, insight, and an increased understanding of the self or the world. The first goal of the thesis was to determine whether meaning for specific events and feelings associated with these events reflect thoughts and feelings specific to that event, or more non-specific global feelings and stable personality

characteristics. This was addressed in Study 1. The second goal of the thesis was to identify associations between having a sense of meaning for past events and current emotions and goals. Two central aspects of goals were identified as the most relevant and were therefore explored. These were people's perceived self-efficacy with regard to the achievement of personal goals (Emmons, 1986), and the importance people attribute to these goals. These objectives were pursued in Study 2. Finally, a third set of goals was to document changes in sense of meaning over time, to explore the relation of sense of meaning to experiencing intrusive thoughts and avoidance with regard to a traumatic or negative event, and to identify associations between sense of meaning and individual differences in personality, specifically extraversion, conscientiousness, and neuroticism. These objectives were pursued in Study 3.

Taken together the three studies constitute an opportunity to consider the nature and role of an important cognitive process, namely having a sense of meaning for memories of personally significant or traumatic events. Although meaning making has been studied widely with a number of populations, it has usually been studied in isolation as a means to better understand outcomes such as psychological well-being and physiological health. The current research is novel in that it places sense of meaning in the context of broader psychological processes and aspects of the self.

Meaning Making

Definitions and measurement of meaning making. Meaning making is a process by which individuals attempt to reconcile new and unexpected events with established views of the self and the world (Janoff-Bulman & Frieze, 1983; Taylor, 1983). It is also a

way of finding benefit or making sense of unpredictable and sometimes extremely challenging events such as sudden illness, accidents (to oneself or close ones), and even the death of close others. Sense of meaning in the present context is characterized by personal growth, the discovery of new insights, and a better understanding of the world or oneself. Meaning making has been shown in many studies to be beneficial for both psychological well-being and physical health (Affleck & Tennen, 1996). Meaning making research has been largely conducted with individuals who are currently coping with or have been faced with serious life events, such as surviving breast cancer (Taylor, Lichtman, & Wood, 1984), living with multiple sclerosis (Russell, White, & White, 2006), living with AIDS (Schwartzberg 1993), surviving a stroke (Thompson, 1991), coping with sexual assault (Janoff-Bulman, 1979; 1992), and coping with the loss of a loved one (Davis & Nolen-Hoeksema, 2001; Davis, Nolen- Hoeksema & Larsen, 1998). Some researchers have been concerned with more common experiences such as conflicts with parents and friends during adolescence (McLean & Thorne, 2003; Thorne, McLean, & Lawrence, 2004). Meaning making has been assessed from individuals' accounts of what they thought and felt in response to a traumatic or difficult event. Data has been collected mostly through personal interviews, written narratives, and closed-ended questionnaires (Bauer & McAdams, 2004; Blagov & Singer, 2004; Davis et al., 1998; Fiese et al., 1999; Taylor, 1983; Taylor et al., 1984; Thorne et al., 2004; Wood & M. Conway, 2006).

Meaning making has been addressed in terms of different mechanisms or modes of cognitive restructuring. One mechanism is causal attributions, which has been investigated in various populations, including breast cancer survivors (Taylor et al., 1984).

Part of meaning making is identifying a reason for the misfortune. The reason may not in fact be valid, but what seems important is the identification of some reason by the afflicted individual.

When the difficult or traumatic event is one of loss, another important mechanism is to make sense of the loss. This type of mechanism appears to be especially important when there is no opportunity to feel in control of the situation, as is the case with the death of a loved one. Making sense of the loss may rest on religious beliefs, the acceptance of the death as part of the life cycle, considering the loss as somehow predictable (and therefore easier to accept), or on the understanding that the now-deceased individual had accepted the death, and therefore it became acceptable to the loved ones as well (Davis & Nolen-Hoeksema, 2001; Davis et al., 1998).

Finding benefit is another mechanism in meaning making. For example, when making sense of a loss is not possible, people may still find a benefit in it (Affleck, Tennen, Croog, & Levine, 1987; Davis et al., 1998). Common perceived benefits are: growth in character, a gain in perspective, reprioritizing of important activities, shifting of values, and strengthening of close relationships (Affleck & Tennen, 1996; Bower, Kemeny, Taylor, & Fahey, 1998, 2003; Nolen-Hoeksema & Davis, 2002; Russel, White, & White, 2006; Taylor et al., 1984).

To summarize, manifestations of meaning making include the ability to find causes for one's misfortune, making sense of loss, and the capacity to identify benefits resulting from the experience, all of which help to reframe the negative event in a positive light. What is consistent across all these manifestations of meaning making is

that they all reflect individuals' efforts to maintain, or even enhance, a more benign view of self, the world, or both.

The specific manifestations of meaning for particular individuals may vary as a function of the individuals' particular difficulties, their circumstances and environmental resources, their personality, as well as the duration of time since the difficult events occurred. Despite some inconsistent associations between reports of posttraumatic growth and negative outcomes, such as depression, anxiety, and posttraumatic stress symptoms (Linley & Joseph, 2004), one can conclude that meaning making has been generally associated with at least the perception of positive outcomes by the meaning maker, if not the positive outcomes themselves.

It is also important to note that there may be individual differences in the extent to which people engage in meaning making, and report having gained a sense of meaning. Extraversion has been shown to be linked with a greater tendency to engage in cognitive restructuring and meaning making, such as finding benefit, drawing strength from adversity, and positive thinking (Affleck & Tennen, 1996; Connor-Smith & Flachsbart, 2007; McCrae & Costa, 1986; Tedeschi & Calhoun, 1996; Vollrath, 2001). It has been shown that people who are more extraverted are generally more likely to engage in meaning making, to experience positive emotions, to seek social contact, and to cite positive consequences of misfortune in terms of improved personal relationships.

The Course of Meaning Making Over Time. Although there are no clear theoretical guidelines as to the expected course of meaning making over time, it seems that efforts to restore meaning after a difficult event are likely to be initiated and intensify

within the first 2 to 18 months after the event. Following this, the sense of acquired meaning seems to remain relatively stable, with small fluctuations occurring over time.

In Janoff-Bulman's (1979, 1992: Janoff-Bulman & Frieze, 1983) theory, the task of the survivor is to reconcile and or reinterpret the trauma in ways that are somewhat compatible with their old assumptions. If the process of assimilation and integration proceeds successfully, it can result not only in a return to prior levels of functioning and a cessation of negative symptoms, but also in great potential for personal growth and transformation. Indeed, a number of studies exploring the strengths of resilient individuals suggest that resilient individuals find meaning in difficult events. For example, a study of resilient families affected by Hurricanes Katrina and Rita (Garrison & Sasser, 2009) revealed that those families who coped well with the disaster engaged in different types of meaning making in order to overcome the adverse effects of the traumatic event. Studies of resilient survivors of childhood sexual abuse have also documented that finding meaning and making sense of the abuse experience was one of the characteristics of survivors who go on to live rich and fulfilling lives (Grossman, Cook, Kepkep, & Koenen, 1999; Grossman, Sorsoli, & Kia-Keating, 2006; Lev-Wiesel, 1999; Lyons, 1991).

The critical time for seeking meaning and obtaining resolution has been debated in the literature. Some research indicates that the process of meaning making is most adaptive in the first year to year-and-a-half after a traumatic event (Davis et al., 1998). In the study of bereaved individuals of Davis and colleagues (1998), making sense of the loss of a family member and finding benefits in the experience, was associated with less

distress and better adjustment between 12 to 18 months after the loss. Other research suggests that meaning may be generated and assimilated during distinct episodes (Finkel, 1975, Finkel & Jacobsen, 1977). In his work on the experience of traumas, Finkel (1975) discovered that a majority of individuals (67%) has experienced events which they initially viewed as traumatic, but which they later on came to view as events that strengthened their personalities. According to Finkel (1975), the cognitive restructuring process, or the conversion of the event from traumatic to empowering, takes place between 2 weeks and 4 months after the event occurred. His findings, he suggests, indicate that crisis resolution is not successful if it is attempted too soon or too late. Finally, a number of studies have shown that acquired meaning remains stable over the course of 12 months (Pakenham & Cox, 2008), and even years (Affleck, et al., 1987; Bower et al., 2005; Frazier, Conlon, & Glaser 2001; Kernan 2006; McMillen, Smith, & Fisher, 1997).

In contrast, it seems that prolonged ruminative preoccupation with the memory of a traumatic event may signal a failure to assimilate it or find any meaning in it. Silver, Boon, and Stones (1983), in their study of women who experienced sexual abuse in their childhood, concluded that if the period of searching does not bring about resolution and mastery of the trauma, the continuing process of searching and ruminating becomes maladaptive. Furthermore, research has shown that not all individuals are able to resolve or make sense of loss. In a study of long-term effects of losing a spouse or a child in a motor vehicle crash, Lehman, Wortman, and Williams (1987) found that 7 years after the

loss, many of the respondents (30% to 85%) continued to ruminate about the loss and were unable to find meaning in terms of making sense of the loss.

It appears that there is a critical window of opportunity during which meaning making is fruitful and adaptive. Once a sense of meaning has been acquired, individuals who have adjusted well to the traumatic event experience stability in the overall significance they assign to the event, reflected in a lessened preoccupation with the event and a consistent sense of acquired meaning.

The Measurement of Life Satisfaction and Purpose in Life

Whereas meaning making refers to distinct episodes, life satisfaction refers to individuals' ongoing subjective sense that life as a whole is satisfying and consistent with one's expectations. Purpose in life refers to individuals' ongoing belief that they are pursuing activities and goals that are personally valued and meaningful (Scheier et al., 2006). The process of evaluation of one's satisfaction with life is partly a cognitive one, and the standards for judgment may differ vastly among individuals. Individuals set standards for satisfaction depending on their personal values, priorities, and beliefs, and compare their current circumstances with such standards. Life satisfaction is viewed as an overall assessment of one's life as a whole, rather than the sum total of different domains in life. The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) was developed to address this holistic and integrated sense of individuals' perceptions of their lives in terms of degree of overall satisfaction. In designing the scale, the authors were careful to isolate the construct of satisfaction with life from other psychological states such as apathy versus energy or positive and negative emotions.

Still, researchers have asked whether the daily experience of affect is synonymous with the broader categorization of satisfaction with life as measured by the SWLS (Lent, 2004). For example, do people when asked about their general satisfaction with life, reflect on the amount of time they have been happy through daily events and situations? Research has shown that the constructs of positive affect, negative affect, and satisfaction with life are distinct, but related. For example, Diener et al. (1985) in validating the SWLS have shown that the scale correlates positively and highly (e.g., .5) with Bradburn's (1969) scale of positive affect and negatively with negative affect. Similarly, Lucas, Diener, and Suh (1996) have shown that life satisfaction is discriminable from the PANAS (Watson et al., 1988) scales of positive and negative affect, although it correlates quite highly with positive affect (with correlations ranging between .42 and .52) and negative affect (with correlations ranging between -.31 and -.50). Based on such results, researchers have concluded that life satisfaction is theoretically different from the daily experience of positive and negative affect, although life satisfaction and affect are moderately (Arthaud-Day, Rode, Mooney, & Near, 2005) to highly correlated.

A number of other measures exist for the operationalization of meaning and purpose in life, in questionnaire-based formats (Antonovsky, 1979; Crumbaugh & Maholick, 1964). For example, Antonovsky (1979, p.132) referred to *a sense of coherence* (SOC) as "a global orientation that expresses the extent to which one has a pervasive, enduring, though dynamic, feeling of confidence that one's internal and external environments are predictable and that there is a high probability that things will work out as well as can reasonably be expected." The SOC is a stable personality

characteristic or tendency to view one's internal as well as external circumstances as making sense, as well as a tendency to feel connected, coherent, and reasonably positive. This sense of coherence has implications, argues Antonovsky, for how individuals respond to various stressful situations. Coherence can be thought of as the presence of meaning in life.

An additional tool for the measurement of meaning is Crumbaugh and Maholick's (1964) Purpose In Life questionnaire (PIL) based on Frankl's (1959; 1986) logotherapy. The PIL was designed to assess the presence or lack of meaning in individuals' lives based on Frankl's existential principle that the essence of human motivation is "the will to meaning" – the will to perceive one's personal existence as meaningful.

Another approach to meaning consists of identifying motives for daily activities, and measuring the extent to which people find these activities meaningful and worthwhile. The Life Engagement Scale (LES; Scheier et al., 2006) adopts this approach. The scale reflects individuals' sense of purpose and engagement in valued activities. The measure is global in that it refers to general day-to-day goals and values. It is anchored in people's sense that the things they do are worthwhile, important, and valued, and as such their activities give meaning and purpose to their lives as a whole.

Goals and Personal Strivings

The construal of goals and personal strivings. According to Emmons (1999), the lives of human beings are structured around the pursuit of goals that individuals seek to achieve or avoid. Similarly, goals have been conceptualized in terms of "incentives" which provide motivation for behavior (Klinger, 1998). In addition to directing behavior,

goals influence thoughts and emotional reactions, and provide direction and purpose in life (Klinger, 1998). People spend much of their time and effort in reflecting upon, deciding about, and pursuing important personal goals (Emmons, 1986). Austin and Vancouver (1996) defined goals as internal representations of desired states, where states are construed as outcomes, processes, or events. These desired states cover a broad range of temporal and behavioral levels, from biological internal states, such as the regulation of body temperature, to life-long interpersonal goals, such as maintaining intimate relationships.

The attainment of personally valued goals is associated with daily positive affect in the short term, and with long term emotional well-being (Emmons, 1986; 1999). When asked what makes for a happy, fulfilling, and meaningful life, people spontaneously discuss their goals and wishes for the future (Emmons, 2005). Emmons and Diener (1986), in a study in which participants recorded daily moods in different situations, found that positive affect was experienced in situations that involved engagement in behavior that was relevant to valued goals, as well as instances of progress toward these goals. It has been suggested that personal goals represent how people structure and experience their lives in the long term (Emmons 1999). Research has shown that individuals who are involved in the pursuit of personally meaningful goals report greater well-being and physical health compared to individuals who lack such over-arching goals (Emmons, 1999; Emmons & Kaiser, 1996). For example, Brunstein (1993) has shown that three different aspects of goals, including commitment to goals, attainability, and progress toward goals, predicted college students' well-being over the course of a

semester. Similarly, King, Richards, and Stemmerich (1998) found that individuals' progress toward daily goals that were related to broader life-goals showed the strongest relation with well-being.

According to most models of goal structure, a hierarchical order is thought to organize multiple coexisting goals (Austin & Vancouver, 1996). A common hierarchical structure identifies a number of higher level goals such as "optimize personal meaning," beneath which a larger number of subgoals, such as "succeed in school" are organized, cascading to the most basic units of daily behavior such as doing homework or even controlling muscle movements. However, most researchers incorporate only one or two levels of goals in any one theoretical framework.

Goals tend to be complex and can be studied in terms of a number of dimensions. For example, Austin and Vancouver (1996) suggested six common goal dimensions. The first dimension includes importance and commitment and refers to the relative importance of a goal as rated by the individuals themselves or others and to how long individuals are prepared to persevere in order to attain the goal. Another dimension is level of difficulty of attaining a goal; this dimension is related to the probability of success and to individuals' perceived self-efficacy for that goal. Time frame refers to the period of time over which the goal extends. Specificity of goals indicates the level of concreteness or vagueness of a goal, or the nature of the goal in terms of it being quantitative (e.g., more specific) or qualitative (e.g., less specific). Consciousness is the degree to which individuals are conscious of their goals, and is related to the accessibility of a goal to conscious thought. Finally, the complexity of goals refers to the degree to

which goals are connected to other goals, feelings, memories, and behaviors. These dimensions can be further studied in the context of between–individual differences, within individual changes over time, and interaction of goals within a person. In other words, differences along these dimensions of goals can be compared across a number of individuals, within the same individual over time, and in terms of how the characteristics of goals in terms of these different dimensions determine the allocation of resources for the pursuit of each goal (Austin & Vancouver, 1996).

Due to the multidimensional nature of goals, there are many methodologies that may be used to measure goals at their different levels. Personality researchers have tended to study a stable set of goals that represent individuals' life goals over the course of many years, and which are manifested in individuals' behavior (Pervin, 1983). In a personality framework, Emmons (1986; Emmons & Diener, 1986) conceptualized goals in terms of personal strivings, which are enduring end points that individuals try to achieve over long periods of time. Emmons (1986) also distinguished between positive and negative strivings. A positive striving is what an individual is trying to achieve such as "try to appear attractive" whereas a negative or nonattainment striving is what an individual is trying to avoid such as "try to avoid being dependent on parents." Singer (1990) argued that the personal strivings approach to goals is preferable because unlike the study of motives and wishes – that may be nonconscious – personal strivings are conscious and related to overt behaviors.

Personal strivings are construed as superordinate and abstract goals, which guide numerous concrete subordinate goals (Emmons, 1986). This is consistent with Austin and

Vancouver's (1996) portrayal of the hierarchical organization of goals. For example, a person may have the superordinate goal of having good and caring relationships and friendships. He may pursue a number of subordinate goals to achieve this end, such as participate in social gatherings to meet new people, maintain contact with old friends, and engage in efforts to maintain good relationships with parents and family.

A number of researchers (Graham, Argyle, & Furnham, 1980; Singer, 1990) have used Murray's (1938) psychogenic needs to generate lists of long-term general life goals. For example, Graham et al. (1980) provided individuals with 8 common situations and asked participants to write down all the goals persons in each situation might have. The authors added to the list of goals generated by participants a number of additional basic motivators of human behavior based on Murray's (1938) and Atkinson's (1958) work. These three sources yielded a list of 120 fairly specific goals, which the authors reduced to a list of 18 more general goals. Most of these final 18 goals represent basic motivations for behavior, similar to those described by Murray (1938), such as the wish to be accepted by others, the wish to help look after other persons, or the wish to have fun and enjoy oneself. Graham et al. (1980) used these goals to test various hypotheses regarding the hierarchy and interaction of goals in different situations.

Singer (1990) provided undergraduate students with a list of 15 long term goals based on Murray's (1938) psychogenic needs and asked individuals to rate these goals in terms of their personal desirability. Participants then used the goals as cues for recalling related memories. Later, they rated the relevance of memories to the attainment or nonattainment of goals, and indicated their affective responses to memories. Relevance of

a memory to the attainment of a goal was defined as the relevance of the remembered event to the advancement of the goal. That is, the memory was seen as supporting goal achievement. Relevance of a memory to the nonattainment of a goal was defined as a memory whose content was seen as frustrating a goal.

Singer (1990) chose to provide a list of goals, rather than allow participants to generate their own goals – as in Emmons' (1986) study, in which individuals generated their own list of strivings – in order to prevent the content of generated goals from being confounded with the content of recalled memories. Goals were worded such that they were quite general and were likely to be perceived as important in the present as well as in the future. The 15 life goals sentences expressed 16 of the original 20 needs identified by Murray, and 2 of these needs were combined into one life goal sentence. For example, needs such as the need for dominance and achievement were worded as life goals such as "I would like to be a leader and sway others to my opinion" and "I would like to create a lasting and notable accomplishment."

Singer (1990) found that participants' current affective responses to memories were linked to the attainment or nonattainment of desired goals. Participants felt more positive feelings in response to memories that were related to the attainment of current goals, and more negative feelings for memories that were associated with the nonattainment of goals. Singer (1990) also found, in a second study, that the 15 goals could be further reduced to four main goal domains, which included relationships, accomplishment, self-gratification, and avoidance. This categorization is significant because the relevance of memories to the attainment of goals may generalize from

specific goals to more general goal domains. Sutin and Robins (2008) conducted a short term (2 month) longitudinal study on significant memories and personal strivings, and observed relations over time between emotion for significant memories and strivings. For example, greater commitment to strivings was associated with higher positive and negative affect later on for significant memories.

In sum, goals are viewed from the perspective of personality researchers as life-long stable endpoints, which individuals may be trying to achieve and view as desirable in the present as well as the future, or the goals may be states or conditions that people are consistently trying to avoid. Research has shown that a group of 15 superordinate personal strivings capture the majority of interpersonal, personal, and achievement related goals valued by young adults. These goals are related to a number of cognitive, motivational, and affective processes, including to self-defining memories. For example, individuals who recall personally significant memories that are relevant to the attainment of important life strivings feel more positively about such memories, compared with the recall of memories relevant to avoidance strivings.

Self-efficacy and importance of goals. As noted above, importance of goals and self-efficacy are basic dimensions of goal structure. Prior research on goal self-efficacy and goal importance, and their contribution to successful coping, has shown that goal importance and goal efficacy are often positively correlated, yet represent independent constructs (Martin & Gill, 1995; Orbell, Johnston, Rowley, Davey, & Espley, 2001). Self-efficacy has been identified in Bandura's (2006) social cognitive theory as one of the most powerful and important mechanisms of human agency. Agency refers to the

intentional influence of one's functioning, life circumstances, and environment. It has been shown that greater self-efficacy and greater importance of goals encourages people's engagement in the pursuit of their personal goals and achievement in those domains (Emmons, 1986; Wofford, Goodwin, & Premack, 1992).

In practical applications of models related to self-efficacy and goal performance, researchers have found that self-efficacy is important for achievement in academic and educational settings (Pajares & Schunk, 2001), that self-efficacy constitutes an important mechanism in self-management of chronic conditions and thus plays an important role in enhancing people's health (Lorig & Holman, 2003), and that self-efficacy in the professional domain enhances people's capacity for occupational self-development and self-renewal (Bandura, 1997). Thus, Bandura (2006) suggested that self-efficacy promotes and enhance people's skills and their capacity for self-regulation, growth, and positive behavioral change.

Affect, motivation, and self-efficacy. As noted above, affect plays an important role with regard to importance of goals and with regard to motivation to achieve these goals. Some feelings are associated with more active states of mind, and therefore are more relevant for motivated approach behaviors. For example, although feeling satisfied and happy are positive emotions, they suggest a less active state of mind than emotions such as feeling energized, enthusiastic, or proud. Researchers have shown that experimental manipulations of feelings of pride enhance task performance (Williams & DeSteno, 2008). Active positive affect is well captured, for example, by the Positive Affect subscale of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, &

Tellegen, 1988).

Classical motivation theory is based on the idea that affect underlies motivation and its behavioral manifestations (Bjornebekk, 2008). Furthermore, findings support the idea that emotion is organized such that there is a division between positive and negative affect (Tellegen, Watson, & Clark, 1999; Watson & Tellegen, 1985) with antagonistic effects of emotion on approach and withdrawal behavior toward and away from goals, respectively. In their model of emotion, Tellegen et al. (1999) identified positive affect and negative affect as two dimensions that define an emotion circumplex. High positive affect (PA) reflects feeling activated, engaged, and pleasant (e.g., strong, interested, excited), whereas high negative affect (NA) reflects feeling engaged but unpleasant (e.g., fearful and nervous). Items on the PA and NA scales of the PANAS indicate positive and negative emotions, which correspond closely to Watson and Clark's notion of positive and negative activation. Individual differences in positive and negative affectivity have been shown to be linked to differences in incentive motivation, and mapped on to approach and avoidance temperaments (Elliot & Thrash, 2002)

Some studies have shown that induced affect has a profound impact on motivation. For example, a recent study (Bartels, 2007) with university students provided support for the idea that intensity of negative affect is predictive of greater fear of failure with regard to desirable goals and to less need for achievement. Intensity of positive affect in this study was not a significant predictor of goal-approach behaviors. In other research, however, Custers and Aarts (2005) have shown that positive affect plays an important role in non-conscious goal pursuit. Custers and Aarts argued that when behavioral states

are associated with positive affect, people are more strongly motivated to attain these states and to engage in goal-directed behavior, without necessarily having an awareness of the source of their motivation. In one of a series of studies, the authors showed that participants who were subliminally primed with behavioral states in combination with positive affect words showed a higher degree of motivation to achieve these behavioral states.

Other studies (Isen & Reeve, 2005) have shown that positive affect fosters intrinsic motivation with regard to an enjoyable task, in this case playing with a three-dimensional puzzle, but also with regard to a less enjoyable task that participants were asked to do regardless of their preferences, in this case identifying strings of letters. Similarly, Williams and DeSteno (2008) found that pride predicted perseverance at a cognitive ability task.

Some research has shown that affect is directly related to perceived self-efficacy. In a mood induction experiment, Kavanagh and Bower (1985) showed that individuals who were instructed to think of a romantic failure experienced negative affect and a diminished sense of self-efficacy in different spheres of life, whereas those who thought of a successful romantic relationship experienced positive affect and a sense of enhanced self-efficacy in different life domains. In a related study, mood inductions were followed by an assessment of attributions of success for hypothetical stories in which positive outcomes could be attributed to the protagonist's effort, the external circumstances of the situation, or luck (Forgas, Bower, & Moylan, 1990). Positive affect was associated with

more attributions of success being due to protagonist's efforts. This finding suggests that positive mood increased participants' beliefs in the efficacy of the protagonist's efforts.

Meaning making, positive affect, and commitment to goals. Some researchers have linked the presence of meaningfulness in life not only with self-efficacy, but also with positive affect and with greater commitment and clarity to valued goals. Yalom (1980), after reviewing the relevant research in this area, concluded that the presence of life meaning was related to clear life goals, among other positive outcomes. Zika and Chamberlain (1992) argued that meaning in life relates closely to goal commitment and accounts for a resilient individual's ability to withstand stress. In Kobasa's (1979) terms, meaning accounts for individuals' hardiness. In sum, research has shown that there is a strong association between meaning in life, advancement toward goals, and positive psychological outcomes. These positive outcomes include strong transcendent values and religious beliefs, membership in groups (Yalom, 1980), self-esteem, and psychological well-being (Chamberlain & Zika, 1992; Zika & Chamberlain, 1992).

Studies have also documented relations among positive affect, meaning making, and commitment to goals. For example, Sutin and Robins (2008) have shown that individuals who experienced more positive affect in relation to meaningful memories were more committed to their goals and perceived them as more attainable. In other research, a meaning making intervention with cancer patients was shown to increase both well-being and self-efficacy (Lee, Cohen, Edgar, Laizner, & Gagnon, 2006). More generally, it has been argued that positive affect in the context of goals may signal to people that they are efficacious or that they can use feedback from previous experiences

to improve themselves (Aspinwall, 1998; for empirical support, see Trope & Neter, 1994; Trope & Pomerantz, 1998).

Similarly, a reversed chain of causality has also received empirical support. Some studies have shown that valuing and feeling self-efficacious regarding important goals leads to feeling generally more positive and having a sense of meaning. According to Scheier et al. (2006), "valued goals are important because they provide a purpose for living." Here too the effects of valuing and feeling self-efficacious about creating a sense of meaning in one's life may be mediated by the presence of positive affect. For example, Moffitt and Singer (1994) and Singer (1990) have shown that the more relevant memories were to individuals' current goals, the more positive affect they reported for these memories. Singer and Moffitt (1994) asked participants to generated self-defining memories, which are memories of significant personal events, and a week later a list of personal strivings. Some strivings were achievement strivings that individuals were hoping to accomplish such as succeed in school, and some were avoidance strivings, representing outcomes that individuals wished to avoid, such as avoiding harm or illness. Participants reported their affect in response to these memories, and indicated the relevance of their memories to the attainment or nonattainment of strivings. Participants who recalled more memories relevant to the attainment of strivings reported more positive emotions, compared to individuals who described memories that were relevant to avoidance strivings.

Experimental evidence also supports the view that focusing on one's valued goals can improve affect. People who were led to affirm their own goals and values after a

threat to their sense of self (such as posed by a personal failure) were better able to manage their distress, showing improved overall affective functioning (Koole, Smeets, Knippenberg, & Dijksterhuis, 1999;Tesser, Crepaz, Colins, Cornall, & Beach, 2000). Finally, studies have shown that experimentally induced positive mood can lead to increased meaningfulness. In a series of studies, King, Hicks, Krull, and Del Gaiso (2006) found that positive mood, whether experienced spontaneously or induced by means of experimental manipulations, led people to report more meaning in life.

It is important to note that in summarizing the existing research, studies depicting meaning for specific events and meaning in life were included. Similarly, studies which elicited spontaneous ratings of affect were included along with studies in which affect was induced via experimental manipulations. In other words, in some of the studies cited above, the focus was on participant's overall current affective state or overall sense of meaningfulness in life as opposed to the affect or meaning they associated with some event or memory. Also in some cases, mood was induced via experimental manipulations, which is fundamentally different than the spontaneous reporting of affect. These differences are significant because they may lead to contradictory results and also because they have different implications for theory. In addition, goals have been discussed so far in the context of individuals' wishes for the future and current affective states, but it is important to remember that goals can span long periods of time and are linked to individuals' memories and on-going life-story. For example, goals have been implicated in the self-memory system that includes autobiographical memories and the self-knowledge base (M. A. Conway & Pleydell –Pearce, 2000).

Autobiographical Memory and the Specific Case of Self-Defining Memories

Autobiographical memory. Meaning making as described above is usually a process that occurs in response to important events from one's past. Goals and personal strivings are also often linked to one's memories of important past events. Such events are represented in a person's autobiographical memory system and knowledge base and tend to be retrieved and reconstrued according to ongoing activities and goals. Autobiographical memory consists of the memories that people have regarding past events and experiences in their lives. Researchers have provided different definitions of autobiographical memory and emphasized different aspects of this construct. M. A. Conway, Singer, and Tagini (2004) have conceptualized autobiographical memory in terms of a self-knowledge base that is related to current goals of the self. According to Tulving (1972), autobiographical memory may include two types of information processing systems referred to as episodic and semantic memory. The first, episodic memory, contains temporally dated information about events and episodes in one's life, whereas the second, semantic memory, is a knowledge base containing information about the world and the self and at its most basic level is related to the use of language, words, their meanings and interrelations (Tulving, 1972; 2002).

M.A. Conway and Pleydell-Pearce (2000) have classified autobiographical memories into three levels of specificity: lifetime periods, general events, and event-specific knowledge. Lifetime periods, such as when I was at university, include general knowledge about places, people, plans, actions, common location, and events that occurred during a specific period of time framed by a beginning and an end point.

General events, such as a trip to Venice, are more specific than life time periods, and are often linked to a number of other memories related to the same theme. The third category, event specific knowledge, refers to highly specific knowledge, often represented through vivid imagery and sensory details. In extreme cases of traumatic memories, such details "pop" into the individual's mind without being intentionally recalled. Almost always, memories contain knowledge at all these three levels of specificity, such as remembering a specific meeting that took place during a period of time spent in college.

In M. A. Conway and Pleydell-Pearce's (2000) model of autobiographical memory, the self plays a unifying and central role in the encoding and retrieval of events. More specifically, the working self, which includes current goals and motivations, and which is linked to people's identity, beliefs, and personality, has a great influence on the encoding and retrieval of memories. This theoretical perspective is consistent with prior research, which has shown that people retrieve memories that are consistent with their self-concept (Markus 1977; McAdams, 1996). For example, people who view themselves as independent recall more instances of independent behavior. Similarly, M. A. Conway et al. (2004) have argued that people's understanding of themselves, and their current goals and concerns influence how and what they recall from their past in an ongoing dialectical relation. In other words, self both emerges from, and contributes to, the narration of autobiographical events.

Research has shown that the accumulation of autobiographical events is not equally distributed across the life span. For example, people have difficulty recalling

events that have occurred before the age of three (Pillemer & White, 1989). It has been suggested that this phenomenon is related to developmental changes that take place during childhood (Nelson & Fivush, 2004). Recent research suggests that the age of the person reporting the memory may also influence the age beyond which events are not remembered. Tustin and Harlene (2010) found that the earliest memories reported by children and adolescents, but not adults, preceded the typical 3 1⁄2-year-old boundary of childhood amnesia.

In contrast, memories are over-represented for the period of time between the ages of 10 and 30. When middle aged or older individuals are asked to describe autobiographical memories, they tend to over-represent events that occurred during adolescence and early adulthood (Rubin, Rahhal, & Poon, 1998). This phenomenon has been termed the reminiscence bump, and research has shown that it is particularly true for positive memories (Berntsen, Wilert, & Rubin, 2003; Rubin & Berntsen, 2003). A number of theories have been proposed to explain this phenomenon. One way of understanding this phenomenon is from an identity formation perspective (Rubin et al., 1998). According to this perspective, more events are retained during young adulthood because this is a time during which individuals form and consolidate their identity.

Autobiographical memories have been shown to serve a range of functions including self-related, social, and directive (Bluck, 2003; Bluck, Alea, Habermas, & Rubin, 2005; Pillemer, 2003). Autobiographical memories are often memories of personal significance and meaning, in that they are linked to individuals' goals, feelings, other memories, and to individuals' sense of identity. Individuals reflect on past events

and relate them to their lives as a whole in an attempt to create a coherent life-story (Bluck & Habermas, 2001). According to McAdams (2001), identity is an internalized life story. McAdams (1993) asked participants to provide in-depth descriptions of their lives. Participants were asked to look at their lives as a book with a title, with significant periods in their lives as chapters. These accounts were then coded for meaning, cohesiveness, narrative integration, personality development, and the presence of particular themes such as communality (i.e., interpersonal warmth), agency (i.e., assertiveness), and generativity (i.e., supporting others' development). According to McAdams, individuals intuitively ordered their past, present, and future in the form of a cohesive story or narrative. Based on extensive research in this area, McAdams (2001) has argued that narrative forms the foundation and structure of the self and of personality.

This view that autobiographical memory is of fundamental importance to the self has been adopted by a number of personality researchers. Singer and Bluck (2001) have argued that autobiographical memories are the building blocks of the life story, and as such, when coherently strung together through individuals' reasoning and reflection, play a central role in individuals' sense of identity. Singer and Bluck (2001) have elaborated on the role of narrative processing and autobiographical reasoning in the construal of personal stories, which are an important source of self-definition. Autobiographical reasoning is the process by which individuals interpret and evaluate their experiences in a way that provides important lessons and insights. Narrative processing is the selection of events and their organization into a causal story with a valued endpoint.

Similarly, M. A. Conway et al. (2004) have delineated a model of autobiographical memory that construes the functions of autobiographical memory in relation to the self. In their model, the coherence and correspondence of autobiographical memories are considered. Coherence refers to the important role memories play in supporting a stable representation of the self's interaction with the world. Correspondence refers to the individuals' need to record the relevance of events in relation to their ongoing goal pursuits.

Similar arguments have been made in the context of identity formation during important developmental stages for children and adolescents (Fivush 2001; Nelson & Fivush, 2004). For example, Bohanek, Marin, Fivush, and Duke (2006) found that the way in which families interacted when recounting shared past events had implications for pre-adolescents' sense of self. For example, discussions of the shared past which included all members' points of view, and in which different perspectives were coordinated with one another were associated with higher self-esteem – especially for girls, whereas uncoordinated narratives were associated with external locus of control – especially for boys. In sum, one of the most prominent and elaborate functions of autobiographical memory is in relation to the functioning of the self in general, and in relation to the pursuit of personal goals, and the support of a stable and coherent sense of self and identity, in particular.

In addition, autobiographical memory has social and directive functions. The social function of autobiographical memories refers to the use of memory to develop and maintain relationships (Alea & Bluck, 2003). Sharing memories serves to make contact

with others, elicit empathic responses, and generally engage others in an interpersonal exchange. For example, in a study by Marsh and Tversky (2004) the most common reasons for retelling events were to convey facts, to elicit sympathy, and to entertain. Autobiographical memories can also provide guidance for solving current problems, which has been referred to as the directive function. Pillemer (2003) provides a number of examples of how traumatic events as well as everyday memories serve a directive function. For example, Pillemer (2003) refers to the September 11, 2001 attacks as an example of a tragic event that can be seen as fulfilling social and directive functions. Pillemer (2003) argued that vivid memories of the tragic event, which were filled with violent images of danger, served a directive function in guiding subsequent efforts to prevent additional harm and ensure the future safety of Americans. Although the impact of the attacks was manifold and likely did not occur solely through the effects of autobiographical memory, there are multiple stories and narratives shared by the survivors, which certainly contributed to the great impact the event had on seeking new measures of safety. Normative daily events can also provide a memorable and lasting source of guidance. For example, Pratt, Arnold, & Mackey (2001) provided the account of an adolescent, whose memory of her parents' friendly and outgoing behavior at a social event continued to provide guidance for her own social problem solving long after it had occurred.

Many factors contribute to the process by which some memories are selected to be retrieved over others. Such factors may include the relevancy of the memory to the attainment of current goals of the self, which will be discussed later, as well as the

affective qualities of the memory. Emotion is an important aspect of autobiographical memories and it contributes to the selection of memories to be encoded, stored, and retrieved (M.A. Conway, & Pleydell-Pearce, 2000). Both the valence (e.g. positivity versus negativity) and intensity of memories have been shown to influence encoding and retrieval as well as other perceptual and cognitive properties of memories (Talarico, Labar, & Rubin, 2004). In a case study, White (2002) found that pleasant events were better recalled than unpleasant events, and that generally, memories which were emotionally intense, rare, and vivid were better recalled even after a long period of time. Berntsen (2001) found that traumatic experiences and vivid involuntary events (e.g., flashbacks) characterized by strong positive or negative feelings were more vivid. Similarly, Rubin, Berntsen, and Boals (2008) found that stressful memories that were characterized by greater emotional intensity were recalled more frequently, both voluntarily and involuntarily. Generally, Talarico et al., (2004) found that the emotional intensity of a memory, more than its valence, was positively correlated with a number of important dimensions of the memory such as perceived vividness, coherence, and rehearsal of the event.

To summarize, autobiographical memory includes events from individuals' lives that are important and meaningful and that are linked to other important memories and current goals. An important aspect of autobiographical memory is emotion. More specifically, the valence and intensity of the emotional experience have been shown to influence a number of properties of the memory such as perceived accuracy, coherence, and vividness, as well as rehearsal of the event (Talarico et al., 2004). Three broad

functions of autobiographical memories have been classified as being directive, self, and social (Bluck, et al., 2005). Specifically, in the self-related domain autobiographical memory is thought to contribute to identity through the narration of a coherent life-story and the integration of autobiographical events with individuals' more general self-knowledge.

Self-defining memories and meaning making. Self-defining memories are a specific type of autobiographical memory, in that they have great personal significance and meaning. As noted above, much of the study of meaning making has been done in the context of individuals' recollections of coping with specific types of traumatic events such as severe illness, natural disasters, or physical abuse. However, a different approach has been to study meaning making in the context of self-defining memories in the general population.

Self–defining memories have been identified as a unique type of autobiographical memory (Blagov & Singer, 2004; Moffitt & Singer, 1994; Singer & Salovey, 1993) and have been defined as important personal events that are viewed by individuals as shaping and defining who they are (McLean, Pasupathi, & Pals, 2007). Self-defining memories are often associated with strong and complex emotions such that both positive and negative emotions may be experienced in response to the same event (Moffitt & Singer, 1994; Singer & Moffitt, 1991; Wood & M. Conway, 2006). Self-defining memories are also experienced as more vivid than other autobiographical memories and tend to be recalled repeatedly over time (Singer & Moffitt, 1991). Such memories are also linked to other important cognitive and emotional processes and serve a number of important

functions. They often correspond to important motives and concerns of individuals, and are linked to current goals, as well as to other important memories. Finally, themes of self-defining memories cover a wide range of domains including negative events such as life-threatening situations, illness, death, break-up of close relationships, as well as positive events such as success in achievement domains and exploratory or recreational activities.

Self-defining memories have been studied with young adult university students and adolescents in the context of individuals' life goals (Moffitt & Singer, 1994), and emotions and motives (Sutin & Robins, 2005). Moffitt and Singer (1994) asked participants to write self-defining memories and their affective responses to these memories. They also asked participants to generate a list of important goals and rate these goals in terms of their relevance to the memories described. Participants who listed more attainment goals that were relevant to their self-defining memories felt more positively about their memories. Attainment goals refer to goals participants wish to achieve, such as saving money or starting a family, as opposed to avoidance goals, which refer to outcomes participants wish to avoid such as avoiding harm or illness.

Sutin and Robins (2005) asked participants to write about five self-defining memories and to rate their emotions during the memories as well as their motives. Participants also rated each memory in terms of each of three motives including achievement, power, and control, on a 5-point scale. For example, a memory of school success may have been rated as high on achievement motivation and low on power and control motivation. The authors found that emotions and self-reported motives for self-

defining memories were stable over a period of two weeks and were associated with changes in personality, well-being, and academic performance over a 4-year period. For example, achievement motivation was associated with higher self-esteem and well being over a 4-year period, whereas, power motivation was associated with decreases in well-being.

A number of researchers (McLean & Pratt, 2006; McLean & Thorne, 2003; Thorne et al., 2004) have studied meaning making in the context of self-defining memories in an effort to better understand the functions of meaning making and how it contributes to the formation of life narratives and identity. McLean and Thorne (2003) asked participants who were young college students to describe important self-defining memories. Narratives were coded for themes of interpersonal conflict, separation, and closeness with peers and parents. In addition, memories were coded in terms of spontaneous references to two types of meaning-making that were included by participants when they were asked to simply describe the past event: lessons learned, and insight gained.

Learning lessons reflected specific instances of learning concrete lessons about important consequences that could be applied to similar future situations. Gaining insight was defined as instances of general and more abstract changes in attitudes, values, and beliefs. The latter types of changes require that individuals step back from the experience and reflect in depth about its broader implications, in terms of their attitudes, values, and goals, as well as their self-understanding (Pillemer, 1992). An example of a learned lesson would be not to lie to a particular friend after having compromised the friendship

due to lying, whereas an example of having gained insight would be realizing that one is not as honest as one ought to be and resolving to become more truthful and honest with oneself and others.

In their study, McLean and Thorne (2003) found that situations that involved interpersonal conflict were associated with more meaning making, and in particular with gaining insight. This was particularly true for memories of separation, due to the conflict that characterized these types of memories. In contrast, memories of closeness and intimacy were not associated with meaning making, suggesting that such memories do not require individuals to engage in further analysis or cognitive restructuring. The authors suggested that memories of closeness may serve a different function than those including conflict, such as representing individuals' capacity for love and closeness with others. In a related study, Thorne and colleagues (2004) found that references to meaning, as coded directly from individuals' spontaneous references in their narratives, emerged in one fourth of self-defining memories. As in prior research, meaning was more prevalent when narratives contained tension and conflict, especially in the context of relationships and mortality.

However, some types of stressful events, such as those involving interpersonal conflict, generated more evidence of meaning making compared to other types of events, such as those containing references to mortality. Comparatively little or no meaning was associated with events that were not stressful, such as leisurely activities and achievement related events. The authors suggested, based on these results and prior theorizing, that situations that involve tension or are stressful, such as those containing interpersonal

conflict, are more likely to promote reflection. Interpersonal conflict situations may reflect young adults' needs for autonomy and self-sufficiency, and force them to resolve these conflicts through the process of reflection and better self-understanding. Conflicts may also lead individuals to new discoveries about their relationships and about their parents and peers, as well as promote taking new perspectives regarding their own role in those relationships. These attempts at meaning making contribute to young adults' formation and consolidation of identity as they transition from adolescence to adulthood

Another function of meaning making, applicable to negative and stressful events, is that stressful events elicit more efforts at meaning making as part of an overall effort to minimize the impact of negative events. This is done through a number of physiological, emotional, and cognitive responses, including meaning making and cognitive restructuring. Such responses are greater for negative events, and are thought to represent an effort to dampen or even erase the impact of stressful events (Taylor, 1991).

In addition to the study of meaning making and its functions in the context of self-defining memories, researchers have identified a number of associations between meaning making and affect and personality. For example, meaning for self-defining memories has been linked to personality traits such as self-restraint. Blagov and Singer (2004) examined different dimensions of self-defining memories in a sample of undergraduate students. They defined self-defining memories as high in integrated meaning when memories included instances of interpretations, evaluations, insights, explanations, and lessons, as well as evidence of the integration of these insights and lessons with an ongoing sense of self and self-knowledge. The authors hypothesized that

individuals who reported more memories that were characterized by integrated meaning would be better adjusted as reflected by an index of self-restraint. Self-restraint is a dimension of personality, which includes the ability to control one's internal impulses, as well as control aggression and behave responsibly in interpersonal situations. Moderate self-restraint is a sign of personal adjustment, and more specifically the ability to regulate one's emotions, and delay instant gratification. Low restraint is associated with problem behavior, and over-control may be the result of overly rigid personality traits. As expected, individuals who reported more self-defining memories that were characterized by highly integrated meaning reported moderate levels of self-restraint. This finding further supports the view that the ability to draw meaning from self-defining memories and integrate it with a broader sense of self is related to important aspects of adjustment.

An additional important aspect of meaning making for self-defining memories is its association with affect. Wood and M. Conway (2006) have also focused on self-defining memories, and explored their relation to the regulation of affect over time. In their study, a self-defining memory was defined as one that helped individual consolidate who they were as individuals, and which is still associated with strong positive or negative emotions. Individuals who reported that an event had a great impact on them, also reported having engaged in more meaning making with regard to that event, i.e. having learned from the experience and gained a sense of personal growth as a result. Positive feelings regarding a self-defining event were shown to increase over time in those individuals who engaged in more meaning making. More specifically, individuals who experienced an event as having great impact on them and as being meaningful,

reported feeling better than when it occurred. This would suggest that meaning making plays an important role in the regulation of positive emotions regarding important events in one's life.

In sum, self-defining memories are related to a number of important constructs of the self, including affect and motives for past behaviors, and orientation toward future goals and strivings. Self-defining memories have also been studied in the context of meaning making, and research suggests that meaning making is more likely to occur in situations that involve interpersonal conflict and tension, and that the integration of meaning gleaned within the self is associated with better adjustment. Unlike the majority of research on meaning making, which has been conducted with special populations of survivors of traumatic events, research on meaning making in the context of self-defining memories has been largely conducted with university students. Students are not, as a group, individuals who have suffered a serious trauma, and as such results from these studies may reflect what can be observed in the population at large. This distinction is important as it allows for the generalization of results for the general population, and suggests that meaning making is not only an important coping mechanism in extremely adverse situations, but also a normative process that contributes to identity and personality formation in adults in general, and late adolescents in particular.

Theoretical Models of Response to Trauma and the Experience of Intrusions and Avoidance

Intrusions and avoidance have been identified in some survivors of traumatic experiences as the hallmarks of maladjustment and even post traumatic stress disorder

(PTSD; *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* DSM-IV, American Psychiatric Association [APA], 1994). Horowitz's (1986) stage model of universal responses to trauma provides a departure point for discussion of normative response to trauma. Horowitz's Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) has been extensively adopted to measure reactions to stress caused by a wide range of traumatic events and is used in clinical settings to identify individuals who might require treatment. According to Horowitz's stage model of universal responses to trauma, an initial emotional outcry is followed by denial, intrusions and avoidance, working through, and finally, completion. This sequence of stages, however, is not considered universal, as for example when defensive avoidance is present during a stage that is mostly characterized by intrusions (Horowitz, 1983), or as when individuals skip or experience alternative sequences of the phases (Greenberg, 1995). Horowitz regards intrusions as automatic cognitive processes, which encourage a search for "personal meaning" following trauma. Although Horowitz's complete stage model has received only limited empirical support (Maciejewski, Zhang, Block, & Prigerson, 2007), a general conclusion emerging from his model is that intrusions and avoidance are a normative response to trauma, at least in early stages of the recovery process. This conclusion is consistent with other predominant models of response to trauma such as those advanced by Janoff-Bullman (1979), Foa, Steketee, and Rothbaum, (1989), Greenberg (1995), and others. Most of these models, and some of the resultant research, suggest that intrusive and avoidant thoughts are normative experiences of survivors of trauma, although theorists differ in the length of time after which the normative process is

considered pathological. Furthermore, most theories imply, at times in slightly different terms, that intrusions and avoidance symptoms reflect adaptation in that they set in motion a process of searching for meaning and cognitive restructuring that allows individuals to assimilate trauma-related information with existing beliefs and schemas.

Intrusions and avoidance and negative affect. Considering that intrusions are experienced as non volitional thoughts that disturb normal functioning, and that avoidant coping has been shown to be ineffective, it is not surprising that both these processes are associated with negative outcomes. The association between the experience of intrusions and avoidance and negative affect is readily demonstrated through a number of studies which show links between intrusive thoughts and avoidance – characteristic of PTSD – and depression, anxiety, and other negative affective states. Negative affect and the disruption of normative emotional experience are, in fact, constituents of the diagnostic criteria for PTSD. It seems that one of the outcomes of trauma is general distress, a characteristic shared with many other anxiety and mental health disorders. Simms, Watson, and Doebbeling (2002) have noted that 8 out of 17 PTSD symptoms, such as sleep disturbance, irritability, or impaired concentration are actually characteristic of many general depressive and anxiety disorders. Simms et al. (2002) have labeled this cluster of PTSD symptoms as broad dysphoria.

Using this categorization of symptoms of PTSD, Milanak and Berenbaum (2009) found that the dysphoria factor of PTSD predicted the experience of negative affect. Similarly, Litz and Gray (2002) found that combat veterans exposed to a trauma-related video expressed more negative emotions, such as overwhelming fear, horror, and anxiety

in response to the video compared to a control group and experienced less positive emotion in response to pleasant stimuli presented after the viewing.

The course of intrusions and avoidance over time. Intrusions and avoidance are initially associated with negative affect, however, the normative course of both distress levels and intrusions and avoidance is to decrease over time. This pattern has been supported by empirical data from a number of studies (Richter & Berger, 2006; Sloan, Rozensky, Kaplan, & Saunders, 1994; Sundin & Horowitz, 2003). For example, Richter and Berger (2006), in a study of mental health workers who had been assaulted by patients, found that rates of PTSD (assessed with the IES) decreased from 17% to 11% at a two month follow-up, and to 9% at a 6 month follow-up. In a study of different types of emergency personnel involved in providing services after an elementary school shooting, Sloan et al. (1994) found that intrusions and avoidance scores as measured with the IES decreased significantly for all groups at a 6 month follow-up.

Despite the general tendency for IES symptoms to decrease over time, there is a growing body of evidence suggesting that the course of PTSD over time may be yet more complicated. Single case studies replicated with larger populations have now repeatedly shown that some survivors of trauma who initially do not report any unusual distress develop symptoms characteristic of PTSD as late as 2 or more years after the trauma (Bremner, Southwick, Darnell, & Charney, 1996; Gray, Bolton, & Litz, 2004; Ehlers et al., 1998; Herrmann & Eryavec, 1994; Wolfe, Erickson, Sharkansky, King, & King, 1999). Such instances have been referred to as delayed-onset PTSD.

In a retrospective study of Vietnam combat veterans, Bremmer et al. (1996) found

that 14 out of 61 individuals diagnosed with PTSD did not report significant symptoms associated with PTSD until 2 or more years after the trauma. Given difficulties in interpreting retrospective data, longitudinal studies have been designed more recently to assess the course of delayed-onset PTSD. In one such study of peacekeepers in Somalia, Gray et al. (2004) found that 6.5 % of a large sample (N = 1040) of veterans, who did not meet the criteria for PTSD 15 weeks after their return from the peacekeeping mission, exceeded these criteria at an 18 month follow-up interview. The authors also found that negative appraisals of the mission predicted the onset and course of PTSD at the 18 month follow-up. Such results are particularly important because originally PTSD was thought of as an acute disorder, unfolding within a short time span following the occurrence of trauma. Being that the time line for the onset and course of PTSD may vary greatly among individuals, it is difficult to set a clear time line for the normative cessation or decrease of symptoms.

Possible Relations Among Sense of Meaning and Intrusions and Avoidance

Consistent with theoretical models proposed by Horowitz (1986), Janoff-Bullman (1979), Foa et al. (1989), Greenberg (1995) and others, it seems that intrusions and avoidance overlap with the search for meaning, at least in the initial stages of coping with trauma. These processes seem to imply that the assimilation of new meaning with regard to trauma occurs in tandem, or has a reciprocal relation with the experience of intrusions and avoidance. Research has provided some contradictory findings regarding the relation between sense of meaning and intrusive thoughts and avoidance as they influence one another over time. Some researchers have found that sense of meaning acts to buffer and

protect individuals from subsequent negative symptoms, whereas others have found that they lead to no such results or to the opposite effect. Similarly, some studies have shown that early meaning making predicts adaptive responses to trauma and positive psychological outcomes later on. Others have focused on the role of rumination in persevering intrusions, which are associated with negative outcomes. While it is beyond the scope of the current thesis to fully assess psychological and physiological correlates of sense of meaning and intrusive thoughts and avoidance, key relevant studies are reviewed.

Sense of meaning as protective of subsequent intrusions and avoidance. Only a few studies have directly linked sense of meaning with intrusions, and the majority of these studies indicate that when people engage in searching for meaning and report having found meaning, they are less likely to suffer from intrusions later on. In a prospective study of trauma survivors of three different types of events (tornado, mass killing, and plane crash), McMillen et al. (1997) found that those individuals who had engaged in more benefit finding in the first 4-6 weeks after the disaster were less likely to suffer from PTSD three years later. They also found that benefit finding was associated with better mental health of survivors, especially for those individuals involved in a more severe trauma. The authors suggested that benefit finding was protective for some individuals because it allowed them to process the traumatic event. Similarly, Frazier et al. (2001) found that positive changes in outlook 2 weeks and 12 months after trauma were associated with less distress 12 months after the trauma. Similar protective effects of perceiving positive benefits, after exposure to combat trauma, were found by Aldwin,

Levenson, and Spiro (1994): perceiving benefits mitigated the lifelong negative consequences to combat exposure, including decreasing the likelihood of PTSD.

Similarly, Dohrenwend et al. (2004) showed that PTSD rates were lower in war veterans who engaged in positive cognitive appraisals (in other words, sense of meaning) regarding a traumatic event, suggesting that such individuals benefit from these reformulations and show more successful adaptation to the trauma. They concluded that positive reformulations are indicative of affirmation of the positive aspects of the event and mark adaptation rather than defensive denial associated with maladaptive outcomes. Interestingly, milder positive reformulations rather than more extremely positive ones were more adaptive.

Similar conclusions were drawn from studies in which written disclosure leads to cognitive processing of the traumatic event and was associated with lower levels of intrusions at a later time. Park and Blumberg (2002) asked participants to write about the most traumatic event in their lives over 4 consecutive days. Sense of meaning, intrusions, and avoidance were measured on each of the days as well as at a 4-month follow-up. When compared to a control group who wrote about trivial topics, those individuals who described that the traumatic event provided evidence for sense of meaning and positive changes in their appraisals of the traumatic event by the fourth day, and reported less distress and intrusive thinking associated with the event 4 months later.

Similarly, Lepore, Ragan, and Jones (2000) as well as Lutgendorf and Antoni (1999) have found that verbal disclosure of a traumatic event facilitated cognitive processing and reappraisals of the traumatic event and was ultimately associated with

reduced levels of intrusions and psychological distress. A number of researchers have argued that cognitive processing and assimilation of the traumatic event, as well as the achievement of insight through verbal or written disclosure (Greenberg, Wortman, & Stone, 1996; Pennebaker, 1997; Pennebaker, Mayne, & Francis, 1997) lead to a decrease in negative psychological and physiological symptoms due to an affective and cognitive integration of the traumatic event within a coherent narrative.

Sense of meaning as predicting subsequent increases in intrusions, avoidance, and negative symptoms. In contrast, a small number of studies have shown that people who exhibit more sense of meaning exhibit more intrusions and avoidance later on. As mentioned above, cognitive processing, including sense of meaning and cognitive restructuring, are part of a greater process unfolding over time. As such, the process of arriving at a sense of meaning is not always easily distinguished from the process of experiencing intrusions and rumination. Neither is it easy to separate consequences of these processes from one another. Rather, the relation between the two can be conceptualized both as reinforcing as well as antagonistic.

Some researchers have argued that the more intense the struggle to cope, the greater the potential for benefit (Harper et al., 2007; Tedeschi & Colhoun, 1996). According to this view, there is a positive association between sense of meaning and intrusions and avoidance, as both posttraumatic growth and distressing feelings and thoughts in the wake of the event evolve side by side. According to this view, growth and benefit finding do not exclude the presence of distress; neither do perceptions of growth and of benefits imply a complete resolution of the trauma. For example, in a meta-analytic

study of 87 cross-sectional studies, Helgeson, Reynolds, and Tomich (2006) reported that benefit finding was associated with experiencing more intrusive and avoidant thoughts regarding the distressing event, in 14 studies measuring these constructs.

A number of studies point to the fact that some meaning making may not result in a sense of mastery over the experience, but rather perpetuate the suffering. In certain cases, people cannot reconcile themselves with the traumatic event (Lehman et al., 1987) or their sense of benefit is not associated with actual positive outcomes. Frazier et al. (2001) have reported both positive and negative outcomes associated with self-reports of posttraumatic growth in the wake of trauma caused by sexual assault. Others have shown that even when people report finding benefits as a result of trauma, these reports are not always associated with positive outcomes. In their study of women with breast cancer, Tomich and Helgeson (2004) found that benefit finding was associated with more negative affect 4 months after diagnosis and with poorer quality of life for a subset of the participants. In a meta-analytic study, Helgeson et al. (2006) found that benefit finding was positively associated with less depression and more well-being but also with more intrusive and avoidant thoughts about the stressor, as noted above. This finding suggests that benefit finding may be beneficial in some ways, yet may not always lead to a reduction in various forms of distress.

Indeed, according to Horowitz (1991, p. 15-20), the experience of intrusions and avoidance is not only an indication of current distress and strong negative feelings, but is also a marker of changes in the self-schema, or changes in the relationship schema – if mourning over a loved one is the traumatic event. Consistent with this line of thought,

Park, Cohen, and Murch (1996) found that scores on a scale measuring stress-related growth were positively associated with scores on the IES as well as with severity of trauma. In addition, events that caused more initial distress were associated with more reported growth. Similarly, in a study of multiple sclerosis patients (Mohr et al., 1999), benefit finding was associated with some measures of positive behaviors such as adaptive coping and seeking social support, but it was also positively related to higher levels of anger and anxiety. Frazier et al. (2001) found that self-perceived growth in the wake of sexual assault was associated with fewer PTSD symptoms 2 weeks after the trauma but this association did not persist 12 months later. A meta-analytic study (Helgeson et al. 2006) summarized the effects of benefit finding as being related to more intrusions and avoidance symptoms.

In sum, only a handful of studies have assessed the direct association between intrusion symptoms and benefit finding. This was assessed for example in 14 out of the 87 studies reviewed by Helgeson et al. (2006). Most of these studies suggest that sense of meaning confers some degree of protection from avoidance and intrusion at a later time. A few recent studies suggest, however, that sense of meaning may actually be positively related to intrusions, avoidance, and anxiety, at least when measured concurrently. The measurement of meaning may also account for the different findings in different studies. More specifically, researchers have distinguished between the search for meaning versus the experience of meaning (Steger et al., 2008), suggesting that the search does not necessarily lead to the presence of meaning, and that search and experience might be associated with different psychological and behavioral outcomes.

Sense of meaning as a predictor of adjustment versus intrusions and rumination as predictors of negative outcomes. The distinction between adaptive and disruptive cognitive processing of negative events has been more thoroughly studied in terms of implications for individuals' short- and long-term adjustment. Sense of meaning and benefit finding have been associated with positive outcomes in a large number of studies, which can be broadly classified in terms of addressing health outcomes (Affleck &Tennen, 1996) and subjective well being and quality of life (Helgeson et al., 2006; Tomich & Helgeson, 2002). In contrast, intrusions and avoidance symptoms have been associated with subjective distress and even clinical syndromes.

A small number of studies have focused on sense of meaning and physical health outcomes. Affleck et al. (1987) found that patients who cited benefits from their misfortune 7 weeks after the first heart attack were less likely to have another attack and had lower levels of morbidity 8 years later. Bower et al. (1998) conducted a study with HIV positive men and found that those who reported finding meaning as reflected by major shifts in values, priorities, and perspectives experienced a slower progression of the illness and lower mortality rates due to AIDS over a 4 to 9 year follow-up period. In a more recent study, Bower et al. (2003) found that finding positive meaning through written emotional disclosure was associated with better immune functioning as measured by increased natural killer cell cytotoxicity. Results could not be attributed to the emotional disclosure alone, as they were only true for those participants who were able to find meaning by emphasizing relationships, prioritizing goals, and striving for meaning in life, through the writing exercise.

Other researchers have focused on global measures of well-being and quality of life and found that sense of meaning and benefit finding were associated with general well-being and improved quality of life. A cross-sectional study showed that finding benefits following a fire was associated with better coping and fewer physical symptoms both immediately after the event and 1 year later (Thompson, 1985). In a study of bereaved individuals, Davis et al. (1998) reported that making sense of the loss of a loved one was associated with less distress in the first year post-loss, and benefit finding was associated with better adjustment 13 and 18 months post-loss. For breast cancer survivors, finding positive meaning was associated with more positive affect 5 and 10 years later (Bower et al., 2005), lower distress and depression 4 to 7 years later (Carver & Antoni, 2004), and predicted positive mood and better perceived health at 3 and 12 month follow-ups (Sears, Stanton, & Danoff-Burg, 2003). Similar findings were reported by Park, Edmondson, Fenster, and Blank (2008), who concluded that meaning making efforts in breast cancer survivors were related to better adjustment. Finally in a meta-analysis, Helgeson et al. (2006) defined positive health outcomes as the absence of depression and the presence of positive well-being and found benefit finding to be positively associated with these outcomes in a large number of studies.

In contrast, rumination and intrusive thinking have been associated with maladjustment and poor outcomes including depression (Nolen-Hoehsema, 1991; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema et al., 1994). Rumination has been defined as a persistent, repetitive and passive focus on negative emotions and symptoms. Some researchers have suggested that rumination is, in effect, a form of avoidance (Ehlers,

Mayou, & Bryant, 1998; Stroebe et al., 2007). Ehlers et al. (1998) have shown that rumination is a strong predictor of persistent PTSD. They argued that rumination is focused on events surrounding the trauma, thus facilitating avoidance of the actual traumatic event. Others have shown that intrusive and avoidant thinking are linked to depression and maladjustment. For example, Affleck, Tennen, Rowe, and Higgins (1990) found that mothers of premature babies, who were having more intrusive thoughts and negative memories at discharge, were more likely 6 months later to feel less attached to their babies and to report more problems with care providers.

Sense of meaning and intrusions as predictors of similar outcomes. Despite the abundance of studies showing that sense of meaning on the one hand, and rumination, intrusions and avoidance on the other hand, lead to opposite outcomes in terms of adjustment, recent studies have also pointed to some common outcomes. Some researchers have suggested that rumination may not always have negative consequences (Kross, Ayduk, & Mischel, 2005). As well, some studies suggest that sense of meaning and benefit finding may not always be beneficial. For example, in a few studies benefit finding was unrelated to positive outcomes including indices of quality of life, psychological adjustment, and well-being (Cordova, Cunningham, Carlson, & Andrykowski, 2001; Fromm, Andrykowski, & Hunt, 1996; Lehman et al., 1993). In other cases, benefit finding was even associated with negative outcomes such as anger and anxiety (Mohr et. al., 1999), and more distress (Lehman et. al., 1993). A more nuanced understanding of the consequences of benefit finding points to a number of factors including severity of the trauma, the length of time since the negative event occurred, and

individual differences in personality that may qualify the extent to which finding benefit translates into actual benefits and positive outcomes (Tomich & Helgeson, 2004).

In their studies, Tomich and Helgeson (2004) found that for women with more severe stages of breast cancer, finding benefit was linked with negative consequences for quality of life, and that breast cancer survivors who were still searching for meaning five years later, had poorer mental functioning, and more negative affect (Tomich & Helgeson, 2002). As mentioned earlier, the distinction between searching for meaning and experiencing meaning may also account for the different outcomes outlined in the studies reviewed above. Individuals predisposed to search may be the ones who have more difficulty making sense and coming to terms with their experience, and they may continue to feel this way despite their search. Such individuals may be identified in some studies as "meaning makers" because the assessment of meaning does not distinguish between searching for it and achieving it. These searchers may experience elevated levels of distress and may account for associations found between meaning and negative outcomes.

The Five Factor Model of Personality and Associated Outcomes

The tendency to engage in meaning making, to experience certain affective states, as well as the predisposition to use certain types of coping strategies, to develop psychopathology and symptoms such as intrusions are all related to individuals' overall personality, as is the likelihood of a number of other general life outcomes. Personality and individual differences in character traits have been studied for decades by various researchers, with different taxonomies and methods of measurement emerging from

different lines of inquiry. More recently, the five-factor model (McCrae & Costa, 1985) has become one of the more widely known and used models of personality. The so-called Big Five model assesses 30 separate traits, which cluster into five main factors. These factors constitute the basic dimensions of personality and include Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C).

To measure individual differences along these traits and domains, McCrae and Costa (1985) and Costa and McCrae (1992a) developed and used the NEO Personality Inventory (NEO PI) and the revised version (NEO PI-R). Other researchers have used somewhat different conceptualizations, taxonomies, and instruments (Digman, 1990; 1996; Goldberg, 1990; 1993; Trapnell & Wiggins, 1990; Wiggins & Trapnell, 1997) and have found similar dimensions of personality, showing convergent validity with Costa and McCrae's (1992b) dimensions.

The five factors have been shown to be stable over time. For example, Costa, Herbst, McCrae, and Siegler (2000) have shown that personality retest correlations for a large sample of men and women in their 40's over a period of 6 to 9 years using the NEO-PI-R exceeded .60. Similarly, Costa, McCrae, & Siegler (1999) found retest correlations, using the NEO-PI-R, for a large number of men and women over a period of 10 years to range from .64 to .80. It is important to note, however, that such correlations do not suggest necessarily that personality does not change over time, but rather that it changes in a similar manner for an entire cohort of people. Indeed, small decreases in neuroticism, extraversion, conscientiousness, and openness over time have been documented (Costa et al., 2000) suggesting a process of maturation of personality (Costa

et al., 2000; McCrae & Costa, 1994). In these studies, life events showed very little influence on the initial levels of traits and changes in personality traits over time.

Cross observer validity for the NEO-PI-R has been shown to be good, with correlations between self-reports and peer and spouses' reports ranging between .30 and .67 (Costa & McCrae, 1988). These findings suggest that the five factor model is not just an important theoretical model, but also represents reality as experienced by lay people. In a study based on self- and peer-ratings for a pool of person-descriptive adjectives (Saucier & Goldberg, 1998), the same five factors emerged as important aspects of personality. A number of additional factors, such as religiosity and a factor of physical attractiveness, were also identified as potential dimensions that are not well captured by the Big Five model, but are relevant for laypeople. This study provides further evidence for the validity of the Big Five model as representing many, if not all, of the real-life dimensions of personality as perceived by laypeople.

Finally, the five-factor model has been instrumental in allowing for the prediction of behaviors, affective predispositions, coping strategies, and vocational interests. A number of studies have found that the Big Five predict coping strategies (Connor-Smith & Flachsbart, 2007), academic success at university (Chamorro-Premuzic & Furnham, 2003; Trapmann, Hell, Hirn, & Schuler, 2007), vocational interests (Larson, Rottinghaus, & Borgen, 2002), job satisfaction (Judge, Heller, & Mount 2002), and job performance (Barrick & Mount, 1991).

Extraversion and neuroticism have been identified as the two most central dimensions of personality (Costa & McCrae, 1992b), and have even been called the Big

Two. Though a comprehensive review of these dispositions is beyond the scope of this thesis, a summary of some of the relevant findings with regard to these two dimensions of personality is presented below. This includes a general review of the thoughts, feelings, behaviors, and life outcomes associated with these two dimensions.

Extraversion implies a number of qualities and tendencies including sociability, (Ashton, Lee, & Paunonen, 2002), positive affect, self-efficacy, and confidence (Carver & Connor-Smith, 2010). According to Funder, Furr, and Colvin (2000), extraversion is characterized by being enthusiastic, animated, secure, humorous, dominant, socially skilled, and forthcoming. Extraversion has been shown to have biological components such as differences in brain structure and function (Depue & Collins, 1999), and is moderately heritable (Bouchard & Loehlin, 2001; for a review, see Wilt & Revelle, 2009). The fact that extraversion has a biological basis suggests that certain traits associated with extraversion appear early on in development and remain stable over the course of life. For example, the temperament dimension of extraversion – measured via mood, laughter, soothability, approach behaviors, and fear of strangers – has been identified in infants, and was shown to remain stable from infancy to age seven (Rothbart, Ahadi, & Evans, 2000).

Extraversion has been associated with emotional and cognitive processes. A strong positive association between positive affect and extraversion has been established across many cultures and using different methods (Lucas & Baird, 2004; Lucas & Fujita, 2000). Associations between extraversion and positive affect have been found in single ratings of positive affect as well as over longer periods of time, suggesting that extraverts

are happier in general. This greater positive affect may reflect their reactions to life events. For example, Zelenski and Larsen (1999) found that individuals high on extraversion react with more intense positive experiences to positive mood inductions.

In addition, extraversion predicts how individuals think, how they categorize the world, and what types of information they pay attention to. Generally, extraverted individuals tend to view the world more positively, as they judge neutral events as more positive than introverts (Uziel, 2006). Extraversion has also been found to be associated with more sensitivity to pleasant stimuli. In a study of word categorization, extraverted individuals categorized words according to their pleasantness, rather than their semantic similarities. For example, words such as *smile* and *hug* were judged as being more similar than *smile* and *face* by extraverted individuals, but not by individuals low on this dimension (Weiler, 1992). Consistent with this bias, individuals high on extraversion tend to seek and enjoy pleasurable activities to a greater extent (Lucas & Diener, 2001).

Others have focused on the behavioral aspect of extraversion. For example, extraversion is associated with high motivation for social contact (Olson & Weber, 2004), personal strivings of intimacy and loving relationships, and motivation for higher levels of positive affect and happiness (King & Broyles, 1997). Although there is little empirical data to document concrete associations between extraversion and specific behaviors (Funder, 2001), research has shown that extraversion reliably predicts positive life outcomes. For example, extraversion has been positively associated with job performance for positions that involve interpersonal contact, such as managers and sales representatives (Barrick & Mount, 1991), as well as with job satisfaction (Judge et al.,

2002) and training proficiency. These results are consistent with a meta-analysis that found associations between extraversion and Holland's (1985) domains of social and entrepreneurial vocational interests (Larson et al., 2002).

Finally, extraversion is strongly associated with coping mechanisms. Extraversion has been shown to be linked to a greater tendency to engage in cognitive restructuring such as meaning making (e.g., finding benefit), drawing strength from adversity, and positive thinking (Affleck & Tennen, 1996; Connor-Smith & Flachsbart, 2007; McCrae & Costa, 1986; Tedeschi & Calhoun, 1996; Vollrath, 2001). Cognitive restructuring refers to a reevaluation of an event in a manner that casts it in a more meaningful or positive light. In general, extraverted individuals tend to choose active and engaged coping strategies both in terms of their primary, and secondary, coping efforts. Problem solving and seeking social support, which are attempts at coping by changing objective conditions, are classified as active primary coping. Coping through cognitive restructuring, and distraction, which are attempts at coping by adjusting oneself to objective conditions, are classified as active secondary coping (Rothbaum, Weisz, & Snyder, 1982). Connor-Smith and Flachsbart (2007) suggested that extraverted individuals engage in active primary and secondary coping efforts because they have the energy, optimism, and enthusiasm required to initiate and persevere in these types of coping efforts.

The second central dimension of personality has been identified as neuroticism. Neuroticism refers to the ease and frequency with which a person tends to become upset and distressed (Carver & Connor-Smith, 2010). Individuals with high levels of

neuroticism are more likely than the average person to experience negative emotions (Caspi, Roberts & Shiner, 2005) such as anxiety, anger, and guilt, to feel insecure in interpersonal relationships, to be easily frustrated, and to lack confidence. Moodiness and depression are also associated with neuroticism (Carver & Connor- Smith, 2010), as is the avoidance temperament, which includes the tendency to experience the world as distressing or threatening (Evans & Rothbart, 2007). Widiger (2009), citing Costa and McCrae's (1992a) work, has also included the construct of impulsivity and emotional instability in his description of the neurotic temperament. Impulsivity in the context of neuroticism refers to the tendency to experience strong impulses, and an urgency to act, especially when upset or experiencing negative affect. Accordingly, the NEO PI-R includes a subscale that measures impulsivity, along with subscales measuring sadness, anxiety, and hostility.

Caspi et al., (2005) have argued that different aspects of neuroticism can be classified under one of two lower order traits defined as inner focused anxiety, and outer-directed hostility. The inner-focused dimension includes feelings of anxiety, sadness, insecurity, and guilt, whereas the outer-directed dimension includes hostility, anger, frustration, jealousy, and irritation. Both of these dimensions can be identified in early childhood, and some traits are apparent already during infancy. DeYoung, Quilty, and Peterson (2007) used factor analysis and found that each of the five factors contains two distinct trait dimensions. With regard to neuroticism, they have identified volatility and withdrawal. Withdrawal in this context refers to worrying, feeling threatened, discouraged, afraid and overwhelmed, whereas emotional volatility refers to the tendency

to be emotionally inconsistent or explosive. According to DeYoung et al., 2007 these factors align well with factors of the NEO-PI-R.

In terms of the manifestation of neuroticism in individuals' daily lives, neuroticism has been associated with the use of ineffective coping mechanisms. In a meta-analysis, Connor-Smith and Flachsbart (2007) found a strong relation between neuroticism and maladaptive coping such as wishful thinking, withdrawal, and emotion-focused coping. Others have found similar results linking neuroticism with disengagement coping (Carver & Connor-Smith, 2010). Neuroticism has also been linked with avoidance coping (Carver, Scheier, & Weintraub, 1989; Gomez, Holmberg, Bounds, Fullarton, & Gomez 1999; Robinson & Clore, 2007; Vollrath, Torgesen, & Alnaes, 1995; Watson & Hubbard, 1996). It is difficult to ascertain whether poorer coping mechanisms are always the result of neuroticism, or whether at times, such strategies result in less favorable outcomes, which can then lead to depression, anxiety, and self-consciousness (Widiger, 2009). However, there is good evidence to suggest that, like other personality traits, neuroticism has strong biological and hereditary components (Bouchard & Loehlin, 2001; Caspi et al., 2005; Depue & Collins 1999; Rothbart et al., 2000). As such, neuroticism remains fairly stable across the life span and is a strong predictor of negative psychological and life outcomes.

Negative life outcomes may follow from dysfunctional or ineffective coping. Given the summary above, it is not surprising that neuroticism has been associated with a number of negative life outcomes, such as lower subjective well-being (Steel, Schmidt, & Shultz, 2008), more daily distress (Bolger & Zuckerman, 1995), and more dissatisfaction

in life (Robinson, Wilkowski, Kirkeby, & Meier, 2006). In a meta-analytic study, Judge and Ilies (2002) found that neuroticism was negatively correlated with achievement motivation in general, and goal setting and self-efficacy for goals, in particular. In addition, individuals high on neuroticism report lower levels of academic and job satisfaction (Judge et al., 2002; Trapmann et al., 2007).

At the more extreme end of the spectrum of negative outcomes, neuroticism has been associated with psychopathology (Widiger, 2009). For example, large effect sizes for correlations between neuroticism and mood disorders, anxiety disorders, eating disorders, and schizophrenia were reported in a meta-analytical study by Malouff, Thorsteinsson, and Schutte (2005). Similarly, Parslow, Jorm, and Christensen (2006) reported a higher likelihood for individuals with higher levels of neuroticism to develop posttraumatic stress disorder after exposure to trauma. In addition, neuroticism has been found to predispose individuals to depressive rumination, which, in turn, is associated with persistent episodes of dysphoria or unhappiness. In addition, rumination about depressive symptoms and negative affect is considered a risk factor for the development of clinical depression (Roberts, Gilboa, & Gotlib, 1998). Overall, neuroticism is a stable and dominant personality factor and it is a strong predictor of negative life outcomes across a vast range of domains, including health, financial, and interpersonal domains (Widiger, 2009).

Current Research

Rationale for the Chosen Measure of Sense of Meaning. Different approaches to the measurement of any given variable of interest may lead to different results, or

emphasize different aspects of a construct. This issue is particularly relevant for the study of broad and conceptual constructs such as meaning for specific events or even meaning in life. Furthermore, with regard to meaning making, despite the fact that a great variety of measures have been used in prior research, there appears to be a lack of a standardized measure that is universally accepted. For this reason, it is important to consider the rationale for the choice of the meaning making measure utilized in the current program of study.

Much of the data on meaning making has been collected and coded in an open-ended fashion through personal interviews (Davis et al., 1998; Fiese et al., 1999; Taylor, 1983; Taylor et al., 1984), written narratives of individuals' life stories (McAdams, 1993; 1996), written narratives of specific periods and events in individuals' lives (Bauer & McAdams, 2004; Cohn, Mehl, & Pennebaker 2004), or written descriptions of self-defining memories (Blagov & Singer, 2004; Thorne et al., 2004; Wood & M. Conway, 2006). Such methods are well suited for qualitative and exploratory studies where the quality and particular content of meaning are of focal interest.

A limitation of coding spontaneous references to meaning making in individuals' open-ended responses is that it might introduce variability to the interpretation of results. Personality factors and other individual differences may impact individuals' willingness and ability to make spontaneous references to meaning, independent of the amount of meaning they might have acquired. Indeed Wood & M. Conway (2006) found only a weak association between self-reports of the impact of an event and participants' spontaneous references to meaning made in their descriptions of self-defining memories.

They understood these disparities in terms of different factors that may affect how much people spontaneously report meaning making when describing self-defining events. These factors include placing emphasis on describing what happened versus reasons they attribute to it, describing the event itself and its consequences rather than their interpretation of its meaning, and individual differences in self-focused attention.

A number of closed-ended questionnaires have also been designed to assess purpose and meaning in life (Antonovsky, 1979; Crumbaugh & Maholick, 1964; 1969; Scheier et al., 2006). Such measures are concerned with individuals' overall sense of having a purpose in life and not with meaning associated with a specific event, as was the case in the current research.

Given the above considerations, and the fact that the main interest in the current program of research was to explore associations between sense of meaning and other constructs of interest, the assessment of meaning was constrained to a closed-ended quantitative measure. A short and effective scale including four items adapted from Wood & M. Conway (2006) was used. The scale includes one item that measures subjective impact and three other items that assess sense of meaning. Wood and M. Conway (2006) have shown that the subjective impact rating is a good marker of meaning making and that the items show patterns of association with positive affect that are consistent with other research on meaning making.

The four-item scale reflects the subjective accumulation of insight and perspective. Items also capture individuals' understanding of how the event directly impacted and affected their lives. The items reflect the main theme identified by researchers as the

hallmark of meaning – a conscious, positive, and growth-oriented assimilation of the event into one's sense of self. The items are "I feel that I have grown as a person since experiencing this past event," "Having had this experience, I have more insight into who I am and what is important to me," "Even as I think of the event now, I think about how it affected me," and "This past event has had a big impact on me."

Finally, the distinction between the *search* for meaning versus *having an understanding* of the event's meaning is an important one and can help account for inconsistent results in the literature in terms of positive versus negative psychological outcomes associated with meaning making. Indeed, researchers have found that individuals who lack meaning may search for it, but the search may not be successful (Steger et al., 2008). The focus in the current study was on an acquired sense of meaning, and the scale chosen for this program of research reflects a coming to terms with the event. Items of the scale suggest a certain level of completion of the cognitive processing of the event, or in other words, items reflect meaning found or the presence of sense of meaning, rather than an active search for it. Hence, I use the term "sense of meaning" to refer to an acquired sense of meaning measured in the current studies, throughout the rest of the thesis, to differentiate this construct from an active search for meaning or "meaning making."

Hypotheses. In Study 1 it was hypothesized that individuals' affect and sense of meaning for a specific self-defining event are distinct from global sense of purpose and satisfaction in life, and therefore that no significant correlations between these constructs would emerge. It was also hypothesized that global sense of purpose and satisfaction in

life would be correlated with one another. This hypothesis is consistent with prior findings Zika & Chamberlain, 1992) that global sense of purpose is associated with global satisfaction in life and other general measures of well-being. Finally, it was expected that prior findings (Wood & M. Conway, 2006) linking meaning making for self-defining events with positive affect in response to these events would be replicated in Study 1 and Study 2. The association between positive affect and sense of meaning for a specific event was predicted to be significant

In Study 2, it was hypothesized that the sense of meaning for a self-defining event is associated with positive affect for that event, which is, in turn, associated with a sense of self-efficacy and importance of current and relevant goals. Two pathways of causal influence were considered. One path of influence starts with a sense of meaning, which, in turn, leads to more positive affect for the event. Positive affect, in turn, leads individuals to feel more committed to important goals and more self-efficacious in achieving these goals. This hypothesis is consistent with prior research that shows that individuals who engage in more meaning making for events feel more positively about these events (Wood & M. Conway, 2006) and that positive feelings and meaning lead to stronger commitment for goals (Sutin & Robins, 2008), motivation for achieving goals (Aspinwall, 1998; Trope & Neter, 1994; Trope & Pomerantz, 1998), and more self-efficacy for goals (Lee et al., 2006).

It was also expected that an association, albeit of a smaller magnitude, between sense of meaning and negative affect would emerge. This association between negative affect and sense of meaning is expected because meaning making is usually a response to

difficult events and indicates a struggle to reconcile negative feelings with a stable and positive world view (Tedeschi et al., 1993).

In addition to considering how sense of meaning and positive affect might influence goal representation, the reverse hypothesis testing the complimentary pattern of influence was also considered. That is, feeling efficacious for achieving one's goals would lead to having more positive feelings about relevant self-defining memories, which would then lead individuals to feel an increased sense of meaning for these memories. This hypothesis is consistent with prior research and theory suggesting that the valuing of goals can bring about a sense of meaningfulness (Scheier et al., 2006), and that the relevancy of goals to memories is associated with feeling more positive emotions about these memories (Moffitt & Singer, 1994; Singer, 1990). It is also consistent with research that shows that the affirmation of valued goals can improve affect (Koole et al., 1999; Tesser et al., 2000), and positive affect can in turn lead to reporting more meaning in life. Finally, based on prior research, it was expected that no gender differences would emerge for the previously stated hypotheses.

In Study 3, six hypotheses were tested, as follows:

1. Sense of meaning and intrusions and avoidance are positively correlated with one another at any given point in time. This association is consistent with predominant models of response to trauma (Horowitz, 1986; Janoff-Bulman, 1992) and with research pointing to an association between posttraumatic growth and the experience of intrusions and avoidance (Park et al., 1996; Helgeson et al., 2006).

2. Reports of having found meaning are stable over time, whereas the experience of

intrusions and avoidance decreases over time. This is consistent with research suggesting that IES scores decrease over time (Richter & Berger, 2006; Sundin & Horowitz, 2003), whereas acquired meaning tends to reach an optimal level during the first year and remains stable thereafter (Davis et al., 1998; Janoff-Bulman, 1979; 1992; Janoff-Bulman & Frieze, 1983).

3. Individuals with high levels of extraversion and conscientiousness have higher overall levels of sense of meaning and lower levels of intrusions and avoidance symptoms.

4. Individuals high on neuroticism experience higher overall levels of intrusions and avoidance. Both hypotheses 3 and 4 are consistent with results of studies examining associations between personality and coping styles (Carver et al., 1989; Connor-Smith & Flachsbart, 2007; McCrae & Costa, 1986; Vollrath, 2001).

5. Sense of meaning and intrusions and avoidance symptoms are associated with positive and negative affect, respectively

6. Extraversion and neuroticism account for overall levels of positive and negative affect. This last hypothesis is consistent with theories that associate neuroticism with negative emotionality (Borkovec, Ray, & Stober 1998), vulnerability to dysphoria and depression (Roberts et al., 1998), and perseveration associated with negative emotion and dissatisfaction in life (Robinson, et al., 2006). It is also consistent with research on extraversion, which documents a positive correlation between extraversion and positive affect, (Lucas & Baird, 2004; Lucas & Fujita, 2000), and between extraversion and more positive responses to life events (Zelenski and Larsen, 1999).

Chapter 2

Sense of meaning and positive affect for self-defining memories and self-efficacy and importance of life goals

Introduction

People situate themselves in time by reflecting on past experiences, engaging in present activities, and looking to the future. When considering their pasts, people may think of very significant personal events that they feel have had a great impact in their lives. These have been labeled *self-defining* memories and consist of negative events, such as the death of a loved one, or positive events such as a graduation or getting married (Singer & Salovey, 1993). These events are often very meaningful for people, and people report that they continue to think back to these events, even as time goes on, and that such events continue to evoke in them strong emotional reactions. In contrast, when considering their futures, people often think of goals they wish to achieve. Such goals are likely related to personal growth, particularly for young adults (Ebner, Freund, & Baltes, 2006). Key psychological factors that relate to goal achievement are how efficacious people feel they are in achieving these goals, and how important these goals are for them.

The two studies discussed in this chapter (Study 1 and Study 2) were concerned with the relations between people's representation of self-defining memories and their orientation toward their personal strivings (Emmons, 1986), which are major life goals. The hypothesis was that people who report more meaning and more positive affect for self-defining memories are also likely to feel more efficacious in achieving life goals, and to see them as more important. Prior research suggests that these associations may be due to one causal sequence whereby meaning and positive affect for memories enhance

feelings of efficacy and importance for goals, and to the reverse causal sequence whereby feelings of efficacy and importance for goals influence affect and meaning for memories.

Self-defining memories are significant memories in people's lives (Blagov & Singer, 2004; Sutin & Robins, 2008; Thorne et al., 2004). These are events that people consider as having determined the type of person they are (Singer & Salovey, 1993). These events are highly meaningful; people consider the events to have had a great impact on them, to have led to personal growth, and to have taught them a great deal about themselves and about life (Wood & M. Conway, 2006). Self-defining memories might reflect persistent themes and conflicts in an individual's life, as well as serve as an important source of information for people in their formation of personal identity (Blagov & Singer, 2004). Themes of self-defining memories may be related to self-discovery or self-understanding, or focus on unresolved conflicts or concerns (Sutin & Robins, 2005, 2008; Thorne et al., 2004). Not surprisingly, people report that they continue to feel quite strong positive and negative emotions when, years later, they think back to these events (Singer & Moffitt, 1991; Wood & M. Conway, 2006). The emotional reactions are complex, including both positive and negative feelings, regardless of whether people construe the initial events as primarily positive or negative (Moffitt & Singer, 1994; Wood & M. Conway, 2006). In addition, sense of meaning and emotional reactions are related. People who have a greater sense of meaning for a self-defining memory also report more positive and fewer negative emotions about the event now as compared to how they recall feeling when it occurred (Wood & M. Conway, 2006).

People seem to engage in meaning making for self-defining memories, just as they do for other significant events. Meaning making is a process by which individuals try to make sense and gain benefit from significant experiences, particularly difficult ones (Janoff-Bulman & Frieze, 1983; Taylor, 1983). Having a sense of meaning has been shown in many studies to be beneficial for both psychological well-being and physical health (Affleck & Tennen, 1996). The focus in Studies 1 and 2 is on an acquired sense of meaning for self-defining memories, as opposed to a search for meaning. This distinction between having and searching is important and can help account for inconsistent results in the research on sense of meaning. Indeed, individuals who lack meaning may search for it, but the search may not be successful (Steger et al., 2008). With regard to having a sense of meaning, some of the mechanisms by which a sense of meaning brings about benefits remain unclear. The current research speaks to this issue, in that sense of meaning for self-defining memories was expected to be associated with more positive affect for these memories, which, in turn, would be associated with greater feelings of efficacy and importance of goals. Prior research indicates that such feelings of efficacy and importance support goal achievement, which is itself relevant to well-being (Emmons, 1986; Sheldon & Elliot, 1999).

Feeling efficacious for goals has major consequences for the achievement of those goals. Such feelings are referred to as *self-efficacy*, which has been identified in social cognitive theory (Bandura, 2006) as an important mechanism of human agency. Agency refers to the intentional influence of one's functioning and life circumstances. Self-efficacy can promote people's skills and their capacity for self-regulation, achievement,

growth, and positive behavioral change (Bandura 1997; Lorig & Holman, 2003; Pajares & Schunk, 2001). In their meta-analysis, Wofford, Goodwin, and Premack (1992) concluded that self-efficacy leads to greater commitment to goals, which is, in turn, positively related to goal achievement. They also found that the importance of goals, or specifically the perceived desirability of goal attainment, also supported greater commitment to goals. The latter finding is consistent with social cognitive theory (Bandura, 1991, 1997), which states that goals that are considered important could have an incentive value regardless of individuals' beliefs in their ability to achieve them. In sum, self-efficacy and importance are two related but distinct aspects of goal pursuit (Martin & Gill, 1995; Orbell et al., 2001). The focus in Study 2 was on people's self-efficacy and goal importance with regard to personal strivings (Emmons, 1986) that are major life goals.

The hypothesis was that people who have a greater sense of meaning and who feel more positive about their self-defining memories also feel more efficacious in the pursuit of their life goals, and consider these goals as valued and important. These goal-related effects would be particularly evident when people consider their self-defining memories as being supportive of their life goals. Note that seeing a past event as supportive of a life goal may itself be the result of meaning making, with the latter resulting in the identification of benefits drawn from a difficult past event. Indeed, the most relevant prior research (because of similarities in procedure and population) indicates that most of the self-defining memories that young adults – who were the participants in the present research – recall are of events and experiences that are at face value negative (Wood & M.

Conway, 2006). In contrast, the hypothesized goal-related effects for self-efficacy and importance can be expected to be attenuated when people consider that their self-defining memories are of experiences or events that they consider as reflecting impediments or their inability to achieve their life goals. Nevertheless, one can expect some benefits of meaning making for such negatively construed events, given people's efforts with meaning making to draw (perceived) benefits from prior difficulties.

There are different causal pathways by which the predicted associations may be observed. One path of influence starts with a sense of meaning, which would, in turn, lead to more positive affect for the recalled event. A meaning to affect link was documented by Wood & M. Conway (2006). The type of positive affect of concern here is not feelings of satisfaction or happiness, but rather feeling energized, enthusiastic, and proud. The latter emotions are significant. For example, experimental manipulations of pride enhance task performance (Williams & DeSteno, 2008). One path considered in Study 2 is that a sense of meaning supports positive affect for self-defining memories, which, in turn, would lead to greater self-efficacy and importance for life goals. In support of this argument, Sutin and Robins (2008) have shown that individuals who experienced more positive affect in relation to meaningful memories were also more committed to their goals and perceived them as more attainable. In other research, a meaning making intervention with cancer patients increased both their feelings of well being as well as their self-efficacy (Lee et al., 2006). More generally, it has been argued that positive affect in the context of goals may signal to people that they are efficacious

or that they can improve themselves (Aspinwall, 1998; for empirical support, see Trope & Neter, 1994; Trope & Pomerantz, 1998).

The focus in both studies was on the positive, as opposed to the negative affect, that people feel when thinking back to self-defining memories. As noted above, the type of positive affect of interest here includes feelings of enthusiasm, excitement, and pride. In contrast, negative affect refers here to feelings of fear or distress. As such, constructs of positive and negative affect in the two studies are conceptualized as advanced by Watson, Tellegen, and their colleagues. As they note, positive affect is related to an approach motivational orientation (Watson, Wiese, Vaidya, & Tellegen, 1999), which is deemed of particular relevance to people's life goals in the present research. In contrast, negative affect is related to an avoidance or withdrawal orientation, and so it is considered of little relevance to a person's life goals – particularly if the person is a young adult for whom goals are growth oriented (Ebner et al., 2006). In sum, positive and negative affect are clearly distinct dimensions of affective experience. Furthermore, prior research supports the view that positive affect is related to feelings of self-efficacy (Lent et al., 2005), and more so than is negative affect (Seo & Ilies, 2009).

It is important to distinguish between a person's sense of meaning for a particular self-defining memory and their overall sense of how meaningful life is. In Studies 1 and 2 it is proposed that there are specific links between how people construe and feel about self-defining memories, and how these individuals orient themselves to their life goals. It is not being argued that a general sense of a meaningful life is a determinant of self-efficacy and importance for life goals. Similarly, the positive affect that people feel for

self-defining memories is to be distinguished from people's general life satisfaction. Here it is positive affect for memories that is of interest, and not general positive affect, which is related to life satisfaction (Lucas et al., 1996). Study 1 was conducted to support the view that people's sense of meaning and affect for self-defining memories are distinct from their overall sense of having a meaningful life and from their overall life satisfaction, respectively.

Just as meaning and positive affect for self-defining memories can encourage greater self-efficacy and goal importance, the reverse pattern of influence may also occur. Feeling efficacious for achieving one's goals, or thinking about how important one's goals are, can lead individuals to feel more positive about self-defining memories, which can, in turn, foster a sense of meaning for those memories. This sequence would be particularly the case for memories deemed supportive of goals, but should also be evident for memories seen as representing obstacles to goal achievement. There is empirical support for this argument for a reversed pattern of influence. First, consider evidence regarding goals and affect. Moffitt and Singer (1994) and Singer (1990) have shown that affect associated with certain memories may be linked to individuals' current goals. In their studies, there was a positive association between how relevant memories were to individuals' goal attainment and how much positive affect individuals reported for these memories. Second, experimental evidence supports the view that focusing on one's goals can improve affect. People who were led to affirm their own goals and values after a threat to their sense of self (such as from a failure) were better able to manage their distress, showing improved affective functioning (Koole et al., 1999; Tesser et al., 2000).

Note, however, that in the latter studies, the focus was on participants' overall current affective state, as opposed to the affect they associated with some event or memory. Third, other, indirect, evidence for the impact of self-efficacy on affect and sense of meaning is provided by Bauer and Bonanno (2001), who found that bereaved individuals who felt more efficacious experienced less grief over time, which the authors interpreted as reflecting a greater sense for the bereaved of their lives being meaningful despite the loss.

The second part of the above argument is that more positive affect for a self-defining memory can lead to a greater sense of meaning for that memory. There is indirect evidence for this position. In a series of studies, King et al. (2006) found that positive mood, whether experienced spontaneously or induced by means of experimental manipulations, led people to report more meaning in life. The studies by King and her colleagues do not concern self-defining memories – or memories of any type for that matter – but do demonstrate that current affect can influence a person's current sense of how meaningful life is. It seems plausible on this basis that people who feel more positive about a self-defining memory, which is by definition of major personal significance, will also see it as more meaningful. As King et al. argue, there may be a strong association in memory between positive affect and sense of meaning.

Two studies were conducted. In Study 1, the goal was to document that sense of meaning and positive affect for self-defining memories are distinct from the more general constructs of general meaning in life and of overall life satisfaction, respectively. It was also expected that sense of meaning for self-defining memories would be positively

correlated with positive affect for these memories, and that general meaning in life would be positively correlated with overall life satisfaction. The purpose of Study 2 was to examine the associations between sense of meaning and positive affect for self-defining memories, and self-efficacy and goal importance for individuals' personal strivings (Emmons, 1986), which are broad life goals. The expectation was that a greater sense of meaning and more positive affect for self-defining memories is positively associated with greater self-efficacy and importance for life goals.

Sense of meaning for self-defining memories was assessed via self-report, using items from a scale developed by Wood and M. Conway (2006). Thus, participants reported on the extent to which the recalled events had had an impact on them, they had grown as a consequence of the events, and so on. Although meaning making can occur at multiple levels including dreams and fantasy, Wood and M. Conway showed that subjective ratings of the impact of an event are a good marker of sense of meaning, in that these ratings were systematically related to their participants' reports of emotional reactions (present and past) to the self-defining events they recalled. At the same time, they found only weak associations between participants' ratings of sense of meaning (e.g., of the impact of the event) and references to meaning made spontaneously by participants in their descriptions of self-defining memories.

Study 1

The hypothesis was that individuals' reports of meaning and positive affect for a self-defining event are positively related to each other but are not related to the more general constructs of meaning in life and overall life satisfaction, respectively.

Method

Participants. In Study 1, participants described self-defining memories, reported how meaningful the events were for them, and reported how they currently felt when thinking about these events. Participants also completed measures of meaning in life and of life satisfaction. Participants were students who approached a booth on the Concordia University campus. The sign indicated *Psychology Project - Volunteers Needed*. Those who completed a packet of questionnaires were offered a chance to win monetary prizes; participants also received $2.50 CDN vouchers redeemable at a local coffee shop. Four of the questionnaires were for the present study. The questionnaires on the self-defining memory were presented in counterbalanced order, as were the questionnaires on life purpose and life satisfaction. Each set of questionnaires was separated from the other by another questionnaire unrelated to the present study, and the complete packet was also counterbalanced for order. All participants received and signed a consent form (See Appendix K1 for a sample consent for all recruitment sessions in studies 1, 2, and 3 that took place at a booth or in undergraduate classes). Of the 113 participants who completed the packet, there were 13 whose data were excluded on the basis of age (> 3 *SD*s from the mean), limited proficiency in English, or because of excessive missing data (> 20% of items). The resulting sample consisted of 54 women and 42 men (4 did not specify

gender). Mean age was 23.26 years (range 18-32). Reported ethnicity according to Census Canada categories was White (57.57%), South Asian (11.11%), Chinese (10.10%), Arab (6.06%), Black (4.04%), West Asian (2.02%), Latin American (1.01%), Korean (1.01%), and Other (7.07%). One participant did not indicate ethnicity.

Measures

Self-defining memories. Self-defining memories have been described as memories of great personal significance (Singer & Salovey, 1993). Each participant provided a description of one self-defining memory (for detailed instructions, see Appendix A1). Instructions were as per Wood and M. Conway (2006), who adapted their questionnaire from Singer and Moffitt (1991). The instructions stated that the memories had to be at least 1 year old, that they had to be very clearly remembered and still felt important, that they helped the individuals understand themselves, that they were still associated with strong emotional feelings, and that they were thought about many times. The requirement that the memory be at least 1 year old was in order to ensure that individuals do not report trivial events just because these are fresh in their memories. Participants were asked to "travel back in time" and to try and 'see' the entire scene, and notice what the setting was like, who are the people that are present and what they are saying or doing. They were also instructed to pay attention to their actions and feelings. Finally, participants were asked to write on one page a brief description of the event.

Events were not coded in Study 1 as to type of event. Memories were coded in a subsequent study (Study 2), and the results were very similar to those obtained by Wood and Conway (2006) with a similar sample. In these studies, people tend to recall both

positive and negative events. The most commonly reported positive events in Wood and M. Conway's study were related to positive relationships (e.g., falling in love) and recreation or exploration (e.g., vacations). The most common negative events reported were related to interpersonal conflict (e.g., breakups) and death of close others.

Sense of meaning for memories. A subset of the meaning items of Wood and M. Conway (2006, Study 1) was used. The 4 items were "Having had this experience, I have more insight into who I am as a person and what is important to me," "This event had a great impact on me," "I feel that I have grown as a person since experiencing this past event," and "Even when I think of the event now, I think about how it has affected me." Ratings were on 7-point scales with end points *not at all* (1) and *very much* (7). For detailed instructions, see Appendix B. A mean score was calculated for sense of meaning across all the meaning items, and a mean score of meaning was derived across all participants. Cronbach α for sense of meaning in the current study was relatively high (α = .85).

Affect for memories. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to measure how participants currently felt about the memory. For detailed instructions, see Appendix C. For example, the positive affect scale includes items *enthusiastic*, *interested*, and *proud*; the negative affect scale includes items *distressed*, *guilty*, and *scared*. Participants were asked to describe "how you now feel when thinking about that event." Ratings were on 5-point scales with endpoints *very slightly or not at all* (1) and *extremely* (5). In prior research, internal consistency (Cronbach α) for both the positive and negative scales has been high, ranging

from .84 to .90 (Watson et al., 1988). Correlations between positive and negative affect scores were low, ranging from -.12 to -.23. In the current study, Cronbach α for positive and negative affect was high (.88 and .87, respectively).

Life satisfaction. The five items of the Satisfaction with Life Scale were used (SWLS; Diener et al., 1985). The items are "In most ways my life is close to my ideal," "The conditions of my life are excellent," "I am satisfied with my life," "So far I have gotten the important things I want in life," and "If I could live my life over, I would change almost nothing." Cronbach α for this scale in the current study was high (α = .81) For the questionnaire, see Appendix D. Participants responded on 7-point scales with endpoints *strongly disagree* (1) and *strongly agree* (7). Diener et al. (1985) found that the scale had good psychometric properties. The two month test-retest correlation coefficient was .82, and the scale was internally consistency (α = .87). The scale also showed convergent validity with other measures of global well being.

Meaning in life. An 11 item scale was used, which was an expanded version of the 6 item Life Engagement Scale (LES; Scheier et al., 2006). The LES scale consists of items reflecting people's sense of purpose and engagement in valued activities. The LES includes items such as "There is not enough purpose in my life" (reverse coded), "To me, the things I do are all worthwhile," and "I have lots of reasons for living." For instructions, see Appendix E. The scale has good psychometric properties, with Cronbach α in prior studies ranging from .72 to .87 (Scheier et al., 2006) and α = .88 in the current study. The additional 5 items used in the present study expanded on notions of purpose and meaning, and included "I understand my life's meaning," "My life has a clear sense

of purpose," and "I have a good sense of what makes my life meaningful." Participants rated items on 5-point scales with endpoints *strongly disagree* (1) and *strongly agree* (5).

Results

The hypothesis was that sense of meaning and positive affect regarding self-defining memories reflect a psychological experience specifically related to those memories and not more general perceptions of life. As such, it was expected that sense of meaning and positive affect for the self-defining memories would be positively correlated, even as these constructs would be unrelated to the more general corresponding constructs of sense of meaning in life and overall life satisfaction. In addition, having a sense of meaning in life would be positively related to overall life satisfaction. Correlations, z-tests, and regressions were used to test associations and differences between measures.

Participants reported that their self-defining memories were highly meaningful (M = 5.72, SD = 1.14); values of 5 and 6 on the memory meaning scales were labeled *quite a bit* and *a lot*, respectively. Additionally, participants felt moderate positive affect (M = 3.17, SD = .98) which was significantly greater than the little negative affect (M = 1.95, SD = .80) they felt when thinking back to these events, t (99) = 8.93, $p < .001$, d = .89. Values of 2 and 3 on the affect scales were labeled *a little* and *moderately*, respectively.

In terms of overall outlook on life, participants in Study 1 were moderately satisfied with their lives (M = 4.62, SD = 1.15) and found their lives to be moderately filled with meaning (M = 3.11, SD = .29). For both general outlook scales, mean responses were close to the mid-point. As predicted, sense of meaning and positive affect

for self-defining memories were significantly positively correlated ($r = .36$, $p <. 01$). Furthermore, findings (see Table 1 for all correlations) indicated that these constructs are specific to self-defining memories and are not related to the corresponding global constructs of meaning in life and of life satisfaction. Sense of meaning for self-defining memories was unrelated to meaning in life ($r = .03$, *ns*). Similarly, positive affect for self-defining memories was not related to life satisfaction ($r = -.05$, *ns*). Finally, as expected, the two global measures were positively correlated: the more participants felt their life had meaning, the more they were satisfied with their lives ($r = .31$, $p < .01$). In sum, results confirmed the expectation that sense of meaning and positive affect regarding self-defining memories were not a reflection of global tendencies to view life as meaningful and satisfactory.

In addition, a z-test was conducted to determine whether the association between positive affect and meaning in life, which was only .18 and not significant, was significantly different than the association between positive affect and meaning regarding self-defining memories, which was .36 and significant. The z-test assumes the null hypothesis that the two correlations are equal. The test takes a transformation of the correlations to correct for the skewness in the sampling distributions and estimates a z-score from the difference in the transformed estimates. A difference in correlations test accounted for the dependent nature of the estimates (i.e. both correlations were estimated on the same sample). The result was not significant in a two-tailed test ($z = 1.34$, $p = .18$)

Table 1

Correlations in Study 1 Between Sense of Meaning, Affect, Meaning in Life, and Life Satisfaction for Self-Defining Memories, Study 1

Variables	1	2	3	4	5
1. Positive affect	—	—	—	—	—
2. Negative affect	-.18	—	—	—	—
3. Sense of meaning	.36**	-.04	—	—	—
4. Life satisfaction	-.05	-.01	.02	—	—
5. Meaning in life	.18	-.08	.03	.31**	—

Note. N = 100, *$p < .05$. **$p < .01$

Thus, the z-test did not provide evidence to reject the null that the two correlations are significantly different from each other. A hierarchical regression (See Table 2) did suggest that meaning in life related to positive affect differently than meaning for memories related to positive affect. A first block of a regression treating positive affect as the dependent variable included only meaning in life as the sole independent variable. The resulting adjusted R-squared was less than zero, and the F-test for the first model was not significant, F (2, 98) < 1. Adding meaning for memories in the second block, however, upped the adjusted R-squared to .112 and resulted in a significant model (F (2,97) = 7.21, p < .01). In addition, an F-test comparing the models also showed a significant improvement with the addition of meaning for memories, F (1, 97) = 14.31, p < .001. Thus, the hierarchical regression provides some evidence that the relation between positive affect and meaning in life is different from the relation between positive affect and meaning for memories.

Discussion

In Study 1, participants felt that their memories were highly meaningful and important, and that they felt quite positive about these memories. Participants felt moderate positive affect, which was significantly greater than the little negative affect they felt when thinking back to these events. Participants were also moderately satisfied with their lives and found their lives moderately meaningful and purposeful.

For both general outlook scales, mean responses were close to the mid-point. As such, not only was there no correlation between sense of meaning for the self-defining

Table 2

Summary of Hierarchical Regression Analyses for Variables Predicting Positive Affect in Study1

	Model 1			Model 2		
Variable	*B*	*SE*	β	*B*	*SE*	β
Meaning in Life	.126	.393	.032	-.129	.374	-.033
Meaning for Memories				.426***	.113	.364
Adjusted R^2	-.009			.112		
F for Change in R^2	.10			14.313***		

Note. N = 100. *** $p < .001$.

memories and meaning for life in general, but the meaning attached to the memories seems greater than that felt by participants for life as a whole. Furthermore, as expected, whereas purpose and meaning in life were correlated with satisfaction in life, these constructs were not correlated with meaning and positive affect for specific events.

Study 2

The main focus in Study 2 was to examine the relations between how people construe their pasts, specifically with regard to self-defining memories, and how they look to the future, specifically in terms of self-efficacy and importance for life goals. Study 1 clarified that the measures of sense of meaning and of positive affect for self-defining memories are specific to the memories; they do not reflect the more general constructs of meaning in life and life satisfaction, respectively. Given this clarification, Study 2 served to examine links between individuals' self-defining memories and their life goals. The hypothesis in Study 2 was that people who exhibit a sense of meaning and positive affect for self-defining memories also show a greater sense of self-efficacy and importance for personal strivings, which are major life goals, and that this would be the case particularly when memories are deemed supportive of the goals. When participants considered the memories as interfering with goal achievement, it was expected that the association between sense of meaning and positive affect for memories, and self-efficacy and goal importance would be weaker.

Method

Participants. Participants were students at Concordia University. Some were recruited from a booth, as in Study 1 (except that no cash vouchers were given). The goal

questionnaire was completed at the booth, along with other unrelated questionnaires. Other participants were recruited from undergraduate classes for various disciplines (not psychology); individuals who were interested immediately completed the goal questionnaire. All individuals interested signed a consent form (see Appendix K1 for a sample consent form). Of the individuals recruited at the booth and in classes, a subset (n = 153) participated in a second session. Eight participants' data were excluded as they did not follow instructions or had more than 20% missing data; no participants were excluded due to age. The resulting sample consisted of 93 women and 52 men. Mean age was 22.01 years (range: 17 – 40). Reported ethnicity was White (62.07%), Chinese (7.59%), Black (7.59%), Arab (4.14%), West Asian (3.45%), Latin American (2.76%), South Asian (2.76%), Korean (.69%), Filipino (.69%), and Other (8.28%). Participants were each paid $10CDN for participation in the second session.

Procedure. At recruitment, participants completed the goal importance and self-efficacy questionnaires, in that order. In terms of sequence of administration, the goal questionnaires were completed first for practical reasons (it was shorter), rather than a theoretical position taken on the causal nature of goal representation. The purpose of separating the administration of the goal questionnaires from that of the other measures was to avoid any demand characteristics that might be present with participants completing all measures at one sitting. Participants were contacted between 2 and 8 weeks after completing the goal questionnaire and invited to participate in a study that was described as a follow-up to the questionnaire. They were told that the study focused on people's recollections of important events in their lives and their goals. The second

session was approximately 50 minutes in duration. All participants signed a consent form (for a sample consent form for all in-laboratory sessions for studies 2 and 3 please see Appendix K2). Participants recalled three self-defining memories and completed measures of sense of meaning, affect, and goal relevance for the self-defining memories. After describing each of the three memories participants completed a sense of meaning questionnaire for that specific memory, followed by the PANAS for that specific memory, followed by the goal relevance questionnaire for that memory. This sequence was repeated three times. Participants were then debriefed and paid.

Measures

Life goals. The life goals questionnaire consisted of a list of what can be considered personal strivings (Emmons, 1986) and was based on that of Singer (1990), which itself was based on Murray's (1938) list of human needs. Fifteen life goals were provided. Examples are "I would like to be a leader and sway others to my opinions" and "I would like to honor the needs and wishes of my mother and father, or other important individuals in my life." Of the 15 goals, 13 referred to positive states (e.g., accomplishment, leadership, gaining other's attention, having loving relationships, and seeking truth) and two related to avoiding outcomes (avoiding pain and danger, and avoiding failure). Respondents rated how much each was a goal for them, and how capable they felt of achieving each goal. Ratings were on 5-point scales with endpoints *not at all* (1) and *very much* (5). For the complete questionnaires, see Appendices F and G.

Self-defining memories. As in Study 1, participants provided descriptions of self-defining memories according to the methodology of Wood and M. Conway (2006; see Appendix A2). The authors reported for the same type of participants (i.e., undergraduate students) recruited a few years earlier at the same university that they recalled approximately 1.33 negative events for every positive event recalled. Similar themes and percentages as in Wood and Conway's study were observed in the Study 2 and are presented in Table 3. The only difference between Study 1 and Study 2 in terms of self-defining memories was that participants described one memory in Study 1 and three memories in Study 2. All three memories for all participants (N=145) were coded by the author, and all three memories of 88 randomly selected participants were rated by a second rater. Coding was based on Wood and Conway's categories, which were developed inductively based on data. Raters coded memories into 1 of 18 categories. Levels of agreement between the two coders were quite high. For the first memory, the raters agreed 85.23% of the time, with a Cohen's Kappa of .84. For the second memory, the raters agreed 81.61% of the time, with a Cohen's Kappa of .79. For the third memory, the coders agreed 80.68% of the time, with a Cohen's Kappa of .79. For a distribution of themes for all three memories as well as for the Wood and M. Conway (2006) study, see Table 3.

Sense of meaning for memories. The meaning scale used in Study 1 for self-defining memories was used again in Study 2. The scale was adapted from Wood and M. Conway (2006) and consisted of four items with ratings on 7-point scales with end points

Table 3

Themes and percentages of Memories in Study 2 and in Wood and M. Conway, 2006

Negative Events	Memory 1 %	Memory 2 %	Memory 3 %	Wood & Conway %
1. Interpersonal conflict (e.g., breakups, conflict with bosses, close others, or teachers, divorces)	15.9	22.1	15.2	16.6
2. Death (e.g., death of close others by illness, murder, or suicide)	6.9	2.1	5.5	5.8
3. Disappointment in self (e.g., for engaging in promiscuous activities, hurting others, shoplifting)	5.5	6.2	5.5	5.3
4. Failure in a skill-related domain (e.g., failing a course, getting fired, losing a small business)	1.4	3.4	3.4	4.7
5. Physical assault (e.g., being attacked by strangers, familial violence, being mugged)	.7	1.4	1.4	4.5
6. Struggles in skill-related or personal domains (e.g., adjusting to new situations, social anxiety)	3.4	2.8	5.5	3.7
7. Various negative events (e.g., being close to a war zone, death of a pet, losing possessions)	6.2	2.8	.7	3.4
8. Accidents, injuries, and illnesses (e.g., bike accidents, burns, car accidents)	6.9	3.4	2.8	2.1
9. Accidents, injuries, and illnesses of close others (e.g., falls, heart attacks, suicide attempts)	2.1	2.1	4.8	2.1
10. Harassment (e.g., bullying or teasing, peeping toms, racial slurs)	3.4	2.8	1.4	2.1
11. Geographic separation from close others (e.g., moving away from close others)	3.4	2.1	1.4	1.8
12. Lack of relationships (e.g., an inability to attain or maintain relationships)	1.4	.7	1.4	1.6
13. Sexual assault	1.4	1.4	0	1.1

Table 3 (Continued)

Positive Events	Memory 1 %	Memory 2 %	Memory 3 %	Wood & Conway %
14. Positive relationships (e.g., dating, falling in love, marriage, moments with close others)	9.7	9.7	13.8	14.2
15. Recreation or exploration (e.g., drug experimentation, hobbies, travel experiences, vacations)	13.8	15.2	13.1	11.3
16. Skill-related achievement (e.g., completing a degree, receiving recognition or an award)	9.0	10.3	12.4	11.1
17. Attaining a personal goal (e.g., losing weight, obtaining a visa, saving money)	4.1	6.2	6.9	3.7
18. Being a good Samaritan (e.g., caring for a injured cat, helping a vagrant)	4.8	4.8	4.8	1.1
19. Not classifiable	.7	.7	__	3.9

Note. N = 145 for first three memories, N=77 for Wood and Conway (2006).

not at all (1) and *very much* (7). For detailed instructions, see Appendix B. The Cronbach α values varied from .77 to .83 for the first through third memory.

Affect for memories. Affect for self-defining memories was measured with the PANAS as in Study 1 (see Appendix C). The Cronbach α values for the positive affect scale in Study 2 varied from .87 to .90 for the first through third memory, and for the negative affect scale from .84 to .91 for the first through third memory.

Relevance of memories to goals. To identify whether participants considered their self-defining memories as being supportive or as interfering with their life goals, a questionnaire was developed based on the work of Singer and Moffitt (1991) (see Appendix H). After describing their self-defining memories, participants indicated for each memory whether the memory was relevant in a positive or a negative manner to each of the 15 goals provided in the goal questionnaire at the first session. Participants were presented once again with the same list of fifteen goals they rated at the first session (those they initially rated as not at all important were crossed out by the experimenter). Participants indicated whether the memory supported, interfered with, or was not relevant to each goal. Participants were instructed that a memory could be seen as supporting a goal if it contained themes and topics that were relevant to the goal and that conveyed to the participant a sense of getting closer to the goal or furthering it. A memory interfered with a goal if it was perceived as an obstacle or an impediment to achieving the goal.

Results

Preliminary analyses included the computation of means, t-tests, and correlational analyses. These analyses were carried out in order to establish the importance and

efficacy for goals reported by participants, as well as the degree of positive and negative feelings they associated with reported memories. Memories were also coded for themes in a manner previously used by Wood & M. Conway (2006). Memories were coded by the author and by an additional rater according to the scheme used by Wood and M. Conway (2006). For the distribution of themes for all three memories in Study 2 and in Wood and M. Conway's study please see Table 3. Goals appeared to be important, and individuals felt more positive emotions than negative emotions when recalling these memories. Furthermore, correlation analyses replicated prior findings in terms of positive associations between sense of meaning and positive affect, as well as revealed associations among other variables of interest. See below. These correlations were followed by primary analyses examining associations and paths of influence as assessed by Structural Equation Modeling (SEM). The main hypothesis in Study 2 was that sense of meaning leads to increased positive affect, which, in turn, leads to more self-efficacy for important goals, was theoretically plausible, as was the reversed causal path. As such, SEM was used to test the causal model, as well as its reversed counterpart. Based on prior studies, gender differences were not expected to emerge. An SEM model controlling for gender was conducted and, as expected, gender had little or no effect on results. Furthermore, regression analyses were used to test similar associations, eliminating the causal element implicit in SEM. The regression analyses complement the results obtained through SEM analyses.

Preliminary analyses. Preliminary analyses included correlations and descriptive statistics, and are reported below. Analyses revealed that individuals reported that a

majority of goals were quite important for them and that they felt quite self-efficacious for these goals. Participants felt that memories were highly meaningful for them, and they associated more positive than negative emotions when thinking back about these events. Consistent with expectations, participants who saw their memories as more meaningful also felt more positive affect when thinking of those memories.

Goals and self-efficacy. Of the 15 goals, participants on average rated 11.63 (*SD* = 2.36) goals as somewhat, quite, or very important. On average, there were 1.10 (*SD* = 1.37) goals rated as not at all important. Nearly all participants (97.20%) rated at least 7 of the 15 goals as somewhat, quite, or very important. On average, participants felt at least somewhat efficacious with regard to the majority of goals; the mean number of goals for which this was the case was 11.82 (*SD* = 2.64). Nearly all participants (96.60%) rated feeling at least somewhat self-efficacious for at least 7 of the 15 goals.

Self-defining memories. Across the three memories, participants expressed high levels of meaning (*M* = 5.72, *SD* = .81). In terms of affect associated with all three memories, participants reported more positive (*M* = 2.92, *SD* = .75) than negative affect (*M* = 1.86, *SD* = .61), t (144) = 13.14, $p < .001$, $d = 1.09$.

Relevance of memories to goals. On average, the first through third self-defining memories were rated as being supportive of 5.94 (*SD* = 2.55), 6.07 (*SD* = 2.51), and 5.26 (*SD* = 2.98) goals, respectively. For each self-defining memory, a mean for self-efficacy and importance was derived for supported goals. Following this, an overall mean self-efficacy score was derived for all the goals supported by the three memories. In a parallel manner, an overall mean importance score was derived for all the goals supported by the

three memories. In this approach to deriving overall indices, there is greater weight given to the ratings of self-efficacy and importance for goals that are supported by more memories. These indices indicate that for goals supported by memories, participants felt quite efficacious (M = 3.72, SD = .60) and felt that the goals were quite important (M = 4.03, SD = .46). For both indices, a value of 4 on the scale was labeled *quite*.

The first through third self-defining memories were rated as interfering with 2.52 (SD = 2.27), 2.26 (SD = 2.19), and 2.72 (SD = 2.72) goals, respectively. A procedure parallel to the one used for supported goals was employed to calculate the mean self-efficacy and importance of goals deemed as having been interfered with by the memories. For such goals, participants felt somewhat efficacious (M = 3.30, SD = .69), and felt that the goals were somewhat important (M = 3.46, SD = .71). For both indices, a value of 3 on the scale was labeled *somewhat*. It is important to note that the latter scores are not conceptually distinct or statistically independent of those derived for supported goals, as the same goal may be supported by one memory and interfered with by another.

Finally, the first through third self-defining memories were rated as being irrelevant to 5.44 (SD = 2.70), 5.57 (SD = 2.79), and 5.92 (SD = 2.91) goals, respectively. Note that the sum of the means of the numbers of supported, interfered with, and irrelevant goals for each of the three memories is 13.90, which is the average number of goals that were rated by participants as at least a little important (as noted above, 1.10 goals were on average rated as not at all important).

Correlational Analyses. In Table 4 correlations between sense of meaning and affect for self-defining memories across the three memories, and self –efficacy and

Table 4

Correlations in Study 2 Between Sense of Meaning and Affect for Self-Defining Memories, and Self-Efficacy and Importance for Goals Supported and Interfered With by the Memories

Variables	1	2	3	4	5
1. Positive affect	—	—	—	-.01	.17*
2. Negative affect	-.02	—	—	.10	-.06
3. Sense of meaning	.45**	.11	—	.01	.08
4. Goal importance	.33**	-.03	.22**	—	.34**
5. Self-efficacy	.25**	-.17*	.19*	.54**	—

Note. Correlations for supported goals are below the diagonal and correlations for interfered-with goals are above the diagonal. Correlations between sense of meaning, positive affect, and negative affect for self-defining memories are presented below the diagonal. N = 145. *$p < .05$. **$p < .01$

Importance for supported goals are displayed. Consistent with expectations, participants who saw their memories as more meaningful also felt more positive affect when thinking of those memories (r = .45, p < .01). Sense of meaning was unrelated to negative affect (r = .11, *ns*). In addition, positive and negative affect for the memories were not significantly correlated (r = -.02, *ns*).

Correlations for self-efficacy and importance for supported goals were considered next (below the diagonal in Table 4). Self-efficacy and goal importance were positively correlated with each other (r = .54, p < .01). With regard to the memories, greater meaning of memories was positively correlated with greater self-efficacy (r = .19, p < .05) and greater goal importance (r = .22, p < .01). Furthermore, more positive affect for memories was positively correlated with greater self-efficacy (r = .25, p < .01) and greater goal importance (r = .33, p < .01). Negative affect for the memories was negatively correlated with self-efficacy (r = -.17, p < .05).

For goals that were interfered with by the memories, the corresponding correlations were in most cases smaller or not significant (above the diagonal in Table 4). Self-efficacy and goal importance were positively correlated (r = .34, p < .01). With regard to the memories, meaning for memories was not correlated with self-efficacy (r = .08, *ns*) or goal importance (r = .01, *ns*). It was only positive affect for memories that was positively correlated with greater self-efficacy (r = .17, p = .05), but not with goal importance (r = -.01, *ns*).

Primary Analyses.

Structural Equation Modeling (SEM). Structural equation modeling (SEM) was conducted on the meaning and affect for memories and the self-efficacy and importance for goals. The hypothesis was that more meaning and positive affect for memories is associated with greater self-efficacy and importance for life goals. In addition, there are different causal pathways by which such associations may be observed. One possibility is that a sense of meaning supports positive affect for memories, which, in turn, leads to greater self-efficacy and goal importance. The other possibility is that greater self-efficacy and importance for goals lead to positive affect for memories and, in turn, to a greater sense of meaning for the memories. Each of these possibilities was put under scrutiny by testing the corresponding model in SEM (EQS 6.1 for Windows; Bentler, 2005). Model fit was assessed using the likelihood ratio chi-square (χ^2), the comparative fit index (CFI), root mean square error of approximation (RMSEA), and its 90% confidence interval (CI). A good fit is reflected in a nonsignificant χ^2, a CFI above .95, RMSEA less than .05, and a CI between .00 and .08.

The first model was the one in which sense of meaning leads to positive affect, which, in turn, leads to self-efficacy and importance for goals. Self-efficacy and importance for both supported and interfered-with goals were included in the model. Positive affect was the mediator variable of the relation between sense of meaning and self-efficacy, as well as for the relation between sense of meaning and goal importance. It was not expected that negative affect would mediate the relations between sense of meaning on the one hand, and self-efficacy and goal importance on the other.

Nevertheless, paths for these links were included in the model, given the results for the zero-order correlations. The results of the SEM analysis indicated that the model provided a good fit ($\chi^2(7) = 3.43$, $p = .84$, CFI = 1, RMSEA < .01, CI = .00 - .06). Note that the paths from sense of meaning to negative affect ($\beta = .14$, $z = 1.70$, $p > .05$), from negative affect to importance for supported goals ($\beta = -.03$, $z = -.40$, $p > .05$) and interfered-with goals ($\beta = .10$, $z = 1.18$, $p > .05$), and to self-efficacy of interfered-with goals ($\beta = -.06$, $z = -.72$, $p > .05$) were nonsignificant. The path from positive affect to importance of interfered-with goals was also nonsignificant ($\beta = -.01$, $z = -.03$, $p > .05$).

The SEM analysis was repeated after constraining the nonsignificant paths leading to and from negative affect to zero. The results of the SEM analysis indicated that the model provided a good fit to the data ($\chi^2(11) = 9.43$, $p = .58$, CFI = 1, RMSEA < .01, CI = .00 - .07). In addition, a chi-square difference test indicated that constraining the nonsignificant paths leading to and from negative affect did not worsen model fit ($\Delta\chi^2$ (4) = 6.00, $p = .20$). Next, the constrained paths were omitted from the model (see Figure 1). Consistent with expectations for supported goals, positive affect mediated the relation between sense of meaning and self-efficacy and the relation between sense of meaning and goal importance. Sense of meaning was directly associated with positive affect ($\beta = .43$, $z = 5.62$, $p < .01$), which, in turn, was associated with self-efficacy ($\beta = .23$, $z = 2.82$, $p < .05$) and goal importance ($\beta = .31$, $z = 3.78$, $p < .01$) for supported goals. Furthermore, sense of meaning was indirectly associated with self-efficacy ($\beta = .10$, $z = 2.52$, $p < .05$) and goal importance ($\beta = .13$, $z = 3.14$, $p < .01$) through positive affect for

Figure 1. Primary SEM Model for Study 2

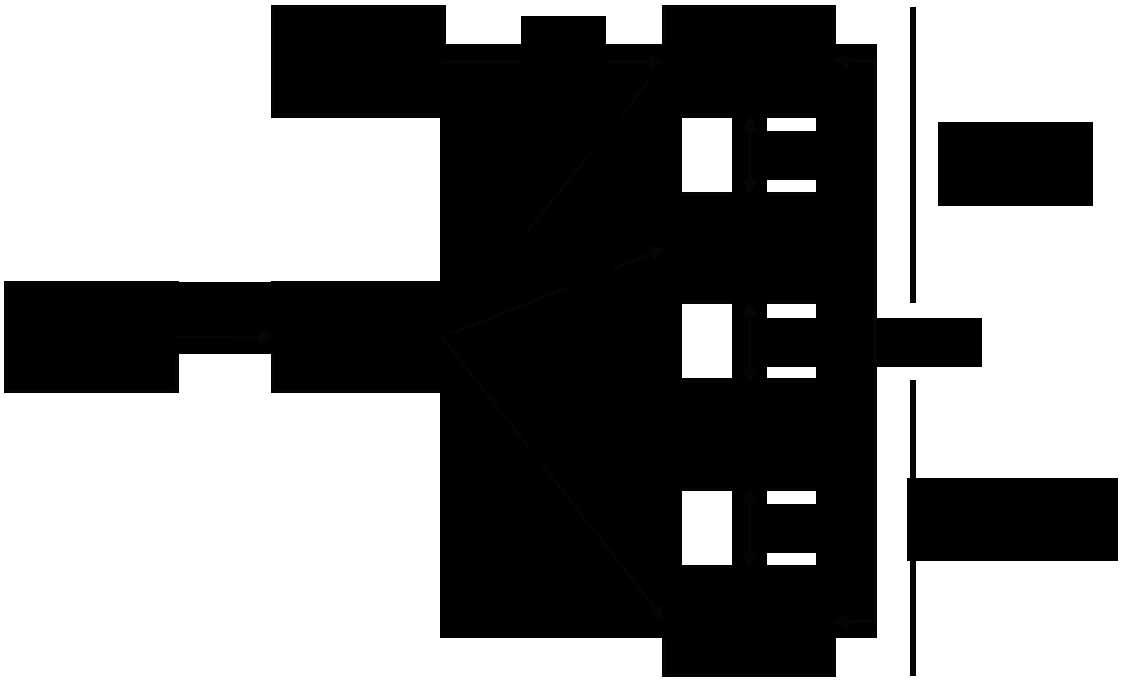


Figure 1. Structural Equation Modeling portraying the relation between sense of meaning and affect for self-defining memories, and self-efficacy and goal importance for goals supported and interfered-with by the memories in Study 2.

Note. N = 145. $^{\dagger}p = .06$; $*p < .05$; $**p < .01$; $***p < .001$.

supported goals. Goal self-efficacy and goal importance were positively correlated (r = .45, z = 5.11, p < .01) for supported goals. Finally, negative affect tended to be negatively associated with self-efficacy (β = -.11, z = -1.69, p = .09) for supported goals. For interfered-with goals, greater positive affect for memories was positively associated with self-efficacy (β = .17, z = 1.99, p < .05). In addition, a greater sense of meaning for memories tended to be indirectly positively associated with self-efficacy for interfered-with goals through greater positive affect (β = .07, z = 1.89, p < .06). There was no significant path from positive affect to goal importance for interfered-with goals (β = -.01, z = -.01, p > .05).

Variance explained by the model was 19% for positive affect (R^2 = .19), 7% for self-efficacy for supported goals (R^2 = .07), and 3% for self-efficacy for interfered-with goals (R^2 = .03). The model also explained 10% of the variance in goal importance for supported goals (R^2 = .10).

The reverse causal model was tested as well, given that another plausible causal account is that self-efficacy and importance for goals leads to feeling more positive about relevant self-defining memories, which, in turn, fosters a sense of meaning. For this model, all the unidirectional paths in Figure 1 were reversed in direction. The resultant model provided a good fit to the data ($\chi^2(11)$ = 9.89, p = .54, CFI = 1, RMSEA < .01, CI = .00 - .08). However, three paths were nonsignificant: the path from self-efficacy for supported goals to positive affect (β = .01, z = .01, p > .05), the path from self-efficacy for interfered-with goals to positive affect (β = .16, z = 1.64, p > .05), and the path from

importance for interfered-with goals to positive affect (β = -.11, z = 1.27, p > .05). A second model was tested in which the nonsignificant paths were constrained to zero. The results indicate that the model provided a good fit ($\chi^2(14) = 13.93$, p = .46, CFI = 1, RMSEA < .01, CI = .00 - .08). A chi-square difference test indicated that constraining the nonsignificant paths to zero did not worsen model fit ($\Delta\chi^2(3) = 4.04$, p = .26). As such, the resultant model does not support the theoretical argument that self-efficacy for goals leads to feeling more positive affect about memories, which, in turn, fosters a sense of meaning for those memories. Yet the findings support the view that importance of supported goals alone fosters more positive affect about self-defining memories, which, in turn, can lead to a greater sense of meaning for these memories.

Analyses were also conducted to examine whether the model in Figure 1 would apply to goals for which the memories were deemed irrelevant. That is, whether sense of meaning is associated with positive affect, which, in turn, is associated with self-efficacy and importance of non-relevant goals. Correlations indicated that self-efficacy for non-relevant goals was positively associated with self-efficacy for supported (r = .38, p < .01) and interfered with goals (r = .47, p < .01). Importance of non-relevant goals was positively associated with importance of supported (r = .68, p < .01) and interfered-with goals (r = .59, p < .01). As such, the shared variance for the self-efficacy and importance measures for non-relevant and relevant goals (i.e., supported and interfered-with goals) was controlled by partialling out their shared variance.

Unstandardized residuals of the means for self-efficacy and importance of non-relevant goals were used in a SEM analysis analogous to the one in Figure 1 for

supported goals. The results indicated that the model did not provide a good fit to the data (χ^2 (5) = 9.76, p = .08, CFI = .91, RMSEA = .08, CI = .00 -.16). As well, all paths were nonsignificant except for the path leading from sense of meaning to positive affect and the correlation between goal importance and self-efficacy. The reverse of this model was also tested. The results indicate that the model provided a marginal fit (χ^2 (5) = 7.70, p = .17, CFI = .95, RMSEA = .06, CI = .00 -.17). In addition, all the paths were nonsignificant except for the paths leading from positive affect to sense of meaning and self-efficacy to negative affect. The SEM analysis was repeated after constraining the nonsignificant paths to zero. The results indicate that the model provided a good fit (χ^2 (7) = 8.60, p = .28, CFI = .97, RMSEA = .04, CI = .00 -.12). A chi-square difference test indicated that constraining the nonsignificant paths to zero did not worsen model fit ($\Delta\chi^2$ (2) = .90, p = .66).

Next, the possibility of gender differences was tested through two additional models. First, a multi-group SEM was run in which the path coefficients and intercepts for men were constrained to be equal to those of women. The chi-square and RMSEA statistics could not reject the null of a good fit of the constrained model (χ^2 = 37.63, df = 34, p = .31; RMSEA = .039). In addition, the constrained model was not a significantly worse fit compared to the unconstrained model (χ^2 = 17.60, df = 14, p = .23).

Second, each variable was first regressed on gender, and the residuals from these regressions were used to estimate the path model. By using the residuals, the analysis was looking only at the portion of variance in each variable that did not overlap with gender. Controlling for gender in this manner impacted the results very little. Self-

efficacy for supported goals had a weak relationship with negative affect (β = -.11, z = -1.70, p = .09) and was significantly related to positive affect (β = .23, z = 2.90, p = .004). Importance of supported goals was significantly related to positive affect (β = .30, z = -1.713, p = .009, as was self-efficacy for interfered-with goals (β = .19, z = 2.25, p = .02). The association between goal importance for interfered-with goals and positive affect was once again not significant (β = -.004, z = -.05, p = .96). Sense of meaning predicted positive affect (β = .42, z = 5.97, p < .01). The correlation between self-efficacy for supported goals and importance for supported goals was significant (r = .45, p < .01), as was the correlation between self-efficacy for supported goals and self-efficacy for interfered-with goals (r = .39, p < .01). The correlation between the two goal importance variables was also significant (r = .15, p < .05). Finally, goal importance for interfered-with goals correlated with self-efficacy for interfered-with goals (r = .33, p < .01).

Regressions. Given that the study design was cross-sectional, regression analyses were used to avoid any causal assumptions. The first analysis sought to determine if sense making was related to goal efficacy (Table 5, Model 1) beyond the effect of positive affect. To test this possibility, sense of meaning was first regressed on goal efficacy for supported goals individually to determine that a simple association exists. Then gender was added (Table 5, Model 2) to determine if the simple association was due to gender differences on the predictors. In a third model (Table 5, Model 3), positive affect was added to test whether goal efficacy retained its significance, or if much of the previously observed association was due to positive affect. A final model incorporated negative affect as well (Table 5, Model 4).

Table 5

Regressions of Sense of Meaning on Efficacy for Supported Goals in Study 2

	Model 1			Model 2			Model 3			Model 4		
	B	SE	ß	B	SE	ß	B	SE	ß	B	SE	ß
Intercept	4.749***	.421		4.324***	.468		3.640***	.445		3.22***	.149	
Efficacy	.264**	.112	.193	.256**	.111	.188	.118	.104	.086	.149	.105	.109
Gender				.275*	.138	.163	.196	.126	.116	.179	.126	.106
Positive Affect							.455***	.084	.417	.454***	.083	.416
Negative Affect										.180	.100	.135

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

The same procedure was repeated for importance of supported goals (see Table 6), self-efficacy of interfered-with goals, (Table 7), and importance of interfered-with goals (Table 8).

For supported goals, the simple association between self-efficacy and sense of meaning was significant (B = .26, SE = .11, p = .02). It retained its significance after controlling for gender (B = .26, SE = .11, p = .02). However, it lost its significance in the third model (B = .12, SE = .10, p = .26). Positive affect was highly significant in the third model (B = .46, SE = .08, p < .001). Self-efficacy remained insignificant in the final model (B = .15, SE = .11 p = .16), whereas positive affect remained significant (B = .45, SE = .08, p < .001). Negative affect was not significant when added (B = .18, SE = .10, p = .07).

Table 6 shows similar results for importance of supported goals. The simple association between sense of meaning and importance was significant (B = .39, SE = .15, p = .009), and it retained its significance after controlling for gender (B = .37, SE = .15, p = .011). However, introducing positive affect caused importance to lose its significance (B = .14, SE = .14, p = .34), with positive affect being highly significant (B = .45, SE = .09, p < .001). Efficacy remained insignificant in the final model (B = .14, SE = .14, p = .31), whereas positive affect remained significant (B = .46, SE = .09, p < .001). Negative affect was not significant (B = .16, SE = .10, p = .11).

Table 6

Regressions of Sense of Meaning on Importance for Supported Goals in Study 2

.

	Model 1			Model 2			Model 3			Model 4		
	B	SE	ß	B	SE	ß	B	SE	ß	B	SE	ß
Intercept	4.167***	.592		3.793***	.617		3.544***	.568		3.240***	.596	
Importance	.387**	.146	.217	.372*	.145	.208	.136	.140	.076	.142	.140	.079
Gender				.267	.137	.157	.194	.127	.115	.179	.126	.106
Positive Affect							.452***	.086	.414	.455***	.086	.416
Negative Affect										.159	.099	.119

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

Table 7

Regressions of Sense of Meaning on Efficacy for Interfered-with Goals in Study 2

	Model 1			Model 2			Model 3			Model 4		
	B	SE	ß	B	SE	ß	B	SE	ß	B	SE	ß
Intercept	5.387***	.337		4.857***	.426		4.013***	.422		3.686***	.460	
Efficacy	.096	.100	.083	.115	.099	.099	.027	.092	.023	.035	.092	.030
Gender				.284*	.142	.171	.169	.132	.101	.158	.131	.095
Positive Affect							.460***	.088	.415	.458***	.088	.413
Negative Affect										.173	.101	.133

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

Table 8

Regressions of Sense of Meaning on Importance for Interfered-with Goals in Study 2

	Model 1			Model 2			Model 3			Model 4		
	B	SE	ß	B	SE	ß	B	SE	ß	B	SE	ß
Intercept	5.651***	.347		5.187***	.409		4.039	.441		3.780***	.461	
Importance	.012	.098	.011	.006	.097	.005	.012	.090	.010	-.004	.089	.004
Gender				.297*	.142	.177	.205	.132	.122	.191	.132	.114
Positive Affect							.443***	.088	.395	.442***	.088	.395
Negative Affect										.181	.103	.137

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

Table 7 shows the results of regressing sense of meaning on efficacy for interfered-with goals. Here the simple relation was not significant (B = .10, SE = .10, p = .34). Adding gender did not change this (B = .12, SE = .10, p = .25), nor did adding positive affect impacted the insignificance of self-efficacy (B = .03, SE = .09, p = .77). Positive affect was highly significant in model 3 (B = .46, SE = .09, p < .001) and model 4 (B = .46 SE = .09, p < .001). Negative affect was not significant (B = .17, SE = .10, p = 09).

Table 8 shows results of regressing sense of meaning on importance for interfered-with goals. Importance was not significant in model 1 (B = .01, SE = .10, p = .90), model 2 (B = .006, SE = .10, p = .95), model 3 (B = .01, SE = .09, p = .90), or model 4 (B = -.004, SE = .09, p = .96). Positive affect was significant in model 3 (B = .44, SE = .09, p < .001) and model 4 (B = .44, SE = .09, p < .001). Negative affect was not significant when added (B = .18, SE = .10, p = .08).

The next analysis regressed positive affect first on sense of meaning and then on sense of meaning plus the goal efficacy and importance measures (Table 9). The simple regression re-establishes the relation between sense of meaning and positive affect. The subsequent regression tests whether the relation remains after controlling for the goal measures. This analysis was then repeated with negative affect as the dependent variable (Table 10).

Table 9 shows that the simple relation between sense of meaning and positive affect was significant (B = .41, SE = .07, p < .001). The significance remained after controlling for supported goal efficacy and importance (B = .36, SE = .07, p < .001) or

Table 9

Regressions of Positive Affect on Sense of Meaning and Goal-Related Variables in Study 2

	Model 1			Model 2			Model 3		
	B	SE	ß	B	SE	ß	B	SE	ß
Intercept	.546	.395		-.802	.562		.366	.510	
Sense of Meaning	.414***	.068	.452	.363***	.068	.396	.381***	.070	.422
Efficacy (Supported)				.075	.108	.060			
Importance (Supported)				.339	.142	.207			
Efficacy (Interfered)							.157	.087	.150
Importance (Interfered)							-.051	.084	-.050

Note. *** $p < .001$.

Table 10

Regressions of Negative Affect on Sense of Meaning and Goal-Related Variables in Study 2

	Model 1			Model 2			Model 3		
	B	SE	ß	B	SE	ß	B	SE	ß
Intercept	1.369***	.359		1.776***	.519		1.124*	.477	
Sense of Meaning	.085	.062	.114	.108	.063	.145	.119	.065	.155
Efficacy (Supported)				-.228*	.099	-.224			
Importance (Supported)				.077	.131	.057			
Efficacy (Interfered)							-.107	.081	-.119
Importance (Interfered)							.124	.079	.142

Note. *** $p < .001$. * $p < .05$.

interfered-with goal efficacy and importance (B = .38, SE = .07, p < .001). None of the goal variables were significant.

Table 10 shows that sense of meaning did not have any significant relation with negative affect. This was the case for the simple model (B = .09, SE = .06, p = .17), the model controlling for supported goals (B = .11, SE = .06, p = .09), and the model controlling for interfered-with goals (B = .12, SE = .07, p = .07). The only variable that negative affect was significantly related to was supported goals efficacy (B = -.23, SE = .10, p = .02).

Discussion

Taken together, Studies 1 and 2 examined how people represent their self-defining memories as well as their life goals. The hypothesis was that there is a positive association between how much people see their self-defining memories as meaningful, how positive they feel about these memories, how efficacious they feel for achieving their life goals, and how important they see these goals. Prior research indicates that these associations may be due to mutual influence. That is, seeing their self-defining memories as meaningful and feeling more positive about these memories can lead people to have a greater sense of self-efficacy and to see their goals as more important. The reverse direction of influence is also plausible, in that having a greater sense of self-efficacy and of goal importance can foster more positive feelings about self-defining memories, which can, in turn, encourage a greater sense of meaning for these memories.

The association between sense of meaning and positive affect for memories, and self-efficacy and importance for goals was examined using SEM and regression analyses

in Study 2. The expected associations emerged in a model in which a greater sense of meaning predicted more positive affect, which, in turn, predicted both greater self-efficacy and more importance for goals that were supported by the self-defining memories. Furthermore, more positive affect for memories also predicted a greater sense of self-efficacy for goals when the memories were considered as representing obstacles or as undermining achievement for these goals. The latter effect is striking. Even when people think back to significant personal events that they see as obstacles to their life goals, these individuals still experience positive feelings that support their self-efficacy for these goals. Self-efficacy supports goal commitment and achievement. As such, the present findings support the view that people's efforts to find meaning has positive benefits (Frazier et al., 2009).

It is a sense of meaning and positive affect for self-defining memories in particular that are of importance in the present context. In Study 1, it was demonstrated that the sense of meaning that people have for self-defining memories is clearly distinct from the overall sense of meaning they have for their lives. With a reasonable sample size, the correlation between these two measures was essentially zero in Study 1. Similarly, the positive affect that people have for self-defining memories was distinct from the overall level of life satisfaction that people have in their lives; again, there was no indication whatsoever of a correlation between the two measures. As such, the results of the first causal model in the SEM in Study 2, with sense of meaning leading to positive affect for memories, which, in turn, leads to self-efficacy and goal importance, speak to how people's construal of their past impacts the way they think about their future.

Another causal model that was tested in Study 2 was the one with the reversed paths of prediction. That is, self-efficacy and goal importance predict positive affect for memories, which, in turn, predicts a greater sense of meaning for these memories. This model was not supported by the data in its original formulation. On statistical grounds, the resultant model was one in which there was no path of influence from self-efficacy for supported or interfered-with goals to positive affect for memories. The one path of influence from goal representation was from importance for supported goals to positive affect for memories. As such, the results of Study 2 provide support for the view that people's goal representation influences how they feel about self-defining memories, which can, in turn, influence their sense of meaning for these memories.

Looking across the two major causal models tested in Study 2, there is evidence that how people represent the past has more influence on how they represent the future, than vice versa. That is, meaning and positive affect for self-defining memories influence self-efficacy and importance for goals. This was the case for goals supported by these memories. In addition, positive affect for memories predicted more self-efficacy for goals that are interfered-with by these memories. In contrast, the second causal model identified only the importance of supported goals as a predictor of positive affect for memories, which, in turn, led to more meaning. Of course, the comparison across causal models is tentative, due to the cross-sectional design of the current study. Analyses were also conducted to examine how sense of meaning and affect for memories might be related to goals for memories considered irrelevant by participants. In this case, the one model of good fit had few paths of interest: notably, self-efficacy for goals was unrelated

to positive affect and sense of meaning for self-defining memories. As such, the distinctions made by participants regarding memories that were relevant to some goals and irrelevant to others were important.

Results of the regression analyses were similar and consistent with the mediation model presented in the SEM analyses. Sense of meaning for supported goals was associated with goals efficacy and importance and that relation was fully mediated by the presence of positive affect. The relation was not affected by the gender of participants. The regression models suggested that having a sense of meaning for self-defining memories is conducive to having a stronger sense of self efficacy and valuing of goals, but that effect was due to a great overlap between having a sense of self-efficacy and positive affect. The relation between self-efficacy and sense of meaning was fully mediated by positive affect. The importance of this relation is further underlined by the fact that the same relation between meaning and self-efficacy is not replicated for memories that are not relevant to important goals. This finding suggests that there is an important relation between meaning for memories and self-efficacy for goals, and that this relation is not the result of a more general association between positive affect and sense of meaning, but that it is specific for goals that are viewed as valued and relevant.

Consistent with SEM models, the regression analyses indicated that sense of meaning was not associated with negative affect, suggesting that sense of meaning in this study is mostly associated with positive outcomes and does not speak to the presence or absence of negative outcomes such as negative affect. In other words, individuals who have a greater sense of meaning also have higher levels of positive affect and self-

efficacy, but those who are lower in sense of meaning are not necessarily afflicted by negative feelings. The only significant relation for negative affect in the regressions is a negative relation to self-efficacy for supported goals, suggesting that negative affect can interfere with feeling self-efficacious for relevant goals. This finding is also consistent with the results of the SEM analysis in Figure 1.

There is evidence of a relation between meaning for interfered-with goals, positive affect, and self-efficacy for these goals. One possibility is that interfered-with goals generate a strong need for compensation for adversity through meaning making. As such, the processing of interfered-with goals leads to gaining a sense of meaning, positive affect, and a strengthening of self-efficacy for those goals. For example, a breakup may interfere with the wish to have a lasting relationship, but it may generate feelings of importance of having a relationship and then generate a sense of self-efficacy in this domain.

The present findings are not readily attributable to broad individual differences that would have influenced in a generally consistent manner sense of meaning and positive affect for memories as well as self-efficacy and importance for life goals. That is, the argument would be that all the observed paths in Figure 1 are due to the influence of another underlying variable. For this type of argument, the most likely candidate is extraversion, which has been linked in the coping literature with meaning making (Connor-Smith & Flachsbart, 2007) and with positive affect (Meyer & Shack, 1989). As noted above, positive affect is linked to self-efficacy. The findings of Study 1 argue against the view that all the results of Study 2 are due to extraversion. In Study 1, sense

of meaning and positive affect for memories were completely unrelated to life satisfaction, yet the link between life satisfaction and extraversion is very well established (Herringer, 1998). In addition, findings of Study 2 argue against an omnibus extraversion effect on all the variables. The distinction in Study 2 between supported and interfered-with goals, as well as non-relevant goals was important. Yet such distinctions should be of no consequence if all the results of Study 2 are due to global effects of extraversion on sense of meaning, positive affect, self-efficacy, and goal importance.

The present findings are consistent with narrative-based life story research (Bluck & Habermas, 2000; Habermas & Bluck, 2000; McAdams, 1993; Singer & Bluck, 2001), which suggests that individuals organize their sense of self according to a coherent and consistent narrative they build from their experiences. This narrative orients the person to the future: "stories deal with human needs, wants, and goals, which connect the present self to the past and the future" (Adler & McAdams, 2007, p. 97). Significant earlier events may be etched in memory and may influence or even redirect the life course (Pillemer, 2001).

In particular, the present findings are consistent with theoretical models of the nature of autobiographical memory in relation to personal goals (M. A. Conway, 2005; M. A. Conway & Pleydell-Pearce, 2000; M. A. Conway et al., 2004; Singer & Salovey, 1993). According to the model proposed by M. A. Conway and Pleydell-Pearce (2000), the self-memory system contains important autobiographical memories and goals of the self wherein they mutually reinforce each other; memories "ground" individuals' goals and keep them motivated and engaged in their goals, whereas goals modulate the affect

related to memories – as well as the accessibility of memories. This process is considered to be dynamic and ongoing, reinforcing links between goals and memories.

Finally, an overall theoretical framework that may incorporate many of the ones mentioned above is that of Janoff-Bulman (1979; 1992) wherein significant life events require persons to take on the important task of restructuring and assigning new meanings to their existing views of the world around them and themselves. Successful attempts of this type of meaning making and cognitive restructuring may lead not only to a return to prior to event levels of functioning, but also to an increased sense of well-being and mastery. Study 1 and 2 suggest a mechanism by which this type of enhancement of personal mastery and well-being may occur, namely through the fostering of positive feelings regarding past events, and the application of these feelings toward feelings of commitment and efficacy toward current important goals.

There are limitations to the present research. Participants were young adults who were attending university. How generalizable the results are to others, such as older adults, is not known. The present research was conducted in the same general manner and with individuals drawn from the same population as in Wood and M. Conway (2006). They argued that the themes reported by their participants were universal having to do with physical security, achievement, and emotional closeness, and that the memories involved individuals such as family and friends. In this respect, the research is generalizable.

Another possible limitation of the present studies is that sense of meaning was measured with a self-report instrument, as opposed to indirect methods such as content

analyses of written descriptions of self-defining memories (Thorne et al., 2004). Yet, as noted in the introduction, Wood and M. Conway (2006) found that self-report ratings of sense of meaning have been shown to be systematically related to participants' reports of emotional reactions (present and recalled) to the self-defining events they recalled, even as these self-reports are only weakly associated with participants' spontaneous references to meaning made in their descriptions of self-defining memories. Furthermore, the correlations obtained in the present studies between sense of meaning and positive affect support the assumption that the sense of meaning scale has high validity in terms of capturing individuals' experience.

Another limitation of the Studies 1 and 2 is that they were cross-sectional. Future studies should be designed longitudinally to document the progress of individuals from an initial significant event, through its consolidation and processing via meaning making over time. Individual goals may then be monitored at a later time to assess their relation to meaning and affect. Furthermore, an additional wave of reports on sense of meaning and progress toward goals could be collected at yet a later point in time, in order to assess how both memories and sense of meaning and goals change over time as a function of one another.

In sum, Studies 1 and 2 support the hypothesis that there is an association between how people construe their pasts and represent their futures, particularly for memories of great personal significance and for life goals. The findings support the view that people strive to maintain a sense of coherence and competence by building on prior experience in the pursuit of future achievement. People may do this even or especially

when they have experienced difficult events that at face value seem to undermine their ability to achieve important goals in the future. In addition, when people focus on goals, they may then be able to have a more a positive outlook on their sometimes tumultuous pasts, and to see the past as more meaningful. These results speak to the resilience of the human spirit.

Chapter 3

Understanding sense of meaning in relation to intrusions and avoidance: neuroticism, conscientiousness and extraversion effects

Introduction

When confronted with a traumatic or negative life event, many individuals will resort to coping strategies that involve cognitive restructuring and gaining a sense of meaning (Affleck & Tennen, 1996). Having a sense of meaning can result from the process of meaning making which is thought to be an adaptive process by which individuals try to come to terms with a negative event by means of understanding why it happened (attributions of causality and responsibility), finding benefits in the experience, making sense of the losses incurred, or subjectively experiencing personal growth. Concurrently, when faced with a traumatic event of sufficient severity, many individuals are plunged into a distressed state in which they experience unwanted negative thoughts and images, rumination about the event, and suffering from at least a subset of the intrusions and avoidance symptoms described by Horowitz (1979; Sundin & Horowitz, 2002). These reactions are considered the hallmarks of stress response syndromes and are often measured with the IES (Horowitz et al., 1979, see Appendix J).

A main objective of the present study was to examine how having a sense of meaning is situated in relation to other processes such as intrusions and avoidance cross-sectionally and over time, in response to exposure to difficult or traumatic events. The role of personality differences, notably in extraversion, conscientiousness, and neuroticism, is also considered. The position being taken is that the experience of struggling for and having meaning, and the experience of unwanted intrusions can be

considered as part of a common set of cognitive processes that can be both subjectively difficult as well as rewarding.

Sense of meaning, also referred to as cognitive restructuring, has been implicated in predominant theories that delineate the process of coping with trauma (Foa et al., 1989; Harber & Pennebaker, 1992; Horowitz, 1986; Janoff-Bulman & Frieze, 1983). Most theories assert that intrusions are an important component of the adaptive path leading to recovery as they lead to confrontation and processing of the traumatic material and allow individuals to find some coherence, benefit, or significance in their experience. There is, however, debate as to the order in which different stages occur. Do intrusions and avoidant thoughts precede, follow from, or occur concurrently with the search for meaning and cognitive restructuring?

Theories of cognitive and emotional processing in PTSD (Foa et al., 1989; Greenberg, 1995; Joseph, & Linley 2005; Lepore, Silver, Wortman, &Wayment, 1996; and Taylor, 1983) share the general view that resolution of a traumatic event is accomplished when the event is confronted and processed and its meaning integrated within a person's sense of self. Horowitz (1986), in his psychodynamically informed model, argued that avoidance and intrusions are normative early responses to trauma, which initiate a process of working through difficult aspects of the traumatic event, eventually leading to the integration of the trauma-related material with previous beliefs and world views. This process ultimately leads to completion or resolution and the process may include cognitive restructuring and searching for meaning. For similar views, see Janoff-Bulman's (1979; 1992; Janoff-Bulman & Frieze, 1983) theory of adaptive

response to trauma, and the conceptualization of responses to trauma by Foa and colleagues (1989). It is within this framework of posttraumatic growth and adaptation to trauma (Janoff-Bulman, 1979; 1992: Janoff-Bulman & Frieze, 1983) that all three studies, and particularly Study 3, are grounded.

Across a large number of theories, intrusions and avoidance are viewed as normative cognitive processes associated with trauma, which can set in motion an adaptive process of searching for meaning and cognitive restructuring. This process allows individuals to assimilate trauma-related information with existing beliefs and world views, and to accomplish a resolution of the event accompanied by a sense of meaning, growth, or benefit. Greenberg (1995), in a review of theories and empirical data, concludes that intrusions and avoidance are normative, at least during early stages of coping (Brom, Kleber, & Hofman, 1993; Patterson, Carrigan, Robinson, & Questad, 1990; Rothbaum, Foa, Riggs, Murdock, & Walsh, 1992; Shalev, Schreiber, & Galai, 1993) and have the potential to lead to both adaptive and maladaptive outcomes depending on the intensity and length of time that they are experienced.

There seems to be a positive concurrent association between gaining meaning (such as benefit finding and subjective stress-related growth) and intrusions and avoidance symptoms (Helgeson et al., 2006; Park et al., 1996). Though intrusions and avoidance are often considered as related constructs and measured together, intrusions appear to serve as a direct reminder of the need for the restoration of meaning and order, whereas avoidance behaviors are associated with other types of behavior (such as distraction, substance abuse, and escapist tendencies).

Over time, intrusions and avoidance symptoms generally decrease (Richter & Berger, 2006; Sundin & Horowitz, 2003). Indeed, intrusions and avoidance are experienced as distressing symptoms, especially if they persist for long periods of time (Horowitz, 1979; Silver et al., 1983). Prolonged and persistent intrusions and avoidance may be indicative of a pathological response to trauma (Horowitz, Wilner, Kaltreider, & Alvarez, 1980). Yet, there is great variation across individuals regarding when symptoms occur after a traumatic event, and how symptoms decrease over time. For example, Wortman and Silver (1987) showed that some people do not report any distress whatsoever immediately following the trauma, whereas a significant number of people report lingering symptoms that persist long beyond the first month or so. Other studies have focused on delayed-onset PTSD, wherein symptoms manifest only months or years after the event occurred (Buckley, Blanchard, & Hickling, 1996; Gray et al., 2004).

Research indicates that most people (up to 97%) report some type of meaning making following a traumatic event (Bulman & Wortman, 1977; Davis et al., 1998; Gotay, 1985; Lyons, 1991; Mendola, Tennen, Affleck, McCann & Fitzgerald, 1990; Silver et al., 1983; Taylor et al., 1984; Thompson, 1991). Resilient individuals, who cope well with adverse events and who bounce back to regular functioning, search and find meaning for their misfortunes (Garrison, & Sasser, 2009; Grossman et al., 1999; Grossman et al., 2006). A significant proportion of individuals do not search for meaning, however, yet appear well-adjusted, and some research suggests that less than half of those who search for meaning find it, even a year or more after the event (Davis, Wortman, Lehman, & Silver, 2000; Downey, Silver, & Wortman, 1990; Lehman et al., 1987). In

sum, meaning making remains an important and relatively ubiquitous process among individuals coping with adversity.

An important cautionary note is in order when discussing the merits of having a sense of meaning, especially in response to posttraumatic growth. Although the merits of perceived posttraumatic growth and its theoretical foundation have been described and observed in survivors of various traumatic events (Tedeschi & Calhoun, 2004), some researchers have questioned the validity of such perceptions of positive transformations (Frazier et al., 2009; Lyons, 1991) and have shown that there are great discrepancies between self-reports of perceived posttraumatic growth and actual growth, suggesting that reported posttraumatic growth may not always reflect actual change. Nevertheless, even in cases were individuals' perceptions of gains may be unrealistically positive, subjective impressions may be associated with positive outcomes (Taylor & Brown, 1988; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000).

In terms of the course of meaning making over time, studies suggest that overall gains in meaning and benefit are stable over 12 months (Pakenham & Cox, 2008), and even years (Affleck et al., 1987; Bower et al., 2005; Frazier et al., 2001; Kernan 2006; McMillen et al., 1997). Nevertheless, benefit finding and meaning making might decrease or increase slightly over time (Park et al., 2008). Different types of meaning making may emerge at different stages of processing of the event anywhere between 6 and 18 months after the event occurred (Davis et al., 1998).

Self-defining memories have been defined as memorable events with a vivid, emotional, and familiar quality and "affective patterns and themes that stamp an

individual's most important concerns" (Singer & Salovey, 1993, p. 4). Memories of traumatic events can be thought of as often being instances of negative self-defining memories, particularly for the type of sample being studied (i.e., well functioning young adults attending university). Indeed, along with themes of love, friendship, and recreation, Wood and M. Conway (2006) found that memories also often contained traumatic events. Themes of self-defining memories that can be considered traumatic include death and illness of close ones, illness or injury of self, and emotional strife, such as break-ups and divorces. Traumatic events are accompanied by intense affective responses and often remain vividly etched in individuals' memories. In sum, memories of traumatic events can be thought of as instances of negative self-defining memories.

Research on self-defining memories has shown that the subjective impact of an event, which is a good marker of meaning making, is associated with positive affect for the recalled memory (Wood & M. Conway, 2006). In Wood and M. Conway's study, participants reported feelings associated with self-defining memories that they remembered feeling at the time, as well as at the time of the study. Both current and recalled positive affect were positively correlated with the impact of the event, as was recalled negative affect. Furthermore, it has been shown in the second study of this thesis that sense of meaning for self-defining memories was associated with greater self-efficacy and importance for current goals, through the mediating effects of positive affect.

In contrast, intrusive and avoidant thoughts have been initially identified through reports of individuals who suffer from symptoms related to trauma within the clinical range. Some studies have shown that intrusive and avoidant thinking are linked to

depression, anxiety, and maladjustment. For example, Affleck et al. (1990) found that most mothers of premature babies (89%) were experiencing intrusive memories regarding their baby's hospitalization 6 months post discharge, and that such memories likely elicited sadness and regrets. Other studies have found relatively large and significant associations between intrusive thoughts and depressive symptoms (Lepore, 1997; Lepore, et al., 1996), PTSD symptoms, and major depression (Milanak & Berenbaum, 2009; Shalev et al., 1998; Shipherd & Beck, 1999).

Research has shown that individuals' intensity of emotions for significant memories tends to change over time. Wood and M. Conway (2006) found that participants reported feeling less negative and more positive about negative memories at the time of reporting compared to the time the events took place. Other studies on autobiographical memories have shown that the intensity of both pleasant and unpleasant emotions associated with positive and negative events fades as the time since the event increases, from 3 months, to 1 year, to 4.5 years after the event (Walker, Vogl, & Thompson, 1997). Furthermore, a number of earlier studies have shown that the intensity of emotions tends to decrease more for unpleasant than pleasant events, over a period of one to three weeks (Cason, 1932). In addition, some research has shown that written and verbal disclosure of stressful events can lead to a decrease in a number of symptoms, including decreases in depressive symptoms and negative affect (Lepore, 1997; Lutgendorf & Antoni, 1999; Pennebaker 1997; Smyth, 1998).

Finally, personality factors may play a significant role in determining whether people are more or less likely to successfully engage in efforts to find meaning, just as

personality can influence more broadly people's adoption of various coping strategies (McCrae & Costa, 1986). Extraversion has been shown to be linked to a greater tendency to engage in cognitive restructuring, sense of meaning (e.g., finding benefit), drawing strength from adversity, and positive thinking. Extraverted individuals are also more likely to seek social contact and to cite positive consequences of misfortune in terms of improved personal relationships (Affleck & Tennen, 1996; Connor-Smith & Flachsbart, 2007; McCrae & Costa, 1986; Tedeschi & Calhoun, 1996; Vollrath, 2001). This tendency of extraverted individuals to have more sense of meaning may be related to their tendency to engage in more narrative construction and sharing of those narratives (Lodi-Smith, Geise, Roberts, & Robins, 2009; McLean & Pasupathi, 2006). Similarly, conscientiousness has been associated with achievement orientation and a deliberative approach (Carver & Connor-Smith, 2010). In sum individuals high on extraversion and conscientiousness are thought to be more likely to engage in problem-solving and successful cognitive restructuring, especially due to their ability to successfully disengage from powerful negative thoughts.

In contrast, neuroticism has been linked to greater use of avoidance strategies (Connor-Smith & Flachsbart, 2007), self-blame, and withdrawal (McCrae & Costa, 1986). Individuals whose personality is characterized by more neuroticism are expected to report more intrusions and more avoidance and other indices of distress. Neuroticism has been associated with higher scores on the IES (Horowitz et al., 1979) after the dissolution of a romantic relationship (Chung, et al., 2002), after surviving a fire (Stabbe, 1996), and in nurses after being verbally abused by psychiatric patients (Inoue, Tsukano, Muraoka,

Kaneko, & Okamura, 2006). To summarize, individuals may place more emphasis on certain coping strategies in line with their personality, and in particular as a function of extraversion and neuroticism.

Study 3

The objective of Study 3 was to explore how intrusions and avoidance and achieved meaning in response to a traumatic event relate to one another and change over time. Another objective was to draw connections between personality traits, specifically extraversion, conscientiousness, and neuroticism, and overall levels of intrusive and avoidant thoughts, as well as sense of meaning.

Although models of response to trauma tend to consider intrusions and avoidance as quite closely related, it seems that intrusions might be more directly related to sense of meaning as they provide an ongoing opportunity to confront the negative event and extract new meanings. As such, it was expected that intrusions, in particular, would be positively related to a sense of meaning.

Intrusions and avoidance tend to decrease over time (Richter & Berger, 2006; Sundin & Horowitz, 2003). Consistent with these findings and given that the current sample was composed of a well-adjusted sample of individuals who were asked to consider a traumatic or significant negative personal event that had occurred more than a year before, it was expected that relatively low levels of intrusions and avoidance as measured by the IES would be reported and that these would decrease over time.

Older memories were expected to be associated with lower levels of intrusive and avoidant thoughts and with less intense negative and positive emotions associated with

the traumatic event. The passage of time between sessions, along with the repeated exposure to a self-written disclosure of the trauma – which was included in the procedure of Study 3 – would also contribute to the lessening of emotional intensity over time. This is consistent with prior research showing that emotions associated with past events tend to fade over time (Walker et al., 1997).

Whereas intrusive and avoidant thoughts were expected to decrease over time, relatively high and stable levels of sense of meaning were predicted to emerge. A sense of meaning is expected to be present after time has passed and individuals have had the opportunity to process the event and find some meaning associated with it (Horowitz, 1986; Joseph & Linley, 2005). Consistent with prior findings (for meta-analytic evidence, see Linley & Joseph, 2004), achieved meaning was expected to have reached its optimal point within a few weeks to a few months following the event and to remain stable thereafter.

It was also expected that a sense of meaning would be associated mostly with positive affect and to a lesser degree with negative affect. This prediction is consistent with prior research in that direct associations between benefit finding and positive daily mood have been identified (Affleck & Tennen, 1996; Affleck, Urrows, Tennen, & Higgins 1992; Park et al., 1996). Benefit finding and meaning making have also been associated with negative outcomes such as anger and anxiety (Mohr, Dick, Russo, Pinn, Boudewyn, & Likosky, 1999) and more distress (Lehman et al., 1993). In contrast, it was expected that intrusive and avoidant symptoms as captured by the IES would be mostly associated with negative affect and not with positive affect.

In sum, the hypotheses in Study 3 were that 1) sense of meaning and intrusions and avoidance are positively correlated at any given point in time, 2) sense of meaning is stable over time, 3) intrusions and avoidance decrease over time, 4) neuroticism predicts higher initial levels of intrusions and avoidance, 5) extraversion and conscientiousness predict higher initial levels of sense of meaning, 6) positive and negative affect associated with the trauma become less intense over time, such that older traumas are associated with lower levels of intrusions and avoidance symptoms and lesser intensity of affect, and also show less change in these constructs over time, 7) sense of meaning is associated with positive affect, and intrusions and avoidance are associated with negative affect, 8) personality factors of extraversion and neuroticism are associated with initial levels of positive and negative affect, respectively.

Finally, as in Studies 1 and 2, meaning in Study 3 refers to a sense of meaning that has been experienced and integrated with one's world view and beliefs, rather than a persistent search for meaning (Michael & Snyder, 2005; Park et al., 2008).

Method

Participants

Data was collected at three different time points. The initial pool of participants was recruited at a booth at Concordia University. A sign indicating *Psychology Project: Volunteers Needed* was placed at the booth. Students who approached the booth were offered an opportunity to win cash prizes for completing a packet of questionnaires. They were also asked whether they would be interested in participating in paid future research. Those who answered positively were contacted at a later time and participated in one or

two additional sessions. The initial packet included a number of questionnaires related to the current study, as well as a number of additional, unrelated questionnaires. At the time of recruitment, participants were asked to report their ethnic or cultural affiliation. The list of groups was the one used by Census Canada in 2001 (the census agency for the Canadian federal government).

The initial packet of questionnaires was completed by 265 participants (100 men and 165 women). The mean age of participants was 24.3 years (range 17 to 60 years old). Ethnicity of participants was White (59.2%), South Asian (8.9%), Chinese (6.6%), Latin American (5.8 %), Arab (4.6%, Black (1.9%), Filipino (1.2%), West Asian (1.2%), Japanese (0.8%), Southeast Asian (.8%), Korean (.4%), and Other (8.5%). Of these participants, 92 (36 men and 56 women) returned between 8 to 10 weeks later for a second session, out of which 88 were included in analyses, and 52 (17 men and 35 women) participated in a third wave of data collection, via mail, a few months following that. Out of the latter group of participants 48 were included in the statistical analyses.

Procedure

At the recruitment booth, participants completed a packet of questionnaires related to an autobiographical self-defining negative event or a traumatic event. They also read and signed a consent form (for a sample consent form, see Appendix K1). The assumption was that traumatic events are likely to often be instances of negative self-defining memories. I also examined the validity of this assumption in the present study in terms of the types of events recalled and the associated affect and sense of meaning. As noted below, the assumption can be considered valid. Participants were free to report on

any event they chose and were asked to provide a short description of the event. After thinking and writing about this event, individuals were asked to report how much meaning they had gained from the event as well as rate of intrusive and avoidant symptoms they may have experienced with regard to this event during the last month. Participants also completed a personality measure. Of the 265 participants who completed the first packet of questionnaires, 255 participants were included in the statistical analyses, out of the 92 participants that completed the second session 88 were included in final analyses, and out of the 52 participants that returned a completed third packet of questionnaires, 48 participants were included in the final analyses. Data of participants was not included in analyses if the participant failed to comply with instructions or had more than 20% of data missing. No participants were excluded due to age, even if age was three standard deviations higher than average.

The second session took place anywhere between 8 to 10 weeks after the completion of the first questionnaire. This session consisted of the completion of an additional questionnaire followed by an unrelated computer task. Participants read and signed a consent form (for a sample consent form, please see appendix K2). The second questionnaire included a copy of the participant's own description of the autobiographical event, and the same blank questionnaires as in the first packet with the exclusion of the personality inventory. Participants were paid $10 CDN for their participation.

Finally, participants who agreed to continue their participation and be mailed an additional questionnaire provided their home address. The third questionnaire was mailed to participants approximately 2 to 3 months later. It consisted of the same blank

questionnaires as the second session. Participants were asked to complete the questionnaires and to send them back to the laboratory as soon as possible. A $5 CDN bill was included in the envelope containing the third questionnaire.

Measures

NEO Five-Factor Inventory, Form S. The short form of the NEO was used to assess different facets of personality: neuroticism (N), openness to experience (O), agreeableness (A), extraversion (E), and conscientiousness (C). The NEO-PI was originally developed and validated with two large longitudinal samples (Costa & McCrae, 1992). The short form has been used with a number of smaller samples for more specific purposes. Both forms are considered reliable and valid tools for personality assessment both with clinical and healthy populations. In terms of internal reliability, McCrae and Costa (2007) reported for a sample of 635 adults, alpha coefficients ranging from .78 to .86 (M = .80) for the five scales of the Brief NEO- PI-3. Although these coefficients are slightly lower than those reported for the long form (alpha coefficients range from .85 to .93; Costa & McCrae, 1992), the authors concluded that brief instruments replicated the factor structure well, and worked well in an adult sample. In terms of validity, the various NEO versions have also been shown to be well correlated with other scales measuring similar constructs.

Sense of meaning. To assess sense of meaning, a modified version of Wood and M. Conway's (2006) questionnaire was used as in Studies 1 and 2 (see Appendix B). However, three additional items that were included in the original questionnaire were included in Study 3 as well. The statements were: "Having had this experience, I have

learned more about what life is all about," "I have often spent time thinking about what this event means to me," and "Having had this experience, I feel I have gained valuable tools and benefits that I would not have had without it" The Cronbach α for Study 3 was high, ranging between .87 and .89 for the three waves of data collection. Participants provided their responses on 7-point scales with endpoints *not at all* (1) and *very much* (7).

Affect. The Positive and Negative Affect Schedule (PANAS; see Appendix B*)* was used to measure current affect associated with the reported event as in Studies 1 and 2 (Watson, Clark, & Tellegen 1988). Participants were asked to report how they currently feel about the event in terms of 10 positive and 10 negative emotion terms, such as *enthusiastic, excited, proud*, and *distressed, hostile,* and *upset*. See Appendix C for the PANAS questionnaire. In prior research, internal consistency (Cronbach α) for both the positive and negative scales has been shown to be acceptably high, ranging from .84 to .90 for different time frames. Intercorrelations between the positive and negative scales have been relatively low, ranging from -.12 to -.23 for different time scales (Watson, Clark, & Tellegen 1988). Cronbach α in the current study was high, ranging from .83 to .85 for the positive affect scale, and from .88 to .94 for the negative affect scale for the three waves of data collection. Participants reported their affect on 5-point scales with endpoints *slightly or not at all* (1) and *very much* (5).

Intrusions and Avoidance. Intrusive thoughts about the difficult event or attempts to avoid thinking about it were identified with the IES (Horowitz et al., 1979; see Appendix J). The IES is a measure of reactions to stress caused by a wide range of traumatic events and is used in clinical settings to identify individuals who might require

treatment. The scale has been shown to have good psychometric characteristics. In an analysis of reliability and validity compiled from data reported in 23 studies, Sundin and Horowitz (2002) state that both the intrusions and avoidance subscales have good internal consistency: for the IES intrusions scale, the internal consistency (Cronbach α) is .86 (ranging from .72 to .92) and for the IES avoidance scale the internal consistency (Cronbach α) is .82 (ranging from .65 to .90). Studies have found that the intrusions and avoidance subscales are correlated (mean correlation of .63) but distinct from one another. The intrusions and avoidance subscales of the IES are moderately correlated with other measures of PTSD (correlations range between .32 and .79) as well as with measures of depression, anxiety, social dysfunction, and somatic symptoms (correlations range between .19 and .73). In the current study, Cronbach α was relatively high, ranging from .86 to .94 for the intrusions subscale, and from .79 to .85 for the avoidance subscale, for the three waves of data collection.

Traumatic or Negative Self-Defining Event. Participants were asked to recall either a negative self-defining event or a traumatic memory (for traumatic event questionnaires, see Appendix I). The instructions for the negative self-defining event were identical to the ones in Study 2 (Appendix A) with the exception that events were constrained to negative themes only. Instructions for the traumatic event were modeled after Horowitz and colleagues' (1979) guidelines. In both cases, instructions to recall the event were followed by instructions to imagine the event in much detail prior to writing about it. Instructions in both cases were to recall an event that was at least one year old.

Results

Preliminary Analyses. The primary goal of the analysis was to examine within-individual differences in terms of sense of meaning and intrusions and avoidance (IES) over time, as well as between-individual differences in associations between and with these variables. Specifically, the moderating effects of personality factors on meaning and intrusions and avoidance were examined. Data for each individual's intrusions and avoidance (IES scores), measures of affect, and sense of meaning were nested within people over time. Analyses were performed in HLM (Raudenbush, Bryk, & Congdon, 2004), a multilevel modeling program that accounts for nesting of data within individuals, as well as with the MIXED command in SPSS for random effects models (Bryk & Raudenbush, 2002; SPSS Inc., 2009).

Scores for affect, sense of meaning, and intrusions and avoidance were measured over time at Level 1 (L1). They were treated as nested within individuals at Level 2 (L2). Individual characteristics that are considered stable over time, such as personality factors, were measured at L2. For means, see Table 11. There were a maximum of three data points per participant, although degrees of freedom varied between analyses due to attrition and missing data. Unlike some other statistical techniques, individual missing data points at L1 in multi-level modeling do not pose a major problem, as estimates can still be computed.

Table 11

Descriptive Statistics for Individuals' Sense of Meaning, Affect, Intrusions and Avoidance (IES), For Each of Three Waves of Data Collection, and Personality Factors in Study 3

Variables	N	Mean	SD
Sense of meaning wave1	255	5.00	1.38
Sense of meaning wave2	88	4.90	1.46
Sense of meaning wave3	48	4.84	1.34
Positive affect wave1	255	2.29	.89
Positive affect wave2	88	2.26	.83
Positive affect wave3	48	2.14	.78
Negative affect wave1	255	2.25	.93
Negative affect wave2	88	2.22	.90
Negative affect wave3	48	1.96	.96
IES wave1	255	2.33	.64
IES wave 2	88	1.96	.68
IES wave 3	48	1.72	.70
Neuroticism (NEO)	255	2.42	.65
Extraversion (NEO)	255	2.91	.51
Openness (NEO)	255	2.82	.54
Agreeableness (NEO)	255	2.45	.51
Conscientiousness (NEO)	255	2.98	.54

One set of models was conducted for each outcome of interest (i.e., IES, sense of meaning, negative and positive affect). Time was entered as an L1 predictor. This allowed testing whether reports of sense of meaning, negative and positive affect, and intrusions and avoidance changed over time and, if so, whether different individuals changed according to different trajectories, or whether change was similar across participants. Controlling for time, covariation among L1 variables was also tested (e.g., whether sense of meaning and measures of the IES vary together across waves).

Time between the traumatic event and the first observation was entered as a L2 variable to control for the time elapsed since the event occurred. The models were built up gradually, starting from null models that contained only the dependent variable, with time and time since trauma as predictors added at a later stage. These models were initially built on the assumption that different individuals may vary on their trajectory of change over time. If this assumption was not met (i.e., if the variance component for the slope was not significant), slopes were treated as fixed effects at L2. Personality factors of the NEO inventory (N, O, A, E, and C) were added gradually to models to understand how they might account for between-individual variance in variables of interest such as meaning, affect, and intrusions and avoidance. For an overall schematic representation of the HLM analyses, see Figure 2, Figure 3 and Figure 4.

The interpretation of a HLM model is similar in many regards with that of a regression. The intercept, as in any regression model, is the expected value of the dependent variable when all of the other variables are equal to zero. In other words, it is

Figure 2. HLM Modeling the Relation between Sense of Meaning and Intrusions and Avoidance, as well as the Effect of Time on These Variables, while Controlling for Time since Trauma in Study 3.

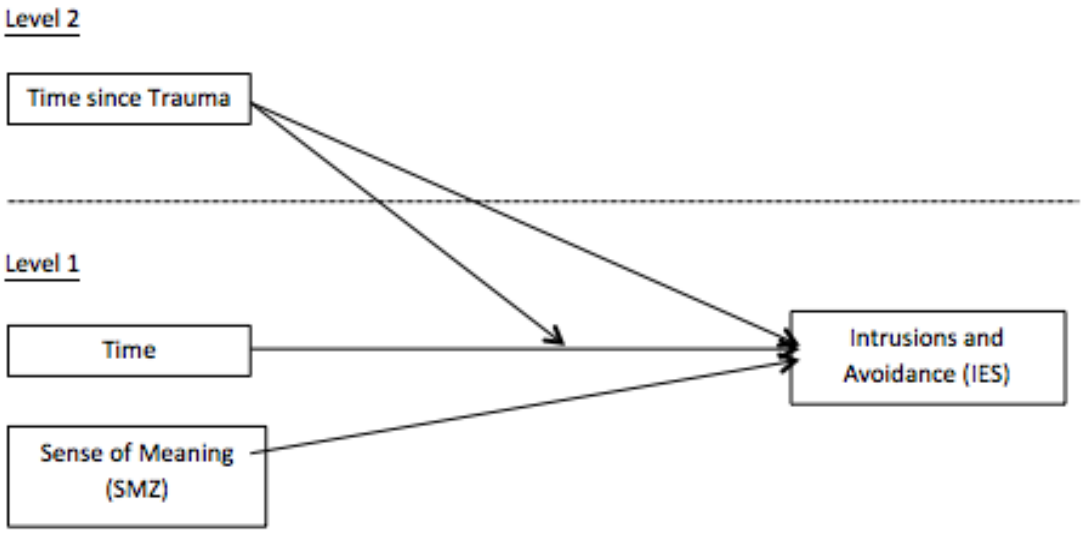


Figure 3. HLM Modeling of the Effects of Time, as well as Extroversion and Conscientiousness, on Sense of Meaning, while Controlling for Time Since Trauma in Study 3.

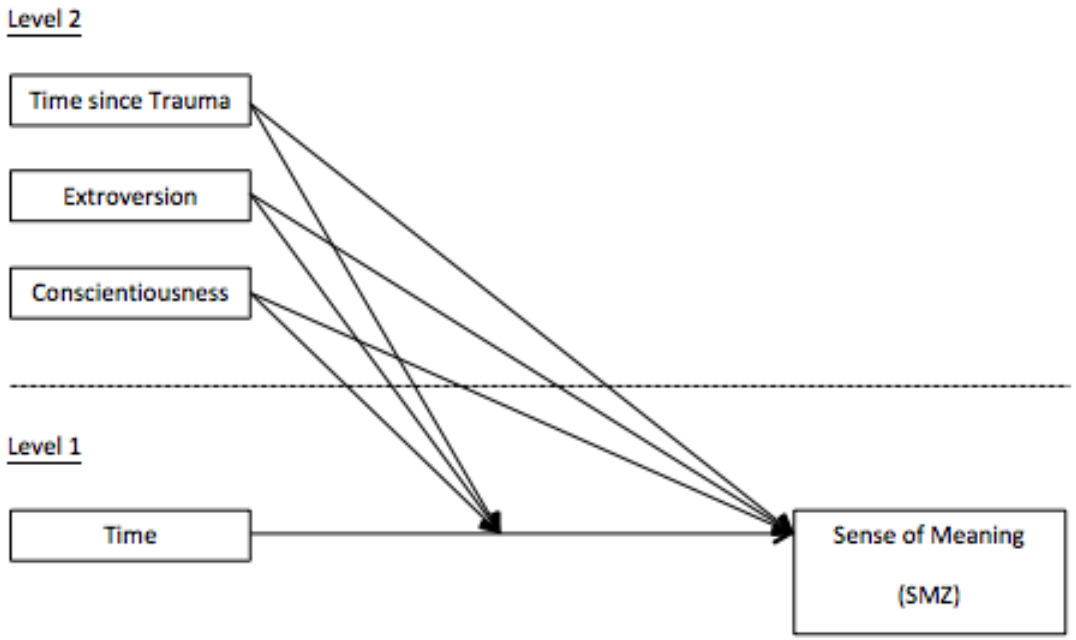
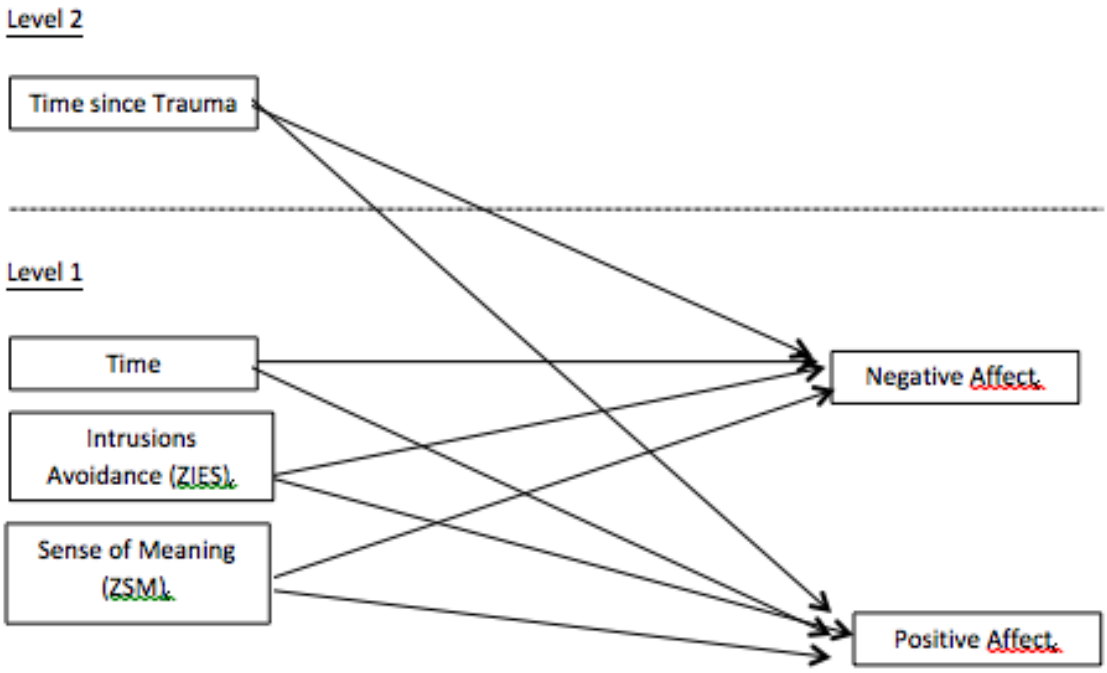


Figure 4. Modeling of the Effects of Time, and the Presence of Intrusions and Avoidance on Negative and Positive Affect while Controlling for Time Since Trauma in Study 3.



personality factors or time since trauma, as predictors of the intercept is akin to modeling the expected change in the average value of the dependent variable for a unit-change in the level-2 variable. In this sense, level-2 predictors of the intercept are similar to level-1 predictors of the dependent variable. A one-unit shift in the level-2 predictor of the intercept leads to an expected increase of *b* in the dependent variable.

The slope of a level-1 coefficient is the amount of change expected in the dependent variable for a one-unit change in the independent variable. If the variance component for a slope is significant, it means that *b* takes on a different value for different individuals. A level-2 predictor of the slope tries to explain some of the between-subjects variation in the slope. In this sense, level-2 coefficients for predicting the level-1 slope represent a *cross-level interaction*. That is, the size of the effect of the level-1 independent variable is in turn dependent on the value of the level-2 variable. This means that, for some individuals, the level-1 variable will have a small effect. For others, the effect will be large. A significant level-2 slope predictor shows that the level-2 context does indeed impact the size of the effect of the level-1 variable.

Preliminary analyses established whether the original sample of participants who completed the first questionnaire was significantly different along any dimension than the sample that completed all data waves. There were no significant differences between these groups of participants in terms of initial levels of sense of meaning, positive and negative affect, intrusions and avoidance scores, or any of the five personality factors. Traumatic memories were on average 78.00 months old (6.5 years), with the time delay ranging from 1 month to 414 months.

Themes of memories were then coded into 1 of 12 categories by the author. This coding was repeated 2 months later, with the author blind to the previous categorization. For the distribution of themes, see Table 12. Reliability for coding the events was high. The first and second ratings were 89.53% in agreement, with a Cohen's Kappa of .88.

To address the assumption in the present study that traumatic events are likely negative self-defining memories, averages of variables of interest such as sense of meaning, intrusions and avoidance, and affect were compared among the group of participants who completed the negative self-defining event questionnaire, versus the group that completed the traumatic event questionnaire. The null hypothesis was that means were the same for both groups, where failure to reject the null hypothesis favored the interpretation that there were no differences between the two samples. The Mann-Whitney and Kolmogorov-Smirnov tests were used. Results showed that in nearly every case the null hypothesis was retained. There were two exceptions: mean of sense of meaning for the first wave of data collection and mean of positive affect at the third wave of data collection had significant Mann-Whitney tests ($z = -2.02$, $p = .043$; $z = -2.36$, $p = .02$, respectively). However, in both cases, the Kolmogorov-Smirnov test did not reject the null of no difference between the self-defining and traumatic event instructions for sense of meaning for first wave ($z = 1.03$, $p = .20$) and for positive affect for third wave ($z = 1.03$, $p = .24$). Furthermore, these two tests were only significant when no adjustment

Table 12
Themes of Traumatic and Negative Self-Defining Memories in Study 3

Negative or Traumatic Event Theme	Frequency of event	Percentage of events
1. Sexual assault to self (e.g., rape, sexual harassment)	9	3.5
2. Physical assault to self (e.g., being attacked by strangers, familial violence, being mugged)	16	6.2
3. Death of close others (e.g., death of close others by illness, murder, or suicide)	38	14.7
4. Accidents, injuries, and illness of self (e.g., car accidents, burns, chronic illness, drug abuse, abortions, miscarriages)	27	10.4
5. Accidents, injuries, or illness, of close others (e.g., car accidents, illness, drug or alcohol use, suicide attempts)	14	5.4
6. Interpersonal conflict of self (e.g., breakups, divorces, conflict with bosses, close others, or teachers)	42	16.2
7. Struggles in skill-related or personal domain (e.g., failing a course, getting fired, losing a small business, struggling financially)	32	12.4
8. Guilt and regrets (e.g., committing or witnessing an immoral act, failing to protect a victim of injustice)	6	2.3
9. Witnessing difficult interpersonal situations or hardship of others (such as parents' divorce, abuse of friends or parents, use of drugs or alcohol)	23	8.9
10. Mental illness of self or close others (including depression, anxiety, eating disorders, psychosis)	14	5.4
11. Harassment (e.g., bullying or teasing)	18	6.9
12. Various negative events to self or others (e.g., getting lost, watching a violent movie)	19	7.3

Note. N=255

was made to the *p*-values to account for multiple tests. Because of repeated testing, some results will be significant simply due to random variation. Finally, the two groups (i.e. the group that received instructions to report a traumatic event) were compared in terms of the distribution of themes of the recalled memories. A chi-square test was used to determine if the distribution of themes differed significantly between the two questionnaire types. The result of the test was marginally significant (χ^2 (11) = 19.31, p = .06), suggesting that there was not enough evidence to reject the null hypothesis that the distributions were similar for the two groups. Thus, it was concluded that the distinction between the two types of questionnaires given to participants was not meaningful both in terms of means of variables of interest and in terms of distribution of themes of memories. As a result, this distinction was dropped from any subsequent analyses and all participants were considered as being part of one sample.

Primary analyses

Explaining variability in intrusions and avoidance scores. Models tested how and whether intrusions and avoidance scores changed within individuals over time and took into account differences in personality, entered as L2 variables. Results for the unconditional model – that is, the model without any predictors – are displayed in Table 13. This model is akin to a random effects ANOVA and makes it possible to determine how much variance is due to L1 versus L2; this is done by comparing the variance components at each level to the total variance.

The variance component for the random intercept in the unconstrained model for intrusions and avoidance scores was .29 (*SE* = .04, $p < .01$), whereas the variance

Table 13

Variance Components for Unconstrained Models of Intrusions and Avoidance (IES and IES Subscales) in Study 3

Parameter	Model 1: IES	Model 2: Intrusions	Model 3: Avoidance
Level 2			
Intercept Variance	.291*** (.038)	.353*** (.050)	.323*** (.044)
Level 1			
Error Variance	.167*** (.019)	.245*** (.028)	.210*** (.024)
- 2 * log likelihood	729.447	846.290	797.618

Note. Standard errors in parentheses. *** $p < .001$.

component for the L1 residual was .17 (*SE* = .02, $p < .01$). Thus, the unconditional model for intrusions and avoidance scores revealed that 63.5% of variability in intrusive and avoidant thoughts was a function of between-individual differences (L2) (.291/(.291+.167) = .635), whereas 36.5% of variability in intrusive and avoidant thoughts was within individuals (L1) (.167/(.291+.167) = .37). The intercept for IES varied between people significantly, as indicated by the significant estimate for the variance component**.** In other words, different people varied in their initial levels of intrusive and avoidant thoughts.

The same was true for the intrusions subscale. The variance component for the random intercept was .35 (*SE* = .05, $p < .01$) whereas the variance component for the L1 residual was .25 (*SE* = .03, $p < .01$). For the variance, 59% was attributable to between individual differences (L2) for the intrusion subscale (.35/(.35+.25) =.59). For the avoidance subscale, the variance component for the random intercept was .32 (*SE* = .04, $p < .01$), and the variance component for the L1 residual was .21 (*SE* = .02, $p < .01$). Thus, 85.6% of the variance is attributable to L2 (.32/(.32/.21) = .86).

Table 14 displays results for a hierarchical linear model of intrusions and avoidance. Time and time since trauma were added as predictors of variability within individuals and between individuals, respectively. In model 1, the level-1 intercept, representing the average of the dependent variable – intrusions and avoidance scores – when all of the level-1 and level-2 variables equal zero, is 2.425 (*SE* = .058, $p < .001$). The other level-1 coefficients show what the expected change in the dependent variable would be given a one-unit change in their value. For each new month that passes, the

Table 14

Fixed Effects Estimates (top) and Variance-Covariance Estimates (bottom) for Models of the Predictors of Intrusions and Avoidance (IES and Subscales) in Study 3

Parameter	Model 1: IES	Model 2: Intrusions	Model 3: Avoidance
		Fixed Effects	
Intercept			
Level 1	2.425*** (.058)	2.496*** (.065)	2.363*** (.065)
Time	-.292*** (.051)	-.388*** (.058)	-.214** (.061)
Sense of Meaning (Z)	.088** (.034)	.191** (.038)	.012 (.038)
Level 2			
Intercept			
Time since trauma	-.001** (.001)	-.002** (.001)	-001* (.001)
Time Slope			
Time since trauma	.000 (.001)	.001 (.001)	.000 (.001)
		Random Parameters	
Level 2			
Intercept Variance	.252*** (.034)	.305*** (.043)	.283*** (.042)
Level 1			
Error Variance	.136*** (.017)	.179*** (.022)	.201*** (.024)
- 2 * log likelihood	669.672	758.501	769.785

Note. Standard errors in parentheses. *** $p < .001$. ** $p < .01$. * $p < .05$.

expected value of the intrusions and avoidance decreases by .292 (*SE* = .051, $p < .001$). A one-unit increase in sense of meaning leads to a .088 (*SE* = .034, $p < .009$) increase in intrusions and avoidance. In other words, higher sense of meaning is associated with higher avoidance and intrusion. The level-2 predictors of the intercept model the expected change in the mean of intrusions and avoidance for a one-unit increase in the value of the level-2 variable. For each additional month between the trauma and the initial measurement, scores on the avoidance and intrusion scale decrease by .001 (*SE* = .001, $p = .007$).

The level-2 predictor of the level-1 slope for time since trauma was not significant ($B < .001$, *SE* = .001, $p = .30$). In other words, although the passage of time decreases scores on the avoidance and intrusion scale, the size of this effect did not depend on how long in the past the event occurred. In a separate model, (not displayed) neither the relation between intrusions, avoidance, and time nor intrusions, avoidance, and sense of meaning varied significantly between individuals. Thus, the random variance components for these slopes were not included in the model reported in Table 14.

Random parameters at the bottom of Table 14 include the "intercept variance" – which is the error left over between individuals after adding level-2 variables and "error variance" which is the error left over within participants after adding level-1 variables. The variance component for the level 2 intercept was significant ($\sigma^2 = .252$, *SE* = .034, $p < .001$), meaning that there remains some between-subjects variance in the intercept that is not accounted for by the model. The error variance for level 1 variables was also significant ($\sigma^2 = .136$, *SE* = .017, $p < .001$) meaning that the effect of the passage of time

does vary between individuals, even if the time since trauma could not account for these differences.

Models 2 and 3 of Table 14 are interpreted in the same manner with the only difference being that the dependent variables are intrusions in Model 2 and avoidance in Model 3. When separate models were computed for intrusions and avoidance, analyses revealed that the association between sense of meaning and intrusions was significant, controlling for time and time since trauma (B = .19, SE = .04, p < .01), whereas the association between sense of meaning and avoidance was not (B = .01 SE = .04).

In the model for the intrusions subscale, symptoms declined with time (B = -.39, SE = .06, p < .01) as well as time since trauma (B = -.002 SE = .001, p < .01). Controlling for these time variables, a one-unit increase in sense of meaning led to a .19 increase in intrusive symptoms (SE = .04, p < .01). The cross-level interaction between time and time since trauma in the intrusions model was marginally significant (B = .001, SE < .001, p = .07). Thus for this scale there is slight evidence that the effect of time becomes less strong as time since trauma increases, so that decreases in intrusions are less pronounced as traumatic events are further in the past.

Table 14 also shows the results of running the model on the avoidance subscale. The results again show that time reduces avoidance symptoms (B = -.21, SE = .06, p < .01), as does time since trauma (B = -.001, SE = .001, p = .03). Controlling for time in the avoidance model, sense of meaning does not have a significant effect (B = .01, SE = .04, p = .76). In addition, the time by time since trauma interaction was not significant (B < .001, SE = .001, p = .89).

Next, personality factors were added in an attempt to explain between–individual variability in intrusions and avoidance scores. With the exception of neuroticism, none of the personality factors were associated with initial levels of intrusions and avoidance scores. Neuroticism was positively associated with the intercept for intrusions and avoidance scores controlling for time since trauma (B = .22, SE = .04, p < .01). The variance component for the intercept was estimated to be .23 (SE = .03, p < .01). Compared to the variance component from the same model after dropping neuroticism, the inclusion of neuroticism accounted for 16.9% of the between-individual variability in intrusions and avoidance scores.

The significance of neuroticism remained even when all other personality factors were added as between-individual predictors simultaneously. When added individually, none of the personality factors predicted the trajectories of intrusion and avoidance scores. The variance component for the time slope was not significant in these models exploring personality traits, such that declines in intrusions and avoidance scores were similar across individuals regardless of personality factors, and so the variance component in this model was constrained to zero.

Explaining within and between subject variability in sense of meaning scores. Sense of meaning scores were examined next for change within individuals over time, and for variation between individuals as a function of personality scores, which were entered as L2 variables. The unconditional model for sense of meaning scores produced a variance component estimate for the random slope of 1.40 (SE = .17, p < .01) and a residual variance of .53 (SE = .06, p < .01). Thus, 72.6% (1.402/(1.402+.529)) of

variability in sense of meaning was at L2 (between individuals), and 27.4% (100 – 72.6) of variability was at L1 (within individuals). The intercept (B = 4.9, SE = .08, p < .01) for sense of meaning varied between people significantly (σ^2 = 1.40, SE = .167, p < .01). In other words, different people vary in their initial levels of sense of meaning.

Time and time since trauma were next added as predictors at L1 and L2, respectively. A time by time since trauma interaction was also included. In the model with effects for time and time since trauma, sense of meaning scores were not significantly related to time (B = -.19, SE = .10, p = .07). In other words, sense of meaning did not change over time. Time since trauma also did not predict variance in the time slope (B < .001, SE = .001, p = .54), so that there were no differences in sense of meaning as a function of how recent the memory was. The variance component for the time slope was not significant (σ^2 = .06, SE = .07, p = .39), indicating that there were no differences among individuals in terms of how sense of meaning changed over time. Therefore, the random variance component was constrained to zero in subsequent models.

When all the personality factors were added as predictors of initial levels and change over time in sense of meaning, extraversion emerged as the only significant predictor of the intercept, that is as the only predictor of overall levels of sense of meaning (B = .20, SE = .09, p < .05). Conscientiousness was marginally significant (B = .19, SE = .10, p = .06). The more extraverted and conscientious individuals were, the more they reported having a sense of meaning. None of the personality factors accounted for changes in sense of meaning over time. When each personality factor was entered as a unique predictor of sense of meaning in a separate model, conscientiousness (B = .31, SE

= .09, $p < .001$), openness ($B = .26$, $SE = .09$, $p < .01$), extraversion ($B = .31$, $SE = .09$, $p < .01$) and agreeableness ($B = .23$, $SE = .09$, $p = .01$), all emerged as significant positive predictors of the intercept of sense of meaning, but not of the slope of change over time. Neuroticism, by comparison was not a significant predictor ($B = -.06$, $SE = .09$, $p = .51$).

Next, given the relative robustness of extraversion and conscientiousness in predicting initial levels of sense of meaning, a model was constructed with the most robust personality factors (extraversion and conscientiousness) entered as predictors (see Table 15). The level-1 intercept – the expected value of sense of meaning scores when all level-1 and level-2 variables equal zero – was 5.050 ($SE = .125$, $p < .001$). The effect of time, however, was not significant. For each month that passed, sense of meaning scores decreased by .179 ($SE = .098$) with a p-value of .070. The error variance for level-1 variables, at the bottom of Table 15, labeled "error variance" was significant ($\sigma^2 = .491$, $SE = .061$, $p < .001$) indicating that meaning varies within each individual due to factors unaccounted for by the model. Time since trauma did not have any significant effect on average sense of meaning scores ($B = -.001$, $SE = .001$, $p = .350$). However, extraversion did. For each one-unit increase on the extraversion scale, the expected sense of meaning score increased by .228 ($SE = .090$, $p = .012$). That is, higher extraversion was associated with higher sense of meaning. Likewise, a one-unit increase in conscientiousness was associated with a .235 ($SE = .091$, $p = .011$) increase in sense of meaning. The variance component for the intercept, at the bottom part of Table 15 under the heading "Random parameters," was significant ($\sigma^2 = 1.311$, $SE = .159$, $p < .001$) indicating that, even after

Table 15

Model Explaining Between Individual Differences in Changes in Sense of Meaning Over Time as a Function of Extraversion and Conscientiousness in Study 3

Parameter	Estimate
Fixed effects	
Level 1	
Intercept	5.050*** (.125)
Time	-.179 (.098)
Level 2	
Intercept	
Time since trauma	-.001 (.001)
Z Extraversion	.228* (.090)
Z Conscientiousness	.235* (.091)
Time Slope	
Time since trauma	.000 (.001)
Z Extraversion	-.096 (.064)
Z Conscientiousness	.105 (.069)
Random parameters	
Level 2	
Intercept Variance	1.311*** (.159)
Level 1	
Error Variance	.491*** (.061)
- 2 * log likelihood	1220.514

Note. Standard errors in parentheses. *** $p < .001$. * $p < .05$.

accounting for these level-2 variables, individuals differ in their average sense of meaning scores due to unaccounted variables.

Turning to the predictors of the time slope, time since trauma again had no significant effect ($B < .001$, $SE = .001$, $p = .744$). That is, the effect of the passage of time on sense of meaning does not change if the trauma happened a long time ago. Furthermore, neither extraversion ($B = -.096$, $SE = .064$, $p = .136$) nor conscientiousness ($B = .105$, $SE = .069$, $p = .130$) interacts with the level-1 time variable. In other words, the passage of time has the same effect for those who score high on extraversion as it does for those who score low on extraversion. Likewise, the passage of time has the same effect for those who score high on conscientiousness as it does for those who score low on conscientiousness. In sum, the model assumed that there was no random variance in the time slope across individuals, thus the residual parameter for the effect of time was set to zero, and personality factors did not explain any variance in the time slope.

Explaining within and between subject variability in negative and positive affect. Negative affect was the next outcome of interest, particularly whether and how it changed over time within individuals (L1), and which personality factors may have accounted for variance between individuals (L2). The unconditional model for negative affect produced a random intercept variance coefficient of .63 ($SE = .07$, $p < .01$) and a residual variance of .22 ($SE = .03$, $p < .01$. Thus, 73.8% (.62/(.62+.22)) of variability in negative affect was at L2, (between individuals), and 26.2% (100 – 73.8) of variability was at L1 (within individuals). The intercept for negative affect ($B = 2.24$, $SE = .06$, $p < .01$) varies

between people significantly (σ^2 = .63, *SE* = .07, $p < .01$). In other words, different people vary in their initial levels of negative affect, as seen in the L2 variance component.

Time and time since trauma were added as predictors of variability within individuals along with a time by time since trauma interaction. Overall, negative affect decreased significantly over time (*B* = -.24, *SE* = .07, $p < .01$). In addition, time since trauma was significant (*B* = -.002, *SE* = .001, $p < .01$). The more time that had passed since the trauma, the less negative affect was reported. The variance component for the time slope was not significant (σ^2 = .01, *SE* = .04, $p = .75$), indicating that time trajectories are similar among individuals after controlling for time since trauma.

Next, models that included personality factors as predictors of negative affect were built. When all the personality factors were added as predictors of the intercept and slope, neuroticism and agreeableness emerged as significant predictors of overall levels of negative affect (*B* = .36, *SE* = .05, $p < .01$, and *B* = .13, *SE* = .06, $p = .03$, respectively). Individuals who were higher on neuroticism and agreeableness were more likely to experience initially more negative affect. When the analysis was repeated entering each personality factor individually in a separate model, similar results were obtained for neuroticism. Neuroticism was positively associated with the intercept for negative affect (*B* = .34, *SE* = .05, $p = .46$), indicating that individuals who have higher scores on neuroticism have higher initial levels of negative affect. For agreeableness, individuals who have higher levels of agreeableness showed a tendency to have higher initial levels of negative affect, but the effect was not significant (*B* = .11, *SE* = .06, $p = .07$).

In terms of patterns over time, none of the personality traits predicted the time slope. However, the time slope did vary significantly with time since trauma. Whereas the time slope was negative, indicating a decrease in negative affect over time, the coefficient for the interaction between time and time since trauma slope was positive**.** This positive interaction indicates that the decrease in negative affect is less drastic if the trauma occurred a long time ago, and as a result, the passage of time has less of an effect on decreases in negative affect**.** For example, in the model that included neuroticism as the personality trait, the coefficient of time for negative affect was -.23 (*SE* = .06, *p* < .01). The time by time since trauma interaction yielded an estimate of .001 (*SE* = .01, *p* < .01). Thus, as time passes, negative affect tends to decline. The rate of this decline, however, trends back towards zero as time since trauma increases.

Intrusions and avoidance scores and sense of meaning scores were next introduced as predictors of negative affect (see Table 16) controlling for time and time since trauma. Both intrusions and avoidance scores and sense of meaning scores were entered together in one model. Intrusions and avoidance were a significant positive predictor of negative affect (*B* = .48, *SE* = .04, *p* < .01), as was sense of meaning ratings (*B* = .07, *SE* = .04, *p* < .01). Experiencing intrusive and avoidant thoughts was associated with reporting more negative affect. To a lesser degree, having a sense of meaning was also associated with more overall levels of negative affect.

Table 16

Model for Negative Affect Explaining Within Individual Associations with Intrusions and Avoidance (IES), and Sense of Meaning, Controlling for Time in Study 3

Parameter	Estimate
Fixed effects	
Level 1	
Intercept	2.280*** (.069)
Time	-.041 (.068)
ZIES	.477*** (.043)
Z Sense of Meaning	.074*** (.040)
Level 2	
Intercept	
Time since Trauma	-.002* (.001)
Time Slope	
Time since Trauma	.002*** (.001)
Random parameters	
Level 2	
Intercept Variance	.287*** (.050)
Level 1	
Error Variance	.234*** (.031)
- 2 * log likelihood	808.836

Note. Standard errors in parentheses. *** $p < .001$. ** $p < .01$.
ZIES = Standardized Intrusions and avoidance scores

Time did not have a significant effect on negative affect (B = -.04, SE = .07, p = .55). That is, negative affect stayed more or less the same as time went by. Time since trauma, however, was significant (B = -.002, SE < .01, p = .02). Negative affect was slightly lower if the event occurred further back in time. The interaction of time with time since trauma did remain significant (B = .002, SE = .001, p < .01**)** such that negative affect decreases less over time when the trauma is older. These results were replicated when predictors were entered individually.

Positive affect as an outcome of interest was analyzed in a similar manner, first in terms of whether and how it changes over time within individuals (L1) and then in terms of which personality factors may account for variance between individuals (L2). The L2 variance component was significant (σ^2 = .52, SE = .07, p < .01), as was the residual variance (σ^2 = .24, SE = .07, p < .01). Thus, the intercept for positive affect varies between people significantly, so that individuals vary in their initial levels of positive affect. The unconditional model for positive affect revealed that 68.4% (.52/(.52+.24)) of variability in positive affect was at L2 (between individuals), and 31.6% (100 – 68.5) of variability was at L1 (within individuals).

Time and time since trauma were added as predictors of variability within individuals along with a time by time since trauma interaction. Overall, positive affect did change significantly over time (B = -.18, SE = .07, p =.01), with positive affect decreasing with the passage of time. The random variance component for the time slope was not significant, (σ^2 = .05, SE = .04, p = .15), thus, this variance component was constrained to zero in subsequent models.

Models that attempt to account for variance between individuals and variance in patterns of change over time in positive affect were built next. Personality factors were added as predictors of positive affect. When all the personality factors were added as predictors of the intercept and slope for positive affect, the model explained 11% of between-subject variability.

Extraversion (B = .20, SE = .06 p < .01) emerged as the only significant personality trait predictive of positive affect, with more extraversion predicting higher levels of initial positive affect. Agreeableness (B = -.10, SE = .06, p = .08) and openness (B = .09, SE = .05, p = .09) were marginally significant. Note that the relation between positive affect and agreeableness is a negative one, such that individuals who show higher levels of agreeableness are less likely to report experiencing positive emotions, whereas individuals with higher levels of extraversion and openness are likely to report more positive affect. Time (B = -.17, SE = .07, p = .01) and time since trauma (B = -.01, SE = .00, p = .05) were also significant, as was the time by time since trauma interaction (B = .001, SE = .001, p = .02). Positive affect decreased over time, but the decrease was more pronounced for more recent memories.

When the analysis was repeated entering each personality factor individually in a separate model, agreeableness was no longer a significant predictor (B = .02, SE = .05, p = .75). Openness, however, was significant at the .05 level (B = .13, SE = .05, p = .01), as was extraversion (B = .23, SE = .05, p < .01) and conscientiousness (B = .15, SE = .053, p < .01). The effect for neuroticism was marginally significant, with more neurotic individuals reporting less positive affect (B = -.10, SE = .05, p = .053). None of

the personality factors explained differences in the time slope. However, time since trauma significantly predicted the slope across models, so that decreases in positive affect remained more pronounced for more recent memories.

Intrusions and avoidance scores and sense of meaning ratings were introduced as predictors of positive affect controlling for time and time since trauma. Both intrusions and avoidance scores and sense of meaning ratings were entered together in one model, and results are displayed in Table 17. With these predictors in the model, the variance component for the time slope was not significant (σ^2 = .02, *SE* = .03, *p* = .42) and was removed from the model. In other words, positive affect decreased over time, but there was no evidence that the effect of time varied between individuals, so the model did not estimate any such variation.

Time had a significant effect on positive affect (*B* = -.17, *SE* = .07, *p* = .01), with average positive affect scores decreasing as time passes. In addition, positive affect scores decreased significantly as time since trauma increased (*B* = -.001, *SE* < .001, *p* = .50). The interaction between the two time variables was also significant (*B* = .001, *SE* < .001, *p* = .04). As time since trauma increased, the effect of time on positive affect grows less strong.

Both intrusions and avoidance scores and sense of meaning ratings were significant predictors of variability in positive affect within individuals. Intrusive and avoidant thoughts predicted less positive affect (*B* = -.09, *SE* = .04, *p* = .05), whereas sense of meaning predicted more positive affect (*B* = .38, *SE* = .04, *p* < .01). The addition of these two predictors accounted for 20% of variance after controlling for time.

Table 17

Model for Positive Affect Explaining Within Individual Associations with Intrusions and Avoidance (IES), and Sense of Meaning, Controlling for Time in Study 3

Parameter	Estimate
Fixed effects	
Level 1	
Intercept	2.381*** (.070)
Time	-.166** (.065)
ZIES	-.086* (.043)
Z Sense of Meaning	.382*** (.040)
Level 2	
Intercept	
Time since Trauma	-.001* (.001)
Time Slope	
Time since Trauma	.001* (.001)
Random parameters	
Level 2	
Intercept Variance	.326*** (.050)
Level 1	
Error Variance	.211*** (.027)
- 2 * log likelihood	806.780

Note. Standard errors in parentheses. *** $p < .001$. ** $p < .01$.

Discussion

In the current study, sense of meaning and the experience of intrusions and avoidance were studied in terms of how they co-occur cross-sectionally and over time in a sample of undergraduate students. Individuals described a traumatic or negative autobiographical self-defining memory and reported on affect and sense of meaning associated with that event. Individuals also reported on any intrusive or avoidant thoughts experienced vis-à-vis the event during the last month. A standard personality inventory was administered to all participants in the initial session. A second and third follow up session enabled the following of changes in sense of meaning, intrusions, and avoidance for a subset of the participants. Consistent with expectations and with prior research, results indicated that sense of meaning remained stable over time, whereas intrusions and avoidance decreased over time. Furthermore, consistent with several theories of PTSD, particularly Janoff-Bulman's (1979; 1992) and Horowitz's (1986) models, and with hypotheses, having a sense of meaning was positively associated with intrusions. Personality factors accounted for initial levels of sense of meaning, intrusions and avoidance. Specifically, extraversion and conscientiousness were associated with a greater sense of meaning, and neuroticism was associated with greater levels of intrusion and avoidance.

Intrusions, but not avoidance, were associated with a sense of meaning. This result is consistent with theories that propose that intrusions serve an important function in promoting the emotional and cognitive processing of a traumatic event, including through the process of meaning making (Horowitz, 1986; Janoff-Bulman 1979). Despite

these widely acknowledged models of PTSD, the processes of meaning making and of experiencing intrusions have been studied mostly in isolation from one another, and have been typically associated with opposite outcomes in prior research. That is, sense of meaning has been considered an adaptive process traditionally associated with positive outcomes (Affleck et al., 1987; Bower et al., 1998), whereas persistent intrusions and avoidance, along with rumination, have been associated with maladaptive outcomes (Ehlers et al., 1998; Nolen-Hoehsema, 1991; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema et al., 1994). Study 3 underscores the importance of integrating the study of intrusions and ruminative reactions to trauma along with having a sense of meaning in order to better understand how these processes relate to and affect individuals' emotional and cognitive responses to trauma.

In the current study, the focus was on affect as one important aspect of responding to trauma that is likely associated with both a sense of meaning and intrusions and avoidance. As expected, and consistent with prior research, (Wood & M. Conway, 2006), greater sense of meaning was associated with both more positive affect and to a lesser degree with more negative affect. Given the discussion above, it makes sense that the process of coming to terms with negative events, which in real life includes a mix of struggling with unwanted thoughts and images concurrent with rewarding experiences of growth, understanding, and insight, is associated with strong feelings, both positive and negative.

Intrusions and avoidance decreased over time. This pattern is particularly interesting given that memories were older than 1 year, and on average were about 6.5

years old. Studies have found that intrusive and avoidant thoughts continue to decrease, over time, as long as 3 years post-event (Winje & Ulvik, 1998). Furthermore, some studies (Lehman et al., 1987) have shown that individuals continue to grapple with reasons and acceptance of the trauma even many years after it has occurred. Other individuals only begin to show signs of emotional distress at a delay of months after the event occurred (Andrews, Brewin, Stewart, Philpott, & Hejdenberg, 2009). Thus, it is feasible that even after the passage of many years, individuals still experience decreases in intrusive and avoidant thinking.

Still, measurements were only a few months apart from one another, whereas prior research compared intrusions and avoidance scores at longer time intervals (e.g., 1 year and 3 years post-event). Therefore, a second explanation might contribute to understanding the results. It can be argued that the study has inadvertently provided an intervention by exposing participants repeatedly to the contents of the traumatic event. Participants provided their own hand-written descriptions of the trauma at the first session, and were given a copy of their own descriptions to review at the second and third session. Indeed, some researchers have shown that disclosure of a traumatic event, whether verbal (Lutgendorf & Antoni, 1999) or in writing (Park & Blumberg, 2002; Pennebaker, Kiecolt-Glaser, & Glaser, 1988), can have beneficial effects for participants, such as improved health and decreased intrusions and avoidance. Although in such disclosure studies, participants are often prompted to engage in more detailed processing of the traumatic event, it is possible that the current study could have re-activated the processing of the event, perhaps prompting individuals to delve deeper into unresolved

parts of their experience, leading to further decreases in symptoms. A limitation of the current study is that a control group that was not engaged in re-processing of the trauma was not included in the study. Nevertheless, it would be difficult to measure the effects of a trauma without having participants think about the event and at least mentally expose themselves to its details. As such, some level of intervention seems inevitable.

Still, if writing about the trauma was the main cause for the observed decreases in intrusions and avoidance, this effect should have been equally strong for older and newer memories. This was not the case; decreases in intrusions and avoidance scores over time were more pronounced for memories that were newer, and the effect of time on intrusions and avoidance scores diminished the older the memory was. This difference in the processing of newer and older memories suggests that the passage of time, in addition to the effects of exposure to the traumatic event, has a unique effect on the severity of intrusions and avoidance, as reported in prior research.

Both negative and positive affect deceased over time. When different personality factors were included, associations between neuroticism and overall negative affect and between extraversion and overall positive affect were discovered. Similar associations have been documented in prior research. Extraversion and neuroticism have been understood in terms of cognitive processing theories as being related to affective memory structures that favor positive and negative affect, respectively (Robinson, 2007).

A number of personality traits played an important role in overall levels of sense of meaning and intrusions and avoidance. As expected, extraversion and conscientiousness were positively associated with overall levels of meaning. This is

consistent with prior research (Affleck & Tennen, 1996; Connor-Smith & Flachsbart, 2007; McCrae & Costa, 1986; Tedeschi & Calhoun, 1996; Vollrath, 2001), which suggests that individuals who are more extraverted are more likely to use coping mechanisms such as cognitive restructuring and meaning making. In addition, extraverted individuals benefit from a greater tendency to seek social support, and tend to engage in more narrative construction and in sharing or disclosing of personal narratives (Lodi-Smith et al., 2009; McLean & Pasupathi, 2006). As such, extraverted individuals may acquire more of a sense of meaning and cope better with difficult events, showing higher levels of positive affect. Nevertheless, extraversion was not associated with lower levels of intrusive and avoidant thoughts, suggesting that sense of meaning and positive affect alone do not directly affect levels of intrusions and avoidance. It further suggests that there might be other important factors, which are better predictors of the course of intrusions and avoidance over time. Factors, such as pre-trauma levels of worry, hostility, and distress, as well as emotional reactivity would be interesting to explore in future research as direct predictors of intrusions and avoidance.

Conscientiousness was also positively associated with overall levels of meaning. This finding is also consistent with prior research, for example, Connor-Smith and Flachsbart, (2007) in their meta-analysis examining 165 samples, found that conscientiousness predicted more problem-solving and cognitive restructuring. In their study, the authors suggested that conscientious individuals are more likely to engage in cognitive restructuring activities due to their capacity to disengage from negative emotions and redirect their thoughts and activities in more positive directions. In addition,

conscientious individuals may be more committed to solving their problems and persevering until they achieve resolution. Seeking meaning and cognitive restructuring may be one of the major pathways by which conscientious individuals come to terms with traumatic events.

Neuroticism was not associated with a sense of meaning but was associated with intrusions and avoidance. This lack of association between neuroticism and sense of meaning is consistent with prior research (Tedeschi & Calhoun, 2004; Tedeschi, Park, & Calhoun 1998) showing a similar lack of associations between post-traumatic growth and neuroticism. That intrusive and avoidant thoughts are associated with neuroticism is consistent with a large body of research suggesting that more neurotic individuals tend to rely less on adaptive coping mechanisms and are more likely to use avoidance strategies (Connor-Smith & Flachsbart, 2007), to be emotionally reactive, and to experience self-blame and withdrawal (Costa & McCrae, 1986). There are then at least two mechanisms by which neuroticism may be associated with intrusions and avoidance: the first being that highly neurotic individuals are generally more emotionally reactive and more prone to developing anxiety in response to a negative event, and the second being that such individuals engage in less effective coping mechanisms to ward off intrusions and other symptoms, thus perpetuating these states for longer periods of time. These processes may be independent of their willingness or ability to gain meaning.

Finally, agreeableness emerged as an important personality factor predicting more negative and less positive affect. This finding is interesting since agreeableness has been associated with less emotional reactivity and hostility in situations that might involve

interpersonal conflict (Robinson, 2007; Vollrath, 2001). As such, highly agreeable individuals report fewer interpersonal conflicts and seem to be better at regulating their anger and hostility in interpersonal conflict situations. It may be that this tendency to regulate anger and hostility and avoid interpersonal conflict may lead to feeling more negative affect and less positive affect when the traumatic event involves an unresolved interpersonal issue. A relevant example may be that of physical or sexual abuse, where stifling well-justified anger toward the perpetrator may result in unexpressed feelings of hurt and anger. Generally speaking, attempts to please and be agreeable may come at the price of personal upset and inner turmoil. Indeed in some theories of depression, unexpressed anger can contribute to its development (Gilbert, Gilbert, & Irons, 2004).

There were no differences whatsoever among individuals in terms of trajectories of change in sense of meaning, affect, or intrusions and avoidance over time. Given that there has been little longitudinal research regarding the effects of personality on change in intrusive and avoidant thoughts, sense of meaning, and affect over time in the wake of trauma, this was an open ended question in the current research. Although in Study 3 differences were found in initial levels of intrusions and avoidance, sense of meaning, and affect as a factor of personality, all individuals followed similar trajectories of change over time, regardless of their personality traits. This lack of variance among individuals is somewhat surprising, given that personality factors have been associated with different coping strategies, and thus might be expected to affect the course of coping with trauma. One possible explanation may be related to the finding that aggregated results from meta-analytical studies suggest that there is only a small to moderate direct effect of

personality on coping (Connor-Smith & Flachsbart, 2007). Given that the sample was relatively small, (N = 48 for three data points, and N = 88 for two data points) and that effects of personality on coping are usually small to moderate, it is possible that the study did not have sufficient power to detect differences among individuals in trajectories of change over time.

A second possibility is that cumulative effects of personality on coping might manifest themselves in the long term, but remain undetected in a short-term longitudinal study like the present one. Although effect sizes for the impact of personality on coping were found to be small to moderate (Connor-Smith & Flaschbart, 2007), the impact of such small effects may be significant over long periods of time of daily implementation of certain coping strategies. Future research might further pursue this line of inquiry by extending the intervals between waves of data collection to span a number of years rather than months.

One limitation of the current study is that it relied on self-reports of a sample of undergraduate students. However, prior research has shown that a majority of undergraduate students (55.80% - 84.50 %) in a large sample (N > 6000) experienced stressful or adverse life events, and 20% of these students experienced clinical or subclinical PTSD symptoms (Smyth, Hockemeyer, Heron, Wonderlich, & Pennebaker, 2008). In another survey study of college students, 42% reported having experienced traumatic events such as automobile accidents, deaths of close others, and harassment (Oswalt & Silberg, 1995). In interpreting the above results, researchers argued that samples of undergraduate students can be used reliably to study the implications of

adverse life events and that results from such studies can be generalized to the broader population.

An additional possible limitation of the current study was that memories differed in terms of themes and delay in time since the event occurred. In the present study, there was no time limit on how old the memory could be, and reported events ranged from 1 month to 414 months. In addition, a number of participants (7.70%) reported memories that were less than 1 year old, despite instructions to provide memories that were at least 1 year old (so as to avoid a bias toward newer memories that might be for less significant events). Nevertheless, such memories were not excluded from analyses, as the contents of the events seemed meaningful and impactful for these participants. Indeed, prior studies (Park et al., 1996) have found that participants' most negative events during the past year occurred 4.86 months prior to data collection. To account for the great range of time delays since the trauma occurred, this variable was controlled for in all of the analyses, as was its interaction with other variables over time. Overall, the passage of time slightly attenuated the intensity of affect and of intrusions and avoidance associated with the trauma, but it had no effect on sense of meaning. These results suggest that a great range of traumatic memories may be significant in individuals' daily lives, even many years after the events have occurred, and that long term longitudinal studies may be needed to uncover the impact of such events both in terms of meaning gained and negative sequels.

An ideal solution for controlling the time delay post-trauma is to follow individuals immediately after the trauma occurred. Future studies may be designed to follow individuals from the time of the event and over an extended period of time so that

causal conclusions may be drawn. Individuals at risk for experiencing a traumatic event need to be identified and followed longitudinally, such as in the case of family members of terminally ill patients (Ong, Fuller-Rowell, & Bonanno, 2010) or in the case of cohorts of survivors of natural disasters or large-scale accidents.

Another limitation of Study 3, as noted above, was that it was difficult to separate the effects of the passage of time on sense of meaning and intrusions and avoidance from the effects of repeated exposure to trauma. Decreases in intrusive and avoidant thoughts and negative and positive affect were documented over time, but given the study design it was not possible to determine whether these effects were exclusively due to the passage of time, or whether individuals' description of the traumatic event and their repeated exposure to this account served as an intervention. Indeed, prior research has shown that written and verbal disclosure of a stressful event can facilitate adaptive coping with the event, and lead to lower indices of distress, such as negative affect and intrusions and avoidance (Lepore, 1997; Lutgendorf & Antoni, 1999; Pennebaker, 1997; Smyth, 1998). Future studies may address this issue by designing a control group for the "intervention" by including a group of individuals who are not exposed to the trauma through a writing task. However, if the aim is to compare groups of individuals, both of whom have experienced trauma, any method of recalling the trauma may be considered an intervention, even if, for example, the trauma is described verbally rather than in writing.

Study 3 makes a novel contribution in that it opens up a number of possibilities for future research wherein sense of meaning and intrusive thoughts are considered side by side and conceptualized as two sides of the same coin. In Study 3, it was found that

sense of meaning and intrusions are related, despite the fact that they are associated with different types of affect and different personality factors. This is important because so far researchers have generally tended to segregate these two cognitive processes and examine only one process at a time. There remains much to be explained about how intrusions and sense of meaning evolve over time, and whether there is an optimal ratio of the two for optimal adjustment. As the research presented here suggests, personality factors may play a big role in determining which individuals tend to experience intrusions versus a sense of meaning, and different courses of action may be indicated for different individuals depending on their temperament.

Chapter 4

General Discussion

General Discussion

Meaning making and having a sense of meaning with regard to specific events or episodes have been identified as adaptive, being associated with positive psychological and physiological outcomes in different populations coping with chronic illness or trauma. The mechanisms by which a sense of meaning confers such benefits have been researched less thoroughly. The ways in which sense of meaning relates to other processes that involve reinterpreting and reworking of the event, such as intrusions, has been little explored. The aim of the current thesis was to explore some of the pathways by which a sense of meaning for past events leads to positive outcomes. Another goal was to examine the nature and course of sense of meaning and intrusions and avoidance as they unfold over time and in the context of individual differences in personality.

It was hypothesized that a sense for meaning for specific events would be distinct from a more general sense of purpose and satisfaction in life. Consistent with prior research (Wood & M. Conway, 2006) it was also hypothesized that sense of meaning would be significantly correlated with positive affect, and to a lesser degree with negative affect. Next, in a short longitudinal design, sense of meaning was hypothesized to be positively correlated with intrusions and to remain stable over time. Finally, personality characteristics such as extraversion and neuroticism were expected to predict overall levels of intrusions and meaning and to influence the trajectories of change in these constructs over time. More specifically, it was hypothesized that extraversion would be associated with higher overall levels of sense of meaning and positive affect, whereas

neuroticism would be associated with higher levels of avoidance and intrusions and more negative affect.

Results from three studies supported the hypotheses. The first study consisted of individuals' ratings of their sense of meaning in response to a specific autobiographical memory, as well as their general sense of purpose and satisfaction in life. It was assumed that scores on general measures of purpose and satisfaction in life are an indication of individuals' stable tendencies towards purposefulness and positivity in life. As expected, and consistent with prior research, (Zika & Chamberlain, 1992), general purpose in life and general satisfaction with life were positively correlated to one another, but not to sense of meaning and affect for specific events. Furthermore, confirming prior studies, sense of meaning for a specific event was significantly associated with positive affect in response to that event. These results established the validity of ratings of sense of meaning as reflecting a response to a distinct event, rather than indicating baseline levels of purposefulness in life. The lack of association between general traits and specific responses supports the argument that any associations between sense of meaning and other psychological outcomes are not simply a by-product of general personality dispositions, but rather the outcome of individuals' unique efforts to cope with difficult events.

It could be argued that personality factors such as extraversion –discussed in the third study – account for individuals' higher ratings of sense of meaning, positive affect, and orientation toward goals. Such an effect would undermine the importance of having a sense of meaning in generating positive affectivity and supporting the pursuit of goals, or

for that matter, the impact of having a sense of meaning on any variety of positive outcomes. Indeed, personality traits such as extraversion are highly correlated with positive affectivity. Therefore, results from Study 1 wherein global life satisfaction and sense of meaningfulness in life were found to differ from positive affect and sense of meaning for a specific event, were used to guide the interpretation of the results of Study 2. Particularly, they supported the view that global personality tendencies could not fully account for the results in Study 2.

That specific emotional and cognitive responses to a specific event diverge from more general and global tendencies is in itself a puzzling finding. One might expect that a tendency to find everyday life full of purpose would be related to the ability to extract meaning out of important memories. Similarly, one might expect the tendency to be satisfied and positive about one's life to be related to the ability to feel better about specific events in one's past. However, the results of Study 1 suggest that this is not necessarily the case. Though broad constructs such as life satisfaction and purposefulness may have some impact on specific reactions to events, they do not account for affect and meaning generated in response to events of great personal significance.

One possible explanation is that there are many facets of cognition and emotion involved in the processing of self-defining events, which are not expressed in daily functioning, and vice-versa. For example, individuals may routinely engage in many constructive and meaningful daily activities, such as participating in sports, spending time with friends, or having hobbies. These activities might make their lives feel purposeful and important. However, it does not provide an indication as to whether these

individuals will be inclined to think deeply and make sense of a negative event, such as illness or separation. Similarly, individuals may be generally well disposed and satisfied with their career and relationships, but experience overwhelming sadness and even depression at the unpredictable loss of a family member. Indeed, the results of Study 1 suggest that individuals exhibit unique patterns of thinking and feeling in response to their autobiographical memories, which are not fully accounted for by general orientations to life.

Study 2, which was built on Study 1, also explored individuals' reported self-defining autobiographical memories, and their acquired sense of meaning and affect for these memories. In addition, individuals reported their sense of valuing and being self-efficacious with regard to major life goals. They also indicated the relevance of memories for these goals. The hypothesis was that positive affect mediated a bi-directional influence of meaning for memories on goals, and vice versa. The hypothesis was supported in that sense of meaning was associated with more positive affect for that memory, which, in turn, was associated with more perceived self-efficacy for goals deemed relevant and to a lesser degree for goals in general.

Strong associations found between sense of meaning, positive feelings, and increased self-efficacy and valuing of goals relevant to these memories are consistent with predominant theories of autobiographical memory (Bluck, 2003; Bluck et al., 2005; M. A. Conway and Pleydell- Pearce, 2000; Pillemer, 2003). A predominant model advanced by M.A. Conway and Pleydell-Pearce (2003) emphasizes the dynamic relation between autobiographical memory, affective responses to these memories, and the

relation of memories to ongoing goals of the self. According to this model, memories are dynamic and transitory constructs of the self-memory system. The self-memory system contains an autobiographical knowledge base as well as current goals of the self. A reciprocal relation between the autobiographical knowledge base and current goals exists, such that goals provide cues for the encoding and retrieval of memories, whereas memories ground goals and provide important information for the pursuit or avoidance of outcomes. In Studies 1 and 2, participants reported that memories evoked quite strong emotions, even many years after the events occurred. They also rated many of the memories as being relevant to the attainment of current goals, suggesting that memories and goals were meaningfully linked. Furthermore, goals were shown to be linked to memories through the mediating effects of affect, suggesting the presence of an ongoing dynamic relation between memories and goals. Emotions about past events seem to support future goals.

Studies 1 and 2 are also consistent with theories regarding the self-related function of autobiographical memory. More specifically, autobiographical memories are memories of personal meaning and significance and they play an important role in individuals' construction of a coherent life story and a sense of identity (Bluck & Habermas, 2001; McAdams, 2001; Singer & Bluck, 2001). In the words of Adler in McAdams (2007): "Stories deal with human needs, wants, and goals, which connect the present self to the past and the future" (p. 97). In Study 1 and Study 2, individuals indicated that their self-defining memories were characterized by strong emotions, and reported having gained a sense of meaning for these events. Meaning for past events was

associated with positive affect, and positive affect was associated with importance and self-efficacy of current goals. These associations suggest that individuals engage in meaning making with regard to past events, and that these meanings are associated with positive feelings which energize and galvanize current goals. The reverse is also true in that current goals of the self, in all likelihood, influence individuals' perceptions of the meaningfulness of their memories. This influence is mediated by the experience of positive affect in response to current important goals.

Positive affect, experienced in response to meaning regarding important memories, may help shape people's hopes and wishes for the future. The conceptualization of meaning as cognitive restructuring and rebuilding of values and beliefs is consistent with the theoretical framework offered by Janoff-Bulman (1992). Meaning, as it emerges from the current research, is strongly associated with a positive affective component that contributes to individuals feeling energized, excited, and proud. These feelings are associated with motivated and focused action toward meaningful personal goals, including the rebuilding of assumptive worlds and of shattered lives.

The relation between meaning, positive affect, and self-efficacy is also consistent with research that points to the motivational incentive of positive affect. For example, some studies have shown that self-efficacy in a number of domains can be influenced by means of inducing happy or sad moods (Kavanagh & Bower, 1985). Similarly, attributions of success versus failure for a protagonist in a story (Forgas, et al., 1990; Experiment 1) and for one's own performance on an exam (Forgas et al., 1990; Study 2 & 3) were shown to be influenced by mood manipulations, with positive moods leading

to more attributions for success to stable internal factors. The present research, however, cannot be equated with such studies, because in the current study affect was reported in terms of a specific past event rather than being induced, and affect was assessed weeks apart from the collection of information regarding goals. Nevertheless, the current study seems to show that positive affect associated with a sense of meaning and resolution for a difficult event in the past can carry over to foster a stronger sense of commitment and competence for related goals in the present.

Goals in the current research were conceptualized as personal strivings (Emmons, 1986). Personal strivings are long-term goals individuals try to achieve, such as maintain intimate relationship, or try to avoid, such as avoid harm or illness. Pervin (1983) noted that affect plays an important role in motivation and goal-directed behavior. Similarly, Emmons and Diener (1986) found that positive affect was related to the presence and attainability of goals in everyday situations. Results from Study 2 were consistent with this prior research. Positive affect was associated with more importance of goals and with an increased sense of self-efficacy. The dimensions of importance and self-efficacy were selected for the present research from a number of dimensions identified by Austin and Vancouver (1996) as basic properties of goals. Importance of goals is related to commitment to goals, and self-efficacy is related to motivation to accomplish goals and probability of success. That sense of meaning for self-defining memories is related to importance and self-efficacy for goals is also consistent with a general goal-directed understanding of human behavior. Bandura (1982; 2001) has referred to individuals' capacity to determine their own destinies through their behavior as a sense of agency.

Thus, agency for personal strivings seems linked to having a sense of meaning and experiencing positive affect for self-defining memories.

The association between sense of meaning and self-efficacy is especially important as it offers a possible pathway by which sense of meaning can produce positive outcomes. This relation is only sustained, however, by the presence of positive affect. In other words, regression analyses showed that the relation between meaning and self-efficacy and importance is indirect, and fully mediated by positive affect. Nevertheless, the fact that sense of meaning is associated with self-efficacy is important. Self-efficacy is one of the central mechanisms by which individuals come to believe in their own capabilities to influence and control the world around them, and it is one of the central pillars of agency (Bandura, 2001). Furthermore, according to Bandura's (2001) model of agency, self-reflection is an important component of agency, a meta-cognitive capacity to examine and evaluate one's own functioning, motivation, values, and purpose of one's pursuits. Sense of meaning may operate within this framework of self-conscious evaluation and may help people form and adjust their views of themselves, including their sense of being efficacious. Sense of meaning may not only play a role in the regulation of people's affect, but it may also more broadly affect their general view of themselves as motivated agents, capable of choosing meaningful important goals and of exerting the necessary actions to accomplish these goals.

In Study 3, sense of meaning was explored in the broader context of personality as well as in relation to a process that appears similar, yet is associated with opposite outcomes- namely intrusive and avoidant thinking. Individuals reported on a traumatic or

negative autobiographical memory and on the affect and meaning associated with that event. Individuals also reported on any intrusive or avoidant thoughts experienced, in relation to the event, during the last month or so. A standard personality inventory was administered to all participants in the initial session. A second and third follow-up session enabled changes in meaning and in the experience of intrusions and avoidance to be followed over time for a subset of the original participants. Results indicated that both sense of meaning and instances of intrusions and avoidance decreased over time. Furthermore, sense of meaning was positively associated with intrusions. Personality factors accounted for initial levels of sense of meaning and intrusions and avoidance, more specifically extraversion and conscientiousness were associated with a greater sense of meaning, and neuroticism was associated with a greater amount of intrusions and avoidance. As expected, personality factors were also associated with positive and negative affect. Extraversion was associated with more positive affect, and neuroticism and agreeableness were associated with more negative affect.

These results are consistent with prior findings regarding the Five Factor model of personality and its correlates. The Five Factor model is a well studied system of categorization of individuals' personalities and it has been shown to have high convergent validity with other taxonomies and conceptualizations. For example, Trapnell and Wiggins, (1990) have shown that their circumplex model of interpersonal behavior has convergent properties with the Big Five model. Extraversion and neuroticism have been identified as two predominant dimensions of personality that have been associated with a large number of affective, cognitive, and behavioral processes as well as life

outcomes. For example, extraversion has been associated with active and well-adjusted coping strategies in response to stress (Carver & Connor-Smith 2010; Connor-Smith & Flachsbart, 2007), and with a tendency toward feeling energized, enthusiastic, and happy in the short term (Lucas & Baird, 2004), and with being satisfied with life in the long term (Lucas & Fujita, 2000).

Results from Study 3 were consistent with these findings; extraversion was associated with higher overall levels of sense of meaning, which included learning lessons and feeling empowered by the experience of negative and traumatic events. Individuals who were more extraverted also experienced higher levels of positive affect in response to these memories. Uziel (2006) found that extraverted individuals judge neutral events as more positive than introverts. Perhaps extraverted individuals have an ability to "see the good in the bad" which allows them to view neutral and even negative events as having a silver lining or a positive aspect. This quality goes hand in hand with their ability to draw meaning and positive lessons from events that were originally traumatic.

Another possible explanation for the association between extraversion and sense of meaning is that acquiring meaning may involve disclosing, expressing, or discussing information relevant to the traumatic event, and extraverted individuals are more likely to engage in these types of disclosure. Furthermore, the language and quality of disclosure may be associated with different personality aspects (Pennebaker & King, 1999). For example, Pennebaker and Graybeal (2001) have shown that extraverted individuals disclose their feelings using a language that includes more references to positive

emotions and social factors. Other researchers have found that personality characteristics, such as sociability, social poise, and extraversion, were associated with self-disclosure for difficult events (Carpenter & Freese, 1979). To conclude, one possible explanation for the association between sense of meaning and extraversion has to do with individuals' tendencies to experience more positive affect and view events in a positive light. A second explanation may be related to individuals' tendencies to disclose aspects of their experiences, and in so doing to work through and gain meaning from these events. This possibility is particularly relevant for Study 3, as part of the experimental manipulation required individuals to self-disclose. Possible implications for results will be discussed below. Finally, a third explanation is related to extraverted individuals' ability to engage in a number of adaptive coping strategies that are likely to result in the resolution of difficult events.

In contrast, neuroticism has been associated with negative affect (Caspi et al., 2005) and ineffective coping mechanisms such as avoidance, passivity, and other escapist tendencies (Connor-Smith & Flachsbart, 2007). Consistent with prior findings, in Study 3 neuroticism was not associated with a sense of meaning, but was associated with more intrusions and avoidance. It was also associated with negative affect in response to traumatic memories. Intrusions and avoidance can be thought of as both coping mechanisms and symptoms. Early on during the process of coping, they can be seen as normative automatic responses to trauma and catalysts of facing the difficult experience, whereas later on the persistent and troubling experience of these thoughts is referred to as a symptom. The association of neuroticism with intrusions can be understood either as a

direct causal relation in which neurotic traits bring about avoidant ineffective coping strategies, or as an indirect indication of ineffective coping leading to unresolved issues and persistent suffering from unpleasant and persistent symptoms in general, and avoidance and intrusions in particular.

That neuroticism was linked with more intrusions and avoidance is also consistent with prior research that suggests that individuals with higher levels of neurotic traits are more susceptible to developing PTSD or PTSD-like symptoms in reaction to traumatic events, such as the dissolution of a romantic relationship, being the recipient of verbal abuse, or surviving a fire (Chung et al., 2002; Inoue et al., 2006; Stabbe, 1996). The presence of negative affect in response to memories expands on existing findings, in that negative affect is experienced not only in relation to ongoing events, but also in recalling past events.

Conscientiousness was also associated with a greater sense of meaning. This also is consistent with Connor-Smith and Flachsbart's (2007) findings that conscientiousness predicts more problem-solving and cognitive restructuring. Connor-Smith and Flachsbart (2007) suggested that these results can be attributed to conscientious individuals' tendency to be persistent, have good impulse control, high achievement motivation, and self-discipline. These qualities are relevant to meaning making, because meaning making requires the ability to persist in the face of possibly difficult emotions, and the ability to self-regulate emotion and shift attention from unpleasant to positive thoughts.

Finally, agreeableness was associated with more negative affect. This finding was somewhat unexpected. Individuals high on agreeableness are thought to be "stoic" and

highly compliant. As such, it is possible that in the context of traumatic memories, especially those involving conflict, individuals high on agreeableness sacrifice their own well being in order to avoid conflict and appear strong and content. For example, in Study 3 many individuals reported memories that included witnessing or experiencing conflict with close others. Individuals high on agreeableness may have acted in a non-confrontational fashion in such situations, thus avoiding conflict, but also being left with negative feelings about the situation being unjust or frustrating.

Interestingly, both sense of meaning and intrusions and avoidance tended to have one general trajectory of change over time, regardless of individuals' personality traits. One possible explanation for this finding is that effect sizes for the influence of personality on coping are small to moderate, and in a relatively small sample could not be detected. Another possibility is that the time elapsed between sessions in Study 3 was not sufficiently lengthy to allow for individual differences due to personality factors to emerge. It is also possible that personality factors affecting coping with stressors and gaining a sense of meaning may have a greater impact early on in the process of coping. In many cases of PTSD, the onset of intrusions and avoidance is often acute, and manifests itself within the first week to few months following the event (Buckley et al., 1996). Similarly, most instances of meaning making have been documented during the first 6 to 18 months post-event. In Study 3, participants were asked to recall an event that was older than 1 year. The effect of personality on changes in sense of meaning and intrusions and avoidance over time, may have been dampened by the fact that memories were fairly old.

The fact that intrusions and avoidance showed a small but significant decline over time is suggestive of two possibilities: that the tendency for remission of intrusive and avoidant thoughts is strong and long lasting, and that some of the decreases observed can be attributed to the re-exposure to the earlier traumatic event experienced by individuals through participation in the current study. In others words, self-disclosure, whether to another person, or in writing, may in itself constitute an intervention that may carry benefits in terms of decreases in intrusions and avoidance. In the current study participants wrote in detail about a negative or traumatic experience and were subsequently re-exposed to these written accounts within the span of 2 to 6 months.

The act of disclosing details and revisiting these negative events, may have contributed to further resolution of the events, such that decreases in both intrusions and avoidance were observed. This assumption is consistent with prior research showing that writing or disclosing information about a trauma facilitates meaning making and results in a decrease in anxiety, intrusions, and avoidance (Park & Bloomberg, 2002). Researchers designing future studies should consider the inclusion of a control group in which the trauma is thought of, but not disclosed.

That intrusions and sense of meaning were positively correlated is striking because sense of meaning is associated with positive outcomes, and intrusions and avoidance are associated with negative outcomes. It serves as a reminder that the human psyche is complex, and can tolerate ambiguity and mixed feelings. Difficult events are characterized by both sorrow and negative feelings as well as by the potential to initiate (at least self-perceived) growth and foster resilience. Both processes occur in tandem.

Sometimes the struggle intensifies the gains, other times people remain in rumination without gaining a sense of resolution or mastery.

Novel Contributions of Current Thesis to Existing Literature

Taken together, the three studies in this thesis provide an opportunity to consider the nature and role of the important cognitive process of meaning making. Meaning making has been studied extensively in the context of post-traumatic growth. Individuals who have survived difficult events, such as being diagnosed with chronic illness or surviving various disasters, exhibit a sense of resilience and resourcefulness by extracting positive meaning and perceiving positive changes resulting from the difficult event. Most studies have focused on meaning making as a unique isolated process and have explored its association with a number of outcomes. The current research is novel in that it explores the presence of a sense of meaning in a population of undergraduate students, who are not a specific target group, and in the context of other important constructs of the self, such as goals, affect, and personality, rather than as an isolated process.

Study 1 is novel in distinguishing between people's representation of self-defining memories and more general evaluations they may have about their lives. This has not been done before. Study 2 is the first study in which goals, meaning, and self-defining memories were studied together and linked with one another in a meaningful and empirically supported way. A novel mechanism is proposed suggesting that the act of owning a certain sense of meaning with regard to autobiographical self- defining events is strongly linked to affect, specifically positive affect, which, in turn, plays an important role in individuals' attitudes toward current goals, specifically attitudes of efficacy and

valuing of such goals.

Study 2 builds and expands on studies such as those of Singer (1990) and Moffitt and Singer (1994). In these studies, Singer and his colleagues found that individuals who recalled memories relevant to the attainment of their strivings felt more positively about their memories. Singer and colleagues have understood these results in terms of how orientation toward current goals modulates and shapes individuals' affective responses to past events. According to Singer (1990) and to Moffitt and Singer (1994), memory serves a motivational role and is used to help individuals gauge whether past experiences resulted in successes or failures in similar or relevant situations.

Interestingly, despite the fact that Singer's and Moffitt and Singer's data were not longitudinal, the authors implied a causal relation wherein the presence or absence of certain goals causes individuals to remember certain memories and to feel more positively about these memories. It could have been equally valid to argue, based on the correlational nature of the data in these earlier studies, that memories that are inherently more pleasant and evoke stronger positive feelings lead individuals to pursue relevant goals. However, this line of thought, although mentioned briefly as a reciprocal hypothesis by Singer and colleagues, was not pursued in detail or tested.

Study 2 is also cross-sectional in nature, and so suffers from the same limitations. Nevertheless, both reciprocal hypotheses were considered and empirically supported. Furthermore, a new construct, namely sense of meaning, was introduced. The inclusion of sense of meaning allowed for a novel approach to be conceptualized, wherein sense of meaning for specific events is thought to bridge between the processing of the past and

preparedness for the present and future. In this model, it is the amount of meaningful insight that is gained from prior experience, and not the memories themselves, that is directly associated with the generation of positive feelings, which, in turn, are linked to the importance and self-efficacy of current relevant goals.

The present Study 2 was conducted before that of Sutin and Robins (2008). In their study, sense of meaning was not considered. It was also not noted whether memories supported or interfered with personal strivings. Sutin and Robins (2008) used a more general global approach. They assessed personal strivings in an open-ended manner (each participant wrote their own). Participants then made ratings for each of their personal strivings, which the researchers used to derive overall indices across strivings of degree of commitment, progress, and conflict. The researchers then used these 3 scores for each participant in analyses of their association with the affect participants reported for their memories. In sum, the research of Sutin and Robins (2008) has the quality of being longitudinal, but their research goals differed substantially from those of the present Study 2, specifically in that the study was not concerned with sense of meaning for events.

Another important contribution of the current study is the study of meaning in a population of undergraduate students. It is noteworthy that the age range in all three studies is somewhat atypical for an undergraduate population ranging from 18 to 63 years old (Study 1), 17 to 40 years old (Study 2), and 17 to 60 years (Study 3). Concordia University is known for its versatility in terms of programs offered and the diversity of the student body. For example, Concordia University offers many opportunities for part-

time study, and as a result attracts students of different ages, including older students with families and jobs. This heterogeneity is reflected in the range of participants' ages in the current research. Nevertheless, the majority of participants were younger than 30 years old (95.9%, 89.3%, 86.7%) in Studies 1, 2, and, 3 respectively, and as such, these studies are more comparable with other studies conducted with university students, rather than studies of the general population.

Although sense of meaning has been studied in some normal populations of adolescents (McLean & Thorne, 2003) and young adults, the bulk of studies concerned with meaning making have considered the significance of a sense of meaning in populations characterized by the experience of some unusual and traumatic event. This overrepresentation of meaning making in the context of trauma may impress the idea that meaning making is only common in extreme situations, and that most people do not undergo traumatic events. In the current research it is shown that both of these impressions are inaccurate. It is shown that a large percentage of a sample of college students, including young and older adults, experience serious, traumatic, and negative memorable events, and that most individuals extract meaning from a large variety of self-defining events. This sense of meaning is associated with strong positive feelings and is related to current goals. These findings are important as they broaden the degree to which the discussion on gaining a sense of meaning may be generalized to the general population.

Study 3 further expanded and broadened the context of the common understanding of sense of meaning both in terms of time and in scope. The study is novel

in its inclusion of the construct of sense of meaning in conjunction with other processes that so far have been studied in isolation. Specifically, the relation between having a sense of meaning, and other cognitive processes such as the experience of intrusive thoughts are studied in relation to a traumatic event. This is a first study to have measured meaning and intrusions concurrently and over time in relation to the same event.

Another objective of Study 3 was to broaden the scope of our understanding of having a sense of meaning in relation to personality factors. As such, the thesis is novel in linking a number of related concepts that were previously studied only in isolation, and placing them in a broader perspective in terms of time (longitudinal design) and individual differences (personality factors). In so doing, the thesis allowed for the conceptualization of sense of meaning over and beyond prior findings. It explored how sense of meaning converges and departs from other established coping responses such as intrusive thinking, as well as how it may be impacted by individual differences in stable personality factors.

Limitations and Future Directions

A potential limitation of the current research is that in all three studies, participants were high functioning undergraduate students. This limitation may be particularly relevant given that the focus is on self-defining memories, and often negative or traumatic events. One may question the extent to which mostly young and highly functioning individuals have been exposed to severe trauma or life-changing events. A lack of exposure to real-life stressors would call into question whether results can be generalized to a wider population. However, studies have shown that the prevalence, content, and

severity of traumatic events in the college population are comparable to other populations (Oswalt & Silberg, 1995; Smyth et al., 2008; Wood & M. Conway, 2006). Smyth and colleagues (2008), in a large study of 6053 undergraduate students, found that prevalence rates of adverse events ranged between 55.8% to 84.5%. In a subset of 97 students, 11% met criteria for PTSD and an additional 8% suffered from subclinical PTSD symptoms. These results were comparable to findings in other samples. The authors concluded that the inclusion of undergraduate students in the study of life events is a useful and reasonable strategy. In a study of autobiographical memories, Wood and M. Conway (2006) coded self-defining events for content and found that the themes in the memories reported were quite universal and common, having to do with physical security, achievement, emotional closeness, family, and friends. They concluded that such themes are universal and similar to major themes in the lives of the general population. In the current study, distribution of themes was similar to that found by Wood and M. Conway (2006).

Another limitation of the current study is that sense of meaning was measured through a closed-ended four item self-report questionnaire. It can be argued that meaning making and having a sense of meaning can manifest at multiple levels of conscientiousness, such as dreams and fantasies, which are not accessible through a self-report or other face-valid measures. It can also be argued that the full scope and content of meaning cannot be adequately expressed through a closed ended format. While these limitations are valid, and researchers in future studies may chose to modify or expand the scope of the sense of meaning measure, the selected measure of sense of meaning served

the objectives of the current research well and did not compromise the validity of the obtained results for a number of reasons.

With regard to the possibility that meaning is better represented by indirect measures, Wood and M. Conway (2006) found only weak associations between coded spontaneous references to meaning and other measures of meaning making such as the impact of the event. They showed that subjective ratings of the impact of an event are a good marker of meaning making, and capture well individuals' efforts at making sense of their experiences. Differences between spontaneous references to meaning and responses to closed-ended questionnaires may be due to differences in self-conscious awareness (Trapnell & Campbell, 1999) or individual differences in other personality factors, which may affect the tendency to self-disclose (Carpenter & Freese, 1979).

Furthermore, the strong correlations obtained in the present study between sense of meaning and positive affect, which are consistent with the literature, support the assumption that these measures of sense of meaning have high validity in terms of capturing individuals' experiences. Although open-ended questionnaires and narrative coding lend themselves well to content analysis and are especially useful when the goal of the study is to understand the qualities and nature of meaning making (e.g., Thorne et al., 2004), such methods are less well suited for studies that measure a number of constructs (e.g. goals, personality, affect) and therefore require briefer measures. In the present study, the goal was to understand how sense of meaning fits within the broader context of individuals' feelings, thought processes and personality.

A number of closed-ended meaning making questionnaires have been designed to assess purpose and meaning in life (Antonovsky, 1979; Crumbaugh & Maholick, 1963; Scheier et al., 2006). As mentioned previously, the major limitation of these questionnaires is that they measure overall purpose in life, whereas the current study was concerned with a sense of meaning associated with a specific self-defining memory. Such general questionnaires were used, however, in Study 1 to assess the individual's global purpose and satisfaction with life. For the purpose of measuring meaning for specific self-defining events the short and effective measure designed by Wood and M. Conway (2006) was chosen. To conclude, there are various ways in which sense of meaning has been measured, including open-ended interviews, coding of spontaneously generated narratives and closed-ended questionnaires. The short, face valid measure of sense of meaning, selected for the current program of research has been previously shown to have high content validity and significant correlations with relevant constructs such as positive affect, and thus was an optimal choice to address current objectives and goals.

An additional limitation of the current research is that directionality of the effects could not be conclusively determined. Both Study 1 and Study 2 were cross-sectional. In the Study 2, two alternative mediation pathways were tested. Based on the fit of the data and on prior theoretical models, results suggested that both directions of causality were plausible. Further investigation of these causal paths is necessary in order to deepen our understanding of the way in which memories serve as a guiding and driving force for current goals on one hand, and are being reconstrued in light of current goals on the other hand. It is likely that both processes work reciprocally to help individuals in the

formulation of a coherent sense of self. An ideal study design would follow individuals during a "real time" trauma, and assess sense of meaning, affect, and goals immediately after the trauma and at 6 months intervals for a number of years. In this way, causality may be easier to establish.

To address some of these concerns, a third short-term longitudinal study was designed. Study 3 assessed individuals' thoughts and feelings regarding a trauma that occurred more than a year prior to the study. A limitation of this type of design is that it is difficult to interpret trends and associations over time without measuring baseline levels of the processes of interest before the trauma occurred and during the first year after it occurred. This is especially relevant for the understanding of meaning making and with regard to intrusions and avoidance, for which much of the change in feelings and patterns of thoughts occur within the first months to a year after the trauma.

Unfortunately, retrospective studies that rely on the memory of participants have inherent limitations. The requirement in the current research that the memory be at least 1 year old was in order to ensure that individuals do not report trivial events just because these are fresh in their memories. One solution for this type of problem is to design longitudinal studies that follow individuals immediately after the traumatic event has occurred and for a prolonged period of time. The current research sets the stage for the design of such studies. Even with a relatively small sample and a relatively short longitudinal data set, significant and meaningful trends of change over time, such as decreases in intrusions and avoidance over time and associations between personality traits and sense of meaning and intrusions and avoidance, were detected. As such, these

results are encouraging and warrant the design of more comprehensive studies in the future.

Furthermore, the fact that personality did not appear to play a role in moderating the course of sense of meaning and intrusions over time may have been a result of the study design, specifically the fact that longitudinal data was collected over a few months rather than a few years, and the sample size was rather small. It is possible that differences in trajectories of change as a function of personality exist but could not be detected with the relatively small number of participants ($N = 47$) that completed three waves of data collection. In other words, it is possible that for an event which is older than a year, changes in thoughts and feelings happen more gradually over an extended period of time, and different trajectories for groups of people would be detectable over a longer period of time. Along the same lines, effects of personality on coping may be more pronounced immediately after the event and may play a less important role later on.

A categorization of personality traits that complements the Big Five scheme could also produce interesting results. For example, self-disclosure has been shown to vary as a factor of some personality traits, which are not captured by the Big Five factor structure (e.g., Pennebaker & Graybeal, 2001; Pratap, & Bhargava, 1982). Pennebaker and Graybeal (2001) found that self-disclosure was poorly correlated with traditional five-factor personality dimensions such as neuroticism, but that it did correlate well with other markers of personality such as real-world behaviors (e.g., alcohol use, grades in school) and health (Pennebaker & King, 1999). Similarly, it is possible that there are additional markers of personality, which have not been included in the current studies, such as real-

world behaviors, and aspects of mental health (e.g. depression, anxiety) that may account for overall levels and changes over time in sense of meaning and intrusions and avoidance.

To summarize, the current program of study integrated a number of important constructs that have been thus far studied in isolation from one another. Having a sense of meaning for autobiographical events was studied in relation to current emotions and current orientation toward important goals. It was also studied in relation to intrusions and avoidance, which often overlap with the process of meaning making, in the process of coping with trauma.

An analysis of sense of meaning in relation to intrusions and avoidance revealed that these two processes are indeed related and tend to co-occur as evidenced by significant correlations among the two. Nevertheless, different personality factors were associated with having a sense of meaning (extraversion, and conscientiousness), versus experiencing intrusions and avoidant symptoms (neuroticism). These important results suggest that further studies of sense of meaning in the context of broader aspects of the self such as personality, memories, and goals are needed. Future studies may use additional tools for the measurement of meaning, and may chose to add additional markers of personality that are not captured by the five-factor model of personality.

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Appendices

Appendix A1
Self –Defining Memory for Studies 1 and 3

In this questionnaire, you will be asked to write about a memory that helps you define who you are (i.e., a self-defining memory). This type of memory…

1. is at least one year old.

2. is a memory from your life that you remember very clearly and that still feels important to you even as you think about it now.

3. is a memory that helps you to understand who you are as an individual and might be a memory you would tell someone else if you wanted that person to understand you in a basic way.

4. It may be a memory that is **positive or negative, or both,** in how it makes you feel now. The only important aspect is that it leads to strong feelings.

5. It is a memory that you have thought about many times. It should be familiar to you like a picture you have studied or a song (happy or sad) you have learned by heart.

   This is a self-defining memory. It is something that you would describe to another person when you want that person to get to know you better. That is, you really want the other person to get to know the "Real You." The memory is of some significant event or experience in your life, one that has had a major impact on you as a person. This memory is of something that has influenced who you have become as a person.

Please turn to the next page for more on your self-defining memory.

Now we would like you to take a few moments to think about this event as if you could “travel back in time” to when it happened. Please try and “see” the entire scene. Try to notice what the setting was like, who are the people that are present and what they are saying or doing. Also pay attention to your actions and your feelings.

After you have taken the time to see and feel the event fully in your mind, please provide a brief description of the event using the lines below.

Appendix A2

Self-Defining Memories for Study 2

In this study, you will be asked to write about memories that help you define who you are (i.e., a self-defining memory).

A self-defining memory has the following attributes:

1 It is at least one year old.

2 It is a memory from your life that you remember very clearly and that still feels important to you even as you think about it now.

3 It is a memory that helps you to understand who you are as an individual and might be a memory you would tell someone else if you wanted that person to understand you in a basic way.

4 It may be a memory that is **positive or negative, or both,** in how it makes you feel now. The only important aspect is that it leads to strong feelings.

5 It is a memory that you have thought about many times. It should be familiar to you like a picture you have studied or a song (happy or sad) you have learned by heart.

To understand what a self-defining memory is, imagine you are talking to somebody and your goal in the conversation is to describe who you are. The person you are talking to may be someone you have met recently or it may be someone you have known for a long time and want him or her to get to know you better. You are very committed to helping the other get to know the "Real You"… In the course of the conversation, you describe a memory of some significant event or experience from your past, one that has had a major impact on you as a person. This memory is of something that has influenced who you have become as a person. It is precisely this memory that constitutes a self-defining memory.

In the following pages, you are provided space to write three self-defining memories. After you finish describing each memory, please complete the questionnaires related to that memory before moving on to the next memory.

Appendix B

Sense of Meaning

For the memory that you just described, please tell us how true the following statements are from *not at all* (1) to *very much* (7).

This past event has had a big impact on me.

1	2	3	4	5	6	7
Not at all	A little bit	Somewhat		Quite a bit	A lot	Very much

I feel that I have grown as a person since experiencing this past event.

1	2	3	4	5	6	7
Not at all	A little bit	Somewhat		Quite a bit	A lot	Very much

Having had this experience, I have more insight into who I am and what is important to me.

1	2	3	4	5	6	7
Not at all	A little bit	Somewhat		Quite a bit	A lot	Very much

Even when I think of the event now, I think about how it has affected me.

1	2	3	4	5	6	7
Not at all	A little bit	Somewhat		Quite a bit	A lot	Very much

Appendix C

PANAS

In this questionnaire we would like you to focus on the memory that you just described, and indicate to what extent the following list of emotions and feelings describe how **you currently feel** when thinking about that event. Please circle the number that best represents your response

1 **Very slightly or not at all**	**2** **A little**	**3** **Moderately**	**4** **Quite a bit**	**5** **Extremely**

1.	Interested……	1	2	3	4	5
2.	Distressed……....	1	2	3	4	5
3.	Excited……...	1	2	3	4	5
4.	Upset……..	1	2	3	4	5
5.	Strong…….	1	2	3	4	5
6.	Guilty…….	1	2	3	4	5
7.	Scared……	1	2	3	4	5
8.	Hostile……	1	2	3	4	5
9.	Enthusiastic……..	1	2	3	4	5
10.	Proud…….	1	2	3	4	5
11.	Irritable……..	1	2	3	4	5
12.	Alert……...	1	2	3	4	5
13.	Ashamed……	1	2	3	4	5
14.	Inspired……...	1	2	3	4	5
15.	Nervous……...	1	2	3	4	5
16.	Determined…….	1	2	3	4	5
17.	Attentive…….	1	2	3	4	5
18.	Jittery……..	1	2	3	4	5
19.	Active…….	1	2	3	4	5
20.	Afraid……...	1	2	3	4	5

Appendix D

Satisfaction with Life Scale

SWLS

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by circling the appropriate number for each statement. Please be open and honest in your responding. The 7-point scale is:

1	2	3	4	5	6	7
strongly disagree	disagree	slightly disagree	neither agree nor disagree	slightly agree	agree	strongly agree

In most ways my life is close to my ideal.

1 2 3 4 5 6 7

The conditions of my life are excellent.

1 2 3 4 5 6 7

I am satisfied with my life.

1 2 3 4 5 6 7

So far I have gotten the important things I want in life.

1 2 3 4 5 6 7

If I could live my life over, I would change almost nothing.

1 2 3 4 5 6 7

Appendix E

Purpose in Life - LES

Please answer the following questions about yourself by indicating the extent of your agreement using the following scale:

	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
There is not enough purpose in my life	1	2	3	4	5
To me the things I do are all worthwhile	1	2	3	4	5
I value my activities a lot	1	2	3	4	5
Most of what I do seems trivial and unimportant	1	2	3	4	5
I don't care very much about the things I do	1	2	3	4	5
I have lots of reasons for living	1	2	3	4	5
I understand my life's meaning	1	2	3	4	5
My life has a clear sense of purpose	1	2	3	4	5
I have a good sense of what makes my life meaningful	1	2	3	4	5
My life has no clear purpose	1	2	3	4	5
I have discovered a satisfying life purpose	1	2	3	4	5

Appendix F

Life Goals – Importance

- MAG 1–

In this questionnaire, you are asked to indicate your life goals. A life goal is about how you would like your future to be. Your life goals guide the "big" choices and actions in your life. They may not be on your mind every moment, but they might come to mind on a long walk, in sharing ideas with a close friend, or when writing in your personal journal. Life goals can be concrete and specific, or abstract and general. They may be easy or difficult to achieve. Above all, they give meaning and direction to both your daily actions and your thoughts about the future.

Please circle a number on each scale to indicate **how much** each of the following is a **life goal for you**. Use the following scale:

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

My life goal is…

I would like to be a leader and sway others to my opinions.

1	2	3	4	5

I would like to make an important contribution or lasting and notable accomplishment.

1	2	3	4	5

I would like to gain other people's attention and be watched and marveled by others.

1	2	3	4	5

I would like to have a life of amusement filled with sports, parties, dances, and films.

1	2	3	4	5

I would like to have good and loving friendships and relationships.

1	2	3	4	5

I would like to help and take care of others, showing gentleness whenever I can.

1	2	3	4	5

I would like to dedicate my life to the search for truth by the application of reason.

1	2	3	4	5

I would like to honor the needs and wishes of my mother and father, or other important individuals in my life.

1	2	3	4	5

I would like to leave the common path and blaze a new path for myself.

1	2	3	4	5

I would like to live as sensual and erotic a life as possible.

1	2	3	4	5

I would like to be able to accept my fate in life and the things that happen to me, and not quarrel with destiny.

1	2	3	4	5

I would like to be a forceful person that lets no one get in my way or stop me from doing what I want.

1	2	3	4	5

I would like to avoid any kind of physical pain or danger.

1	2	3	4	5

I would like to see my life orderly, organized, and balanced.

1	2	3	4	5

I would like to avoid failure and not attempt things I don’t do well.

1	2	3	4	5

Appendix G

Life Goals – Self-Efficacy

MAG 2

Please now indicate how able you feel you are in reaching each goal. In other words, think of how **confident you are in your abilities** and capacity to attain **each goal** successfully. Please use the following scale:

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

I have the ability …

…to be a leader and sway others to my opinions.

1	2	3	4	5

… to make an important contribution or lasting and notable accomplishment.

1	2	3	4	5

… to gain other people's attention and be watched and marveled by others.

1	2	3	4	5

… to have a life of amusement filled with sports, parties, dances, and films.

1	2	3	4	5

… to have good and loving friendships and relationships.

1	2	3	4	5

… to help and take care of others, showing gentleness whenever I can.

1	2	3	4	5

… to dedicate my life to the search for truth by the application of reason.

1	2	3	4	5

… to honor the needs and wishes of my mother and father, or other important individuals in my life.

1	2	3	4	5

… to leave the common path and blaze a new path for myself.

1	2	3	4	5

… to live as sensual and erotic a life as possible.

1	2	3	4	5

…to be able to accept my fate in life and the things that happen to me, and not quarrel with destiny.

1	2	3	4	5

…to be a forceful person that lets no one get in my way or stop me from doing what I want.

1	2	3	4	5

… to avoid any kind of physical pain or danger.

1	2	3	4	5

… to see my life orderly, organized, and balanced.

1	2	3	4	5

… to avoid failure and not attempt things I don't do well.

1	2	3	4	5

Appendix H

Life Goals –Relevance

At this point, you are asked to think back to one of the questionnaires you completed at the booth in the library building downtown. At that time, you indicated from a list which goals you have, and you also may have added some of your own. Some of the goals on the questionnaire were:

- I would like to be a leader and sway others to my opinions
- I would like to have a life of amusement filled with sports, parties, dances, and films.
- I would like to avoid any kind of physical pain or danger.

Now, I would like you to indicate how the memory you just described is relevant to each of your goals. A memory that is relevant to a goal is a memory that involves themes, thoughts, behaviors or episodes that are related to a goal you might have.

You will again be presented the list of goals (including any that you added), and you will be asked to indicate whether the memory you just described supports or interferes with each goal.

A memory supports a goal if it makes you feel that the goal can be achieved or is realistic. A memory interferes with a goal if it makes you feel that the goal cannot be achieved.

Please indicate as relevant ***only those goals*** that are ***specifically*** related to this memory. For those goals that are irrelevant please indicate "Not relevant"

On the following page please check a mark in the appropriate column beside each goal, according to whether the memory supports, interferes, or is not related to the memory you just described.

Please indicate whether the memory you just described supports, interferes, or is unrelated to the following goals.

	My memory ***supports*** the goal…	My memory ***interferes*** with the goal…	My memory is ***not related*** to the goal…
I would like to be a leader and sway others to my opinions.			
I would like to make an important contribution or lasting and notable accomplishment.			
I would like to gain other people's attention and be watched and marveled by others.			
I would like to have a life of amusement filled with sports, parties, dances, and films.			
I would like to have good and loving friendships and relationships.			
I would like to help and take care of others, showing gentleness whenever I can.			
I would like to dedicate my life to the search for truth by the application of reason.			
I would like to honor the needs and wishes of my mother and father, or other important individuals in my life.			
I would like to leave the common path and blaze a new path for myself.			
I would like to live as sensual and erotic a life as possible.			
I would like to be able to accept my fate in life and the things that happen to me, and not quarrel with destiny.			
I would like to be a forceful person that lets no one get in my way or stop me from doing what I want.			
I would like to avoid any kind of physical pain or danger.			
I would like to see my life orderly, organized, and balanced.			
I would like to avoid failure and not attempt things I don't do well.			

Appendix I

Traumatic Event Questionnaire

SEQ – MM

In this questionnaire you are asked to think abut a stressful or traumatic life event that you have experienced personally. The traumatic or stressful event has the following attributes:

1. It is at least one year old.

2. It is an unusual and stressful situation in your life that you had to cope with.

3. It is an event that is tied to strong negative feelings even as you think of it now.

4. A traumatic event could, ***for example***, be related to one of the following:

    - Injury, illness accident, or assault to you or close others, or death of a close other
    - Family break up, separation or loss of close others
    - Violence, harassment or racism against yourself or close others
    - Any other negative events could also qualify as traumatic if they are tied to strong negative feelings.

Now we would like you to take a few moments and think about this stressful event as if you could "travel back in time" to when it happened. Please try and "see" in your mind's eye the entire scene. Try to notice what the setting is like, who are the people present and what are they saying or doing. Also pay attention to your actions and your feelings. Try to imagine and visualize the event, and let yourself relive the experience.

After you have taken the time to see and feel the event fully in your own mind, please provide a brief description of the event in the lines below.

Please indicate how long ago this event happened.

_____ and _____
years months

Appendix J

Impact of Events Scale

IES

The following is a list of reactions people sometimes have a after stressful life events. Please read each item, and then indicate how much you have *recently* (during the last month or so) experienced each of these reactions **for the event that you described** above.

1. I thought about it when I didn't mean to.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

2. I avoided letting myself get upset when I thought about it or was reminded of it.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

3. I tried to remove it from memory.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

4. I had trouble falling asleep or staying asleep, because of pictures about it that came into my mind.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

5. I had waves of strong feelings about it.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

6. I had dreams about it.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

7. I stayed away from reminders of it.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

8. I felt as if it hadn't happened or it wasn't real.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

9. I tried not to talk about it.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

10. Pictures about it popped into my head.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

11. Other things kept making me think about it.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

13. I tried not to think about it.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

14. Any reminder brought back feelings about it.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

15. My feelings about it were kind of numb.

1	2	3	4	5
Not at all	**A little bit**	**Somewhat**	**Quite**	**Very Much**

Appendix K1

Sample Consent Form

for Booth and Class Recruitment Studies 1, 2, and 3

Assessment Project Consent Form

Dr. Michael Conway and his research associates from the Psychology Department at Concordia University are conducting a project involving a series of questionnaires. The information is to be used to develop research measures and to identify individuals who might be eligible to participate in paid, future research studies.

In exchange for completing the packet of questionnaires, you will become eligible for a drawing that will award one $150 prize, one $100 prize and two $50 prizes. Furthermore, you will receive one gift card worth 2.50$ redeemable at participating Tim Hortons.

The main requirement is that you complete all the questionnaires in the packet.

Please note that this project involves the following:

(1) Eligibility for the drawing and gift card is established when the fully completed packet is returned to the project personnel.

(2) All questionnaires must be completed at this table. For most people, this will require approximately 15 minutes.

(3) All information from this project is confidential. Your identity is protected by a numerical coding system.

(4) You are free to examine the packet of questionnaires before signing this form. You are also free to withdraw from the study at any time. However, eligibility for prizes and gift cards is based on full completion of all questionnaires.

(5) Project staff members will be able to answer questions you may have about completing the questionnaires. However, no specific explanation for the purpose of a particular questionnaire will be provided.

(6) Any questions or concerns about the project can be directed to Dr. Michael Conway (514-848-2424 ext. 7541; Michael.Conway@concordia.ca) at the Psychology Department. In addition, he may contact you about your responses or about participation in a future study if you provide information which will allow telephone contact.

(7) It is important that you respond honestly to all questionnaire items.

"I have read the above and agree to participate in the Winter 2010 Assessment Project conducted by Dr. Michael Conway."

_____ _____

Participant's Signature Date

Any questions about ethics and this research? Contact Kyla Wiscombe, Research Ethics & Compliance Assistant, at 514-848-2424 ex. 2425, kwiscomb@alcor.concordia.ca

Appendix K2

Sample Consent Form For in-Laboratory Sessions for Studies 2, and 3

Consent Form

I agree to participate in research being conducted by Dr. Michael Conway, and Roxana Buchsbaum, of the Psychology Department, Concordia University.
This study has been approved by the Concordia research ethics committee. Dr. Michael Conway can be reached at phone # 514 – 848 2424 ext. 7541 or by email, Michael.Conway@Concordia.ca.
Roxana Buchsbaum can be reached at 514 – 848 2424 ext. 7545 or by email, r_buchsb@alcor.concordia.ca.

- The study involves answering questionnaires about events in your past and your future goals.
- The study takes approximately 50 minutes.
- You will be remunerated 10$ for your participation.
- You are free to withdraw your consent and to discontinue participation at any time and will not be penalized for discontinuing.
- Your responses are confidential (i.e., this sheet will be kept separate from your questionnaire).
- The data from this research might be published in aggregate form (i.e. averaged over many participants)

Name (please print): _____ Signature: _____

Date: _____

If you have questions about your rights as a research participant, please contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848-2424 x7481 or by email at adela.reid@concordia.ca."