

THE MOTIVATIONAL PRIMACY OF ENVIRONMENTAL COHERENCE:
SELF-DEROGATION AND THE EXPERIENCE OF MEANING IN LIFE

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SELF-DEROGATION AND THE EXPERIENCE OF MEANING IN LIFE

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For my parents, for everything.

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	ii
LIST OF ILLUSTRATIONS.....	iv
ABSTRACT.....	v
Chapter	
1. INTRODUCTION.....	1
2. METHODS.....	11
3. RESULTS.....	18
4. DISCUSSION.....	37
6. REFERENCES.....	48
Illustrations	
1. TABLE 1.....	65
2. TABLE 2.....	66
3. TABLE 3.....	67
4. TABLE 4.....	68
5. TABLE 5.....	69
6. TABLE 6.....	70
7. FIGURE CAPTIONS.....	71
8. FIGURE 1.....	72
9. FIGURE 2.....	73
VITA.....	74

LIST OF ILLUSTRATIONS

TABLES

1. Correlations among Variables, Full Sample.....	65
2. Correlations between Writing Ratings and Other Measures, By Condition.....	66
3. Means and Standard Deviations for Self-esteem and Deservingness of Bad Outcomes by Order and Condition.....	67
4. Correlations among Variables, By Condition.....	68
5. Mean Differences by Depression Category.....	69
6. Correlations with Meaning in Life and Coherence by Depression Category.....	70

FIGURES

1. Relationship between Self-esteem and Coherence by Condition in Self-esteem First Order.....	71
2. Adjusted Meaning in Life Means by Condition and Depression Category.....	72

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ABSTRACT

Although the human tendency to make self-serving attributions is well-documented, not all behaviors and cognitions are primarily self-serving. Victims blame themselves for uncontrollable circumstances and individuals derogate themselves to maintain a sense that the world is just. Callan and colleagues (2014) found that random negative outcomes result in lowered self-esteem, increased perceptions that one deserves bad outcomes, and spurred self-detrimental behaviors. How might these self-defeating processes be explained? I examined whether such processes might serve to maintain a broader sense of coherence that allows the experience of life as meaningful. Participants ($N = 1199$) wrote about past bad or good breaks, or daily activities, and then rated self-esteem, deservingness of bad outcomes, and meaning in life and coherence. I found no support for the prediction that self-esteem would negatively relate (or deservingness of bad outcome beliefs would positively relate) to meaning in life following reminders of bad breaks. Some evidence emerged suggesting that self-esteem was less strongly related to coherence in the good breaks condition compared to controls. Exploratory analyses examined the role of depression in processes involved in the experience of life as meaningful. The manipulation had stronger effects on meaning in life in participants experiencing depressive symptoms compared to those who were not. Furthermore, self-esteem was more strongly related to meaning in life in individuals experiencing some depression compared to the non-depressed participants, especially in the bad breaks

condition. Implications for this work regarding the study of meaning in life and future directions regarding this research question are discussed.

The Motivational Primacy of Environmental Coherence:
Self-derogation and the Experience of Meaning in Life

Humans have a propensity to perceive themselves in a favorable, and even an overly favorable, manner, a tendency termed self-serving bias (Heider, 1958; Miller & Ross, 1975). Such a bias in favor of the self seems to be a beneficial process as it is associated with a number of positive and adaptive outcomes (e.g., Taylor & Brown, 1988). Yet, not all attributions are self-serving. The phenomenon of self-blame (i.e., attributing negative outcomes to the self) among victims of traumas is as pervasive as it is perplexing. Self-blame has been noted in victims of crimes (Bard & Sangrey, 1979) including sexual assault (Abbey, 1987; Burgess & Holmstrom, 1974; Janoff-Bulman, 1979; Medea & Thompson, 1974) and domestic violence (Frieze, 1979; Miller & Porter, 1983), as well as in individuals injured in accidents such as car crashes (Davis, Lehman, Silver, Wortman, & Ellard, 1996), and even those stricken with diseases such as cancer (Abrams & Finesinger, 1953; Bard & Dyk, 1956; Mechanic, 1977; Taylor, Lichman, & Wood, 1984).

Self-blame follows milder negative outcomes too. Even when such outcomes are a product of chance, people move to devalue themselves (Apsler & Friedman, 1975; Rubin & Peplau, 1973). For example, individuals actively reconstruct the past and engage in selective recall to emphasize personal shortcomings to make chance negative outcomes seem fairer (Callan, Kay, Davidenko, & Ellard, 2009). Self-derogation following bad breaks extends to self-defeating *behaviors* as well (Comer & Laird, 1975; for review see Baumeister & Scher, 1988). For example, following a bad break people engage in self-handicapping in a subsequent task (Callan, Kay, & Dawtry, 2014). The

commonality of self-blame runs counter not only to self-serving motivations, but also, at times, to reality.

Faced with a potentially random negative life event, why would individuals blame the self? One possibility is that self-blame serves a competing motivation (Baumeister & Scher, 1988), one that supersedes the desire to view the self positively. I propose that maintaining a sense that life is meaningful could be this alternate, prioritized, motivation and that the self is derogated in the service to this overarching need. Essentially, a (potentially random) negative experience, presents a trade-off: A person can maintain the sense that he or she is good person in an apparently senseless world or, instead, derogate the self to maintain the world's essential coherence. Research on self-blame, Just World Beliefs, and System Justification supports the apparent appeal of the latter option. Research on these topics has not, however, explicitly traced the meaning-relevant aspects of this process. Before describing a study that does so, I briefly review the literature on the phenomena of self-blame, just world beliefs, and system justification. Then, I review the literature on meaning in life, highlighting emerging evidence on the role of objective coherence in this experience.

Self-Blame and Adaptive Coping

Not surprisingly, derogating the self in response to negative outcomes is associated with a number of detrimental outcomes such as depression (Frazier, 1990; Meyer & Taylor, 1986) and lowered self-esteem (Katz & Burt, 1988). However, some research suggests this tendency might, at times, be linked to positive adaptational outcomes in dealing with a broad range of traumatic events (Affleck, McGrade, Allen, & McQueeney, 1985; Janoff-Bulman, 1979; Janoff-Bulman & Lang-Gunn, 1988; Janoff-

Bulman & Wortman, 1977; Tennen, Affleck, Allen, McGrade, & Ratzan, 1984). Self-blame has been associated with *lowered* risk of PTSD and *less* posttraumatic symptomology (Startup, Makgekgenene, & Webster, 2007), and more successful coping (Janoff-Bulman & Wortman, 1977; Chodoff, Friedman, & Hamburg, 1964). Furthermore, some studies demonstrate a relationship between self-blame and higher self-esteem (Janoff-Bulman, 1982) and lower depression (Peterson, Schwartz, & Seligman, 1981).

These links between self-derogation and positive functioning seem to be rooted in the ability of self-blaming cognitions to allow victims to retain a sense of personal control (Janoff-Bulman, 1985; Langer, 1975) and maintain the notion that the world is predictable, fair, just, and meaningful (Michela & Wood, 1986). For example, among women in abusive relationships, perceived control was related to fewer harmful psychological symptoms (O'Neill & Kerig, 2000). Furthermore, in a sample of mothers of infants treated for perinatal medical conditions, self-blame was associated with the belief that they exercised control over recovery and the prevention of recurrence and, through these control beliefs, self-blame led to emotional adaptation (Tennen et al., 1986). Although the research literature presents a mixed picture in terms of the association of self-blame with psychological adjustment (e.g., Glander & Compas, 1999; Hall, French, & Marteau, 2003; Janoff-Bulman, 1979), it appears that, at least sometimes, blaming the self is an adaptive way to reinstate functioning following a traumatic event. The idea that victims might benefit from blaming themselves for their "lot in life" is also supported by research on just world beliefs and system justification, as I review next.

Just World Beliefs & System Justification

Self-blame is related to broader cognitive phenomena including just world beliefs and system justification. Just World Theory specifies that individuals have a need to maintain the belief that the world is just, orderly, and nonrandom (e.g., Lerner, 1977; 1980). In such a world, people get what they deserve and deserve what they get. Research supporting this cognitive theory demonstrates that recipients of even explicitly random outcomes are judged by observers as deserving that outcome (Apsler & Friedman, 1975; Lerner, 1965). These beliefs translate to perceptions of one's personal experiences as well (Hafer & Bégue, 2005). Belief in a just world is associated with internal, rather than external, attributions for personal negative outcomes (Hafer & Correy, 1999), and to the perception of one's own negative outcomes as less unfair compared to those with weak just world beliefs (Hafer & Olson, 1998). Behaviorally, participants expecting to subsequently experience an unpleasant situation voluntarily exposed themselves to greater unpleasantness in an immediate task compared to those expecting to experience a pleasant task or those with no knowledge about the task to follow (Walster, Aronson, Brown, 1966). Mirroring the tendency for individuals to devalue themselves to justify negative experiences (Comer & Laird, 1975; Janoff-Bulman, 1979; Jost & Burgess, 2000; Rubin & Peplau, 1973), in the face of good fortune, individuals self-enhance (Dion & Dion, 1987; Ellard & Bates, 1990)

At a broader, cultural level, system justification is the motivation to justify the status quo of societal institutions (Jost, Banaji, & Nosek, 2004). Evidence suggests that these cultural systems are justified, bolstered, and defended with the use of cognitive processes including stereotyping (Jost & Banaji, 1994; Kay & Jost, 2003) and rationalization (Kay, Jimenez, & Jost, 2002) or adherence to belief systems that allow for

inequality such as belief in a just world, Protestant work ethic, and political conservatism. Perplexingly, many disadvantaged people also engage in system justification despite the detrimental personal impact of retaining the status quo (Jost, Blount, Pfeffer, & Hunyady, 2003). Research has explored the effects of system justification for members of various groups. Rankin, Jost, & Wakslak (2009) found that system justification was positively related to well-being and other positive outcomes in low-income European Americans but that this relationship was mitigated, and at times, reversed for African Americans. Indeed, system justification beliefs are associated with decreased self-esteem and increased neuroticism and depression among African Americans (Jost & Burgess, 2000), and personal detriments associated with system justification are especially evident among those strongly identified with this disadvantaged group (O'Brien & Major, 2005).

Clearly, as with self-blame, just world beliefs and system justification can be contradictory to immediate self-serving motivations. However, these beliefs do, at times, seem to support *positive* functioning. Just world beliefs serve to buffer anger-inducing situations allowing the maintenance of self-esteem (Dalbert, 2002), enhancing positive affect and reducing negative affect (Jost & Hunyady, 2002), and supporting the need for autonomy (van Prooijen, 2009) and positive self-evaluations (Libow & Doty, 1979).

Why should victims of traumatic events blame themselves for random negative outcomes? Why would individuals who are unjustly treated maintain the sense that the world is just? And why would individuals who are unfairly limited by a social system nevertheless endorse that system? All three of these phenomena suggest that motivations to enhance and preserve the self can take a backseat to concerns about the world making sense. Individuals are motivated to believe that the world is characterized by structure,

predictability, order, and meaning, rather than by chaos (Dechesne, Janssen, & van Knippenberg, 2000; Epstein, 1991; Janoff-Bulman, 1989; Kay et al., 2002; Kruglanski & Webster, 1996; Landau et al., 2004; 2006). Callan and colleagues (2014) examined self-defeating cognitions and behaviors in the context of self-esteem and deservingness beliefs. Across a series of studies, they found that random negative outcomes lowered self-esteem and, in turn, spurred self-defeating beliefs and behaviors (Callan et al., 2014). They argued that the motivation to perceive the world as orderly (Kay et al., 2008) and characterized by predictable cause and effect relationships where people get what they deserve and vice versa (Lerner, 1980), prompts these effects. In other words, the need for coherence led to the derogation of the self. To the extent that these beliefs are essential for maintaining a sense of structure and coherence, I suggest that they also, crucially, support the sense that life is meaningful. Recent evidence on the topic of meaning in life has demonstrated that coherence is an important contributor to this vital aspect of well-being, as I now review.

Meaning in Life

Meaning in life is a central human motivation (Frankl, 1963/1984; Maslow, 1968; Williams, 2007). Protecting the sense of meaning in life is a valuable goal as this experience has a number of important adaptive benefits. Self-reports of meaning in life are associated with a broad array of health outcomes including superior self-reported health (Steger, Mann, Michels, & Cooper, 2009), decreased risk of heart disease (Kim, Sun, Park, Kubzansky, & Peterson, 2013), reduced rate of age-related cognitive decline and risk of Alzheimer's disease (Boyle, Buchman, Barnes, & Bennett, 2010), increased preventative health behaviors including mammograms, prostate exams, and cholesterol

checks, and shorter hospital stays (Kim, Strecher, & Ryff, 2014), and decreased mortality (Boyle, Barnes, Buchman, & Bennett, 2009; Krause, 2009). The benefits of meaning in life extend into the psychological domain as well, relating to lower incidence of psychological disorders (Mascaro & Rosen, 2005; Owens, Steger, Whitesell, & Herrerra, 2009; Steger & Kashdan, 2009), and decreased suicidal ideation (Heisel & Flett, 2004; Kleiman & Beaver, 2013). Those reporting that their lives are more meaningful are also rated by others as more socially appealing (Stillman, Lambert, Fincham, & Baumeister, 2011).

While it is clear that experiencing one's life as meaningful is beneficial, the essence of this experience is less well understood. Meaning in life is a phenomenon that has been described as ineffable (King, 2012), defying precise definition (Heintzelman & King, 2013). However, in recent years, scholars have honed in on the nature of this construct and have been able to define it, both conceptually and operationally, with some success. King and colleagues (2006) proposed that, "Lives may be experienced as meaningful when they are felt to have significance beyond the trivial or momentary, to have purpose, or to have a coherence that transcends chaos" (p. 180). This definition and others (e.g., Steger, 2012) emphasize three core features of meaning in life: significance, purpose, and coherence (Heintzelman & King, 2013). Significance, or mattering to others and creating a legacy that will outlast the self, and purpose, or goal-directed strivings, have been the primary focus of research on meaning in life. Recently, however, there has been a growing focus on coherence, or the degree to which experience is characterized as, essentially, making sense. As this aspect of meaning in life is central to the proposed study, I address it in some detail next.

Coherence and Meaning in Life

The feeling that experiences possess coherence or that they make sense is reflected in William James' (1983) discussion of the fringe of consciousness. He claimed that humans experienced a feeling of the "subjective rationality of experience," or a "rightness of the direction" of ones thoughts. This emergent feeling has been equated with the "feeling of meaning" (Mangan, 2000, 2001). Contemporary psychologists have also noted coherence as a central aspect of meaning in life, emphasizing the role of connections and expected associations in this experience (Baumeister, 1991; Heine, Proulx, & Vohs, 2006). Baumeister and Vohs (2002) proposed that a life is meaningful to the extent that it "makes sense" to the person living it, and it has been suggested that feelings of meaning emerge when stimuli are experienced as processing an underlying coherence (Hicks, Cicero, Trent, Burton, & King, 2010).

Focusing on this aspect of meaning or meaning in life is particularly fascinating because it is linked (perhaps more so than either purpose or significance) to the outside world. Indeed, to explain *why* meaning in life might be related to adaptive outcomes, Heintzelman & King (2014) developed the meaning-as-information perspective. They proposed that feelings of meaning, like other subjective feeling states (Schwarz & Clore, 1983; 1988), are functional to the extent that they provide the person with information regarding current circumstances. Specifically, they suggested that these feelings provide information about the degree to which the environment is making sense. From this perspective, when the world makes sense, life should feel more meaningful.

Recent empirical investigations provide evidence that meaning in life is, indeed, connected to environmental coherence. First, in two studies, participants were randomly

assigned to view 16 images of trees either arranged in a random order, or in repeating cycles according to their seasonal content (e.g., spring, summer, fall, winter, spring, etc.). In both studies, participants viewing the images in the patterned order rated their lives as more meaningful than did those in the random, control, condition and this effect held controlling for positive and negative mood (Heintzelman, Trent, & King, 2013).

Similarly, exposing participants to coherence via associative links in linguistic triads led to analogous results. Participants read a series of word triads from the Remote Associates Test (Mednick & Mednick, 1967). For half of the participants, these triads shared a fourth (unnoted) common associate that united the other three (e.g., falling, actor, dust; common associate, star). The remaining participants read the same words jumbled to form unrelated triads. Those who read the words arranged coherently rated their lives as more meaningful compared to those who read the words arranged randomly (Heintzelman et al., 2013). These results were replicated conceptually in another study in which participants who completed measures either in the morning or in the evening were primed (via a word find puzzle) with words either congruent (breakfast words in the morning; dinner words in the evening) or incongruent (dinner words in the morning; breakfast words in the evening) with the time of day. Participants exposed to these associations rated their lives as more meaningful compared to participants who completed the same task in the absence of associations (Heintzelman, Clark, Emge, & King, *in prep*).

Of course, meaning in life is most often considered in those times when circumstances might work to challenge this sense of meaning. Would objective coherence in even patently negative stimuli lead to higher meaning in life? A pattern

manipulation following the tree paradigm described earlier was used in a study using images from the International Affective Pictures System database (Lang, Bradley, Cuthbert, 1997). Participants were presented with 15 images, five for each of three negative emotions: disgust, sadness, and fear (Mikels et al., 2005). These pictures were presented either in a random sequence or in a cyclical patterned order based on their emotional content. Participants assigned to view the images in the patterned order rated their lives as more meaningful than those in the random condition (Heintzelman, Ward, & King, *in prep*).

Together this work suggests that environmental coherence plays an important role in the experience that one's life is meaningful, even when this structure is found in negative stimuli. When the world makes sense, life is felt to be more meaningful. Consider again, then, the person faced with a random negative life event. Is it preferable to maintain a sense that one is a good person (at all costs) or might it be preferable to maintain a sense that the world makes sense, and therefore to enjoy a sense of meaning in life?

The Potential Motivational Primacy of Meaning in Life

If coherence is an essential source of meaning in life, then one self-benefiting outcome of this seemingly self-detrimental process might be the maintenance or restoration of the sense that one's life is meaningful. The adaptive nature of experiencing one's life as meaningful suggests that perhaps it is a motivation for which other aspects of the self might be sacrificed. Cognitive self-derogation following negative events does seem to help people to cope with feelings of uncertainty (van den Bos, 2001). Furthermore, belief in a just world has been described as a positive illusion that serves to

encourage the perception of the world as orderly, predictable, and *meaningful* (Lipkus, Dalbert, & Siegler, 1996). Empirically, belief in a just world and system justification ideology are positively associated with meaning in life (Bègue & Bastounis, 2003; Ma & Smith, 1986; Rankin, Jost, & Wakslak, 2009), and violations of these beliefs are negatively related to life meaningfulness (r 's = -.23, -.36, Park, Edmondson, Fenster, & Blank, 2008).

Interestingly, these belief systems undergird another aspect of meaning in life: namely, purpose or goal pursuit. Just world beliefs are related to planning and investing in goals (Xie, Liu, & Gan, 2011) and confidence in achieving these goals (Sutton & Winnard, 2007), and serve an especially self-regulatory function among disadvantaged individuals in this regard (Laurin, Fitzsimons, & Kay, 2011). For example, individuals who have witnessed the suffering of an innocent victim (vs. a non-innocent victim) were more willing to accept a small, immediate reward over a larger, delayed reward (Callan, Shead, Olson, 2009). This finding might indicate that justice challenging events disrupt the degree to which individuals believe that the world is predictable (a notion required to invest in the increase of a delayed pay-out). It might be, then, that self-derogation in the context of negative personal treatment might sustain the sense that one's life is, broadly, meaningful.

Overview of Current Study

The current study aims to test the notion that meaning in life might be related to self-defeating outcomes following a bad break. Specifically, participants wrote about a time in the past that they experienced either bad breaks, good breaks, or a neutral topic. Then, participants rated self-esteem, deservingness of bad outcomes, and meaning in life.

I expect that the extent to which self-esteem tracks the valence of the writing condition (is low in the bad breaks writing condition, or high in the good breaks writing condition) will be related to meaning in life. I expect condition to moderate the relationships between both self-esteem and deservingness of bad outcomes and meaning in life. Specifically, whereas in the good breaks and control conditions, self-esteem would be positively related to meaning in life, I predicted that in the bad breaks condition, self-esteem will be *negatively* related to meaning in life. That is, lowering self-esteem in response to the bad breaks manipulations should lead to higher levels of meaning in life. Additionally, I predict similar effects for deservingness of bad outcomes such that high deservingness of bad outcomes will *positively* predict meaning in life in the bad breaks writing condition, whereas it will negatively predict meaning in life in the good breaks and neutral conditions.

Method

Participants

Twelve-hundred and twenty one participants were recruited from Amazon's Mechanical Turk (MTurk) to complete study materials online and were paid \$0.50. MTurk is a crowdsourcing service that allows for the quick and easy recruitment of participants who typically provide quality data (Buhrmester, Kwang, & Gosling, 2011). I screened for duplicate IP addresses and deleted 22 cases in which the same IP address was used (Chandler, Mueller, & Paolacci, 2014). This deletion left a working sample size of 1199 participants (692 women, 500 men, 7 not reporting gender) included in analyses. Participants ranged in age from 18 to 77, $M = 35.34$, $SD = 12.49$, and represented the following ethnicities: 77.6% white/Caucasian, 8.8% black/African

American, 5.7% Asian, 5% Hispanic, and 2.9% other or not reporting). A majority of participants had completed some college (34.9%) or earned a Bachelor's degree (38.9%) while 2.1% reported their education level to be completing some high school/G.E.D., 8.9% reported completing high school, 12.2% completing a Master's degree, 2.4% completing a Doctoral degree, and .6% not reporting. Finally, most participants, 31.2% of the sample reported their estimated household income to be in the \$40,000-\$79,999 range, with 10.6% earning <\$10,000, 16.4% \$10,000-\$24,999, 21.6% \$25,000-39,999, 15.8% \$80,000-\$149,000, 3.7% >\$150,000, and .7% not reporting.

Materials and Procedure

Premeasures. Participants first completed a series of premeasures. The Personal Need for Structure scale (Neuberg & Newsom, 1993; Thompson, Naccarato, Parker, & Moskowitz, 2001) was used to assess participants' desire for simple structure in their lives. This scale contains 12 items including "It upsets me to go into a situation without knowing what I can expect from it" and "I enjoy having a clear and structured mode of life." These items were rated on a scale from 1 (*disagree strongly*) to 7 (*agree strongly*), $\alpha = .87$, $M = 4.60$, $SD = 0.94$.

Next, participants completed the Protestant Work Ethic Scale (Mirels & Garrett, 1971). This scale typically consists of 19 items. In this study, the six items that demonstrated the strongest factor loadings in a previous data set, including "Most people spend too much time in unprofitable amusements," "Our society would have fewer problems if people had less leisure time," "Most people who don't succeed in life are just plain lazy," "Anyone who is able and willing to work hard has a good chance of succeeding," "People who fail at a job have usually not tried hard enough," and "If one

works hard enough, he or she is likely to make a good life for himself or herself,” were administered. These items were rated from 1 (*disagree strongly*) to 7 (*agree strongly*), $\alpha = .78$, $M = 3.92$, $SD = 1.07$.

Then, participants rated the Single-item Self-Esteem measure (Robins, Hendin, & Trzesniewski, 2001), which consists of the item “I have high self-esteem” rated from 1 (*not very true of me*) to 7 (*very true of me*), $M = 4.74$, $SD = 1.67$. This measure relates strongly to the Rosenberg self-esteem measure (average $r = .75$) and shares similar relationships with physical and psychological variables as does this longer measure (Robins et al., 2001).

To assess depression, participants also completed the Patient Health Questionnaire-2 (Kroenke, Spitzer, & Williams, 2003). This scale consists of two items on which participants report the frequency of occurrence over the past two weeks: “Little interest or pleasure in doing things” and “Feeling down, depressed, or hopeless” on a scale including 1 (*not at all*), 2 (*several days*), 3 (*more than half the days*), and 4 (*nearly every day*), $r = .74$, $p < .001$, $M = 1.76$, $SD = 0.84$.

Lastly, to assess personality traits, participants completed the ten-item personality inventory (TIPI; Gosling, Rentfrow, & Swann, 2003). This scale contains two pairs of adjectives for each of five personality traits. Participants rated from 1 (*strongly disagree*) to 7 (*strongly agree*) how much they see themselves as each pair of adjectives for emotional stability: anxious, easily upset (reverse scored) and calm, emotionally stable, $r = .63$, $p < .001$, $M = 4.74$, $SD = 1.49$; extraversion: extraverted, enthusiastic and reserved, quiet (reverse scored), $r = .58$, $p < .001$, $M = 3.71$, $SD = 1.61$; openness to experience: open to new experiences, complex and conventional, uncreative (reverse scored), $r = .34$,

$p < .001$, $M = 4.99$, $SD = 1.24$; conscientiousness (dependable, self-disciplined and disorganized, careless (reverse scored), $r = .50$, $p < .001$, $M = 5.32$, $SD = 1.25$; and agreeableness (critical, quarrelsome (reverse scored) and sympathetic, warm, $r = .32$, $p < .001$, $M = 5.18$, $SD = 1.22$.

Writing Manipulation. Participants were then assigned randomly to one of three writing conditions. In two of these conditions, participants wrote about either four good breaks ($n = 388$) or four bad breaks ($n = 397$). Instructions (following Callan et al., 2014, Study 1b; adapted from Gaucher, Hafer, Kay, Davidenko, 2010) read as follows:

“For this part of the survey, we’re interested in people’s life experiences. Specifically, we’re currently interested in learning about the kinds of good (bad) breaks people experience in their lives. “Good breaks” (“Bad breaks”) are those sorts of positive (negative) experiences we have that we do not intend, expect, or plan to occur—they just happen to us. Please list below 4 good (bad) breaks that you have experienced in your life.”

A third, control condition ($n = 414$), wrote about other mundane memories with the following instructions:

“For this part of the survey, we’re interested in people’s life experiences. Specifically, we’re currently interested in learning about the kinds of activities people engage in. Below you will be asked to write about four recent times. Please list what you were doing at each of these times. Be as specific as you can with each response. If you can’t remember what you were doing at one of the times listed, just take your best guess.”

They then responded to the four following prompts: “What were you doing at this time last week?” “What were you doing at 2:00 yesterday afternoon?” “What were you doing at 10:00 AM this morning?” and “What were you doing right before you started this survey?”

Dependent Variables. Self-esteem was assessed using the ten-item Rosenberg Self-Esteem Scale (Rosenberg, 1965). Participants rated items such as “I feel that I have a number of good qualities,” and “I feel that I am a person of worth, at least on an equal basis with others,” from 1 (*strongly disagree*) to 7 (*strongly agree*), $\alpha = .93$, $M = 5.24$, $SD = 1.34$.

Participants also rated the six-item State Deservingness of Bad Outcomes Scale (Callan et al., 2014; Wood, Heimpel, Manwell, & Whittington, 2009). This scale includes items such as “Right now, I’d like to feel better about myself than I usually do, but deep down, I don’t feel I deserve to,” and “I feel unworthy of succeeding right now,” which were rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*), $\alpha = .91$, $M = 2.46$, $SD = 1.34$.

In addition, participants completed the ten-item Meaning in Life Questionnaire (Steger, Frazier, Oishi, & Kaler, 2006) using a 1 (*not at all*) to 7 (*very much*) rating scale. This scale consists of a presence of meaning subscale which is five items including, “I understand my life's meaning,” and “My life has a clear sense of purpose,” $\alpha = .94$, $M = 4.66$, $SD = 1.59$. The other five items of this scale make up the search for meaning subscale including, “I am looking for something that makes my life meaningful,” and “I am always looking to find my life's purpose,” $\alpha = .93$, $M = 4.34$, $SD = 1.62$.

The MLQ items were supplemented with five items drawn from other meaning in life measures that tap into the coherence aspect of meaning, specifically. These items were, “I have a sense that the parts of my life fit together in a unified pattern,” “I have a framework that allows me to understand or make sense of my life,” “Overall, my life experiences make sense,” “My personal existence is orderly and coherent,” and “I have a philosophy of life that gives my existence meaning.” These items were rated from 1 (*not at all*) to 7 (*very much*), $\alpha = .87$, $M = 4.67$, $SD = 1.35$.

Participants also rated positive and negative affect by rating the extent to which they felt a number of garden-variety mood descriptors “right now,” on a scale from 1 (*not at all*) to 7 (*very much*). Positive affect was assessed with “cheerful,” “enjoyment/fun,” “happy,” and “pleased,” $\alpha = .94$, $M = 4.24$, $SD = 1.57$, and the negative affect descriptors were “anxious,” “frustrated,” “nervous,” “worried,” “angry,” and “sad,” $\alpha = .92$, $M = 2.34$, $SD = 1.44$.

Order Manipulation. The dependent measures were administered in counterbalanced orders. Half of participants completed the meaning in life measures (MLQ and coherence items) prior to completing the self items (self-esteem and deservingness of bad outcomes) while the other half completed these measures in the reverse order (self measures preceding meaning measures). In addition, the order of the self measures was also counterbalanced. These two order manipulations resulted in four different order conditions: 1) meaning in life, self-esteem, deservingness of bad outcomes ($n = 305$), 2) meaning in life, deservingness of bad outcomes, self-esteem ($n = 313$), 3) self-esteem, deservingness of bad outcomes, meaning in life ($n = 272$), and 4) deservingness of bad outcomes, self-esteem, meaning in life ($n = 309$).

Manipulation Checks and Task Questions. Lastly, participants responded to several questions about the task. First, they rated the item “How much control do you feel you had in the events you wrote about?” from 1 (*no control at all; random*) to 7 (*complete control*), $M = 4.16$, $SD = 2.01$. In addition, they rated “How good or bad were the events you wrote about from 1 (*very bad*) to 7 (*very good*), $M = 4.39$, $SD = 2.01$.

To ensure participants completed the task in one sitting, given the MTurk sample, I also asked participants whether they “completed this hit in one sitting without engaging in other tasks at the same time?” to which 48 participants responded “no,” and whether they “switched back and forth between this task and other tasks?” to which 30 participants responded “yes.” Findings did not differ when excluding these individuals, so all participants were retained in all subsequent analyses.

Results

Table 1 presents the correlations among the variables for the full sample. All included variables, with the exception of personal need for structure, shared moderate to high intercorrelations.

Manipulation Checks

Two analyses of variance (ANOVAs) tested condition differences on valence and control ratings. There were significant valence differences by writing manipulation condition, $F(2, 1186) = 974.74$, $p < .001$. Post-hoc Bonferroni tests revealed that all three conditions differed from one another, p 's $< .001$. Specifically, the good breaks condition rated their writing as more positive ($M = 6.07$, $SD = 1.13$) than did those in the control condition ($M = 4.86$, $SD = 1.33$) and both of these groups rated the events they wrote

about as more positive compared to those in the bad breaks condition ($M = 2.26$, $SD = 1.23$).

There were also significant condition differences in the degree of control participants felt regarding the events they wrote about, $F(2, 1186) = 169.97$, $p < .001$. Again, post-hoc Bonferroni tests revealed differences across all three conditions, p 's $< .001$. Those in the control condition reported having more control over the events they wrote about ($M = 5.42$, $SD = 1.53$) than did those in either of the breaks conditions, providing support for the effectiveness of the manipulation. Those in the good breaks condition also reported higher control over these events ($M = 3.86$, $SD = 1.87$) than did those in the bad breaks condition ($M = 3.16$, $SD = 1.91$).

The difference between the good breaks and bad breaks conditions on the degree of perceived control among the events is interesting as participants in both conditions were asked to write about “breaks,” which ought to be random events over which one has little personal control. To test if this difference was due to the valence of the events, I conducted an additional ANOVA testing for differences between the good and bad breaks conditions including valence as a covariate. In this model, the difference between the good breaks and bad breaks condition on perceived control, $F(1, 779) = 24.44$, $p < .001$, was reduced to nonsignificance, $F(1, 777) = 2.35$, $p = .13$. A Sobel's test with 2,000 resamplings (Preacher & Hayes, 2004) confirmed that valence fully mediated the effect of breaks condition on perceived control, $z = 5.01$, $p < .001$. The differences in perceived control between the two breaks conditions can be accounted for by differences in valence, demonstrating a potential tendency towards self-serving bias with individuals attributing more personal control to good breaks and less personal control to bad breaks.

Table 2 shows the correlations between perceived control and valence and the other measures by condition. Ratings of beliefs about the self and the world were more strongly related to the control and valence ratings in the control condition compared to the good breaks and bad breaks writing conditions.

Testing Condition Equivalence on Premeasures

I next conducted a series of ANOVAs to confirm the equivalence of the conditions on the premeasures. There were no significant group differences on any of the premeasures by writing condition, F 's(2, 1191 to 1196) < 2.07, p 's > .13, or by order, F 's(3, 1191 to 1195) < 0.93, p 's > .43. Similarly, there were no order X writing condition interaction effects on need for structure, protestant work ethic, depression, emotional stability, extraversion, openness, or agreeableness, F 's(6, 1187) < 1.58, p 's > .15. However, and importantly, there were significant order X writing condition interactions predicting both the premeasure of self-esteem, $F(6, 1183) = 2.67, p = .01$, and conscientiousness, $F(6, 1187) = 2.37, p = .03$.

I probed each of these interaction effects by testing for simple effects of condition, first on premeasured self-esteem within each order. Descriptive and inferential statistics for these tests can be found in the top third of Table 3. As can be seen in the table, the effect of condition was significant in one order (in which participants would go on to complete the meaning in life assessment just prior to completing the measure of self-esteem). Follow-up t -tests revealed significant differences between the good breaks and control conditions, with those in the good breaks condition reporting significantly lower self-esteem on the premeasure compared to controls, $t(184) = 3.11, p = .002, d = 0.46$. In addition, in another order (among those who would go on to complete the

deservingness of bad outcomes measure just prior to self-esteem, and both of these measures before meaning in life), the condition effect was marginal. *T*-tests showed that, in this case, the good breaks condition reported significantly higher self-esteem than the bad breaks condition, $t(196) = 2.38, p = .02, d = 0.34$. This result is particularly concerning as it shows a pretest difference on self-esteem in the same direction as that predicted for post-test self-esteem. Indeed, although not significant, it is notable that, collapsing across orders, the good breaks condition reported higher pre-measured self-esteem, $M = 4.79, SD = 1.64$, than the bad breaks condition $M = 4.65, SD = 1.69, t(781) = 1.13, p = .26, d = 0.08$.

With regard to the pretest differences on conscientiousness, there were condition differences within one order (among participants who would go on to complete the self-esteem measure first and meaning in life last), $F(2, 269) = 3.31, p = .04$. Pairwise comparisons revealed that this effect was due to a difference between the control ($M = 5.08, SD = 1.38$) and the good breaks ($M = 5.56, SD = 1.11$) conditions, $t(178) = 2.60, p = .03, d = 0.39$. None of the other orders showed significant condition differences, F 's(3, 302 to 310) < 1.90, p 's > .15.

These differences on the self-esteem and conscientiousness premeasures indicate a failure of random assignment as these measures obviously preceded the manipulation. The probability of this random assignment failure is very low considering the large sample size employed in this study (Hsu, 1989). Nevertheless, participants across the conditions systematically differed from each other in important ways prior to the manipulation. As noted, the differences on the premeasure of self-esteem were in the very direction that was predicted on the post-measure of this variable. Given the high

correlation between the pre- and post-measures of self-esteem ($r = .73$), it seems that any condition effects would need to be quite powerful for the predicted relationships to emerge in the context of this prior group difference. These data, then, do not provide the most informative context in which to test the current hypotheses. Still, I examined the original predictions in subsequent analyses, including premeasured self-esteem as a covariate, and considering the prior difference in this premeasure in interpreting the results.

Testing a Replication of Previous Findings

I first sought to examine whether the condition differences in self-esteem and deservingness of bad outcomes that were found in previous work (Callan et al., 2014, Study 1b) would replicate in the current dataset. To do so, I tested for condition differences between only the good and bad breaks conditions (as a control condition was not included in the previous study), for those participants who completed the self-related measures prior to completing the meaning in life measures. This subset of the data most closely matched the original study.

I had predicted that participants in the good breaks condition would report higher self-esteem and lower deservingness of bad outcomes beliefs compared to those in the bad breaks condition and this difference did emerge on self-esteem for this subset of participants, $t(378) = 2.17, p = .03, d = 0.22$. However, controlling for the premeasure of self-esteem, $F(1,377) = 429.56, p < .001$, eliminated the effect of condition, $F(1, 377) = 0.09, p = .76$. Furthermore, there were no condition effects on self-esteem using repeated measures analyses nor did pretest self-esteem interact with condition to predict posttest self-esteem (interaction $\beta = .02, p = .63$).

Similarly, the predicted condition difference emerged for deservingness of bad outcomes, $t(361) = 1.99, p = .048, d = 0.21$. Yet as above, premeasured self-esteem, $F(1,377) = 245.82, p < .001$, completely explained the difference, $F(1, 377) = 0.15, p = .70$. Finally, deservingness of bad outcomes was regressed on (centered) pretest self-esteem, dummy coded condition (good breaks = 1, bad breaks = 0) and their interaction. Main effects were entered on the first step, $R^2 = .40, p < .001$, with pretest self-esteem contributing significantly, $\beta = -.69, p < .001$, and condition having no effect, $\beta = -.02, p = .63$. A marginally significant interaction emerged on the second step, $\Delta R^2 = .09, \beta = .09, p = .074$. Regressing posttest deservingness of bad outcomes on pretest self-esteem within each condition showed that although self-esteem strongly (and negatively) predicted deservingness of bad outcomes in general, this relationship was of higher magnitude in the bad breaks condition, $\beta = -.66$, than the good breaks condition, $\beta = -.56$, both p 's $< .001$; $z = 1.83, p = .067$. Individuals with high self-esteem felt they were particularly unlikely to deserve the bad breaks they'd just considered.

In sum, condition differences on both self-esteem and deservingness beliefs in this replication subsample were accounted for by pre-existing differences between the groups produced by the random assignment failure, rather than the manipulation itself. These data do not replicate the results of Callan and colleagues (2014). I hesitate, however, to deem this a failure to replicate, per se, as the problem might be due to the difference on the premeasure of self-esteem in the direction of the expected effect. It is possible that the manipulation was not powerful enough to move these self-variables from their already high levels in this good breaks condition. Alternately, because the previous work

did not include premeasures, it is possible that merely measuring these variables prior to the manipulation affected responses to the various conditions in some unexpected way.

Full Sample

Next, I moved to examine the potential effects of condition on self-esteem and deservingness of bad outcomes beliefs within the full sample. These analyses, then, included an additional control group not previously utilized by Callan and colleagues (2014). This condition was added to test whether the higher self-esteem and lower deservingness of bad outcome beliefs in the previous study's good breaks condition compared to the bad breaks condition were due to movement in the positive random events condition, the negative random events condition, or represent a difference in the degree to which they might have both moved in the same direction. In addition, the materials were presented in four different orders.

Self-Esteem and Deservingness of Bad Outcomes. There was a significant condition X order interaction, $F(6, 1184) = 2.82, p = .01$, for self-esteem in the full sample. Group means and inferential statistics probing this interaction are shown in the second section of Table 3. Interpreting these effects, however, would be inappropriate without accounting for the differences between the groups on the premeasure of self-esteem. It is notable that the patterns of differences in the various orders are similar to those reported for the pretest of self-esteem. Indeed, controlling for the premeasure of self-esteem $F(1, 1179) = 1328.76, p < .001$, eliminated the condition X order interaction, $F(6, 1179) = 1.58, p = .15$.

A significant condition X order interaction also emerged for deservingness of bad outcomes, $F(6, 1185) = 2.71, p = .013$. The relevant statistics are provided in the last

section of Table 3. Once again, controlling for the premeasure of self-esteem, $F(1, 1180) = 725.00, p < .001$) eliminated the condition X order effect on deservingness of bad outcomes $F(6, 1180) = 1.14, p = .34$.

Clearly, the expectations for the self-related outcomes were not supported. However, it is worth noting that even in the absence of condition effects on self-related variables, it is possible to examine the main predictions of this study as these do not require self-related differences. That is, meaning in life variables may have differing relationships to the self even if mean levels of self-esteem and deservingness of bad outcomes do not vary by condition.

Meaning in Life

Next, I moved to analyses including meaning in life. The hypotheses made for the current study did not include predictions for straightforward effects on MIL by condition or order, however I began by conducting 3 (condition) X 4 (order) ANOVAs for both meaning in life and coherence. For meaning in life, there were no main effects of condition, $F(2, 1186) = 1.40, p = .25$, or order, $F(3, 1186) = 1.99, p = .11$, and no interaction, $F(6, 1186) = 0.66, p = .69$. Including the premeasure of self-esteem as a covariate did not change this pattern of results.

For coherence, there was an unexpected main effect for condition, $F(2, 1186) = 3.03, p = .049$, a marginal main effect for order, $F(3, 1186) = 2.45, p = .062$, and no condition X order interaction, $F(6, 1186) = 1.19, p = .31$. Post-hoc Bonferroni comparisons revealed that participants in the control condition ($M = 4.78, SD = 1.34$) rated coherence higher than those in the bad breaks condition ($M = 4.55, SD = 1.40$), $p = .04$. Those in the good breaks condition ($M = 4.68, SD = 1.28$) were lower than controls

but not significantly so. Adding the self-esteem premeasure as a covariate did not change the pattern of effects for coherence. Although not predicted, these differences are interesting. Participants who had just thought about negative random events reported less coherence in the world and their lives compared to those in the control condition.

To test whether this difference could be explained by condition differences in perceived control over the recalled events, I conducted an additional ANCOVA examining condition differences on coherence, controlling for perceived control regarding the events described in the writing task. Including perceived control as a covariate eliminated condition differences on coherence, $F(2, 1185) = 0.88, p = .42$. Alternately, including valence as a covariate, the condition difference on coherence remained significant, $F(2, 1185) = 15.13, p < .001$. I also examined whether control or valence would mediate the relationship between condition and coherence. To do so, I focused specifically on the control and bad breaks conditions. This effect of condition on coherence was fully mediated by control. The relationship between condition and coherence, $b(SE) = -0.23 (0.10), p = .02$, was eliminated when adding the indirect paths of perceived control to the model, $b(SE) = 0.13 (0.11), p = .28, z = 5.45, p < .001$. Additionally, while there was an indirect effect indicating significant mediation of the relationship between condition and coherence by valence perceptions, $z = 6.99, p < .001$, the effect between condition and coherence remained significant in the model including valence as a mediator, $b(SE) = 0.43, p = .001$, indicating only partial mediation of this effect by valence. The degree to which participants felt a sense of coherence in each condition was accounted for by the perception of control they felt over the recalled events, and only partially by the valence of these memories.

Most central to the current study are the *relationships* between meaning in life and the self-relevant variables, which I tested next. To test the predictions that self-esteem and deservingness of bad outcomes would interact with condition to predict meaning in life, I conducted a series of hierarchical regression analyses (following Aiken & West, 1991). Two dummy codes were computed for condition, one for good outcomes (good break condition = 1, others = 0) and one for bad outcomes (bad break condition = 1, others = 0), and the continuous predictors, posttest self-esteem and deservingness of bad outcomes, were mean-centered. Each dummy code was then multiplied by each continuous predictor to create interaction terms. I had predicted self-beliefs (self-esteem or deservingness of bad outcomes) X condition interactions predicting meaning in life and coherence. I expected that positive relationships between self-esteem (or negative relationships with deservingness of bad outcomes) and meaning in life and coherence in the good breaks and control conditions would be mitigated, or reversed, in the bad breaks condition. As will become clear, these predictions were not supported. For illustrative purposes throughout the following discussion, Table 4 shows the correlations among the variables within condition, revealing a high level of stability in these relationships regardless of condition.

Self-Esteem as a Moderator. First, I tested condition X self-esteem interactions predicting meaning in life. In the presence of a main effect for self-esteem, $\beta = .63, p < .001$, there were no condition effects, good breaks dummy $\beta = .03, p = .20$, bad breaks dummy $\beta = .00, p = .99, R^2$ for step 1 = .39, and no interaction effects, good breaks dummy X self-esteem $\beta = -.04, p = .98$, bad breaks dummy X self-esteem $\beta = .02, p = .57, \Delta R^2$ for step 2 = .002. Adding premeasured self-esteem as a covariate to these

analyses did not change the pattern of results. Furthermore, these findings were consistent within all orders (whether including premeasured self-esteem or not). And finally, there were no premeasured self-esteem X condition X self-esteem interactions predicting meaning in life. In sum, this prediction was not supported. Self-esteem did not interact with condition to predict meaning in life. Instead, the relationship between self-esteem and meaning in life was stable (and positive) regardless of condition.

I repeated this set of analyses with coherence as the dependent measure. Once again, a main effect of self-esteem, $\beta = .62, p < .001$, emerged, but there were no condition effects, good breaks dummy $\beta = -.02, p = .52$, bad breaks dummy $\beta = -.04, p = .10, R^2$ for step 1 = .36, and no interactions, good breaks dummy x self-esteem $\beta = -.03, p = .32$, bad breaks dummy x self-esteem $\beta = -.001, p = .98, \Delta R^2$ for step 2 = .001. Adding the self-esteem premeasure as a covariate to these analyses did not change the pattern of results. Additionally, there were no premeasured self-esteem X condition X self-esteem interactions predicting coherence.

To fully test the predictions with regard to self-esteem, I repeated these analyses, regressing coherence on condition, self-esteem, and their interaction within each order. The only order in which a hint of an interaction emerged was among those who completed self-esteem and then deservingness of bad outcomes prior to completing the meaning measures. In this order, a main effect for self-esteem, $\beta = .74, p < .001, R^2$ for step 1 = .40, was accompanied by a marginal interaction effect between the good breaks dummy and self-esteem predicting coherence, $\beta = -.12, p = .051$. For the bad breaks X self-esteem interaction, $\beta = .08, p = .26, \Delta R^2$ for step 2 = .009.

To probe the interaction within this order, coherence was regressed on self-esteem for the good breaks and control conditions separately. In the control condition, self-esteem was related to coherence more strongly, $\beta = .75, p < .001$, than in the good breaks conditions, $\beta = .52, p < .001, z = 2.12, p = .034$, see Figure 1. These results maintained controlling for the self-esteem premeasure. That these results emerged in the order that they did is somewhat intriguing. Recall that conceptually, self-esteem changes were hypothesized to undergird the maintenance of a sense of coherence. This good breaks X self-esteem interaction emerged in the order that best conforms to the temporal unfolding of such a process. However, the direction of the difference does not comport with the original hypothesis. Most importantly, contrary to expectations, the relationship between self-esteem and meaning in life was significantly attenuated in the *good* breaks condition. This result might indicate that self-esteem is less relevant to a sense of coherence after thinking about the ways that random positive events have influenced one's life. This pattern fits with some of the reasoning underlying the present hypotheses: In instances in which randomness comes to the fore, a positive self-view may become less relevant to assessments of the coherence of one's life.

Deservingness of Bad Outcomes as a Moderator. Next, I repeated these analyses substituting deservingness of bad outcomes as a moderator instead of self-esteem. Predicting meaning in life from deservingness of bad outcomes, condition, and their interactions revealed main effects for deservingness of bad outcomes, $\beta = -.51, p < .001$, but no effects of condition, β 's = .03 and -.01 for good and bad breaks, respectively, p 's > .24, R^2 for step 1 = .27, and no interactions, $|\beta$'s| = .01, p 's > .73, ΔR^2 for step 2 = .00. Including the self-esteem premeasure as a covariate did not alter the pattern of

results and the results were consistent within each of the orders with or without the premeasure included as a covariate. Furthermore, there were no premeasured self-esteem X condition X deservingness of bad outcomes interactions predicting meaning in life.

Regressing coherence on deservingness beliefs, condition dummies, and their interactions, revealed main effects for both deservingness of bad outcomes, $\beta = -.52, p < .001$, and the bad break dummy, $\beta = -.06, p = .04$, but not the good break dummy, $\beta = -.02, p < .53, R^2$ for step 1 = .25. There were no condition by deservingness of bad outcome beliefs interactions, good breaks X deservingness $\beta = -.002, p = .95$, bad breaks X deservingness $\beta = .03, p = .39, \Delta R^2$ for step 2 = .001. This same pattern of effects remained including the premeasure of self-esteem as a covariate. Furthermore, there were no premeasured self-esteem X condition X deservingness of bad outcomes interactions predicting coherence.

Repeating this analysis within each of the orders separately, the main effect of deservingness of bad outcomes on coherence was consistent across each of the four orders. The main effect of the bad breaks condition code only emerged in when meaning in life directly preceded the deservingness of bad outcomes measure, $\beta = -.16, p = .007$, but not the other three orders. There were no other effects in any of the orders. The pattern of effects by order were the same when adding the premeasure of self-esteem as a covariate.

Additional analyses including each of the potential premeasures, specifically, protestant work ethic and personal need for structure, as moderators of the association between condition and self-esteem, deservingness of bad outcomes as well as of the

association between self-esteem, deservingness of bad outcomes and meaning in life measures were computed with no significant results emerging.

Together, these findings provide no support for the central predictions that the relationships between self-beliefs and meaning in life or coherence would be reduced or reversed in the bad breaks condition compared to the good breaks or control conditions. Instead these relationships seemed to be fairly stable across conditions. One exception is the finding that participants who completed the self-esteem measure first and the meaning in life and coherence measures last, self-esteem was more strongly related to coherence in the control condition, in which participants wrote about daily activities, compared to the good breaks condition. That this effect emerged in this order might suggest an unfolding process in which randomness mitigates, somewhat, the role that self-evaluations play in judgments of stability in the world. Yet, it is important to keep in mind that the failure of random assignment, ironically, a quite unlikely “bad break,” rendered the present data a particularly poor context for testing my main hypotheses. As such these hypotheses await a formal test, absent of this uncontrollable limitation. Nevertheless, the present data do provide an opportunity to explore a different research question, to which I now turn.

Depression and Meaning in Life: Exploratory Analyses

The inclusion of depression as a premeasure allowed me to conduct additional exploratory analyses regarding its role in the processes examined here. There is reason to believe that meaning processes might differ depending on whether an individual is psychologically healthy or experiencing some level of depression. Steger and colleagues

(2006) reported relationships between depression and meaning in life ($r = -.48$), and this relationship has been replicated in subsequent work, ($r = -.60$; Steger et al., 2009).

Depression is a particularly interesting variable to consider in the context of the present data because a body of research suggests that attributional styles for positive and negative outcomes differ for depressed vs. non-depressed individuals. Specifically, depression is related to the tendency to make internal attributions for failures while making fewer internal attributions for successes (e.g., Peterson et al., 1981; Rizley, 1978; Seligman, Abramson, Semmel, & von Baeyer, 1979). The role of self-esteem in the relationship between depression and attributional style has been examined as well. Depression and self-esteem jointly and uniquely predict variance in a number of attributional style factors (Tennen & Herzberger, 1987). The impact of depression on attributional styles has been considered in the context of self-esteem, as well. Whereas in nondepressed individuals, attributional biases can be leveraged to maintain self-esteem (Zuckerman, 1979), some researchers have argued that depressed individuals do not share this same motivation to maintain self-esteem (e.g., Abramson & Alloy, 1981). To the extent that making attributions is a sense-making process, this work is relevant to meaning processes. The current data allow further exploration of the relationships between depression, self-beliefs, and meaning in life in the context of neutral, and random positive or negative events.

Recall that the depression measure used in the current study was the average rating of two items. This variable was not distributed normally with skewness of 1.00 ($SE = 0.07$) and kurtosis of 0.22 ($SE = 0.14$), and so I created a dichotomized depression variable categorizing all participants who scored a 1.5 or lower on this scale as low in

depression ($n = 655$) and those scoring a 2 or higher as high in depression ($n = 544$). The proportion of those characterized as low and high in depression were distributed evenly across the three conditions, $\chi^2(2) = 0.38, p = .83$. I will refer to these groups as non-depressed and depressed for clarity of description, but the reader is cautioned that these labels do not refer to clinical diagnoses.

A series of t -tests revealed that there were differences between the depression groups on each of the premeasures and outcomes (see Table 5). The (marginal) difference on protestant work ethic suggests that those categorized as low on depression adhere to this cognitive belief system more than do those who were categorized as higher on depression. The reverse was true for personal need for structure with those low on depression also rating this need as lower than those higher on depression.

Depression and Condition Effects on Meaning in Life. To examine the potential for condition to differentially influence meaning in life for depressed vs. non-depressed individuals, I conducted a 3 (condition) X 2 (depression) ANOVA examining meaning in life, including premeasured self-esteem, postmeasured self-esteem, and deservingness of bad outcomes beliefs as covariates. There was no main effect of condition, $F(2, 1183) = 1.09, p = .34$, but a marginal effect of depression, $F(1, 1183) = 2.89, p = .09$. The main effect was qualified by a marginal interaction between condition and depression, $F(2, 1183) = 2.71, p = .067$.

To probe this interaction, I tested for condition differences, controlling for these covariates, within depression category. For the non-depressed group, there were no condition differences on meaning in life, $F(2, 645) = 0.82, p = .44$. Meaning in life did not differ for non-depressed participants in the control condition, adjusted $M = 5.35$,

compared to the bad breaks condition, adjusted $M = 5.20$, or the good breaks condition, adjusted $M = 5.27$. However, for the depressed group, there were marginal condition differences on meaning in life, $F(2, 535) = 2.93, p = .054$. Examining the adjusted means produced for this group, the *control* condition was the lowest on meaning in life, adjusted $M = 3.78$, compared to the bad breaks condition, adjusted $M = 3.93$, and the good breaks condition, adjusted $M = 4.10$. Follow-up analyses testing pairwise differences between the conditions revealed that this effect was driven by differences between the control condition and the good breaks condition, $F(1, 359) = 5.24, p = .02$, while the bad breaks condition did not differ from the other conditions. Figure 2 shows these adjusted means in each condition separated by depression category.

Depression and Meaning in Life and Coherence. I next examined the relationships between depression and both meaning in life and coherence. Does depression uniquely relate to these meaning variables controlling for the other measures as covariates? To test this question, I conducted a series of hierarchical regression equations in which entered a composite self-esteem score (an average of the z -scores for the pre- and post- measures), protestant work ethic, personal need for structure, deservingness of bad outcomes, positive affect, and negative affect as covariates, entered on the first step. For these analyses, I utilized the continuous depression scores rather than the dichotomized variable. First, looking at meaning in life, after controlling for all covariates, R^2 for step 1 = .46, depression significantly predicted meaning in life, $\beta = -.09, p = .004, \Delta R^2$ for step 2 = .004. The reverse was true as well: Controlling for all of the covariates, R^2 for step 1 = .53, meaning in life significantly predicted of depression, $\beta = -.08, p = .004, \Delta R^2$ for step 2 = .003. For coherence, on the other hand, after controlling

for the covariates, R^2 for step 1 = .44, depression was not a significant predictor of coherence, $\beta = -.04$, $p = .26$, ΔR^2 for step 2 = .001. Similarly, after controlling for the covariates, R^2 for step 1 = .53, coherence was not a significant predictor of depression, $\beta = -.03$, $p = .26$, ΔR^2 for step 2 = .001.

Lastly, I conducted a pair of partial correlation analyses to examine the relationships between either meaning in life or coherence and depression, controlling for the other meaning measure. The relationship between meaning in life and depression remained strong controlling for coherence, $r = -.26$, $p < .001$. Alternately, the relationship between coherence and depression, although significant, was quite small after controlling for meaning in life, $r = -.08$, $p = .005$.

Relationships with Meaning by Depression Category. To further examine the relationship among included variables and meaning in life and coherence, I computed a series of correlations within each depression category and then conducted a series of correlation coefficient comparisons to test whether these relationships differed significantly for depressed vs. non-depressed participants. Table 6 shows those correlations that differed by depression category. As can be seen, the relationships between premeasured self-esteem, protestant work ethic, and posttest self-esteem and both meaning in life and coherence differed between the two groups. (The relationships between personal need for structure, deservingness of bad outcomes, positive affect and negative affect with meaning in life and coherence did not differ between the depressed and non-depressed groups.) Some beliefs about the self and the world were more strongly related to meaning in life and coherence in the context of some level of depression. Notably, the relationships between self-esteem and both meaning in life and

coherence were stronger in the depressed group compared to the non-depressed group. The correlation between self-esteem and meaning in life in the non-depressed group fit with the relationships between these variables found in previous research (r 's = .43, .37; Steger & Frazier, 2005; Steger et al., 2006). However, beliefs about one's self-worth seem to be more strongly relevant to assessments of one's life's meaning among the depressed.

Does this exaggerated relationship between self-esteem among individuals with depression persist across each of the conditions in the current study? Although there were no interaction effects between self-esteem and either depression or condition predicting meaning in life in a regression equation, I conducted a series of exploratory analyses based on the different relationships between self-esteem and meaning in life by depression category found in the correlational analyses. Specifically, I looked at the relationship between self-esteem and meaning in life, controlling for premeasured self-esteem, in each of the conditions, separated by depression category. For the non-depressed group, self-esteem was related to meaning in life in each of the conditions: control condition $\beta = .33, p < .001$, bad breaks condition $\beta = .37, p < .001$, good breaks condition, $\beta = .31, p < .001$. In the sample reporting some depression, self-esteem was more strongly related to meaning in life, especially in the control condition, $\beta = .46, p < .001$, and the bad breaks condition, $\beta = .55, p < .001$, and similarly related in the good breaks condition, $\beta = .35, p < .001$, compared to relationships in the non-depressed sample. This pattern of findings suggests that self-esteem is more involved in the experience of life as meaningful for those experiencing some depressive symptoms, especially after contemplating negative random events.

Discussion

The current study examined the relationships between self-beliefs (i.e., self-esteem and deservingness of bad outcomes beliefs) and meaning in life in the context of recalling uncontrolled good or bad events, or neutral event memories. I found no support for the prediction that lower self-esteem and higher deservingness of bad outcomes beliefs would be differentially related to meaning in life following recollection of a bad break vs. a good break or a neutral event. Instead, these self variables shared uniform, and strong, relationships with meaning in life in all conditions.

The overarching pattern of null effects regarding the central predictions in this study might indicate one of several conclusions regarding the processes of interest. First, the lack of support found for the hypothesized process might have been due to the spurious failure of random assignment. Namely, there were condition differences on the premeasure of self-esteem in some orders. Although a subset of the data most closely matching previous work showing differences on the self variables between good and bad breaks conditions (Callan et al., 2014) did show some indication of a replication of this effect, when accounting for the premeasure difference, the effect was eliminated. Given that the manipulation did not affect self-esteem and deservingness of bad outcomes beliefs as it has in previous research, this study does not represent the strongest context in which to test the proposed extension of that work, the prediction that such an effect could be accounted for by meaning in life motivations.

Alternately, the absence of effects found in the current study leave open the possibility that meaning processes involved in self-derogation might not be readily captured by explicit self-report methods such as those employed here. Indeed, the

experience of life as meaningful is, at least in part, an intuitive experience (Heintzelman & King, 2013) and some of the processes that undergird conscious feelings of meaning might be subtle and unavailable to the conscious system. The Meaning Maintenance Model (MMM, Heine et al., 2006; Proulx & Inzlicht, 2012), for example, emphasizes the implicit nature of meaning processes. Research in this area has shown that exposure to nonsensical stimuli (even when presented subliminally or otherwise consciously unnoticed) leads to automatic attempts to reinstate meaning (e.g., Proulx & Heine, 2008, 2009; Randles, Proulx, & Heine, 2011; Proulx, Heine, & Vohs, 2010). Specifically, in these studies, in fitting with an emphasis on implicit meaning processes, efforts towards meaning reinstatement are measured with implicit learning and pattern seeking tasks rather than explicit meaning in life self-reports. By focusing on implicit processes, this perspective highlights that some meaning processes operate in the absence of reflection. If some meaning processes function without awareness, then it is possible that the hypothesized role of meaning as a motivational factor driving self-derogation following bad breaks is not explicitly available and, therefore, would not be captured by the self-reports employed in the current study. Perhaps an implicit measure, such as those measures used in MMM studies, would be better suited to capturing meaning processes potentially involved in reactive self-derogation.

Still, another conclusion that can be drawn from the present data is that meaning processes are simply *not* involved in self-derogating cognitions and behaviors following negative random events: That the current hypotheses are wrong. It is possible that the failure to find support for these hypotheses was not simply due to the chance random assignment error or other measurement nuances, but instead, indicate that the predicted

process is not one that exists. If the motivation for meaning in life does not explain Callan and colleagues' (2014) findings, then there might be other motivational drives that can account for self-derogation, victim self-blaming, system justification, and just world beliefs. Alternately, such self-defeating processes might not be guided by self-motivated processes at all. An individual might simply be drawing conclusions based on the currently available evidence: After a random negative experience a person might conclude that his or her self-worth is quite low (or lower than the assessment following a positive experience) and that he or she deserved the bad outcome. As the current data provide no support for a motivational component of self-derogation processes, it is a possibility that such a process does not occur.

Given the lack of straightforward support for either the types of differences reported in past research or the hypotheses that guided the design of this study, the analyses reported took a more data-driven inductive approach. As such, conclusions and generalizations based on these results are best drawn with some caution. Nevertheless, considering the results, most of which were admittedly unanticipated by the conceptual framework proposed, provides an opportunity to consider that conceptual frame in a new way. In rest of this section, I consider some of the potential implications of what the data showed and how these implications might be incorporated into future research.

One notable (but unexpected) result was that in one order condition, self-esteem interacted with condition to predict coherence ratings. Recall that items measuring coherence were, "I have a sense that the parts of my life fit together in a unified pattern," "I have a framework that allows me to understand or make sense of my life," "Overall, my life experiences make sense," "My personal existence is orderly and coherent," and "I

have a philosophy of life that gives my existence meaning.” Among those who had just written about good breaks (i.e., random positive events), the consistently positive relationship between self-esteem and coherence was reduced relative to the controls. This finding suggests that the role that the self plays in assessments of reliabilities in one’s life is attenuated after recalling events in which the self was not occupying a stable environment.

It is possible that the order in which the dependent measures were completed mattered to this pattern of findings in ways that were not previously considered. Specifically, it is interesting that self views were less relevant to coherence when these views had been rendered salient by the measurement. It may be that changes in self-views that follow from consideration of good (or bad) breaks, only matter to self-reported (and therefore conscious) feelings of meaningfulness when those self views have been made salient. However, the possibility remains that the one instance in which condition differences emerge regarding the relationship between self-esteem and coherence might represent, instead, a spurious finding.

In addition to the difference that emerged regarding the relevance of the self to coherence (but not meaning in life) assessments, there were also differences in the extent to which the manipulation itself affected coherence and meaning in life, despite the strong correlation between these two variables ($r = .81$). Whereas there were no condition differences on meaning in life, which was measured with items referring to purpose and meaning, broadly, participants in the bad breaks condition made significantly lower coherence ratings compared to those in the control condition. The divergent findings between the meaning in life and coherence dependent measures might

offer some insight into the relationships between the three facets of meaning in life: purpose, significance, and coherence. Some evidence from previous work suggests that meaning in life is a unidimensional feeling state (Reker, 2005; Krause & Hayward, 2014) and manipulations of each of the facets of meaning in life (e.g., coherence, Heintzelman et al., 2013; significance, Williams 2007, 2012), seem to affect this broader assessment of meaning in life as a whole. That is, research supports a hierarchical structure, where the components of meaning feed into a common higher level experience of general meaningfulness, potentially regardless of its source (Heintzelman & King, 2014). However, the current findings might suggest that there are times when, perhaps, coherence can be distinguished from the other facets of meaning in life. Whereas the broader meaning in life assessment was robust to the current manipulation, it did affect the more specific measure of coherence.

Meaning in Life and Depression

The current study provides some insight regarding the experience of one's life as meaningful in the context of depressive symptoms. Results suggest that, while experimental condition did not affect meaning in life for those participants reporting no depressive symptoms, it did affect meaning in life for individuals reporting mild depressive symptoms. Specifically, in the depressed group, means adjusted for a number of relevant covariates suggested that participants in the good breaks condition experienced slightly higher meaning in life compared to those in the control condition (while neither group differed from the bad breaks condition). This result suggests that good events, even if they are random, can influence assessments of meaning in life in the context of depression to a greater extent than they do among individuals who are not

experiencing depression. Of course, the lack of differences among the non-depressed might be due to a ceiling effect on meaning in life.

Further examining the pattern of these means within depression category is interesting. As shown in Figure 2, for non-depressed participants, thinking about events that are beyond their personal control (i.e., in the good breaks and bad breaks conditions), meaning in life is slightly lower compared to those in the control condition:

Uncontrollability is detrimental, in terms of meaning in life, for psychologically healthy participants (though this pattern was not statistically significant). However, for mildly depressed participants, the pattern of means tells a very different story: Among the depressed, a lack of personal control actually seems to be *beneficial* for the experience of meaning in life. This curious relationship might be better understood by considering the cognitive tendencies that characterize depression. Perhaps individuals suffering from depressive symptoms experience a sense of relief in recognizing the uncontrollability of negative events which would represent a shift away from the stable, internal attributions that tend to be made for negative events among this population. On the other hand, recalling uncontrollable positive events might provide depressed individuals with the insight that sometimes good things *do* just happen to them, a conclusion that also departs from the cognitions typical of depression.

Furthermore, analyses suggest that depression more robustly related to meaning in life (and vice versa) than to coherence. First, the relationships between depression and meaning in life persisted controlling for the host of included covariates whereas the relationships between depression and coherence did not. Such findings might merely indicate that the covariates included in the study were more closely related to coherence

than meaning in life, more generally (which was intentional in the study design) and therefore might account for more of the variance in the relationship between coherence and depression than between meaning in life and depression. However, the partial correlations between depression and meaning in life or coherence controlling for the other, indicate that the relationship between depression and meaning in life is not fully accounted for by coherence, whereas the relationship between coherence and depression is eliminated controlling for meaning in life. Therefore, it seems that it is not simply that the relationship between meaning in life and depression is robust to the only the selected covariates, but is robust, as well, to the inclusion of coherence. Depression seems to relate to a broader conceptualization of meaning in life that includes more than just coherence and so this finding lends support to the theoretical structure of coherence as one of several facets of the broader construct of meaning in life.

Additionally, exploratory findings suggest that the self might play a stronger role in the experience of meaning in life in individuals experiencing characteristics of depression. Self-esteem was more strongly related to meaning in life in the depressed sample than the non-depressed sample in both the control and bad breaks conditions. After recalling negative personal events, whereas non-depressed individuals seem to be able to shift the source of their experience of meaning in life away from aspects of the self that might be challenged through this exercise, individuals experiencing some depressive symptoms seem to continue to emphasize aspects of themselves that have just been challenged in making assessments of life's meaning. This tendency could be further detrimental to individuals suffering from depression as their views of the self are not particularly positive, and so emphasizing the self in assessments of meaning, rather than

being able to shift to focusing on other sources of meaning, might perpetuate the experiences of depression and low meaning in life.

Future Directions

The current study is a limited, initial test of the hypothesized relationships and leaves many unanswered questions about this viability of the hypotheses. A number of steps can be taken in future research to more adequately address the current research questions to discern whether the pattern of null findings here, indeed, indicates that explicitly available meaning processes are not involved in self-derogation following negative random events. First, repeating the current study prior to discounting that the null results found are truly indicative of a lack of effect would be prudent given the chance failure of random assignment. Moving forward, alternate manipulations of bad vs. good breaks could be utilized in future work, as well as implicit measures of meaning processes. In addition, further examining self-beliefs over time, before and after a break, would also serve to expand upon the current study in focusing on changes in these beliefs caused by the experimental manipulation. Finally, these processes could be further tested by moving from examining reactions to relatively mundane misfortunes into looking at these relationships in the context of real-life trauma.

Alternate Paradigms. The present study tested the research question using only a single paradigm, one that relies on retrospective recounting of past experiences. The use of past event recall might be problematic as the meaning processes required to make sense of the “breaks” may have been previously carried out to completion. It might be, then, that participants in the current study did not demonstrate the meaning processes central to the hypotheses because they had done so already. Therefore, it is important for

subsequent work to expand on the current study by using alternate manipulations of bad and good breaks in real-time rather than relying on retrospective memories of such events.

One manipulation to overcome this limitation can be drawn from previous work (Callan et al., 2014; Studies 1a & 3a). In these studies, participants were told they had an opportunity to win or lose a small monetary reward through a “Peel n’ Reveal Lottery.” They peeled off a label to learn whether they won (good break condition) or lost (bad break condition). Utilizing this alternate manipulation would allow a test of these relationships as they would be unfolding, rather than relying on the cognitions and feelings born from recollections of past events.

In addition, studies employing implicit measures of meaning processes, as mentioned previously, would also extend the scope of the current research, allowing an examination of the potential role of meaning motivations in self-derogation that might not be available for explicit reporting.

Measuring Changes in Self-Beliefs. Another limitation of the current study is that the premeasure of self-esteem was included only moments prior to the measurement of self-esteem as a dependent variable. Future work might include premeasures of self-esteem and deservingness of bad outcomes that are more temporally distant from the completion of these variables in the study, perhaps in a survey completed days prior to study participation. Such work would eliminate the possibility that measuring self-esteem immediately prior to the manipulation would impact participants’ experience with the manipulation by making this aspect of the self salient.

Small Bad Breaks versus Traumatic Experiences. Additionally, the current study examined these processes in the context of small bad breaks. It is, perhaps, informative to return to the conflicting relationships found between self-blame and depressive symptoms. Whereas Frazier (1990) found self-blame to be related to greater depression in a sample of victims of extreme rape crimes, Peterson and colleagues' (1981) reverse relationship was in a sample of undergraduates responding to hypothetical scenario stimuli. The possibility remains that derogating the self following relatively mundane negative experiences might differently influence meaning processes compared to such derogation following more extreme traumatic events. As such, future work examining meaning in life in the context of these cognitive processes in trauma victims is important.

A Note on Random Assignment

Finally, the fluke random assignment failure also raises some important questions for science more broadly. Typically, the effectiveness of random assignment is taken for granted, especially in sizable samples such as in the current study. Indeed, random assignment has received little attention as a phenomenon to study empirically. Most scholarly mention of random assignment is in regard to the sample size needed to be confident in its effectiveness of eliminating differences on nuisance variables (e.g., Strube, 1991). For example, Hsu (1989) stated that random assignment "can be expected to result in the equivalence of large samples but need not result in the equivalence of small samples" (p. 131). Interestingly, however, Hsu's (1989) analysis of various sample sizes never exceeded 100, which implies that the probability of nonequivalence in samples larger than this would be appropriately miniscule. Yet, in the current sample of

approximately 1200 participants, the assumption of baseline randomness cannot be made. From this, a person could conclude 1) this was the result of an extremely rare, and unfortunate, fluke or 2) random assignment is less reliable in large samples than is assumed and this problem has been shielded from public attention because equivalence is not always appropriately tested using premeasures or, alternately, that these studies are relegated to the file drawer.

Conclusions

The current study tested the role of meaning in life motivations in the process of self-derogation following negative events. The results provided no evidence supporting the notion that self-derogating cognitions and behaviors following negative random events might be in service to perpetuating a feeling that life, itself, makes sense and is meaningful. The role of the self in assessments of meaning does, however, seem to differ following exposure to randomness depending on the psychological health of the individual. Overall, this study provides an inconclusive answer to the central research question and future work is needed to appropriately draw conclusions regarding these processes.

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Table 1. Correlations among Variables, Full Sample.

	<u>Premeasures</u>				<u>Outcomes</u>						
	PreSE	PWE	PNS	Dep	SE	DBO	MIL	Coh	Search	PA	NA
<i>Premeasures</i>											
PreSE		.21**	-.13**	-.52**	.73**	-.62**	.53**	.52**	-.12**	.54**	-.47**
PWE			.17**	-.08*	.14**	-.09**	.23**	.25**	.06*	.23**	-.06*
PNS				.10**	-.10**	.06*	-.04	.00	.03	-.14**	.12**
Dep					-.68**	.59**	-.49**	-.44**	.28**	-.54**	.62**
<i>Outcomes</i>											
SE						-.82**	.62**	.60**	-.25**	.60**	-.66**
DBO							-.52**	-.50**	.19**	-.49**	.63**
MIL								.81**	-.26**	.58**	-.43**
Coh									-.14**	.56**	-.38**
Search										-.19**	.26**
PA											-.47**

Note. $N = 1999$. ** $p < .001$, * $p < .05$. PreSE: Premeasured Self-esteem; PWE: Protestant Work Ethic; PNS: Personal Need for Structure; Dep: Depression; SE: Self-esteem; DBO: Deservingness of Bad Outcomes; MIL: Meaning in Life; Coh: Coherence; Search: Search for Meaning; PA: Positive Affect; NA: Negative Affect.

Table 2. Correlations between Writing Ratings and Other Measures, By Condition

	Control Ratings	Valence Ratings
<u>Premeasures</u>		
Pre Self-Esteem	.19***	.17***
Control Condition	.31***	.35***
Bad Breaks	.16**	.11*
Good Breaks	.15**	.18***
Protestant Work Ethic		
Control Condition	.06	.13**
Bad Breaks	.15**	.09
Good Breaks	.15**	.02
Personal Need for Structure		
Control Condition	-.02	-.05
Bad Breaks	-.05	-.05
Bad Breaks	-.08	-.07
Good Breaks	.07	.03
Depression		
Control Condition	-.10**	-.14***
Control Condition	-.29***	-.37***
Bad Breaks	-.06	-.06
Good Breaks	.005	-.25***
<u>Outcomes</u>		
Self-Esteem	.17***	.16***
Control Condition	.32***	.37***
Bad Breaks	.07	.03
Good Breaks	.14**	.24***
Deservingness of Bad Outcomes		
Control Condition	-.12***	-.13***
Control Condition	-.29***	-.32***
Bad Breaks	-.003	.03
Good Breaks	-.10	-.26***
Meaning in Life		
Control Condition	.19***	.19***
Control Condition	.35***	.37***
Bad Breaks	.14**	.12*
Good Breaks	.15**	.20***
Coherence		
Control Condition	.20***	.19***
Control Condition	.28***	.36***
Bad Breaks	.14**	.13**
Good Breaks	.16**	.18***
Search for Meaning		
Control Condition	.003	-.02
Control Condition	-.12*	-.06
Bad Breaks	-.01	-.04
Good Breaks	.06	-.05
Positive Affect		
Control Condition	.20***	.20***
Control Condition	.28***	.47***
Bad Breaks	.21***	.18***
Good Breaks	.22***	.12*
Negative Affect		
Control Condition	-.15***	-.15***
Control Condition	-.31***	-.35***
Bad Breaks	-.01	-.01
Good Breaks	-.12*	-.03*

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. The top value for each variable indicates correlation in full sample $N = 1199$, Control $n = 414$, Bad Breaks $n = 388$, Good Breaks $n = 397$.

Table 3. Means and Standard Deviations for Self-Esteem and Deservingness of Bad Outcomes by Order and Condition

<i>Premeasured Self-Esteem</i>	Control Condition	Bad Breaks Condition	Good Breaks Condition	One-way for Condition Main Effect
All Orders	4.79 (1.68)	4.65 (1.69)	4.79 (1.64)	$F(2,1192) = 0.86$
MIL/SE/DBO	5.03 (1.39)	4.69 (1.65)	4.32 (1.84)	$F(2, 300) = 4.88, p = .008$
MIL/DBO/SE	4.76 (1.72)	4.78 (1.60)	4.82 (1.65)	$F(2, 308) = 0.04$
SE/DBO/MIL	4.54 (1.82)	4.58 (1.72)	4.91 (1.41)	$F(2, 269) = 1.32$
DBO/SE/MIL	4.78 (1.77)	4.55 (1.80)	5.11 (1.53)	$F(2, 306) = 2.72, p = .07$

<i>Self-Esteem</i>	Control Condition	Bad Breaks Condition	Good Breaks Condition	One-way for Condition Main Effect
All Orders	5.32 (1.30)	5.14 (1.34)	5.24 (1.34)	
MIL/SE/DBO	5.47 (1.12)	5.24 (1.33)	4.87 (1.49)	$F(2, 301) = 5.34, p = .001$
MIL/DBO/SE	5.29 (1.30)	5.20 (1.28)	5.36 (1.22)	$F(2, 309) = 0.43$
SE/DBO/MIL	5.05 (1.49)	5.12 (1.50)	5.40 (1.30)	$F(2, 268) = 1.54$
DBO/SE/MIL	5.44 (1.28)	5.02 (1.35)	5.34 (1.27)	$F(2, 306) = 2.99, p = .052$

<i>Deservingness of Bad Outcomes</i>	Control Condition	Bad Breaks Condition	Good Breaks Condition	One-way for Condition Main Effect
All Orders	2.38 (1.29)	2.52 (1.42)	2.48 (1.30)	
MIL/SE/DBO	2.23 (1.09)	2.39 (1.39)	2.83 (1.49)	$F(2, 301) = 5.60, p = .004$
MIL/DBO/SE	2.48 (1.37)	2.60 (1.37)	2.50 (1.31)	$F(2, 310) = 0.84$
SE/DBO/MIL	2.60 (1.51)	2.52 (1.52)	2.25 (1.15)	$F(2, 286) = 1.52$
DBO/SE/MIL	2.24 (1.14)	2.56 (1.43)	2.29 (1.12)	$F(2, 306) = 1.99$

Note. MIL/SE/DBO: Meaning in life, self-esteem, deservingness of bad outcomes order, $n = 305$; MIL/DBO/SE: Meaning in life, deservingness of bad outcomes, self-esteem order, $n = 313$; SE/DBO/MIL: Self-esteem, deservingness of bad outcomes, meaning in life order, $n = 272$; DBO/SE/MIL: Deservingness of bad outcomes, self-esteem, meaning in life order, $n = 309$. Control $n = 414$, Bad Breaks $n = 388$, Good Breaks $n = 397$.

Table 4. Correlations among Variables, By Condition

	<i>Premeasures</i>			<i>Outcomes</i>						
	<i>PWE</i>	<i>NS</i>	<i>Dep</i>	<i>SE</i>	<i>DBO</i>	<i>MIL</i>	<i>Coh</i>	<i>Search</i>	<i>PA</i>	<i>NA</i>
Control (n = 414)										
Premeasures										
<i>PreSE</i>	.22***	-.15**	-.51***	.71***	-.60***	.49***	.48***	-.11*	.49***	-.49***
<i>PWE</i>		.18***	-.07	.19***	-.08	.28***	.30***	.07	.17***	-.02
<i>NS</i>			.10*	-.08	.07	-.07	.008	.05	-.18***	.13**
<i>Dep</i>				-.70***	.59***	-.53***	-.45***	.28***	-.53***	.62***
Outcomes										
<i>SE</i>					-.81***	.62***	.60***	-.21***	.59***	-.67***
<i>DBO</i>						-.49***	-.50***	.12*	-.49***	.60***
<i>MIL</i>							.80***	-.26***	.53***	-.48***
<i>Coh</i>								-.11*	.53***	-.40***
<i>Search</i>									-.20***	.24***
<i>PA</i>										-.49***
Bad Breaks (n = 388)										
Premeasures										
<i>PreSE</i>	.21***	-.12*	-.54***	.72***	-.62***	.55***	.52***	-.13**	.53***	-.48***
<i>PWE</i>		.14**	-.08	.15**	-.10*	.26***	.23***	.13*	.24***	-.10*
<i>NS</i>			.12*	-.12*	.03	-.05	.01	.08	-.19***	.12*
<i>Dep</i>				-.71***	.62***	-.51***	-.44***	.27***	-.54***	.66***
Outcomes										
<i>SE</i>					-.81***	.65***	.60***	-.28***	.61***	-.69***
<i>DBO</i>						-.55***	-.47***	.21***	-.47***	.65***
<i>MIL</i>							.82***	-.24***	.62***	-.49***
<i>Coh</i>								-.16***	.56***	-.41***
<i>Search</i>									-.20***	.27***
<i>PA</i>										-.45***
Good Breaks (n = 397)										
Premeasures										
<i>PreSE</i>	.23***	-.12*	-.51***	.75***	-.63***	.54***	.57***	-.13*	.61***	-.44***
<i>PWE</i>		.20***	-.08	.09	-.09	.16**	.21***	-.005	.29***	-.08
<i>NS</i>			.09	-.10	.08	.00	-.02	-.04	-.04	.11*
<i>Dep</i>				-.65***	.57***	-.43***	-.44***	.30***	-.55***	.59***
Outcomes										
<i>SE</i>					-.84***	.59***	.59***	-.27***	.62***	-.63***
<i>DBO</i>						-.51***	-.53***	.25***	-.54***	.62***
<i>MIL</i>							.82***	-.28***	.58***	-.30***
<i>Coh</i>								-.15**	.61***	-.31***
<i>Search</i>									-.17**	.29***
<i>PA</i>										-.48***

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. PreSE: Premeasured Self-esteem; PWE: Protestant Work Ethic; PNS: Personal Need for Structure; Dep: Depression; SE: Self-esteem; DBO: Deservingness of Bad Outcomes; MIL: Meaning in Life; Coh: Coherence; Search: Search for Meaning; PA: Positive Affect; NA: Negative Affect.

Table 5. Mean Differences by Depression Category.

	<i>t</i>	<i>d</i>	Low Depression (<i>n</i> = 665)	High Depression (<i>n</i> = 534)
Premeasure Self-Esteem	18.21**	1.07	5.47 (1.26)	3.87 (1.69)
Protestant Work Ethic	1.90 ⁺	0.10	3.97 (1.01)	3.86 (1.13)
Personal Need for Structure	-3.12*	0.18	4.52 (0.97)	4.69 (0.89)
Self-Esteem	26.51**	1.56	5.99 (0.85)	4.33 (1.24)
Deservingness of Bad Outcomes	-20.50**	1.22	1.82 (0.85)	3.23 (1.40)
Meaning in Life	15.77**	0.92	5.27 (1.36)	3.93 (1.54)
Coherence	14.56**	0.64	5.15 (1.95)	4.09 (1.30)
Search for Meaning	-10.54**	0.61	3.92 (1.64)	4.86 (1.44)
Positive Affect	18.78**	1.10	4.93 (1.29)	3.41 (1.47)
Negative Affect	-21.91**	1.30	1.61 (0.88)	3.21 (1.50)

Note. ***p* < .001, **p* = .002, ⁺ = .058. Degrees of freedom range from 840 to 1197 (reflecting inequality of variances when appropriate).

Table 6. Correlations with Meaning in Life and Coherence by Depression Category.

	<i>Meaning in Life</i>	<i>Coherence</i>
<i>Premeasured Self-esteem</i>		
Depressed	.47***	.47***
Nondepressed	.34***	.35***
<i>z</i>	2.68**	2.48*
<i>Protestant Work Ethic</i>		
Depressed	.30***	.30***
Nondepressed	.15***	.18***
<i>z</i>	2.72**	2.38*
<i>Self-esteem</i>		
Depressed	.57***	.57***
Nondepressed	.43***	.40***
<i>z</i>	3.22*	3.84***

Note. Depressed: $M > 1.5$; $n = 544$; Nondepressed: $M \leq 1.5$; $n = 655$. *** $p < .001$, ** $p < .01$, * $p < .05$. z = the difference between the correlations.

Figure Captions

Figure 1. Relationship between self-esteem plotted at + 1 SD from the mean and coherence by good breaks vs. control condition in the self-esteem first order.

Figure 2. Mean meaning in life, adjusted for pretest self-esteem, posttest self-esteem, and deservingness of bad outcomes beliefs, by condition within depression category, with standard error bars.

Figure 1. Relationship between Self-esteem and Coherence by Condition in Self-esteem First Order.

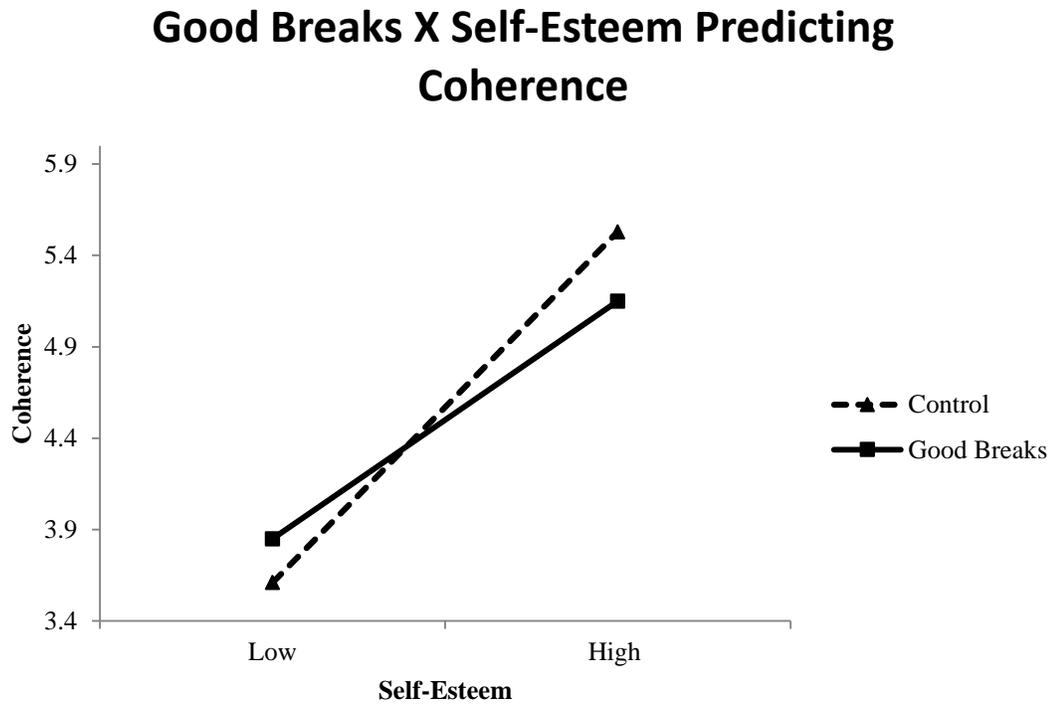
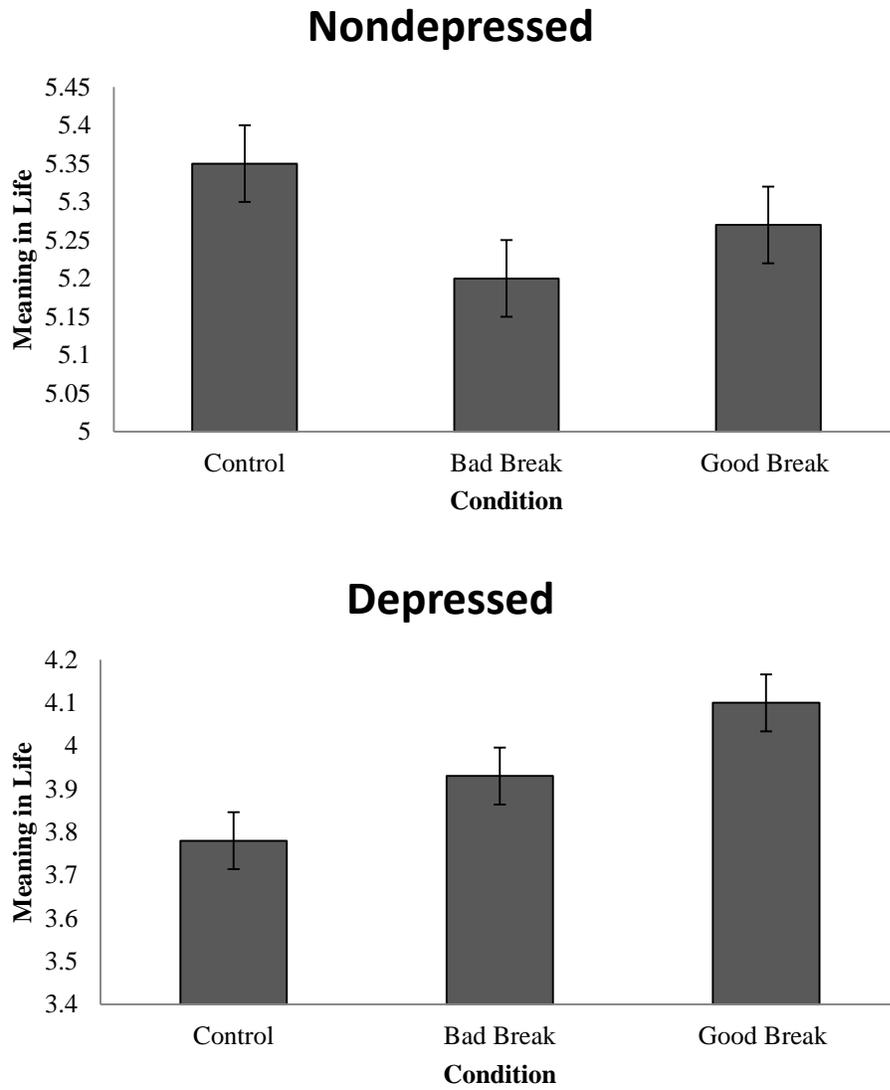


Figure 2. Adjusted Meaning in Life Means by Condition and Depression Category.



VITA

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