PONDERING PURPOSE: THE SEARCH FOR MEANING IN LIFE AS MOTIVATED SOCIAL COGNITION

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The search for meaning in life has been considered a fundamental human motivation (Frankl, 1963). Although research has pointed toward the importance of the search for meaning in life, the basic processes through which it emerges remain unclear. Because the search for meaning entails schema formation in which one connects individual experiences into a coherent framework (Steger, Oishi, & Kesebir, 2011), and abstract thought instigates the organization of information into such knowledge structures (Trope & Liberman, 2010), we predicted that abstract thought would increase the search for meaning in life. Moreover, we predicted that figuratively removing oneself from the here and now would also heighten the search for meaning. Importantly, we predicted that because schema formation is effortful (Shallice & Burgess, 1996), abstract thought and psychological distance would increase the search for meaning to a greater extent when willingness to exert effort is high rather than low. Nine experiments corroborated these predictions, supporting a view of the search for meaning as motivated social cognition.

Keywords: search for meaning; abstract thought; psychological distance; motivation; self-regulation

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1.0 INTRODUCTION

The search for meaning in life has been hailed as "the primary motivational force in man" (Frankl, 1963, p.121). Yet, the intrapersonal factors that may facilitate or obstruct the search for meaning are unclear. In a recent review of work on meaning in life, Hicks and Routledge (2013, p. ix) stated that "people have pondered questions related to meaning in life perhaps as long as they have been able to think abstractly." This statement assumes that abstract thought contributes to the search for meaning. However, evidence in support of this basic principle is lacking. Therefore, the aim of this project was to test a social cognitive account of the search for meaning in life by empirically examining the connection between abstract thought and the search for meaning in life, as well as potential moderators of this effect.

1.1 THE SEARCH FOR MEANING IN LIFE

The *search for meaning* has been considered a "deep-seated human desire to understand, integrate, and synthesize experience" (Steger, Kashdan, Sullivan, & Lorentz, 2008a, p. 222) and has been defined as "the strength, intensity, and activity of people's desire and efforts to establish and/or augment their understanding of the meaning, significance, and purpose of their lives" (Steger et al., 2008a, p. 200). In contrast, the *presence of meaning* has been defined as "shared mental representations of possible relationships among things, events, and relationships"

(Baumeister, 1991, p. 15). Given that the search for meaning is of such central importance to psychological functioning (e.g., Frankl, 1963; Maddi, 1970; Seligman, 2002), it should come as no surprise that its effects carry well beyond individuals' direct meaning making efforts. That is, individuals who are committed to searching for their life's meaning are likely to experience a variety of consequential outcomes, including substantial changes in life satisfaction and subjective well-being (Bronk, Hill, Lapsley, Talib, & Finch, 2009; Cohen & Cairns, 2012; Park, Park, & Peterson, 2010; Seligman, 2002; Steger, Kawabata, Shimai, & Otake, 2008a; Steger, Oishi, & Kesebir, 2011; Zika & Chamberlain, 1992). Moreover, the search for meaning in life represents an essential factor in the processes of identity formation (Marcia, 1966; Steger, Frazier, Oishi, & Kaler, 2006) and psychological growth (Schaefer & Moos, 1992), and predicts behaviors including increased physical exercise and healthier dieting (Brassai, Piko, & Steger, 2012). Thus, consistent with the assertion that "there is good reason for people to seek meaning in their lives" (Crescioni & Baumeister, 2013, p. 3), the search for meaning in life affects a wide range of domains directly pertinent to individual functioning.

So far, the search for meaning has been found to emerge in response to traumatic life events: When perceptions of meaning in life have been challenged by events such as cancer (e.g., O'Connor, Wicker, & Germino, 1990), bereavement (e.g., Gillies & Neimeyer, 2006), or victimization (Collins, Taylor, & Skokan, 1990), changes in individuals' previously held beliefs may be prompted, thus temporarily resulting in increased attempts to search for meaning (Frankl, 1965; Maddi, 1970; Thompson & Janigian, 1988). More recently, attention has been directed toward explaining the search for meaning through other factors, including personality traits. For example, investigative individuals are likely to engage in searching for their life's meaning (Steger, Kashdan, Sullivan, & Lorentz, 2008b). Yet, although the evidence that both

disruptive events and personality traits inform us about when individuals are likely to search for their life's meaning, not much is known about the process through which the search for meaning occurs.

1.2 A MOTIVATED SOCIAL COGNITION ACCOUNT OF THE SEARCH FOR MEANING IN LIFE

Because everyone's life experiences are unique (Baumeister, 1991; Frankl, 1965, Kaufman, 1986), individuals create meaning in their own lives by developing a coherent life narrative or schema (e.g., McAdams, 1993). This motivated construction of life schemata grants individuals the ability to organize seemingly unrelated information under a common header, allowing them to comprehend their past and present, predict their future, and set goals in life (Thompson & Janigian, 1988). Thus, the search for meaning provides a way to connect loose instances into a coherent whole, thereby creating an abstract schema or knowledge structure of their life's meaning. In fact, because the search for meaning entails "identifying and organizing information relevant to meaning in life judgments" (Steger, 2011, p. 173), it was proposed that the act of searching for meaning requires schematic processing (i.e., the creation or modification of knowledge structures in memory; Mandler, 1984). If this is true and the search for meaning reflects a process of schema formation and schema alteration, then that implies that the search for meaning in life may be understood as arising from social cognitive principles that determine people's engagement in thinking styles that foster schema formation and change.

1.3 ABSTRACT THINKING AND THE SEARCH FOR MEANING IN LIFE

Our work seeks to advance previous theorizing on meaning in life by incorporating research according to which people interpret events at varying levels of abstractness. One particularly influential perspective on abstract thinking has been offered by construal level theory (Liberman & Trope, 2008; Liberman, Trope, & Stephan, 2007; Trope & Liberman, 2003; 2010). Because variability in abstractness of thought importantly affects the extent to which individuals are capable of constructing the overarching essence or meaning of information, we reasoned that a potential precursor to people's engagement in searching for their life's meaning may be the abstractness of their thinking. So far, empirical work on the search for meaning in life and abstract thinking styles has had little crosstalk such that each of these constructs has been studied under a different research tradition and has uncovered distinct relations to other variables. Therefore, we aimed to integrate these two consequential bodies of research in the present empirical work.

According to construal level theory, abstract or higher-level representations consist of the gist or essence of a situation whereas concrete or lower-level representations consist of its unique details. That is, eating an apple could be construed as gaining nutrition (i.e., abstract construal), or as chewing and swallowing something grainy (i.e., concrete construal). Moreover, as representations increase in abstractness, the loose and relatively insignificant details comprising an instance or activity are organized under an overarching framework reflective of the details' meaning. Abstract as compared to concrete thinking therefore encompasses schema formation because it conveys additional information about a stimulus that goes beyond its unique

and overt details, allowing individuals to understand its underlying meaning. Indeed, "the process of abstraction involves not only a loss of specific, idiosyncratic, and incidental information, but also ascription of new meaning deduced from stored knowledge and organized in structured representations" (Trope & Liberman, 2010, p. 441).

Thus, we predicted that because the search for meaning in life is concerned with connecting one's experiences into a coherent schema that is reflective of their underlying meaning (Steger et al., 2011) and abstract thinking facilitates exactly such a schema and meaning-constructing process (Trope & Liberman, 2010), abstract thinking would increase individuals' efforts to search for their lives' meaning. However, we do not necessarily expect abstract thought to influence the perceived presence of meaning in life. This is because previous research (e.g., Davis, Wortman, Lehman, & Silver, 2000; Steger et al., 2006) has found that the presence of, and the search for, meaning in life are largely independent. Moreover, while abstract thought may increase the inclination to find connections, it does not necessarily assume that such connections will be discovered.

Hypothesis 1. Abstract as compared to concrete thought will increase the search for meaning in life.

Moreover, the combination of research on meaning in life with research on abstract processing styles offers novel predictions that go beyond the basic assumption that abstract thinking should induce a search for meaning in life. Specifically, previous research (e.g., Fujita, Henderson, Eng, Trope, & Liberman, 2006; Trope & Liberman, 2003) has demonstrated that as perceived psychological distance from the here and now increases -such as when something is far away in space or time- representations of the situation at hand become more abstract. For example, it was shown that individuals organize objects into fewer categories when they are

planning to use them in the distant as opposed to the near future, thus pointing to their ability to recognize the underlying theme tying the objects together as their psychological distance to them increases (Fujita, Trope, Liberman, & Levin-Sagi, 2006). As such, we predicted that considering psychologically distant as compared to psychologically close situations would also increase the search for meaning in life. This is consistent with the heretofore untested notion that "consideration of life's meaning requires stepping back from the moment and seeing events in a long-range context" (Baumeister, 1991, p. 3).

***Hypothesis 2*.** High as compared to low psychological distance will increase the search for meaning in life.

1.4 THE WILLINGNESS TO EXERT EFFORT AS A POTENTIAL MODERATOR

Although abstract thinking (Hypothesis 1) and psychological distance (Hypothesis 2) may increase the search for meaning, other factors may moderate this predicted connection. Specifically, because the search for meaning in life entails schema formation and schema alteration (Steger et al., 2011), and both processes are cognitively effortful (Garcia-Marques & Mackie, 1999; Shallice & Burgess, 1996), instances that limit the willingness to exert effort may disrupt the predicted connection between abstract thought and psychological distance and the search for meaning. Thus, we predicted that factors including individual differences in motivational intensity or the temporary experience of fatigue would moderate the connection between abstract thought, psychological distance, and the search for meaning in life such that abstract thought and psychological distance should lead to increased search for meaning in life to

a greater extent when individuals' willingness to engage in effortful tasks is higher rather than lower. In the present research, then, we operationalized individuals' willingness to exert effort as stable individual differences in self-control, momentary fluctuations in self-control, and achievement motivation.

Self-control reflects the tendency to exert willpower (Baumeister, Heatherton, & Tice, 1994). Not surprisingly, people high in self-reported self-control tend to be successful in a wide range of domains including school and work as compared to their lower self-control counterparts, strongly suggesting that individuals high in self-control do not shy away from tasks that demand considerable effort (Tangney, Baumeister, & Boone, 2004). Yet, research has recognized that people's tendency toward self-control is subject to considerable fluctuations (e.g., Baumeister et al., 1998; Muraven & Baumeister, 2000), suggesting that momentary differences in self-control would moderate the connection between abstract thought and the search for meaning in life, with abstract thought increasing the search for meaning to a greater extent when state self-control is strong than when weak. Finally, we predicted that because achievement motivation refers to people's desire to work hard in order to meet their goals (Cassidy & Lynn, 1989), achievement motivation would also moderate the connection between abstract thought and the search for meaning in the same way.

Hypothesis 3. Abstract thought and psychological distance will increase the search for meaning in life to a greater extent when the willingness to exert effort is strong than when it is weak.

1.5 THE PRESENT RESEARCH

Studies 1 and 2 were designed to test Hypothesis 1, namely that abstract thought should increase the search for meaning in life. In Study 1, we aimed to provide initial correlational evidence for this prediction by measuring each of these constructs. In Study 2, we aimed to gather experimental evidence for the predicted connection between abstract thought and the search for meaning in life. To this end, we manipulated individuals' abstract thinking by asking them to focus on why (i.e., abstract thought) versus how (i.e., concrete thought) their best friend is important to them and measured their search for, and presence of, meaning in life.

Studies 3-6 aimed to test the prediction that increased psychological distance should also heighten the search for meaning (Hypothesis 2). In Study 3, we manipulated psychological distance by asking participants to think about spending a day with their best friend next year (i.e., distant) versus next week (i.e., close). Because Study 3 involved the inclusion of another person in the manipulation, in the following studies we manipulated psychological distance without any reference to social factors by asking individuals to describe a typical day next year versus next week (Study 4) or by asking them to think about what they will do next year versus tomorrow (Study 5). In Study 6, we employed a different manipulation of psychological distance. Specifically, we asked participants to either describe the things they would do in the Western-Australian city Perth (i.e., distant) versus in the city they currently live (i.e., close).

Studies 7-9 aimed to provide evidence for Hypothesis 3 by investigating whether different indicators of individuals' willingness to exert effort moderate the connection between abstract thought, psychological distance, and the search for meaning. We predicted that abstract thought and psychological distance would elevate the search for meaning to a greater extent

when the willingness to exert effort was high rather than low. Specifically, in Study 7 we measured individuals' engagement in abstract thinking and the extent to which they typically search for their life's meaning. In addition, we operationalized willingness to exert effort by measuring stable individual differences in self-control, momentary self-control, and achievement motivation. In Study 8 we measured individuals' achievement motivation and manipulated temporal psychological distance. Finally, in Study 9 we gathered experimental evidence by manipulating individuals' willingness to exert effort as well as temporal psychological distance.

The present integration of work on the search for meaning in life and abstract thinking styles carries important implications. If our hypotheses are supported, it would provide evidence for the assumption and basic principle stating that abstract thought increases the search for meaning in life (cf., Hicks & Routledge, 2013). Moreover, the combination of work on abstract thinking styles and the search for meaning allowed us to test the additional assumption and basic principle that psychological distance would also increase the search for meaning in life (cf., Baumeister, 1991). As such, the present analysis suggests that the search for meaning does not only stem from the experience of important life transitions (Roger, Vess, Routledge, & Juhl, 2013), disruptive events such as psychological trauma (Thompson & Janigian, 1988), or from the possession of personality dispositions that make individuals prone to searching (Steger et al., 2011), but can be triggered by subtle cues that elicit abstract thought.

Finally, the present work introduced important moderators to the connection between abstract thought, psychological distance, and the search for meaning, suggesting that abstract thought and psychological distance should increase the search for meaning in life to a greater extent when the willingness to exert effort is high rather than low. Thus, we aimed to provide empirical evidence for basic principles that govern the occurrence of the search for meaning in

life through the present research by offering a motivated social cognition account of the search for meaning in life.

2.0 METHODS AND RESULTS

2.1 STUDY 1

Our first study investigated whether the extent to which individuals perceive, and search for, meaning in their life is associated with the abstractness of their thinking. To test this, participants completed a measure of abstract thought along with a measure of the presence of, and search for, meaning in life. We predicted that abstract thought would be positively related to the search for meaning in life, but would not necessarily be related to the presence of meaning in life.

2.1.1 Participants and Experimental Design

One hundred eighty-seven (187) participants took part in our study through Amazon's Mechanical Turk in exchange for $.40. Thirty-eight states were represented and participants' age ranged between 19 and 72 (M = 33.25, SD = 12.19). Gender (84 males, 103 females) did not influence our dependent variables in any of our studies and will therefore not be considered further. Participants completed measures of abstract thinking, presence of meaning in life, and search for meaning in life, in randomized order.

Abstract thought. In order to assess participants' abstract thought on a continuum ranging from low to high abstractness, we adjusted a pre-existing categorical measure of abstract thinking (Fujita et al., 2006). The original measure consists of eight one-sentence descriptions of

various situations (e.g., Making an expensive purchase) and participants are asked to choose one of two alternate statements that they believe describes the situation more accurately. One of the statements always offers an abstract description (Doing something for one's pleasure) whereas the remaining one offers a concrete description (Swiping one's credit card) of the situation at hand, allowing researchers to infer whether individuals tend to predominantly think either abstractly or concretely.

Because differences between abstract and concrete representations are relative rather than absolute and range from more to less abstract rather than from either concrete or abstract (Trope & Liberman, 2010), we transformed Fujita and colleagues' (2006) categorical measure to a continuous scale using a 5-point Likert scale ranging from -2 to 2. Prior to reading the measure's eight one-sentence descriptions, participants were presented with an example item in order to ensure that they understood how to complete the present measure. Specifically, they were asked to describe eating an apple on a scale ranging from -2 (Chewing and swallowing; concrete representation) to 2 (Gaining nutrition; abstract representation) and read the following set of instructions: "Please select the description that best expresses how you see the listed behavior. For example, if you think about eating an apple as "chewing and swallowing" but not at all as "gaining nutrition", select option -2. Alternatively, if you think about eating an apple more as "chewing and swallowing" than as "gaining nutrition", select option -1. The reverse would be true if you think about eating an apple more as "gaining nutrition" than as "chewing and swallowing" (1) or as "gaining nutrition" but not at all as "chewing and swallowing" (2). Finally, select option 0 if you do not prefer one of the descriptions over the other." Participants' responses were averaged to create a composite score of abstract thought (Cronbach's α = .61). Although the reliability of this scale was not particularly strong, the use of

a Likert scale improves our ability to test its reliability, which is typically not reported for the dichotomous version of the scale.

Meaning in life. The meaning in life questionnaire (MLQ; Steger et al., 2006) constitutes a 10-item self-report measure designed to measure the presence of ("I understand my life's meaning"), and search for ("I am always looking to find my life's purpose"), meaning in life through two 5-item subscales. Items were measured on a 7-point Likert scale ranging from *absolutely disagree* (1) to *absolutely agree* (7). After reverse coding the negatively formulated items, composite scores were computed for the presence of meaning (Cronbach's α = .93) and the search for meaning (Cronbach's α = .94) by averaging across responses to each subscale-item. As in previous research, the two subscales were moderately negatively correlated, r = - .35, p < .001.

2.1.2 Results and Discussion

We performed a multiple regression analysis whereby the search for meaning in life was predicted by abstract thought. Because previous research (e.g., Steger et al., 2006) demonstrated that age and the presence of meaning in life are substantially negatively related with the search for meaning, we statistically controlled for their influence in the present analysis.

The three predictors explained a significant proportion of variance in the search for meaning in life, $F(3, 182) = 15.63$, $p < .001$, $R^2 = .20$. In accordance with previous work, age was negatively related to search for meaning, B = -. 03, $t(182) = -3.51$, $p = .001$, 95% *CI* [-.05; -.01], and participants who perceived more meaning in their life were less likely to search for their life's meaning, B = -. 33, $t(182) = -3.51$, $p < .001$, 95% *CI* [-.46; -.19]. Finally, and in line with

our predictions, abstract thought was associated with increased search for meaning in life, B = .37, $t(182) = 2.55$, p =.01, 95% CI [.08; .66].

In order to test whether the presence of meaning in life was predicted by abstract thought, a multiple regression analysis was performed on the presence of meaning as predicted by abstract thought while controlling for participants' age and their search for meaning in life. The three predictors explained a significant proportion of variance in the presence of meaning in life, F (3, 182) = 9.13, $p < .001$, $R^2 = .13$. Whereas age was unrelated to presence of meaning, B = .01, t (182) = .69, p =.49, 95% CI [-.01; .02], the search for meaning in life was associated with decreased presence of meaning in life, B = -.34, t (182) = -4.76, p <.001, 95% CI [-.48; -.20]. Finally, abstract thought was unrelated to presence of meaning, B = .18, t (182) = 1.17, p =.24, 95% CI [-.12; .48].

Thus, Study 1 provided initial support for the predicted connection between abstract thought and the search for meaning. However, the current design was limited by its correlational nature. Therefore, our second study experimentally manipulated individuals' abstract versus concrete thinking and measured the extent to which they perceive, and search for, meaning in their life.

2.2 STUDY 2

Our second study was designed to replicate the findings of Study 1 by experimentally manipulating abstractness of thought. To this end, participants were asked to either focus on abstract or concrete aspects of their environment. We then measured their search for, and

presence of, meaning in life. We expected that whereas abstract as compared to concrete thought would spark efforts to search for meaning in life, abstractness of thought would not affect the immediate presence of meaning in life.

2.2.1 Participants and Experimental Design

Eighty-three (16 men; 67 women) undergraduate students at a large Dutch university between age 17 and 24 (M = 19.28; SD = 1.55) were invited to the lab and participated in the experiment in exchange for course credit. Participants were randomly assigned to an abstract versus concrete thinking condition.

Abstract thought. In order to manipulate abstractness of thought, we adapted a procedure from earlier work by Freitas, Gollwitzer, and Trope (2004). Participants were asked to write an essay about why (i.e., abstract condition) or how (i.e., concrete condition) their best friend was important to them.

Meaning in life. As in Study 1, participants completed the MLQ (Steger et al., 2006) as our dependent measure. The internal reliability was .86 for the presence of meaning in life subscale and .84 for the search for meaning in life subscale. The two subscales were uncorrelated (r = .04, p = .71).

2.2.2 Results and Discussion

We conducted two univariate ANOVAs on the presence of meaning and search for meaning as predicted by abstractness of thought (abstract versus concrete). In accordance with our predictions, abstractness of thought did not lead to differences in the presence of meaning in life ($M_{abstract}$ = 4.65, *SD* = 1.19; $M_{concrete}$ = 4.78, *SD* = 1.26), $F(1, 79) = .28$, $p = .60$, *partial* $\eta^2 < .01$. As predicted, abstractness of thought led to differences in the search for meaning in life, $F(1, 79) = 4.62$, $p = .04$, *partial* $\eta^2 = .06$). Participants in the abstract thought condition (*M* = 4.66, *SD* = .98) searched for more meaning in life than participants in the concrete thought condition (*M* = 4.13, *SD* = 1.33).

Thus, Studies 1 and 2 provided evidence for Hypothesis 1, showing that abstract thought is associated with, and leads to changes in, the search for meaning in life. Studies 3 to 6, then, were designed to provide evidence for Hypothesis 2.

2.3 STUDIES 3-5

Studies 3 to 5 were designed in an effort to extend the results of the preceding experiments by manipulating temporal psychological distance. Researchers have suggested, but not tested, that psychological distance may increase the search for meaning (Baumeister, 1991). Therefore, we tested the possibility that thinking about a temporally distant as compared to a temporally close event would increase the search for meaning in life, but would not affect the immediate presence of meaning in life.

2.4 STUDY 3

2.4.1 Participants and Experimental Design

Forty-one (7 men; 34 women) undergraduate students at a large Dutch university were invited to the lab and participated in the experiment in exchange for course credit. The age of the participants ranged from 18 to 50 with a mean of 19.75 (*SD* = 5.01). Participants were randomly assigned to a high versus low psychological distance condition.

Psychological distance. We manipulated temporal distance following the procedures in Trope and Liberman (2003). Participants were either asked to write about spending a day with their best friend next week (low psychological distance) or next year (high psychological distance).

Meaning in Life. Participants completed the MLQ (Steger et al., 2006) as the dependent measure. The reliability was .90 for the presence of meaning in life subscale and was .88 for the search for meaning in life subscale. The two subscales were uncorrelated (r = .16, p = .31).

2.4.2 Results and Discussion

We tested our prediction by conducting two univariate ANOVAs on the presence of, and search for, meaning in life. In line with our prediction, temporal distance did not affect the presence of meaning ($M_{high\ distance}$ = 4.74, *SD* = 1.20, $M_{low\ distance}$ = 4.64, *SD* = .95), $F(1, 39) = .09$, $p = .76$, *partial* $\eta^2 < .001$. In contrast, temporal distance affected the search for meaning in life such that

participants in the high distance condition (M = 5.16, SD = 1.06) reported searching for meaning in life to a greater extent than participants in the low distance condition (M = 4.44, SD = 1.00), $F(1, 39) = 5.04$, $p = .03$, *partial* $\eta^2 = .11$.

Although the findings of Studies 2 and 3 support our prediction that abstract thought and temporal distance increase the search for meaning in life, both manipulations prompted individuals to think about their best friend, thus raising the possibility that interpersonal factors might partially account for the effects. Therefore, our next experiment was designed to manipulate temporal distance in a context that is not tied to interpersonal factors. Moreover, we wanted to ensure that our manipulations of psychological distance elicited changes in the search for meaning independent of changes in affect. Previous research has demonstrated that the experience of positive and negative affect is related to the presence of, and search for meaning in life (e.g., joy, sadness; Steger et al., 2006), suggesting that we should statistically control for the influence of affect if our manipulations produced such changes.

2.5 STUDY 4

2.5.1 Participants and Experimental Design

Two hundred (102 men; 96 women; 2 other) participants living in the United States took part in the experiment over the internet through Amazon's Mechanical Turk in exchange for $.50 payment. Participants were between 18 and 69 years of age (M = 31.90; SD = 11.57) and 41 states were represented. Prior to computing the final analyses, four participants were excluded

from analysis for spending longer than three standard deviations above the average completion time to finish the experiment (M = 8.55 minutes; SD = 13.19 minutes). Participants were randomly assigned to a high versus low temporal distance condition.

Psychological distance. Psychological distance was manipulated through temporal psychological distance (e.g., Trope et al., 2003). Specifically, participants were asked to describe a typical day they expected to experience either next year (high psychological distance) or next week (low psychological distance).

Positive and negative affect. Participants were asked to fill out the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) following our manipulation of temporal distance. This measure asks people to indicate the extent to which they feel ten emotions that are indicative of positive (e.g., enthusiastic) and negative (e.g., upset) affect on a Likert scale ranging from 1 (not at all) to 4 (extremely). Internal reliability for the positive affect subscale was .88 and for the negative affect subscale .93.

Meaning in life. As in the preceding studies, participants were asked to fill out the MLQ (Steger et al., 2006). The internal reliability for the presence of meaning in life subscale was .92 and for the search for meaning in life subscale was .91. The correlation between the presence of, and search for, meaning was -.38, p <.001.

2.5.2 Results and Discussion

First, we performed two univariate analyses of variance on positive and negative affect as predicted by temporal distance. Temporal distance did not influence positive (F(1, 194) = 1.34, p = .25 , *partial* η^2 = .01) or negative (F(1, 194) = 2.29, p = .13 , *partial* η^2 = .01) affect, so we

proceeded with the planned analyses. Specifically, two univariate analyses of variance were performed on the presence of meaning and the search for meaning as a function of temporal distance (high versus low). Temporal distance did not influence the presence of meaning ($M_{high\ distance}$ = 4.43, *SD* = 1.49, $M_{low\ distance}$ = 4.58, *SD* = 1.32), $F(1, 194) = .56$, $p = .45$, *partial* $\eta^2 < .001$. However, temporal distance did significantly cause a change in the search for meaning, $F(1, 194) = 3.73$, $p = .05$, *partial* $\eta^2 = .02$. As expected, participants in the high distance condition (*M* = 4.71, *SD* = 1.43) reported searching for meaning in life to a greater extent than participants in the low distance condition (*M* = 4.32, *SD* = 1.36).

Thus, we conceptually replicated the proposed causal link between psychological distance and the search for meaning in life. In the next experiment, we aimed to replicate the effect of temporal distance on search for meaning using a slightly different manipulation.

2.6 STUDY 5

2.6.1 Participants and Experimental Design

One hundred ninety-six (78 males, 118 females, 1 other) participants were sampled through Amazon's Mechanical Turk in exchange for $.40. Participants came from 38 states and were between 18 and 75 years of age (*M* = 34.34, *SD* = 13.10). Participants were randomly assigned to a high versus low temporal distance condition.

Psychological distance. As in Studies 3 and 4, we manipulated temporal distance. Rather than thinking about a typical day either next year or tomorrow (Study 4), participants in the

present experiment were asked to describe the things that would happen to them next year (high psychological distance) versus tomorrow (low psychological distance).

Positive and negative affect. Following our temporal distance manipulation, participants were asked to fill out the PANAS (Watson et al., 1988). Internal reliability for the positive affect subscale was .90 and for the negative affect subscale .92.

Meaning in life. As in the preceding experiments, participants completed the MLQ (Steger et al., 2006). The internal reliability for the presence of meaning in life subscale was .93 and for the search for meaning in life subscale was .94. The correlation between the two subscales was $r = -.35$, $p < .001$.

2.6.2 Results and Discussion

First, we performed two univariate analyses of variance on positive and negative affect as predicted by temporal distance. Temporal distance did not influence positive ($F(1, 194) = 1.19$, $p = .28$, *partial* $\eta^2 = .01$) or negative ($F(1, 194) = 1.26$, $p = .26$, *partial* $\eta^2 = .01$) affect. Two univariate analyses of variances were performed on the presence of meaning and the search for meaning predicted by temporal distance (high versus low). Temporal distance did not influence the presence of meaning ($M_{high\ distance} = 4.94$, $SD = 1.47$, $M_{low\ distance} = 4.65$, $SD = 1.39$), $F(1, 194) = 1.92$, $p = .17$, *partial* $\eta^2 = .01$. However, temporal distance caused a significant change in the search for meaning such that participants reported searching for more meaning in life in the high distance condition ($M = 4.83$, $SD = 1.48$) as compared to the low distance condition ($M = 4.28$, $SD = 1.54$), $F(1, 194) = 6.46$, $p = .01$, *partial* $\eta^2 = .03$.

Once again, our hypothesis that temporal distance increases the search for meaning was supported. Although we assumed that these manipulations led to differences in the search for meaning because of changes in psychological distance, alternative explanations could exist. For example, thinking about the future as compared to the present may lead people to focus on what they want to accomplish in life, thus temporarily increasing their motivation to search for their life's meaning. To address this possibility, in the next experiment we manipulated psychological distance through a different type of distance, namely spatial psychological distance.

2.7 STUDY 6

Study 6 was designed to replicate the findings of the preceding experiments by experimentally manipulating psychological distance through spatial distance. Therefore, American participants were either asked to describe the things they would do in the Western-Australian city Perth (high distance) or in the city in which they currently live (low distance).

2.7.1 Participants and Experimental Design

Four-hundred five (405) individuals living in the United States participated in our experiment online through Amazon's Mechanical Turk in exchange for $.40. Because we utilized a different way of manipulating psychological distance, we increased our sample size in order to ensure sufficient power for data analyses. The age of the participants ranged between 18 and 75 years

with a mean age of 31.94 years (*SD* = 12.26). All fifty states were represented and participants were males (188), females (216), or a different gender (1). Participants were randomly assigned to a high versus low spatial psychological distance condition.

Psychological distance. Psychological distance was manipulated through spatial distance. Specifically, participants were asked to describe the things they would either do in the Western-Australian city Perth (high spatial distance) or in the city they currently lived (low spatial distance). In order to strengthen our manipulation, in the present experiment we presented participants with a map that either depicted the location of the Western-Australian city Perth in relation to the United States (high spatial distance) or a map of the United States that asked them to select their current state and to type in the name of their city (low spatial distance). This way, the high versus low distance was made apparent through a visual representation.

Positive and negative affect. Participants completed the PANAS (Watson et al., 1988) following the spatial distance manipulation. Internal reliability for the positive affect subscale was .90 and for the negative affect subscale .92.

Meaning in life. Participants completed the MLQ (Steger et al., 2006) as our dependent measure. The internal reliability for the presence of meaning in life subscale was .94 and for the search for meaning in life subscale was .93. The correlation between the presence of, and search for, meaning in life was -.26, $p < .001$.

2.7.2 Results and Discussion

Prior to performing our planned analyses, we conducted two univariate analyses of variance on positive and negative affect as predicted by spatial distance. Spatial distance did not influence positive ($F(1, 403) = .15$, $p = .70$, *partial* $\eta^2 < .001$) or negative ($F(1, 403) = .35$, $p = .56$, *partial* $\eta^2 = .001$) affect. Two univariate analyses of variance were performed on the presence of meaning and the search of meaning as a function of spatial distance (high versus low). Spatial distance did not affect the presence of meaning in life ($M_{\text{high distance}} = 4.56$, $SD = 2.08$; $M_{\text{low distance}} = 4.73$, $SD = 1.47$), $F(1, 403) = 1.15$, $p = .29$, *partial* $\eta^2 = .003$. However, spatial distance affected the search for meaning in life such that high spatial distance ($M = 4.68$, $SD = 1.57$) as compared to low spatial distance ($M = 4.25$, $SD = 1.53$) increased the search for meaning, $F(1, 403) = 7.80$, $p = .01$, *partial* $\eta^2 = .02$.

Thus, six experiments that employed different methodologies provided evidence consistent with Hypotheses 1 and 2. As expected, abstract thought contributed to increased search for meaning when it was measured and manipulated (Hypothesis 1) as did psychological distance when it was induced via temporal and spatial distance (Hypothesis 2). Yet, this evidence should not be taken to suggest that individuals will increase the search for meaning in life whenever thinking abstractly or about psychologically distant events. Hypothesis 3 was designed to test the prediction that the connection between abstract thinking and the search for meaning should be moderated by individuals' willingness to exert effort. Specifically, because the search for meaning requires schema formation and/or change (Steger et al., 2011) and both processes are effortful (Garcia-Marques & Mackie, 1999; Shallice & Burgess, 1996), Studies 7 to 9, then,

were designed to test the prediction that the link between abstract thinking or psychological distance and the search for meaning in life is stronger when the willingness to exert effort is strong rather than weak.

2.8 STUDY 7

In order to test this prediction, we measured individuals' engagement in abstract thinking and the extent to which they typically search for their life's meaning. Moreover, we measured three variables that are directly pertinent to the willingness to exert effort to complete demanding tasks: trait self-control, state self-control, and achievement motivation.

2.8.1 Participants and Experimental Design

Five-hundred thirty-six (266 males; 270 females) individuals from the United States completed our study via Amazon's Mechanical Turk for $.50. In this experiment, we chose to increase our sample size because previous research has shown that correlational designs often require larger sample sizes in order to detect interactions as compared to experiments (e.g., Cohen, Cohen, West, & Aiken, 2003). Participants were between age 18 and 72 with a mean age of 32.92 years (*SD* = 11.56) and were from all 50 states. Participants completed the measures in randomized order. Due to a technical error during the start of the experiment, 102 out of 536 participants did not complete the achievement motivation measure (19.03%). No evidence was present that these participants with incomplete data differed from the participants with complete data on any of the

remaining dependent variables nor on any of the demographic variables, strongly supporting the idea that this data was missing completely at random.

Abstract thought. Participants completed the same eight items designed to measure the extent to which they think abstractly as in Study 1 (Cronbach's α = .59).

Meaning in life. As in the preceding experiments, participants completed the presence of meaning (Cronbach's α = .95) and search for meaning in life (Cronbach's α = .94) subscales of the MLQ (Steger et al., 2006). The presence of, and search for, meaning in life were negatively correlated, r = - .34, p < .001.

Trait self-control. This questionnaire was designed to measure the general ability to exert willpower (Tangney et al., 2004) and consists of 36 items. Example items include "People would say that I have iron self-discipline" and "I am able to work effectively toward long-term goals" and participants were asked to indicate their agreement with each item on a 7-point Likert scale ranging from 1 (Completely Disagree) to 7 (Completely Agree). After reverse coding the appropriate items, a composite score of trait self-control was calculated (Cronbach's α = .91).

State self-control. Participants completed the short form of the state self-control capacity scale (Ciarocco, Twenge, Muraven, & Tice, 2004). Participants were asked to indicate the extent to which they agreed with 10 items that were designed to measure their self-control ability at this moment. Example items include "I would want to quit any difficult task I was given" and "I can't absorb any information" (R) on a 7-point Likert scale ranging from 1 (Completely Disagree) to 7 (Completely Agree). A composite score was created by averaging across all items (Cronbach's α = .81).

Achievement motivation. Participants were asked to indicate their agreement with each of seven items of the work ethic subscale of the achievement motivation scale (Cassidy & Lynn,

1989) on a 7-point Likert scale ranging from 1 (Completely Disagree) to 7 (Completely Agree). This measure taps into individuals' willingness to work hard toward completing tasks and achieving personal standards and example items include "I easily get bored if I don't have something to do" and "I like to work hard." A composite score was calculated by averaging across the seven items (Cronbach's α = .81).

2.8.2 Results and Discussion

Separate multiple regression analyses were performed for each proposed moderator (trait self-control, state self-control, achievement motivation) in order to test whether each of these variables moderates the connection between abstract thought and the search for meaning. Specifically, three multiple regression analyses were conducted on the search for meaning as a function of abstract thought, the moderator at hand, and the interaction between abstract thought and the moderator, while controlling for participants' age and self-reported presence of meaning in life. We decided on this analytic strategy prior to data collection in order to gain more confidence in Hypothesis 3 by providing a within-study replication of the willingness to exert effort variable.

All independent variables were centered prior to analyses. Because this was a correlational design and previous evidence has shown that age and the presence of meaning are negatively related to the search for meaning in life (e.g., Steger et al., 2006), we controlled for their potential influence in evaluating our results. Because the assumptions of normality and linearity were substantially violated due to the presence of several influential cases and transformations were unsuccessful in remedying these violations, we conducted our planned

moderation and simple slopes analyses using bias-corrected accelerated bootstrapping rather than ordinary least squares regression (see Efron & Tibshirani, 1993). Although this analysis renders more conservative tests of the regression coefficients by increasing their standard errors (i.e., by taking into account the influential cases), the estimates reflect their underlying population's values with greater accuracy than estimates derived from ordinary least squares regression.

Trait self-control. A multiple regression was performed on the search for meaning in life predicted by age, presence of meaning in life, abstract thought, trait self-control, and the interaction between abstract thought and trait self-control. The five predictors explained a significant amount of variance in the search for meaning in life, $F(5, 528) = 19.97$, $p < .001$, $R^2 = .16$. Age was unrelated to the search for meaning, $B = -.01$, SE = .01, $p = .09$, 95% *CI* [-.02; .003]. In contrast, the presence of meaning was negatively related to the search for meaning such that increased perceptions of meaning were associated with decreased search for meaning, $B = -.32$, SE = .05, $p = .001$, 95% *CI* [-.43; -.20]. Abstract thinking was marginally related to the search for meaning, $B = .19$, SE = .10, $p = .06$, 95% *CI* [-.01; .40]. Moreover, trait self-control was unrelated to the search for meaning, $B = -.16$, SE = .09, $p = .08$, 95% *CI* [-.33; .00]. However, and consistent with our predictions, abstract thinking significantly interacted with trait self-control to predict the search for meaning, suggesting that the connection between abstract thinking and the search for meaning varies as a function of trait self-control, $B = .35$, SE = .13, $p = .01$, 95% *CI* [.03; .59].

In order to further investigate the pattern of this interaction, we performed simple slopes analyses on the search for meaning as predicted by abstract thought at high (i.e., one standard deviation above the mean) and low (i.e., one standard deviation below the mean) levels of trait self-control (Figure 1). As predicted, abstract thought was associated with increased search for

meaning when trait self-control was high, B = .49, SE = .09, p = .003, 95% CI [.22; .74]. However, abstract thought was unrelated to the search for meaning when trait self-control was low, B = -.11, SE = .16, p = .50, 95% CI [-.38; .28]. Thus, the pattern of the results supported our predictions by demonstrating that abstract thought is associated with the search for meaning to a greater extent when trait self-control is high rather than low.

State self-control. A multiple regression was performed on the search for meaning in life predicted by age, presence of meaning in life, abstract thought, state self-control, and the interaction between abstract thought and state self-control. The five predictors explained a significant amount of variance in the search for meaning in life, $F(5, 528) = 18.73$, $p < .001$, $R^2 = .15$. Age was unrelated to the search for meaning, B = -. 001, SE = .01, p = .12, 95% CI [-.02; .001]. However, the presence of meaning was negatively related with the search for meaning, indicating that higher perceptions of meaning are associated with reduced search for meaning, B = -. 34, SE = .06, p = .001, 95% CI [-.45; -.23]. Abstract thought was marginally related to the search for meaning, B = .19, SE = .11, p = .08, 95% CI [-.02; 43]. Also, state self-control was unrelated to the search for meaning, B = -.05, SE = .08, p = .49, 95% CI [-.21; .08]. Consistent with our predictions, abstract thought and state self-control interacted in predicting the search for meaning, thus suggesting that the connection between abstract thought and the search for meaning differs among levels of state self-control, B = .27, SE = .12, p = .02, 95% CI [.03; .47].

In order to further investigate the pattern of this interaction, we performed simple slopes analyses on the search for meaning as predicted by abstract thought at high (i.e., one standard deviation above the mean) and low (i.e., one standard deviation below the mean) levels of state self-control (Figure 2). When state self-control was high, abstract thought was related to increased search for meaning, B = .46, SE = .16, p = .003, 95% CI [.14; .75]. When state self-

control was low, abstract thought was unrelated to the search for meaning, *B* = -. 08, SE = .16, *p* = .63, 95% *CI* [-.37; .28]. Thus, and as predicted, abstract thought is related to the search for meaning to a greater extent when state self-control was high than when it was low.

Achievement Motivation. A multiple regression was performed on the search for meaning in life predicted by age, presence of meaning in life, abstract thought, achievement motivation, and the interaction between abstract thought and achievement motivation. The five predictors explained a significant amount of variance in the search for meaning in life, $F(5, 431) = 12.78$, $p < .001$, $R^2 = .13$. Age was negatively related to the search for meaning in life, *B* = -. 02, SE = .01, *p* = .02, 95% *CI* [-.03; -.003]. Also, the presence of meaning was negatively related to the search for meaning, *B* = -. 34, SE = .06, *p* = .001, 95% *CI* [-.46; -.21]. Abstract thought was unrelated to the search for meaning, *B* = .12, SE = .12, *p* = .33, 95% *CI* [-.11; .38]. In addition, achievement motivation was unrelated to the search for meaning, *B* = .02, SE = .07, *p* = .78, 95% *CI* [-.14; .18]. However, and in line with our predictions, abstract thought significantly interacted with achievement motivation in predicting the search for meaning, thus suggesting that the connection between abstract thought and the search for meaning differs among levels of achievement motivation, *B* = .27, SE = .09, *p* = .04, 95% *CI* [.01; .34].

Simple slopes analyses were conducted on the search for meaning as predicted by abstract thought at high (i.e., one standard deviation above the mean) and low (i.e., one standard deviation below the mean) levels of achievement motivation in order to further investigate the pattern of this interaction (Figure 3). When achievement motivation was high, abstract thought was related to increased search for meaning in life, *B* = .32, SE = .16, *p* = .05, 95% *CI* [.02; .63]. However, when achievement motivation was low, abstract thought was unrelated to the search for meaning in life, *B* = -.08, SE = .17, *p* = .64, 95% *CI* [-.43; .30]. Thus, abstract thought was

correlated with increased search for meaning to a greater extent when achievement motivation was high rather than low.

Summary. The results of Study 7 provided evidence consistent with Hypothesis 3, demonstrating within a single sample that different operationalizations of the willingness to exert effort moderate the connection between abstract thought and the search for meaning in life. Specifically, it was shown that abstract thought contributes to increased search meaning in life to a greater extent when the willingness to exert effort is high than when it is low. Our next study set out to test the possibility that the willingness to exert effort moderates the link between psychological distance and search for meaning by measuring achievement motivation and manipulating temporal distance.

2.9 STUDY 8

2.9.1 Participants and Experimental Design

Two hundred five (105 males; 84 females; 1 different gender orientation; 15 unrecorded) participants from the United States completed our experiment via Amazon's Mechanical Turk for $.40. Participants were between 18 and 72 years of age with a mean age 31.06 years (*SD* = 11.32). Participants were from 38 states. Participants were first asked to complete a measure of achievement motivation. Then, they were randomly assigned to a high versus low temporal distance condition. This order was chosen to ensure that differences in psychological distance would not lead to changes in our proposed moderator, achievement motivation.

Achievement motivation. Participants completed the same work ethic subscale of the achievement motivation scale (Cassidy & Lynn, 1989) as in Study 7. Because all three scales in Study 7 provided consistent results and Mechanical Turk participants are often more likely to complete shorter than longer experiments, we chose this indicator of motivational resources because it consisted of the fewest number of items. The internal reliability of the scale was .83.

Psychological distance. Similar to Study 5 (see Trope et al., 2003), we manipulated abstract thought through temporal psychological distance by either asking participants to describe the things that would happen to them next year (high temporal distance) versus tomorrow (low temporal distance).

Positive and negative affect. Participants were asked to fill out the PANAS (Watson et al., 1988). Internal reliability for the positive affect subscale was .90 and for the negative affect subscale .93.

Search for meaning. Participants filled out the search for meaning subscale from the MLQ (Steger et al., 2006). The internal reliability was .93. We now chose to abandon the presence of meaning in life as a measure to keep the study as short as possible because previous experiments did not provide any evidence that the presence of meaning was affected by either abstract thinking or psychological distance.

2.9.2 Results and Discussion

Prior to conducting our planned analyses, we performed two univariate analyses of variance on positive and negative affect as predicted by temporal distance. Temporal distance did not influence positive ($F(1, 203) = .19$, $p = .66$, *partial* $\eta^2 = .001$) or negative ($F(1, 203) = 2.47$, $p =$

.12 , *partial* η^2 = .01) affect. As such, affect was omitted from further analyses. In order to test the prediction that achievement motivation moderates the connection between temporal distance and the search for meaning, we performed a multiple regression on the search for meaning as predicted by temporal distance (dummy coded, low distance [0]; high distance [1]), achievement motivation, and the interaction between temporal distance and achievement motivation.

The three predictors explained a significant proportion of variance in the search for meaning in life, F (3, 201) = 3.70, p = .01, R^2 = .05. Temporal distance led to differences in the search for meaning in that high distance increased the search for meaning compared to low distance, B = .39, t (201) = 1.96, p = .05, 95% *CI* [-.002; .79]. Achievement motivation was unrelated to the search for meaning, B = -.08, t (201) = -.72, p = .47, 95% *CI* [-.28; .13]. In accordance with our predictions, achievement motivation affected contributed to the search for meaning differently among high versus low temporal distance, B = .38, t (201) = 2.34, p = .02, 95% *CI* [.06; .69].

In order to further investigate the pattern of this interaction, simple slopes analyses were performed on the search for meaning predicted by achievement motivation when temporal distance was high and low. As expected, achievement motivation contributed to increased search for meaning when temporal distance was high, B = .30, t (201) = 2.47, p = .01, 95% *CI* [0.06; 0.54]. However, achievement motivation was unrelated to the search for meaning when psychological distance was low, B = -.08, t (201) = -.72, p = .47, 95% *CI* [-0.28; 0.13].

Finally, we computed the difference in search for meaning among high versus low temporal distance at high (i.e., one standard deviation above the mean) and low (i.e., one standard deviation below the mean) levels of achievement motivation. Based on Hypothesis 3, we expected to find that high as compared to low temporal distance would lead to increased

search for meaning when achievement motivation was high, but we did not necessarily expect to find differences in the search for meaning between high and low temporal distance when achievement motivation was low. Indeed, when achievement motivation was high, high (M_{search} = 5.04, *SE* = .17, 95% *CI* [4.71; 5.37]) as compared to low (M_{search} = 4.17, *SE* = .21, 95% *CI* [3.76; 4.58]) temporal distance led to increased search for meaning. When achievement motivation was low, high (M_{search} = 4.28, *SE* = .17, 95% *CI* [3.95; 4.61]) as compared to low (M_{search} = 4.37, *SE* = .21, 95% *CI* [3.96; 4.78]) temporal distance did not lead to differences in the search for meaning.

Thus, the present study furnished results showing that achievement motivation contributed to increased search for meaning in life to a greater extent when temporal distance was high rather than low. In addition, it was shown that high as compared to low temporal distance led to increased search for meaning in life when achievement motivation was high, but not when achievement motivation was low. In our final study, we set out to obtain full experimental evidence for this hypothesis.

2.10 STUDY 9

Study 9 was designed to provide experimental evidence for the moderating role of the willingness to exert effort on the connection between psychological distance and the search for meaning in life. To this end, we experimentally induced high versus low willingness to exert effort, after which we experimentally manipulated temporal psychological distance. This order of manipulations was chosen because experimentally induced differences in willingness to exert

effort might have impacted the energy and time individuals would have been willing to spend on our psychological distance manipulation if administered first. We expected that high as compared to low temporal distance would lead to increased search for meaning in life to a greater extent when willingness to exert effort was high rather than low.

2.10.1 Participants and Experimental Design

Two hundred seventeen (103 males, 98 females, 3 different gender orientations, and 14 unrecorded responses) participants living in the United States completed the study through Amazon's Mechanical Turk in exchange for $.50. Participants were between 18 and 76 years old (M = 32.61, SD = 11.29) and were from 37 states. Participants were randomly assigned to a high versus low willingness to exert effort condition and a high versus low temporal psychological distance condition.

Willingness to exert effort. High versus low willingness to exert effort was induced by asking participants to unscramble ten words that were presented in random order. The words that were intended to increase the willingness to exert effort were adapted from the three questionnaires that were used in Study 7 (i.e., trait self-control, state self-control, & achievement motivation). Specifically, participants were told that we were interested in their ability to form words out of letters (Baumeister et al., 1998) and were then presented with ten scrambled words. Five of these words were neutral: turtle, building, plant, green, and staple. In the high willingness to exert effort condition, participants were also asked to unscramble the following words: motivation, achievement, willpower, determination, and focus. In the low willingness to exert

effort condition, participants unscrambled the following words: impulsive, indifference, fatigue, drained, and lazy.

Psychological distance. As in Studies 5 and 8, we manipulated temporal distance (Trope et al., 2003). Participants were either asked to describe the things that would happen to them next year (high temporal distance) or tomorrow (low temporal distance).

Positive and negative affect. Participants filled out the PANAS (Watson et al., 1988) following our manipulations. Internal reliability for the positive affect subscale was .81 and for the negative affect subscale .91.

Search for meaning in life. Participants filled out the search for meaning subscale from the MLQ (Steger et al., 2006; Cronbach's α = .96).

2.10.2 Results and Discussion

Prior to analyzing our data, we checked whether our manipulations produced changes in positive and negative affect by computing a 2(Willingness to exert effort: High vs. Low) × 2(Temporal Distance: High vs. Low) between-subjects ANOVA. In line with a recent meta-analysis (Hagger, Wood, Stiff, & Chatzisarantis, 2010) that showed that induction of increased or decreased willingness to exert effort substantially influences negative affect and moderately influences positive affect, we found that decreased as compared to increased willingness to exert effort elevated negative affect (F (1, 213) = 4.40, p = .04, partial η^2 = .02), but did not influence positive affect (F (1, 213) = .03, p = .87, partial η^2 < .001). As expected, the temporal distance manipulation did not produce any differences in either negative (F (1, 213) = 2.26, p = .14, partial η^2 = .01) or positive (F (1, 213) = 1.11, p = .29, partial η^2 = .01) affect. Because moderate

correlations have been found between negative affect and the search for meaning in life (Steger et al., 2006) and in order to control for the possibility that negative affect rather than willingness to exert effort per se may be responsible for changes in the connection between temporal distance and the search for meaning, we included negative affect as a covariate in our subsequent analyses.

A 2(Willingness to Exert Effort: High vs. Low) by 2(Temporal Distance: High vs. Low) between-subjects ANOVA was performed on the search for meaning. Descriptive statistics are displayed in Table 1. Support for the moderating role of willingness to exert effort on the connection between abstract thought and the search for meaning in life would be provided by finding a significant interaction between temporal distance and willingness to exert effort.

We did not find a main effect of psychological distance on the search for meaning, $F(1, 212) = 1.79$, $p = .18$, *partial* $\eta^2 = .01$. A main effect of willingness to exert effort on the search for meaning emerged, such that high as compared to low willingness to exert effort increased the search for meaning, $F(1, 212) = 5.48$, $p = .02$, *partial* $\eta^2 = .03$. Most importantly, we found the predicted two-way interaction, $F(1, 212) = 4.48$, $p = .03$, *partial* $\eta^2 = .02$.

We conducted four planned simple main effect comparisons in order to further investigate the pattern of this interaction. High as compared to low temporal distance increased the search for meaning when willingness to exert effort was high ($F(1, 212) = 9.77$, $p = .002$, *partial* $\eta^2 = .04$), but not low ($F(1, 212) = .01$, $p = .91$, *partial* $\eta^2 < .001$). Moreover, high as compared to low willingness to exert effort increased the search for meaning when temporal distance was high ($F(1, 212) = 6.33$, $p = .01$, *partial* $\eta^2 = .03$), but not when it was low ($F(1, 212) = .36$, $p = .55$, *partial* $\eta^2 = .002$). Thus, our final experiment provided evidence for the

assertion that temporal distance increases the search for meaning in life to a greater extent when willingness to exert effort is high rather than low.

3.0 GENERAL DISCUSSION

In accordance with the assertion that "people have pondered questions related to meaning in life perhaps as long as they have been able to think abstractly" (Hicks & Routledge, 2013, p. ix), the present set of experiments demonstrated that abstract thought increases the search for meaning in life (Hypothesis 1). Individuals who typically engaged in abstract thinking searched for more meaning in their lives than individuals who did not typically engage in abstract thinking (Study 1). Individuals searched for more meaning in life when they had considered why (abstract) as compared to how (concrete) their best friend was important to them (Study 2). Moreover, the combination of work on the search for meaning in life and abstract thinking styles allowed us to test the additional prediction that increased psychological distance would increase the search for meaning in life (Hypothesis 2). Indeed, individuals searched for more meaning in life when they had thought about a day in the distant versus near future (Studies 3-5), and when they had thought about the things they would do at a physically distant versus near location (Study 6). Therefore, the same pattern was observed when abstract thought was measured in a correlational design and was operationalized according to a direct mindset manipulation as well as when psychological distance was manipulated. In addition to employing various methodologies, evidence for our hypotheses was observed both in the Netherlands and in the United States and across various samples including college students and demographically diverse online participants, thus providing robust evidence for the generality of our results.

As mentioned before, a substantial body of evidence has demonstrated that abstract thought increases as a function of psychological distance (Trope & Liberman, 2010). Although we based our prediction that psychological distance would affect the search for meaning in life partially on this research, we cannot be sure that abstract thought mediates the link between psychological distance and search for meaning in our studies. We did not find evidence directly supporting the link between psychological distance and abstract thought. In fact, manipulation checks of abstract thinking (see Fujita et al., 2006 & Studies 1 & 7) were included in Studies 5, 6, 8 and 9. Yet, no evidence was present that abstract thought increased as a function of psychological distance, nor that such a predicted increased in abstract thought mediated the connection between psychological distance and the search for meaning in life. Thus, although we found evidence for the claim that "consideration of life's meaning requires stepping back from the moment and seeing events in a long-range context" (Baumeister, 1991, p. 3), future research is needed to establish the exact mechanisms underlying this effect.

Finally, the present results provided evidence for the hypothesis that abstract thought and temporal distance would increase the search for meaning to a greater extent when the willingness to exert effort was high rather than low (Hypothesis 3). The willingness to exert effort moderated the connection between abstract thought (Study 7) and psychological distance (Studies 8 & 9) and the search for meaning when operationalized according to trait self-control, state self-control, and achievement motivation (Studies 7 & 8) as well as when experimentally manipulated (Study 9). Indeed, these results are consistent with the assertion that the search for meaning entails schema formation and alteration (Steger et al., 2011) and that schematic processing is effortful (e.g., Shallice & Burgess, 1996).

The present findings offer important implications for various areas in psychology. It is often assumed that the search for meaning is a stable trait (Steger et al., 2008a), that increases in times of significant psychological distress (Thompson & Janigian, 1988) such as following traumatic experiences (e.g., Boyraz et al. 2010; Gillies & Neimeyer, 2006). However, the present research demonstrated that the search for meaning may be brought about by occurrences as subtle or non-invasive as merely considering a day in the distant future, thereby suggesting that the search for meaning is more malleable than previously assumed.

Recent evidence has pointed to the importance of searching for meaning during adolescence for the development of both a sense of meaning as well as healthy habits (Brassai et al., 2012). Given that individuals can benefit from searching for meaning both when meaning appears to be lacking and as a part of normative development, the current research may suggest that interventions be designed in order to facilitate the process of searching for meaning. Alternatively, the search for meaning in life may not always benefit the individuals engaging in it. For example, when perceptions of meaning in life are lacking and individuals engage in the search for meaning, subjective well-being perceptions are likely to decline (Cohen & Kairns, 2012, Park et al., 2010; Steger et al., 2011). In both cases, and based on the present findings, fostering abstract thinking may prove to be a particularly effective way to either instigate or silence the search for meaning in life, thus contributing to individuals' health and well-being.

In addition to providing evidence that individuals' search for meaning is influenced by abstract thought, the present set of experiments offers a starting point for exploring the relationship between the search for meaning and other social cognitive factors. For example, evidence exists that elevated social power increases the psychological distance between oneself and others, thereby leading powerful people to think abstractly rather than concretely (Smith &

Trope, 2006; Smith, Wigboldus, & Dijksterhuis, 2008). Based on the present results on the interconnection between abstract thinking and the search for meaning, powerful as opposed to less powerful individuals should be especially inclined to search for their lives' meaning. In fact, anecdotal evidence appears to support this prediction. Individuals entitled with social power often invest a significant amount of their resources in activities that are intended to construct and establish their life's meaning, commonly referred to as building a legacy. Thus, the possession of power may not only grant individuals with the obvious ability to invest in meaning making, but with the inclination to do so as well.

APPENDIX A

TABLES

Table 1A: Adjusted means and standard errors for the search for meaning in life as a function of psychological distance and motivational resources while controlling for negative affect.

Psychological Distance	Motivation	*N*	*M*	*SE*
High	High	55	5.08	.20
	Low	50	4.36	.20
Low	High	54	4.15	.22
	Low	58	4.32	.20

APPENDIX B

FIGURES

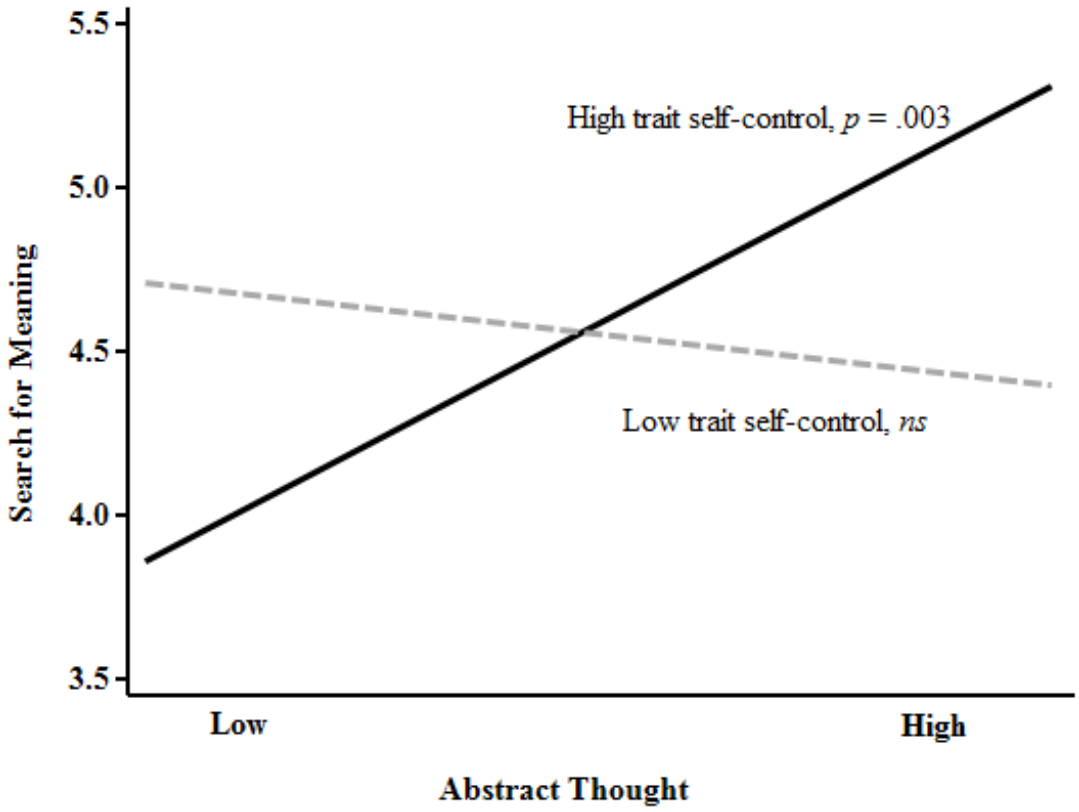

Figure 1B. Search for meaning as a function of abstract thought and trait self-control while controlling for the presence of meaning and age. All predictors were centered.

Figure 2B. Search for meaning as a function of abstract thought and state self-control while controlling for the presence of meaning and age. All predictors were centered.

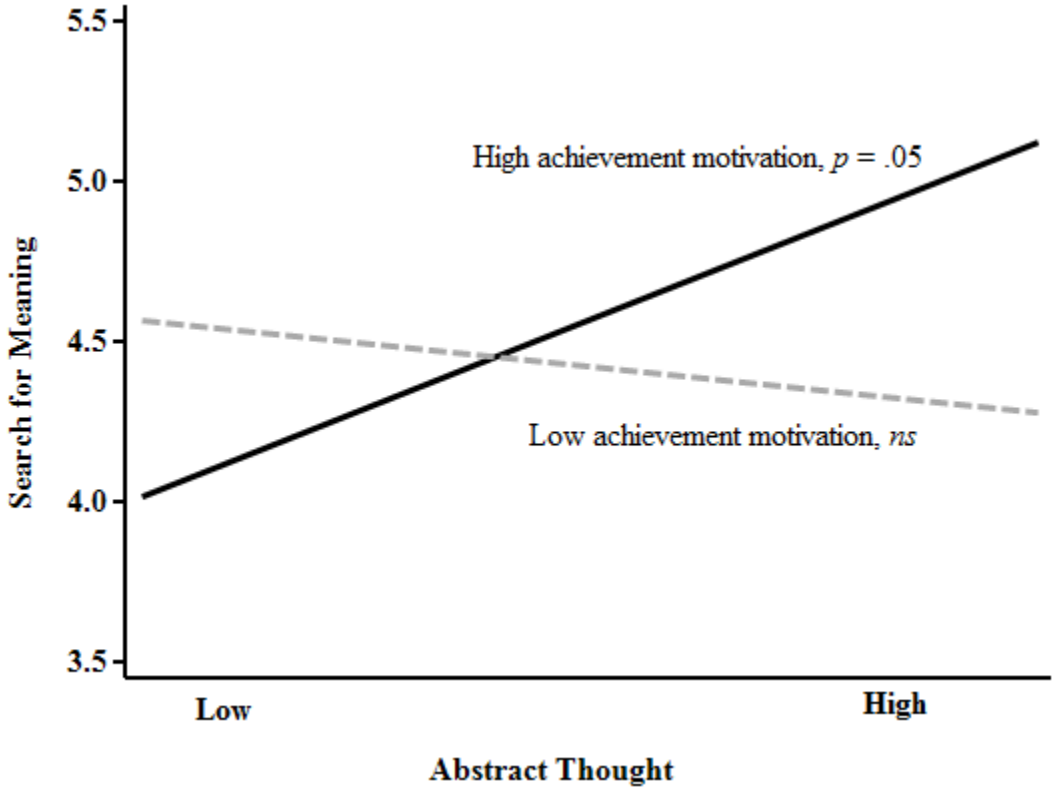

Figure 3B. Search for meaning as a function of abstract thought and achievement motivation while controlling for the presence of meaning and age. All predictors were centered.

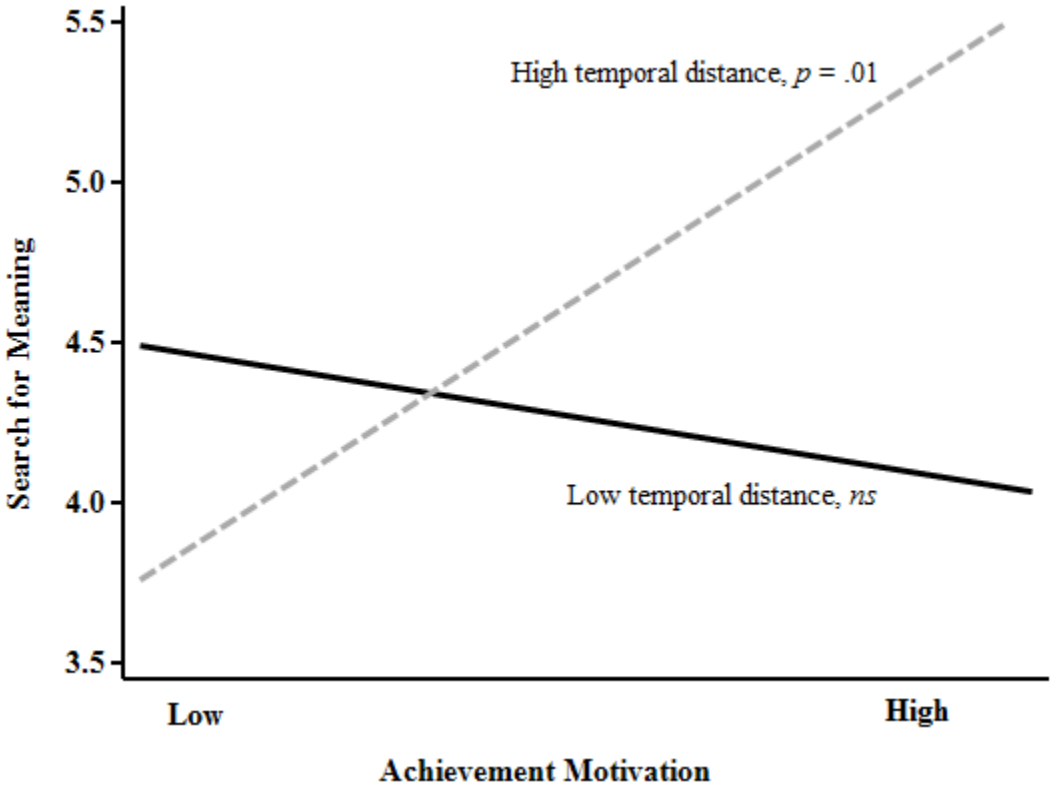

Figure 4B. Search for meaning as a function of achievement motivation and temporal distance. Achievement motivation was centered.

BIBLIOGRAPHY

Bargh, J. A. (2006). Agenda 2006: What have we been priming all these years? on the development, mechanisms, and ecology of nonconscious social behavior. *European Journal of Social Psychology, 36*(2), 147-168.

Baumeister, R. F. (1991). *Meanings in life*. New York, NY: Guilford.

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology, 74*(5), 1252-1265.

Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1994). *Losing control: How and why people fail at self-regulation* Academic Press, San Diego, CA.

Becker, E. (1971). *The birth and death of meaning: An interdisciplinary perspective on the problem of man. (2nd ed.)* Free Press, New York, NY.

Boyraz, G., Horne, S. G., & Sayger, T. V. (2010). Finding positive meaning after loss: The mediating role of reflection for bereaved individuals. *Journal of Loss and Trauma, 15*(3), 242-258.

Brassai, L., Piko, B. F., & Steger, M. F. (2012). Existential Attitudes and Eastern European Adolescents' Problem and Health Behaviors: Highlighting the Role of the Search for Meaning in Life. *Psychological Record, 62,* 719-734.

Bronk, K.C., Hill, P.L., Lapsley, D.K., Talib, T. L., & Finch, H. (2009). Purpose,

hope, and life satisfaction in three age groups. *Journal of Positive Psychology, 4*, 500-510.

Cassidy, T., & Lynn, R. (1989). A multifactorial approach to achievement motivation: The development of a comprehensive measure. *Journal of Occupational Psychology, 62*(4), 301-312.

Ciarocco, N., Twenge, J., Muraven, M., & Tice, D. (2004). The state self-control capacity scale: Reliability, validity, and correlations with physical and psychological stress. Unpublished manuscript, San Diego State University.

Cohen, K., & Cairns, D. (2012). Is searching for meaning in life associated with reduced subjective well-being? Confirmation and possible moderators. *Journal of Happiness Studies, 13,* 313-331.

Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*, Third Edition. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Collins, R. L., Taylor, S. E., & Skokan, L. A. (1990). A better world or a shattered vision? Changes in perspectives following victimization. *Social Cognition, 8,* 263–285.

Crescioni, A. W., & Baumeister, R. F. (2013). The four needs for meaning, the value gap, and how (and whether) society can fill the void. In J. Hicks & C. Routledge (Eds.), *The experience of meaning in life* (pp. 3-15). Springer Science + Business Media, New York, NY.

Davis, C. G., Wortman, C. B., Lehman, D. R., & Silver, R. C. (2000). Searching for meaning in loss: Are clinical assumptions correct? *Death Studies, 24,* 497–540.

Efron, B., & Tibshirani, R. J. (1993). *An introduction to the bootstrap*. New York: Chapman & Hall.

Emmons, R.A., Colby, P.M., & Kaiser, H.A. (1998). When losses lead to gains: Personal goals and the recovery of meaning. In P. Wong & P.S. Fry (Eds.), *The human quest for meaning: A handbook of psychological research and clinical applications* (263-285). Lawrence Erlbaum Associates Publishers, Mahwah, NJ.

Eyal, T., Liberman, N., & Trope, Y. (2009). *Psychological distance and consumer behavior: A construal level theory perspective.* (pp. 65-87) Psychology Press, New York, NY.

Förster, J. (2009). Relations between perceptual and conceptual scope: How global versus local processing fits a focus on similarity versus dissimilarity. *Journal of Experimental Psychology: General, 138*(1), 88-111.

Frankl, V. E. (1963). Man's search for meaning. New York, NY: Pocket Books.

Frankl, V. E. (1965). The concept of man in logotherapy. *Journal of Existentialism, 6,* 53-58.

Frankl V.E. (1985). *Psychotherapy and Existentialism. Selected papers on Logotherapy*. New York: Washington Square Press.

Freitas, A.L., Gollwitzer, P., & Trope, Y. (2004). The influence of abstract and concrete mindsets on anticipating and guiding others' self-regulatory efforts. *Journal of Experimental Social Psychology, 40,* 739-752.

Fujita, K., Henderson, M.D., Eng, J., Trope, Y., & Liberman, N. (2006). Spatial distance and mental construal of social events. *Psychological Science, 17,* 278-282.

Fujita, K., Trope, Y., & Liberman, N. (2006). *The role of mental construal in self-control.* (pp. 193-211) Lawrence Erlbaum Associates Publishers, Mahwah, NJ.

Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self-control. *Journal of Personality and Social Psychology, 90*(3), 351-367.

Garcia-Marques, L., & Mackie, D. M. (1999). The impact of stereotype-incongruent information on perceived group variability and stereotype change. *Journal of Personality and Social Psychology, 77*(5), 979-990.

Gillies, J., & Neimeyer, R. A. (2006). Loss, grief, and the search for significance: Toward a model of meaning reconstruction in bereavement. *Journal of Constructivist Psychology, 19,* 31-65.

Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and cultural worldviews: Empirical assessments and conceptual refinements. In M.P. Zanna (Ed.), *Advances in experimental social psychology, Vol. 29* (pp. 61-139). Academic Press, San Diego, CA.

Hagger, M. S., Wood, C., Stiff, C., & Chatzisarantis, N. L. D. (2010). Ego depletion and the strength model of self-control: A meta-analysis. *Psychological Bulletin, 136*(4), 495-525.

Heine, S. J., Proulx, T., & Vohs, K. D. (2006). The meaning maintenance model: On the coherence of social motivations. *Personality and Social Psychology Review, 10*(2), 88-110.

Hicks & Routledge (2013). *The experience of meaning in life*. Springer Science + Business Media, New York, NY.

King, L. A., Hicks, J. A., Krull, J. L., & Del Gaiso, A. K. (2006). Positive affect and the experience of meaning in life. *Journal of Personality and Social Psychology, 90*(1), 179-196.

Klinger, E. (1998). The search for meaning in evolutionary perspective and its clinical implications. In P. Wong & P.S. Fry (Eds.), *The human quest for meaning: A handbook of psychological research and clinical applications* (263-285). Lawrence Erlbaum Associates Publishers, Mahwah, NJ.

Kruglanski, A. W., Bélanger, J. J., Chen, X., Köpetz, C., Pierro, A., & Mannetti, L. (2012). The energetics of motivated cognition: A force-field analysis. *Psychological Review, 119*(1), 1-20.

Liberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology, 75*(1), 5-18.

Liberman, N., & Trope, Y. (2003). *Construal level theory of intertemporal judgment and decision*. (pp. 245-276) Russell Sage Foundation, New York, NY.

Liberman, N., & Trope, Y. (2008). The psychology of transcending the here and now. *Science, 322*(5905), 1201-1205.

Liberman, N., Trope, Y., & Stephan, E. (2007). Psychological distance. In A.W. Kruglanski & T.E. Higgins (Eds.), *Social psychology: Handbook of basic principles* (353-381). Guilford Press, New York, NY.

Maddi, S.R. (1970). The search for meaning. In M. Page (Ed.), *Nebraska Symposium on Motivation* (pp. 137-186). Lincoln: University of Nebraska Press.

Mandler, G. (1984). *Mind and body: Psychology of emotion and stress.* New York: Norton.

Marcia, J. L. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology, 3,* 351–358

McAdams, D. P. (1993). *The stories we live by: Personal myths and the making of the self*. William Morrow & Co, New York, NY.

Michaels, J. L., Parkin, S. S., & Vallacher, R. R. (2013). Destiny is in the details: Action identification in the construction and destruction of meaning. In J. Hicks & C. Routledge (Eds.), *The experience of meaning in life* (pp. 103-115). Springer Science + Business Media, New York, NY.

Muraven, M., & Baumeister, R.F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126(2),* 247-259.

O'Connor, A.P., Wicker, C.A., & Germino, B.B. (1990). Understanding the cancer patient's search for meaning. *Cancer Nursing, 13,* 167-175.

Osborne, Jason W. (2003). Effect sizes and the disattenuation of correlation and regression coefficients: lessons from educational psychology. *Practical Assessment, Research & Evaluation, 8 (11).*

Park, C. L. (2010). Making sense of the meaning literature: An integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin, 136*(2), 257-301.

Park, N., Park, M., & Peterson, C. (2010). When is the search for meaning related to life satisfaction? *Applied Psychology: Health and Well-being, 2,* 1-13.

Proulx, T., & Heine, S. J. (2006). Death and black diamonds: Meaning, mortality, and the meaning maintenance model. *Psychological Inquiry, 17*(4), 309-318.

Reker, G. T. (2000). Theoretical perspective, dimensions, and measurement of existential meaning. In G. T. Reker & K. Chamberlain (Eds.), *Exploring existential meaning:*

Optimizing human development across the life span (pp 39–58). Thousand Oaks, CA: Sage Publications.

Rogers R, Vess M, Routledge C, Juhl J (2013) An easy feeling: metacognitive ease in generating cultural value adherence reduces the search for meaning in life under conditions of death-relevant thought. Unpublished manuscript.

Ryff, C. D., & Singer, B. (1998). The contours of positive human health. *Psychological Inquiry, 9*, 1–28.

Schaeffer, J.A., & Moos, R.H. (1992). Life crisis and personal growth. In N. Carpenter (Ed.*), Personal coping: Theory, research, and application (pp. 149-170)*. Westport, CT: Praeger.

Seligman, M. E. P. (2002). *Positive psychology, positive prevention, and positive therapy* Oxford University Press, New York, NY.

Shallice, T. and Burgess, P. W. (1996). The domain of supervisory processes and the temporal organisation of behaviour. *Philosophical Transactions of the Royal Society of London B*, **351**, 1405-1412.

Smith, P. K., & Trope, Y. (2006). You focus on the forest when you're in charge of the trees: Power priming and abstract information processing. *Journal of Personality and Social Psychology*, *90*, 578-596.

Smith, P. K., Wigboldus, D. H. J., & Dijksterhuis, A. (2008). Abstract thinking increases one's sense of power. *Journal of Experimental Social Psychology, 44*, 378-385.

Steger, M. F. (2013). Wrestling with our better selves: The search for meaning in life. In K.D. Markman, T. Proulx, & M.J. Lindberg (Eds.), *The psychology of meaning*, (pp. 215-233). American Psychological Association, Washington, DC.

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The Meaning in Life Questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53*, 80–93.

Steger, M. F., Kashdan, T. B., Sullivan, B. A., & Lorentz, D. (2008b). Understanding the search for meaning in life: Personality, cognitive style, and the dynamic between seeking and experiencing meaning. *Journal of Personality, 76*, 199-228.

Steger, M. F., Kawabata, Y., Shimai, S., & Otake, K. (2008a). The meaningful life in Japan and the United States: Levels and correlates of meaning in life. *Journal of Research in Personality, 42*, 660-678.

Steger, M.F., Oishi, S., & Kesebir, S. (2011). Is a life without meaning satisfying? The moderating role of the search for meaning in satisfaction with life judgments. *Journal of Positive Psychology, 6*, 173-180.

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality, 72*(2), 271-322.

Thompson, S.C., & Janigian, A.S. (1988). Life schemes: A framework for understanding the search for meaning. *Journal of Social and Clinical Psychology, 7*, 260-280.

Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review, 110*, 403-421.

Trope, Y., & Liberman, N. (2010). Construal level theory of psychological distance. *Psychological Review, 117*, 440-463.

Vallacher, R. R., Wegner, D. M., & Frederick, J. (1987). The presentation of self through action identification. *Social Cognition,5*(3), 301-322.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. Journal of Personality and Social Psychology, 54(6), 1063-1070.

Wong, P. (2012). *The human quest for meaning: Theories, research, and applications (2nd ed.)*. Routledge/Taylor & Francis Group, New York, NY.

Zika, S., & Chamberlain, K. (1992). On the relation between meaning in life and psychological well-being. *British Journal of Psychology, 83*(1), 133-145.