THESIS

DEVELOPMENT OF THE SITUATIONAL MOMENTARY MEANINGFULNESS QUESTIONNAIRE (SMMQ)

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ABSTRACT

DEVELOPMENT OF THE SITUATIONAL MOMENTARY MEANINGFULNESS QUESTIONNAIRE (SMMQ)

Meaning is widely considered an important component of well-being (Diener et al., 2010; Ryff, 1989; Seligman, 2012). Research on meaning has burgeoned within the social sciences with the preponderance of extant literature on the construct focused on individuals' senses of meaningfulness in their overall lives. This focus has led to a relative shortage of conceptual and empirical literature on meaningfulness as it may occur at more granular levels of subjective experience. In turn, there is a paucity of psychometrically sound instruments capable of measuring meaningfulness at more immediate levels of experience. The present research sought to help ameliorate these concerns by (1) presenting a framework delineating levels at which meaningfulness experiences may occur and (2) creating the Situational Momentary Meaningfulness Questionnaire (SMMQ), a scale designed to measure situational momentary meaningfulness (SM-Meaningfulness) across three interrelated dimensions: coherence, purpose, and significance. To develop the SMMQ, the present research involved conducting two studies, which were cross-sectional surveys administered to samples of undergraduate students. Study 1 was designed to establish an appropriate factor structure for the SMMQ using factor analytic methods, as well as examine psychometric qualities of reliability regarding the SMMQ and its dimensions. Study 2 was designed to (1) test the replication of the factor structure identified in Study 1 in a separate sample, (2) examine correlations between SMMQ scores and an array of criterion variables toward establishing validity evidence, and (3) use t-tests to discern if the

SMMQ and its dimensions could detect differences between two situations which would be sensibly expected to significantly vary in their levels of SM-Meaningfulness. These studies resulted in establishing an SMMQ composed of factors of SM-Coherence, SM-Purpose, and SM-Significance, which demonstrated good fit across both studies. Study 2 showed preliminary evidence of construct validity through mostly expected correlations between SMMQ scores and other variables. Results of t-tests suggested that all dimensions of the SMMQ were significantly higher for self-reported meaningful situations in comparison to randomly selected prior-day situations. Directions for future research that could expand upon the preliminary findings presented herein are discussed.

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CHAPTER 1: INTRODUCTION

Throughout recent years, the study of meaning has burgeoned as a line of inquiry within the social sciences. A robust set of literature supports meaning in life's association with increased psychological well-being (for a review, see Steger, 2017) and improved physiological health (for a review, see Roepke et al., 2014). Given these findings, it is unsurprising that prominent theorists include purpose and meaning among the fundamental components that constitute psychological well-being or flourishing (e.g., Diener et al., 2010; Ryff, 1989; Seligman, 2012).

Viktor Frankl is often credited with turning attention toward the psychological importance of meaning through his seminal work, *Man's Search for Meaning* (Frankl, 1959). In this text, Frankl posited that it is incumbent upon each individual to determine the meaning of their own life. He also proposed that humans are fundamentally and innately inclined toward the pursuit of meaningfulness. Following Frankl, numerous definitions of meaning emerged within the psychological literature with variegated areas of emphasis. Some scholars almost exclusively focused on meaning as denoted by pursuance of important goals or a greater purpose (Emmons, 2003; Klinger, 1977). Others highlighted aspects of existential mattering, such as an individual's understanding of their life's "ontological significance" (Crumbaugh & Maholick, 1964 p. 201). Antonovsky (1987, 1993) defined meaningfulness as the belief that the demands in one's life are worthy of the effort exerted to meet them, while positioning meaningfulness as one of three components of a larger sense of coherence. Nevertheless, another dimension of Antonovsky's sense of coherence scale, "comprehensibility" (i.e., one's sense that the world around them is structured, intelligible, and predictable), presented a facet that would be more germane to later

representations of meaning (e.g., George & Park, 2016; Martela & Steger, 2016). Baumeister's (1991) definition of meaning also prioritized aspects of understanding and comprehension by defining meaning by "shared mental representations of possible relationship among things, events, and relationships" (p. 15). Battista and Almond (1973) presented a multidimensional characterization of meaning, arguing it is a subjective perception of the degree of fulfilment one's life is imbued with, which is assessed in consideration of valued life-goals and life-frameworks.

Several multidimensional conceptions of meaning present tripartite models. Reker and Wong (1988) described a structure for the experience of what they referred to as "personal meaning" which consisted of three components: cognitive (i.e., an overall belief system or worldview through which meaningfulness evaluation must be filtered through), a motivational component (i.e., a system of values that catalyzes behaviors), and an affective component (i.e., sense of fulfillment, happiness, and personal satisfaction). Similarly, King's (2004) *model of meaning of life experiences* presenting three "paths" to meaning of understanding (i.e., a cognitive sense of comprehension), doing (i.e., motivation, pursuit of achievement, and goal-directed behavior), and belonging (i.e., sense of affiliation with others, as well as aspects of affective/emotional experiences of meaningfulness). Many of these components are reflected in contemporary definitions of meaning; although, empirical evidence suggests that the affective experiences of satisfaction, happiness, and sense of belonging, which are included in the aforementioned models, are separate constructs from meaning, despite showing substantial relationships with meaning (e.g., Lambert et al., 2013; Martela et al., 2018; Steger & Kashdan, 2007).

The variety that marked early conceptions of meaning left a muddled theoretical understanding of the construct in its wake. Steger and colleagues (2006) sought to synthesize these disparate characterizations of meaning when creating the Meaning in Life Questionnaire (MLQ). This undertaking resulted in meaning defined and operationalized as "the sense made of, and significance felt regarding, the nature of one's being and existence" (p. 81). Still, for some time following Steger et al.'s efforts, researchers substantially varied in their conceptualizations of meaning's definition. For example, Hill et al.'s (2015) review revealed pervasive conflation of the terms "meaning" and "purpose" in social scientific literature nearly a decade after the MLQ was developed.

Within recent years, many contemporary scholars have endorsed a tripartite definition that seeks to consolidate many of the themes held by earlier definitions. In this definition, meaning is posited to be composed of: (1) *coherence*, which is a sense of comprehension and understanding of one's life, the external world, and how one's life fits within the grander configuration of the world, (2) *purpose,* which refers to an overarching sense of directedness and pursuit of goals that hold high subjective importance, and (3) *significance*, which is an appraisal of one's life as mattering, having intrinsic value, and being worthwhile (George & Park, 2016; Heintzelman & King, 2014a; Martela & Steger, 2016; Steger, 2009). Although these tripartite conceptualizations are largely similar, scholars show some variation in names and definitions of these components. For example, George and Park (2016) referred to the third component as "mattering," while Martela and Steger (2016) called this aspect "significance." For purposes of this manuscript, the construct names and definitions provided by Martela and Steger (2016) were adopted.

The preponderance of empirical investigation and theoretical consideration regarding the construct of meaning has focused on meaning in life, which consists of individuals' evaluations of the meaningfulness of their respective lives as a whole (e.g., George & Park, 2016; Heintzelman & King, 2014a; Reker et al., 1987; Ryff, 1989; Steger et al., 2006). However, as King et al. (2006) pointed out, "meaning in life is not simply a global judgment made about a life as a whole but potentially a quality of everyday existence" (p. 181). Indeed, conceptual and empirical evidence suggests that meaningfulness may be experienced at a variety of different levels of experience, including assessments of domains (e.g., work), situations in daily life, and more (e.g., Choi et al., 2017; Martela et al., 2018; Park & Folkman, 1997; Rosso et al., 2010; Steger, Kashdan, & Oishi, 2008; Steger & Dik, 2009).

A next step for literature on meaning may be to further investigate its application to the more granular levels of subjective experience. Future research along these lines could benefit from a clearly delineated framework that describes the levels of experience at which meaningfulness can be usefully evaluated. The determination of these levels may then guide development of psychometric instruments designed to assess meaningfulness at its more immediate levels (e.g., momentary experiences of meaningfulness). In turn, improved measurement techniques can help catalyze empirical investigation, and therefore understanding, of the human experience of meaningfulness. To contribute toward the pursuit of these objectives within the literature on meaning, the present research sought to (1) propose levels of experience at which meaningfulness may be assessed and (2) construct and examine a scale designed to measure situational momentary experiences of meaningfulness.

Clarifications in the Semantics of Meaning

Some lexiconic clarifications are necessary to inform description of the levels of meaningfulness evaluation. Scholars (e.g., Rosso et al., 2010; Steger, 2016) have noted that the phrases "meaning of" and "meaningfulness" have often been used interchangeably, especially within literature on meaningful work. These researchers have differentiated between the terms by positing that "meaning of," refers to understandings of what work qualitatively signifies, and "meaningfulness" involves evaluation of the extent to which something holds a positively valanced subjective sensation of meaning. This differentiation between "meaning of" and "meaningfulness" is applicable and useful for ensuring precision of language, and it is sensible to consider that drawing this distinction between "meaning of" and meaningfulness is relevant to any level of subjective experience meaning is evaluated at. Consequently, this distinction was adopted for the terminology of the present framework. Thus, the present framework sought to determine appropriate levels at which evaluative judgments of how meaningful one assesses each respective level of experience to be. In other words, the levels described below are designed to allow for quantitative judgments regarding how much meaningfulness is experienced at or during that level of experience. Correspondingly, matters of assessing the meaning of any of these levels is beyond the scope of the present framework, and the term "meaningfulness" will be used in reference to all levels described from this point forward.

Another vital consideration in presenting a framework on the construct of meaningfulness is how people tend to (in English) articulate their experiences of meaningfulness by attributing those experiences to sources. Heintzelman and King (2014b) observed that, "people do not generally report on a feeling of meaning unless that feeling is *about* something" (p. 154). In other words, individuals rarely describe an experience of meaningfulness without assigning it to an entity or source (e.g., one's own life, an event, or a song may be deemed meaningful). This

contrasts with feelings such as happiness or sadness, which are often conveyed by stating that a person is feeling that emotion (e.g., "I feel happy"). Indeed, it would be colloquially unconventional at the time of writing this manuscript for individuals to describe the experience of meaningfulness through phrases such as "I feel meaningfulness." As Heintzelman and King suppose, it is far more common to convey that meaningfulness as attributed to something through phrasing such as, "this X is meaningful." Consequently, it is useful for a framework for meaningfulness evaluation to provide something that people can say the meaningfulness is about at every level of experience presented in the framework (e.g., "my life is meaningful," "my work is meaningful," "this situation is meaningful," etc.).

Delineating the Levels of Meaningfulness Evaluation

A strong framework is comprehensive enough to cover the breadth of necessary content, while maintaining a reasonable degree of parsimony (Dubin, 1978; Whetten, 1989). A framework for meaning evaluation, is presented with the challenge of discerning enough levels to provide helpful guidance and capture the array of research conducted on meaningfulness, but it must also eschew distinctions that are extraneous, lacking in utility, or may inhibit helpful consolidation of literature. Other prominent frameworks that seek to account for levels of subjective experience can provide guidance.

Some frameworks that have attempted delineate levels of subjective experience have focused particularly on the study of meaning/meaningfulness. One attempt to create a levelled structure explaining subjective experiences relevant to meaning is Schnell's (2009) hierarchic model of meaning. Drawing from research on coding, goal attainment, and intrinsic motivation, Schnell provided a structure of increasing abstraction that consists of the following levels: (1) Perception, (2) Actions, (3) Goals, (4) Sources of Meaning, and (5) Meaning in Life.

This structure is designed to explain how individuals integrate stimuli from their environment toward deriving a sense of what makes life meaningful and, therefore, how meaningful their lives are. Also, this structure seeks to explain how individuals' higher levels of abstraction influence "meaning of" determinations at the lower levels of experience. Schnell's structure is useful for helping elucidate what levels of subjective experience may be worth considering for a framework; however, it does not assert whether or not individuals are capable of making assessments of how much meaningfulness is experienced.

Reker and Wong's (1988) aforementioned framework also has a gradation of levels of "personal meaning" and explicitly acknowledges interplay between levels. It presents three components of cognitive, motivational, and affective aspects of meaning, while positing that "the cognitive component [is] the cornerstone" (p. 221). Specifically, Reker and Wong asserted that the cognitive component directly influences the other two aspects, which in turn, provide the cognitive component with feedback. Reker and Wong's framework involves components that seem to correspond better to contemporary understandings of the three dimensions of meaningfulness (e.g., the motivational component seems to correspond to purpose) than it does to discerning levels of subjective experience, making Reker and Wong's gradations suboptimal for the present objective of discerning reasonable levels of meaningfulness evaluation.

G.A. King's (2004) model of meaning of life represents an acknowledgement of three dimensions (albeit labelled as "paths") of meaningfulness, as well as levels of life experience. Specifically, G.A. King postulated the existence of "the micro level of perception, the middle level at which people experience everyday events (the phenomenological level), and the macro level of meaning in life" (p. 74). Still, this framework is designed to assess matters of "meaning of" rather than meaningfulness, and it may not be feasible for individuals to make assessments of

meaningfulness at the level of perception, given this level exists as more immediate than the phenomenological level (i.e., the level at which people have consciously observable subjective life experiences). The other two levels (i.e., phenomenological and meaning in life) seem apt to draw from, given empirical precedent for experiences of meaningfulness occurring at each level (e.g., Choi et al., 2017; Steger et al., 2006). However, G.A. King's model does not seem to account for levels of meaningfulness experience applied to broader areas of life that are "lower level" than overall meaning in life, but "higher level" than the immediate experience. For example, it is unclear how a robust body of literature on work meaningfulness (e.g., Steger et al., 2012) would be placed within this framework.

Kahneman (1999) presented an influential bottom-up theory of hedonic well-being that that provides guidance toward discerning levels of subjective experience at which evaluation can occur. In this framework, four levels of integration of subjective experience ensues across a "Good/Bad" (GB) dimension. Kahneman refers to a foundational level of "instant utility," which is the degree to which one experiences a current state as generating an inclination toward either continuation ("Good") or interruption ("Bad"). Kahneman suggested that a higher level of integration is "remembered utility," positing that this is a highly error-prone estimation of one's aggregated instant utility from a past situation. Kahneman's next level is the assessment of overall "satisfaction" in reference to domains of life (e.g., job satisfaction as an evaluation of the work domain). Lastly, Kahneman supposed that assessments of overall happiness take place at the highest level of integration, which he called "subjective happiness."

Though experiences of meaningfulness certainly differ from hedonic experiences described by Kahneman (1999), conceptual understandings of meaningfulness as a "subjective

feeling state" (Heintzelman & King, 2014b, p. 11) suggest that it is reasonable to consider what levels of meaningfulness might correspond to those provided by Kahneman. Kahneman's (1999) four gradations overlap to some degree with abovementioned frameworks—for example, like G.A. King's (2004) model of meaning of life, it has the equivalent of a phenomenological level (instant utility) and an evaluation of overall life experience (subjective happiness). Still, for the purposes of guiding the development of the present framework, Kahneman's levels benefit from eschewing levels at which meaningfulness could not feasibly be measured given present technology (e.g., the level of perception supposed by G.A. King [2004] and Schnell [2009]), while accounting for levels that the above frameworks lack but hold relevance to burgeoning lines of inquiry in the meaning literature (e.g., domain-levels of meaningfulness experience). For this reason, the present framework involved attempting to transpose the levels in his framework of hedonic well-being onto the eudaimonic experience of meaningfulness. The gradations identified are (top-down) as follows: "life meaningfulness" (i.e., how subjectively meaningful one believes their life to be), "domain meaningfulness" (i.e., the degree of meaningfulness ascribed to any particular broad, enduring facets of one's life), "situational episodic meaningfulness" (i.e., the extent to which meaningfulness is designated to a given past event, situation, or experience of one's life within the context of one's present life circumstances), and "situational momentary meaningfulness" (i.e., the degree of meaningfulness assigned to a presently occurring experience, event, or situation). These four gradations are described in greater detail below through explanation of their relevance in reference to extant lines of inquiry.

The Present Framework

The levels of meaningfulness experience in the present framework are detailed below and briefly defined in Table 1.

Life Meaningfulness. The highest level of meaningfulness evaluation within the present framework is "life meaningfulness." When an individual is evaluating the extent to which one's life as a whole is believed to be meaningful, that assessment would be considered within the present framework to occur at this level. Correspondingly, in the present framework, the construct of overall meaning in life (see G.A. King, 2004; Schnell, 2009; Steger et al., 2006;) would be labelled as "life meaningfulness." Although "meaning in life" is already a well-established phrase in the social scientific literature for this level of meaningfulness experience, the present framework presents the term "life meaningfulness" toward the goal of linguistic consistency (i.e., to use the phrase "meaningfulness" throughout all presented levels of the framework). Through this consistency, the language of the framework is designed to help clarify between "meaning of" and "meaningfulness" distinctions.

Domain Meaningfulness. The present framework designates cumulative assessments of meaningfulness at the level of any specific broad, continual subsets of life as "domain meaningfulness." In Kahneman's (1999) model, examples of domains included one's overall work life or family life. Following a similar understanding of domains, such continual aspects or categories in which one's life can be divided (e.g., work, family, leisure, etc.) fall into the category of domain meaningfulness. Consequently, measures of domain meaningfulness can be thought of as assessing the extent to which any particular one of these life areas is perceived as providing one with a sense of meaningfulness. The construct of work meaningfulness provides an example of one area of domain meaningfulness, but other domains of life would be expected to be able to be assigned separate evaluations of domain meaningfulness in the same manner that areas of satisfaction research have a variety of separate established constructs. For example, Carver and Jones' (1992) presented the construct of "family satisfaction," and a corresponding

domain-level construct for this area could be family meaningfulness. The introduction of a new construct at the domain level of meaningfulness would ideally involve clear and distinct delineation of how meaningfulness is experienced through that domain, given this may vary between domains. For example, Steger and colleagues (2012) identified three dimensions of work meaningfulness: (1) positive meaning, (2) meaning making through work, and (3) greater good motivations. However, a different domain-level experience of meaningfulness (e.g., family meaningfulness) would not necessarily have corresponding dimensions to those discerned for work meaningfulness or any other domain. The dimensions uniquely relevant to any given kind of domain meaningfulness may be empirically and/or theoretically derived.

Situational Episodic Meaningfulness. Kahneman (1999) described a level of evaluation at which individuals retroactively make cumulative assessments of experiences (e.g., "I liked watching that movie last night"). A similar level of evaluation is likely possible for appraisal of meaningfulness. It is widely believed that meaning of situations change over time as we (deliberately or otherwise) construct new narratives or consider past situations in light of our present circumstances (Heine et al., 2006; L. A. King & Hicks, 2009; Park & Folkman, 1997). Park (2010) supposed that these meaning of assessments play a role in determining how much meaningfulness is derived from the situation. Given these considerations, the present framework proposes a level of evaluations called "situational episodic meaningfulness." This would be the quantitative evaluation of how meaningful a past situation is when viewed through the lens of one's current life narrative.

Situational Momentary Meaningfulness. Kahneman's (1999) fundamental level of hedonic experience of *instant utility* provides guidance for how to discern the equivalent level of momentary eudaimonic experience. Many scholars acknowledge that instant, momentary

experiences of meaningfulness happen as we proceed throughout life events (e.g., Choi et al., 2017; Heintzelman & King, 2019; L. A. King & Hicks, 2009) with some even comparing this to a feeling, emotion, or affective state (Heintzelman & King, 2014b; Solomon, 1976). This sense of meaningfulness as presently experienced on a situation-by-situation basis is referred to herein as *situational momentary meaningfulness* (SM-Meaningfulness). In other words, SM-Meaningfulness denotes how meaningful a current experience is believed to be while it is happening.

Empirical Investigation Throughout the Levels of Meaningfulness

This section reviews empirical evidence germane to the four proposed levels of meaningfulness evaluation. In addition to providing an overview of relevant literature, this is designed to further demonstrate the potential appropriateness of this framework through exemplifying how a body of evidence compiled through previous research could be usefully consolidated within the present framework's gradations. As the development of a questionnaire to assess SM-Meaningfulness is the main objective of the present research, greater emphasis will be placed on discussion of that level.

Research Relevant to Life Meaningfulness

Life meaningfulness is arguably the level of meaningfulness experience with the most robust set of empirical literature in the social sciences. Development of scales for purposes of assessment at this level, such as the MLQ (Steger et al., 2006), the Purpose in Life subscale of Ryff's (1989) Psychological Well-being Scale, and others, has facilitated a burgeoning line of empirical inquiry. A full review of extant literature on empirical evidence germane to life meaningfulness is beyond the scope of this paper, but it warrants note that such research has illuminated a profusion of positive outcomes associated with presence of life meaningfulness.

Those with greater life meaningfulness demonstrate greater psychological well-being through higher life satisfaction, optimism, and positive affect, as well as lower depression, hopelessness, and anxiety (for a review, see Steger, 2017). Life meaningfulness has also been associated with higher self-reported general health, greater cardiovascular health, and even decreased risk of mortality (for a review of meaning's impact on health, see Roepke et al., 2014).

Research Relevant to Domain Meaningfulness.

Efforts to understand experiences of meaning at the level of the domain appear to often take two forms: (1) identifying what areas are most relevant sources of meaning and/or (2) measuring the extent to which these sources of meaning tend to actually elicit the experience of meaningfulness. The latter of these two lines of inquiry would be considered domain meaningfulness in the present framework. To further clarify the distinction between sources of meaning and domain meaningfulness, it may be helpful to consider sources of meaning as facets of life identified as providing one with a sense of meaningfulness (e.g., "work" can be a source of meaning), while domain meaningfulness is a rating of *the extent to which* an area of one's life is perceived as being subjectively meaningful (e.g., a measure of work meaningfulness is a form of domain meaningfulness). In other words, a source may be considered the area of life where meaning is attributed to being about (Heintzelman and King 2014b) for a type of assessment of domain meaningfulness.

Research showing what domains are relevant sources of meaning can point scholars toward optimal areas of further research on domain meaningfulness. Empirical evidence on sources of meaning ranges back at least as far as Battista and Almond's (1973) investigation resulting in six orientations of (1) interpersonal, (2) service, (3) understanding, (4) obtaining, (5) expressive, and (6) ethical. Debats (1999) used a mixed-methods approach to better understand

what sources are most pertinent for deriving life meaningfulness and sought to measure how committed individuals are to pursuing personally identified sources of meaning. Debats showed that relationships, lifework, personal wellbeing, and self-actualization goals were the four most commonly identified sources of meaning. For this research, Debats employed his Sources of Meaning Questionnaire (SOMQ), which asks each participant to name the most personally important sources of meaning followed by assessment of the degree to which participants were committed to those three sources of meaning. In this study, he found that commitment to sources of meaning were positively related to life meaningfulness.

Schnell's (2009) Sources of Meaning and Meaning in Life Questionnaire (SoMe) addressed similar matters to those investigated by Debats (1999) study, as Schnell employed 26 subscales that seek to measure "commitments to different areas of life from which meaning is derived" (2011 p. 667). Efforts to identify and understand sources of meaning have also involved novel approaches, such as the use of photography to discern how participant's visually display sources of meaning. One such study resulted in categories of Nature, Hobby/Leisure, Relationships, Pets, Possessions, Everyday Necessities, Religion, Values, Education, Technology, Organization/Activities, Physical Environment, Future Aspirations, Occupation/Work, Self, and Miscellaneous (Steger et al., 2013). Findings such as these illustrate the potential for a variety of enduring life areas (or sources) that could serve as domains for which domain meaningfulness ratings may be relevant.

Empirical efforts to assess domain meaningfulness across an array of domains have been undertaken; although, they are relatively sparse compared to research on life meaningfulness. Fegg et al.'s (2008) Schedule for Meaning in Life Evaluation (SMiLE) provides an approach in which individuals qualitatively identify three to seven areas of life and then quantitatively rate

each area's respective importance. These quantitative ratings on the SMiLE may be considered representative of domain meaningfulness for the corresponding areas of life. Delle Fave and colleagues (2013) conducted a study in which they qualitatively assessed sources of meaning and quantitively assessed domain meaningfulness. Delle Fave et al. asked individuals to provide their top three sources of meaning. Next, Delle Fave and colleagues assessed domain meaningfulness with the prompt "Please rate to what extent each of the following domains is meaningful for you" (p. 521) with domains selected by the researcher and applied across all participants of work, family, standard of living, health, personal growth, interpersonal relationships, leisure, spirituality/religion, and society/community. They found each domain's meaningfulness except for leisure accounted for unique variance in life meaningfulness with composite domain meaningfulness accounting for 31% of the variance in life meaningfulness. In the same study, Delle Fave et al., found composite domain meaningfulness to account for 11% of the variance in life satisfaction with family meaningfulness, work meaningfulness, and interpersonal relations meaningfulness each serving as significant unique predictors of life satisfaction.

Other studies of domain meaningfulness have occurred with focus on one particular domain, rather than seeking to understand a broad array of domains. The area of domain meaningfulness that has received the most empirical attention is arguably the work domain, as research has proliferated in recent years on meaningful work and the related construct of calling, which often includes a dimension of purposeful work (for a review on meaningful work, see Steger, 2016; for a review on calling, see Thompson & Bunderson, 2019). The development and validation of psychometrically sound measures of meaningful work, such as the Work and Meaning Inventory (WAMI; Steger et al., 2012), and calling in the work domain, such as the Brief Calling Scale (BCS) and Calling and Vocation Questionnaire (CVQ; Dik et al., 2012) have

catalyzed recent advances in these subfields, establishing work meaningfulness and sense of calling (as well as its specific dimension of purposeful work) to be associated with job satisfaction, life meaningfulness, and numerous other important work and well-being criterion variables (Duffy et al., 2012; Duffy & Dik, 2013; Marsh & Dik, 2021; Steger et al., 2012).

Some research has examined domain meaningfulness focused on specific domains other than work. For example, studies have focused on domain meaningfulness regarding relationships. Yu and Chang (2018, 2021) modified the MLQ to create a measure of "relational meaning in life" called the Relational Meaning in Life Questionnaire (RMLQ) and showed that it accounted for variance in criterion variables germane to interpersonal relationships beyond that accounted for by life meaningfulness. Hadden and Knee (2018) found reciprocal relationships between domain-specific romantic relationship meaningfulness and life meaningfulness, as well as demonstrating that life meaningfulness' influence on relationship quality and motivation may be mediated by romantic relationship meaningfulness. There have also been calls for further research into experiences of meaningfulness in the leisure domain (e.g., Mannell & Iso-Ahola, 1987), which some empirical research has examined, such as Kelly and Kelly's (1994) effort toward discerning if the dimensions of meaning are distinct between leisure, work, and family domains. Still, there is a relative paucity of research thoroughly and specifically examining the role of domain meaningfulness outside of the work domain. The present framework delineates the concept of domain meaningfulness, in part, to provide explicit terminology that can help researchers identify important constructs, create relevant questionnaires, and consolidate lines of research that may be considered domain meaningfulness, despite existing across a diverse array of life areas.

Research Relevant to Situational Episodic Meaningfulness

Most empirical and theoretical literature at the level of SE-Meaningfulness has focused on highly negative events and the meaning-related coping processes associated with them. The concept of meaning making is particularly relevant to this level of subjective experience. Meaning making is a process by which individuals seek to alleviate psychological ramifications of highly distressful experiences that contradict one's global meaning framework (i.e., beliefs about the world and broad life-goals) by changing the meaning of a situation to align with preexisting understandings (i.e., assimilation) or reshaping their global meaning framework to incorporate the meaning of the distressful situation (i.e., accommodation; Park, 2010; Park & Folkman, 1997). Park (2010) subsumed initial appraised meaning of a situation, discrepancies formed by that appraised meaning, and meaning-making processes under the umbrella term "situational meaning." Empirical evidence indicates that there are mental health implications to meaning making in areas such as adjustment to bereavement/loss, depression, anxiety, posttraumatic stress, and psychological well-being associated with changes in perception of the meaning of past situations (Davis et al., 1998; Fitzke et al., 2021; Holland et al., 2006; Kuijer & de Ridder, 2003; Pakenham et al., 2007; Park et al., 2016).

Although situational meaning involves processes at the level of SE-Meaningfulness, Park's (2010) conception of this concept primarily focused on meaning of situations rather than meaningfulness, given the emphasis on assessment of what situations are qualitatively understood to mean about the world, rather than quantitative assessments of how much meaningfulness is derived through situations. Still, this line of inquiry may be integrated with understandings of SE-Meaningfulness, given changes in the meaning of situation could be expected to correspond to changes in meaningfulness. Indeed, King and Hicks (2009) posited that reflections on meaning of past situations can include the discovery of a new understanding

of the event that could make the situation, in retrospect, highly subjectively meaningful (i.e., high in SE-Meaningfulness), even if that situation was not initially appraised as being highly meaningful. King and Hicks provide the example of how "the unexpected loss of a significant other may, over time, seem meaningful because it is perceived to have allowed the person to have a deeper understanding..." (p. 319).

Several empirical studies have investigated a construct that would correspond to the SE-Meaningfulness construct presented herein. King and Hicks' (2009) empirical examination of SE-Meaningfulness found past events with negative valence are more likely to be associated with high SE-Meaningfulness if individuals deliberately construct meaning from the event. Also, King and Hicks concluded that past events with positive valence elicit higher SE-Meaningfulness when individuals automatically detected that meaningfulness. Murphy and Bastian (2019) expanded on the perspective of SE-Meaningfulness through a study that found that highly positive and highly negative situations both tend to be higher in SE-Meaningfulness than situations with a lower degree of emotional valence. Tov et al. (2019) conducted a study of what they referred to as "event meaningfulness" but would be considered SE-Meaningfulness in the present framework. They contrasted scores across items administered in reference to a prompt for a meaningful situation and the same items administered in reference to a prompt for a meaningless situation. These included face-valid items on event meaningfulness, items designed to address event coherence, items designed to measure event purpose, items assessing the implications of the situation for others, and measures of affect. Their findings indicated unique associations between SE-Meaningfulness and event-level purpose, as well as positive affect during the event. Findings were mixed regarding if event-level coherence and positive implications for oneself uniquely predicted SE-Meaningfulness, while positive implications for

others did not uniquely predict SE-Meaningfulness beyond other variables in their model. Their study also found that participants' reports of positive affect, negative affect, and positive implications for others significantly varied between meaningful and meaningless past situations. The measures used by Tov et al. were a priori in nature, and choices to implement separate measures of event purpose and coherence that differ from their assessment of SE-Meaningfulness may diverge from understandings of the dimensions identified at the level of life meaningfulness (e.g., Martela & Steger, 2016). Correspondingly, this research can help inform the understanding of SE-Meaningfulness, but it also evinces the importance of clearer operationalization of meaningfulness at this level of experience. It is beyond the scope of the present framework and research to discern the most appropriate dimensions of SE-Meaningfulness, but future literature may seek to determine these through conceptual and empirical means.

Research Relevant to Situational Momentary Meaningfulness

Efforts to assess SM-Meaningfulness have often used experience sampling methodology (ESM; Csikszentmihalyi & Larson, 1987), a phrase describing a variety of techniques that allows researchers to assess characteristics about participants' experiences of life as they happen (typically outside a lab setting). Administering face-valid items addressing perceived meaningfulness of situations in an ESM context, Chan et al., (2018) found SM-Meaningfulness to be negatively associated with state boredom and sadness as well as positively associated with trait-level openness. Another ESM study[1] investigated the relationship of SM-Meaningfulness

[1] This study was administered in Korea, and the item "How meaningful do you feel right now?" was implemented. It is not mentioned what language the item was administered in and cultural factors could account for the item's seemingly nonintuitive phrasing in a Western, English-speaking context (cf. Heintzelman & King, 2014b). Depending on these factors, this item may better reflect life meaningfulness than SM-Meaningfulness, but it is included in the present section and labeled SM-Meaningfulness because the study sought to identify how situations vary in their proportion of meaningfulness in comparison to happiness

with momentary happiness, finding the two momentary subjective experiences to be positively correlated but separate constructs (r = .36; Choi et al., 2017). Choi and colleagues also identified how different types of situations may vary in proportion of SM-Meaningfulness to experienced happiness (e.g., "watching TV" was deemed a high happiness, low-meaningfulness situation, while "taking a class" emerged as a low happiness and high meaningfulness situation). One experimental study assessed participants reactions to various videoclips and linked SM-Meaningfulness following the video to the experience of being "moved," which in turn was associated with prosocial behaviors (Landmann et al., 2019).

Other research has assessed constructs relevant to SM-Meaningfulness, even if they have not precisely captured the construct during the moment of experience. For example, the Meaningful Activity Participation Assessment (MAPA; Eakman et al., 2010) has two subscales that seek to assess the frequency with which individuals participate in kinds of activities and the extent to which these activities are subjectively meaningful. Each activity used in this questionnaire (e.g., gardening) could be considered to occur at the situational level (e.g., an assessment of how meaningful an individual is experiencing the activity of gardening to be in the moment would be an assessment of SM-Meaningfulness). With this in mind, the MAPA could be implemented for those seeking to assess an aggregate of SM-Meaningfulness for particular activities over a period of months. Research linking meaningful activity participation to higher levels of life satisfaction, purpose in life, and social functioning as well as lower levels of depressive distress (Eakman et al., 2010) is promising for the importance of SM-Meaningfulness over time.

Studies Assessing Life Meaningfulness During Situations and Daily Life. Some studies have attempted to assess momentary experiences of life meaningfulness. In these studies,

there was explicit reference to individuals' overall lives in the items administered, suggesting that they address life meaningfulness rather than SM-Meaningfulness. While this is not SM-Meaningfulness, it warrants mentioning as an attempt to assess present experiences of meaningfulness during situations. Martela and colleagues (2018) linked life meaningfulness during the most personally meaningful event of the prior two weeks to positive affect and situational satisfaction of autonomy, competence, beneficence, and relatedness needs, using items such as "During this event I felt a sense of deeper purpose in my life" and ''During this event my life felt significant." In an ESM study involving 85 undergraduate students, Heintzelman and King (2019) measured meaningfulness using items like "Overall, my life is meaningful" administered 42 times to each participant over seven days. This study showed that life meaningfulness was higher in situations with a greater sense of routine.

The abovementioned efforts to assess life meaningfulness in the moment advanced knowledge on meaningfulness; however, there is reason to doubt that this is the most precise way to measure momentary assessments of meaningfulness throughout day-to-day life experiences. The next section will review why having meaningfulness assessments focus on situations as the reference point will likely allow for capturing more variance in momentary experiences of meaningfulness.

Why Use Situations as the Reference Point?

The present framework uses situations as the reference point for momentary experiences of meaningfulness, rather than using overall life as the reference point. This is because life meaningfulness has relatively high stability over time. Life meaningfulness assessments have demonstrated high stability over periods of two weeks (r = .81; Oishi et al., 2019) and a month (r = .70 -.92; Costin & Vignoles, 2019; Steger et al., 2006), while showing moderate stability over

thirteen months (r = .41; Steger & Kashdan, 2007). Stability of life meaningfulness is also demonstrated by studies that assess "daily meaning" through items referential to overall life (e.g., "How meaningful does your life feel?") using daily diary methodology (e.g., L. A. King et al., 2006; Steger, Kashdan, & Oishi, 2008). These studies typically find high correlations between baseline life meaningfulness and daily measurements (r = .53-.75; Kashdan & Steger, 2007; L. A. King et al., 2006; Steger, Kashdan, & Oishi, 2008; Steger & Kashdan, 2013). Furthermore, Heintzelman and King's (2019) ESM study on routines and momentary life meaningfulness revealed that 81.7% of the variance in meaning in life was between-person, allowing for a comparatively exiguous 19.7% of variance in life meaningfulness that could be due to within-person fluctuations on a situation-by-situation basis. This can be contrasted with results from Chan et al.'s (2018) ESM study which used the "activity" (i.e., situation) as the reference point in which the authors concluded that "67% of the variability in perceived meaningfulness of the activity were within persons" (p. 560). Likewise, it is intuitively sensible to postulate that as an individual moves between situations in their daily life, their sense of how much meaningfulness is being derived from their present situation will typically vary to a greater degree than does their sense of how meaningful their overall life is. Taken together, these considerations suggest that life meaningfulness cannot be expected to undergo dramatic situation-by-situation variation in daily life[2], while SM-Meaningfulness might be anticipated to do so. Hence, a psychometrically robust measure of SM-Meaningfulness that uses situations as a reference point for

[2] Life meaningfulness has been shown to have *some* momentary fluidity through (1) significant changes in an experimental context (see Hicks et al., 2012; Hicks & King, 2007, 2009; L. A. King et al., 2006; Stillman et al., 2009) and (2) variations in response to life events (see Debats et al., 1995; Steger, Kashdan, & Oishi, 2008). This suggests there may still be utility to measuring momentary changes in life meaningfulness; although, it may not vary as much as SM-Meaningfulness

meaningfulness captures important within-person variation of meaningfulness that is unlikely to be captured through measures using items that have overall life as the reference point.

Operationally Defining Situational Momentary Meaningfulness

It is crucial for those seeking to develop a psychometric instrument to begin with an explicit operational definition of the latent construct of interest (Dawis, 2000). A few theorists believe meaning to have an objective component (e.g., Seligman, 2012), but the preponderance of psychological scholars conceptualize meaning as subjective (George & Park, 2016; Heintzelman & King, 2014a; Martela & Steger, 2016; Steger et al., 2006). In concordance with subjective characterizations, SM-Meaningfulness assessments are presented herein as referential to one's own beliefs and views regarding their experience within a situation. As such, a single situation experienced by different individuals may vary in its perceived SM-Meaningfulness. Rauthmann and colleagues (2015) categorized measures such as these as phenomenological measures of situations, which examine individuals' perceptions of situations, rather than attempting to assess any objective characteristics about the situation itself.

Though no explicit models of SM-Meaningfulness and its components exists in the extant literature, it is helpful to draw from previous models of meaning in which situation-level experience is relevant or referenced. Wong (2012) presented a quadripartite conceptualization of meaningfulness in overall life and situations as (1) Purpose that inspires us to live "an engaged life pursuing a desired future" (p.10), (2) Understanding, in which "making sense of situations" (p.10) is an integral aspect, (3) Responsible action, which guides our actions through answers to questions such as "what is my responsibility in this situation," (p.11), and (4) Evaluation, which "includes assessing the degree of satisfaction or dissatisfaction in a given situation or in life as a whole" (p. 11). This definition demonstrates ways in which meaningfulness may be experienced

similarly across different levels of meaningfulness, suggesting it may be derived from similar components whether at the level of presently experienced situations or at the level of overall life.

Martela and Steger's (2016) definition of the three facets of meaning also provides guidance for how SM-Meaningfulness may be experienced. They conceive meaning as "…emerging from the web of connections, interpretations, aspirations, and evaluations that (1) make our experiences comprehensible, (2) direct our efforts toward desired futures, and (3) provide a sense that our lives matter and are worthwhile" (p. 538). These three components refer to the dimensions of coherence, purpose, and significance, respectively and represent a widely accepted contemporary model of life meaningfulness (George & Park, 2016; Heintzelman & King, 2014a; Martela & Steger, 2016; Steger, 2009). The present study draws from this tripartite conceptualization of life meaningfulness as composed of an overall sense of (1) coherence, (2) purpose, and (3) significance, to apply corresponding dimensions to SM-Meaningfulness. Previous research has acknowledged these dimensions as likely to be the dimensions of situation- or event-level meaningfulness (e.g., Tov et al., 2019), but researchers have yet to clearly delineate operational definitions of the three facets of SM-Meaningfulness for the purposes of scale creation. The following sections seek to do this, while outlining theoretical and empirical support that informs the provided definitions.

Coherence. A coherent life is typically presented as an existence that makes sense to the individual regarding their beliefs about the world around them, the narrative of their life, and the interface between these two components (George & Park, 2016; Martela & Steger, 2016; Steger, 2009). Through this lens, an individual's understanding of their life and the surrounding world can be seen as a functional cognitive organization that consolidates all of the situations and experiences that they have undergone to the present point in their life. This does not assume

flawless memory or complete integration between an individual's accumulated experiences, but it represents the necessity for individuals to make sense of a world and existence that could never be fully understood, given human limitations.

Numerous scholars (e.g., Heine et al., 2006; Park & Folkman, 1997) have asserted that experienced situations have the potential to disrupt our present conception of the world, and these scholars have suggested that individuals may be constantly weighing their current beliefs against stimuli encountered throughout their daily lives. Accordingly, particularly incomprehensible situations are assumed to have the potential to shatter one's conceptions. It follows that experienced situations that *are* comprehensible have the potential to align with, reaffirm, or augment one's current understanding of the world as making sense, perhaps even in a way that is automatically detected (L. A. King & Hicks, 2009). These situations may be expected to be coherent in themselves and (perhaps in conglomeration with numerous other affirming situations experienced over time) contribute toward this sense of overall coherence as life meaningfulness. Indeed, experimental research supports the notion that coherent situations are more meaningful. Participation in tasks with coherent stimuli has been found to be associated with higher levels of life meaningfulness than participation in analogous tasks with random stimuli (Heintzelman et al., 2013). Empirical investigation of these matters supports a model of situational momentary coherence (SM-Coherence) in which meaningfulness may also be detected automatically when we do not encounter disorienting or distressing situations (L.A. King & Hicks, 2009). With these considerations in mind, SM-Coherence is defined as the extent to which a situation is presently deemed understandable and comprehensible to the individual experiencing it.

Purpose

Purpose is regarded by many scholars as being the motivational component of meaning (Heintzelman & King, 2014b; Kashdan & McKnight, 2009; Martela & Steger, 2016; Reker et al., 1987; Wong, 2012). This overall sense of life purpose involves possession of grand aims and a sense of directedness regarding the reason for one's existence. How purpose would be experienced as meaning on a momentary basis has not been thoroughly investigated. As life purpose is distinct from the other dimensions due to its future-orientation and motivational aspect, situational momentary purpose (SM-Purpose) may also be optimally defined in this manner.

Martela and Steger (2016) suggested that meaning as purpose serves to "direct our efforts toward desired futures" (p. 538). Barrick et al.'s (2013) theory of purposeful work behavior addresses the idea of purposefulness of workplace tasks (tasks may be considered a form of situation), and this theory supposes that directedness toward achieving desired outcomes is where purposefulness is derived. Baumeister et al. (2013) conceived of purposeful events as "working toward some future goal or outcome, such that the future outcome is highly desirable..." (p. 506). With these considerations in mind, the understanding of SM-Purpose may involve an individual's perception that a situation is going to make the future more in line with a subjectively improved future that coincides with one's objectives (i.e., a more desirable future). Consequently, SM-Purpose is presented herein as being the extent to which one can identify the aims of that situation in a way that elicits an expectation that the future will be improved or more desirable because of that situation's occurrence. Put another way, SM-Purpose is the degree to which a situation is believed to serve an objective that the individual can identify and considers to be positive in its contribution.

Significance

Significance at the level of meaning in life (also referred to as "mattering"; see George & Park, 2016) has been conceptualized as the evaluation that one's life matters, is of value, and is worth living (Martela & Steger, 2016). This is often regarded as the component of meaningfulness that has received the least empirical attention, but some findings have suggested it may be the facet most germane to the experience of meaningfulness (Costin & Vignoles, 2019). A corresponding conceptualization of significance at the level of situations may involve the perceived situation being subjectively evaluated as mattering, holding value, and being worth engaging in.

Given the ease with which significance can be conflated with purpose, it is important to distinguish the two. Situations may hold value or be perceived as mattering outside of making clear contribution toward the accomplishment of aims. For example, Martela and Steger noted that "although good relationships with the family could also be constructed as a goal, one can argue that spending time with one's family in the present moment might make our lives feel filled with value and significance whether or not it is a conscious goal of ours or not" (p. 537). It is possible that these kinds of situations elicit situational momentary significance (SM-Significance) because these activities hold inherent value and participation in them and may be seen as a means to their own end (Ryan & Deci, 2000). As both are considered components of meaningfulness, SM-Purpose and SM-Significance would be expected to be associated with each other; however, SM-Significance's distinction from SM-Purpose only requires that situations are capable of holding subjective meaningfulness through a sense of present experiences mattering independent of a grander future goal to be achieved.

Synthesizing the Three Components of Situational Momentary Meaningfulness

Overall, SM-Meaningfulness is proposed to exist across the three dimensions of SM-Coherence, SM-Purpose, and SM-Significance. While the dimensions may have distinct cognitive substrates, the three components all may induce the same sensation of meaningfulness, as Heintzelman and King (2014b) suggested that "experiences of coherence, purpose, and significance may share the same feeling state" (p. 10). For the design of the present scale, situations that are subjectively perceived as (1) being understandable and comprehensible (i.e., SM-Coherence), (2) contributing toward a preferable future (i.e., SM-Purpose), and (3) mattering, holding intrinsic value, import, or worthwhileness (i.e., SM-Significance) are expected to be enriched with SM-Meaningfulness. This operationalization will be used toward creating an appropriate questionnaire for measuring SM-Meaningfulness. Definitions of each dimension of SM-Meaningfulness are provided in Table 2.

The Present Studies

The present studies developed and tested psychometric qualities of the Situational Momentary Meaningfulness Questionnaire (SMMQ). Drawing from aforementioned literature on the components of life meaningfulness, the SMMQ was designed to assess SM-Meaningfulness and three proposed dimensions of SM-Coherence, SM-Purpose, and SM-Significance. As the SMMQ is purposed to be used for ESM where minimizing participant burden is of high concern, brevity of the final questionnaire was of high emphasis. As DeVellis (2016) suggested that a minimum of three items is required for the creation of a stable factor, the goal of the SMMQ's development process was to create a nine-item measure (i.e., three items per proposed factor).

For Study 1, a preliminary item pool was created by the author and two other graduate students who were members of a lab focused on the study of meaning, purpose, and quality of life. Next, this item pool was refined using a focus-group style method within a psychology lab

consisting of undergraduate students. The present author also consulted with Subject Matter Experts (SME) regarding the appropriateness of the operational definitions and items.

Study 1 involved administering a cross-sectional survey to a sample of undergraduate students at a large, Western university. Using these data, initial psychometric properties and factor structure of the SMMQ were tested, and a reduced version of the scale was selected. For this study, each participant was asked to recall a situation experienced the prior day at one of three separate randomly assigned time options and rated that situation across the items of the SMMQ as they believe they would have responded during the situation. The SMMQ was designed to reflect three factors representing SM-Coherence, SM-Purpose, and SM-Significance, which were expected to load hierarchically onto one composite factor of SM-Meaningfulness; however, Study 1 did not contain formal hypotheses.

Study 2 (1) tested the factor structure determined through Study 1 to see if the same factor structure replicated in a separate sample and (2) investigated the SMMQ's construct validity through examining relationships with other pre-established situation-level measures and a measure of life meaningfulness, using a sample from the same participant pool in Study 1. Study 2 asked participants to provide two experienced situations. The first situation used similar prompts to those used in Study 1 to have participants provide a quotidian situation experienced the prior day and assess characteristics of this situation across an array of situation-level factors. Subsequently, participants were prompted to recall and describe a second situation, which asked students to provide the most meaningful situation that they have experienced since arriving at Colorado State University (CSU). They also rated this situation on the SMMQ. The SMMQ and its dimensions' relationships to the criterion variables collected were used to examine convergent and discriminant validity. Additionally, SM-Meaningfulness scores of the two situations were

compared to determine whether the SMMQ can detect differences between everyday situations and situations deemed highly subjectively meaningful.

Study 2 had several formal hypotheses. It was hypothesized that the factor structure determined based upon Study 1 would replicate by showing acceptable fit. In regard to convergent validity, it was expected that SM-Meaningfulness will have positive correlations with self-determined motivation, expression of openness/extraversion behaviors, positive affect, perceived characteristics of sociality, intellect, duty, and positivity of situations, and satisfaction of situational needs for beneficence, autonomy, competence, and relatedness. Additionally, negative correlations of SM-Meaningfulness with negative affect, expression of neuroticism behaviors, and perceived characteristics of Deception, Adversity, and negativity of situations will be considered support of convergent validity. It was hypothesized that SM-Meaningfulness would demonstrate discriminant validity through having a nonsignificant or at-most weak correlation with presence of and search for life meaningfulness, as it is expected that overall life meaningfulness would not be highly predictive of a randomly selected prior day situation's SM-Meaningfulness. Lastly, it was expected that scores on the SMMQ corresponding to the most meaningful situation prompt will receive significantly greater scores on all dimensions of the SMMQ than the randomly assigned prior-day situation. The hypotheses for Study 2 are explicitly presented below.

Hypothesis 1: The factor structure demonstrated in Study 1 will replicate by showing acceptable model fit in Study 2.

Hypothesis 2: SM-Meaningfulness and its dimensions will have positive correlations with self-determined motivation, expression of openness/extraversion behaviors, positive affect, perceived

characteristics of sociality, intellect, duty, and positivity of situations, and satisfaction of situational needs for beneficence, autonomy, competence, and relatedness.

Hypothesis 3: SM-Meaningfulness and its dimensions will negatively correlate with negative affect, boredom[3], expression of neuroticism behaviors, and perceived characteristics of deception, adversity, and negativity of situations.

Hypothesis 4: SM-Meaningfulness and its dimensions will have nonsignificant or weak correlations with presence of and search for life meaningfulness.

Hypothesis 5: Scores on the SMMQ in response to the most meaningful situation prompt will be significantly greater than scores on the SMMQ answered in response to a randomly assigned prior-day situation.

[3] In the original proposal document, boredom was not listed among any hypothesized relationships, but based on Chan et al.'s (2018) findings that SM-Meaningfulness is negatively associated with boredom, this was included prior to conducting analyses

CHAPTER 2: METHOD

Study 1

Item Generation

The item generation process began through the development of a large pool of items by three graduate students who held positions in a lab focused on the psychological study of meaning (including the present author). This initial pool consisted of 108 items. Dawis (2000) suggested that receiving detailed responses from a small sample of individuals help improve item clarity, so these items were refined using a focus-group style session in which an initial pool of items was distributed to undergraduate research assistants (RAs) in the aforementioned lab. RAs filled out the questionnaire in reference to a prior day experience and were provided with a section next to each item to provide optional written feedback on the clarity/quality of that item. Verbal feedback was also provided via a group discussion following administration of the items. Feedback was integrated toward refining item clarity and content.

Following DeVellis' (2016) recommendations, the items were sent to subject matter experts (SMEs) to maximize content validity. Specifically, the initial item pool and a definition of SM-Meaningfulness and its constructs were emailed to ten SMEs, who were all published authors on the study of meaning. These were sent alongside a request that these SMEs provide information regarding the appropriateness of the operational definition of SM-Meaningfulness and the item pool. Eight[4] SMEs responded with feedback. All items that received multiple critical comments (i.e., more than one SME remarked upon a potential issue with the item) were

[4] Three SMEs declined to respond or provide feedback. One SME shared the questionnaire during a lab meeting, and an additional SME who was a graduate student in that lab provided responses in addition to those provided by the SME originally contacted.

removed. Several SMEs recommended including additional items, and all of these were added to the pool. This resulted in a pool of 104 items. One SME also recommended the addition of an item assessing how well individuals remember the situation they described, so this item was added to the survey.

Participants and Procedure

After the studies were approved by the Institutional Review Board (IRB) of Colorado State University, participants were recruited from several undergraduate courses offered by the psychology department through the use of a research pool that allows students to receive course credit in exchange for participation in studies. A cross-sectional survey containing Study 1's measures was electronically administered. An informed consent form that described the nature of the study as well as risks and benefits associated with participation was electronically signed by participants (see Appendix A).

Following the method used by Rauthmann and colleagues (2014) in their construction of an instrument designed to measure characteristics of situations, participants were randomly assigned to recall the situation that they were in the prior day during one of three times: 11:00 AM, 4:00 PM, and 9:00 PM. Next, following Rauthmann and Sherman's (2016) procedures, participants were asked to write a brief description of what they were doing and who they were with during the situation. Participants were also asked if they were asleep during the situation, and those who indicated "yes" were randomly assigned to one of the two remaining times. Participants who indicated they were also asleep at the second time were reassigned to the last remaining time. One participant indicated being asleep at all three times and was carried through to the demographic questionnaire without being administered the SMMQ. Once participants outlined what they were doing in the situation, they were asked how well they remember the

situation and administered an initial 104-item version of the SMMQ. After filling out this questionnaire, participants completed a demographic form.

Following best practice recommendations for EFA (Fabrigar et al., 1999; Goretzko et al., 2019), desired sample size involved recruiting at least 400 participants. Twenty of the 491 participants who began the survey did not complete any items from the SMMQ pool. For remaining participants, Parent's (2013) recommendation to set a cutoff point of minimum percentage of items answered was used, and all participants who completed at least 80% of the SMMQ were retained. This resulted in a sample of 458 participants used for analyses. These participants had an average age of 19.03 (*SD* = 1.77). The sample was primarily composed of women (72.5%), while remaining participants identified as men (26.6%) or another gender (.9%). Regarding ethnicity, the sample mostly involved those who identified as White or European (75.3%) with the remaining participants identifying as Hispanic or Central/South American (9.8%), Asian or Pacific Islander (2.8%), Black, African American, or African (1.1%), American Indian or Alaskan Native (.4%), Biracial (9.4%), or another ethnicity (1.1%). Participants were predominantly Freshmen (63.5%), but there were participants who were Sophomores (20.5%), Juniors (10.9%), Seniors (4.1%), and Other (e.g., fifth-year Seniors; .9%). The sample identified their household of origin income across the following ranges: $19,999 or less (4.0%), $20,000-34,999 (7.4%), $35,000-49,999 (6.5%), $50,000-64,999 (13.4%), $65,000-79,999 (16.1%), $80,000-99,999 (13.2%) $100,000 or above (39.5%).

Instruments

(see Appendix B)

Demographic Information. Demographic information was collected using items designed to assess age, gender, socioeconomic status, ethnicity, and level of education.

Memory of Situation. Participants were asked "How well do you remember this situation" and presented with a bipolar rating scale ranging from "1 = I cannot remember this situation at all" to 6 = "I can remember this situation extremely well."

Situational Momentary Meaningfulness. The initial 104-item Situational Momentary Meaningfulness Questionnaire (SMMQ) was used to assess SM-Meaningfulness at the level of situations across three proposed dimensions Situational Momentary Coherence (SM-Coherence), Situational Momentary Purpose (SM-Purpose), and Situational Momentary Significance (SM-Significance). Item order was randomized.

Study 2

Participants and Procedure

A second sample of entirely new participants from the same research participation pool as Study 1 was collected for Study 2. Data were collected from November 2019 through February 2020 with collection temporarily suspended during winter break at the university where data were collected (i.e., from mid-December through mid-January). First, participants completed an informed consent form (see Appendix C). Next, they were presented with the MLQ. Following this, identical procedures to those administered in Study 1 were used in the sense that participants were randomly assigned one of the three aforementioned times, asked to describe the situation they were in during that time, asked how well they remember that situation, and asked whether or not they were asleep during the situation. Participants who indicated they were asleep followed a similar time assignment procedure as in Study 1.

Participants were then administered the 104-item SMMQ[5] in reference to the described situation followed by several other situation-level questionnaires.

Study 2 followed similar procedures regarding missing data for those described for Study 1, which resulted in a sample of 483 participants in this study. Participants in the sample had an average of 19.4 years of age. Most participants identified as women (67.5%) with the rest identifying as men (31.9%) or another gender (.6%). The sample was predominantly White or European (71.9%), but participants also identified as Hispanic or Central/South American (10.6%), Asian or Pacific Islander (4.4 %), Black, African American, or African (1.1%), American Indian or Alaskan Native (.4%), Biracial (10.6%), or another ethnicity (1.1%). The majority of the sample was made up of Freshmen (55.5%), while other participants were Sophomores (25.3%), Juniors (12.0%), Seniors (5.1%), and Other (e.g., fifth-year Seniors; 2.1%). The sample reported household of origin income as $19,999 or less (5.1%), $20,000-34,999 (7.3%), $35,000-49,999 (8.6%), $50,000-64,999 (11.2%), $65,000-79,999 (15.9%), $80,000-99,999 (15.5%) $100,000 or above (36.2%).

Instruments

See Appendix D for all instruments administered that were not already administered in Study 1.

Demographic Information. Demographic information was collected using the same items from Study 1 designed to assess age, gender, socioeconomic status, ethnicity, religion, and level of education.

[5] The full scale was administered in Study 2 because studies were conducted concurrently, and the final scale had not been selected from Study 1 yet. Later analysis only selected the items chosen from Study 1 and the data from the remaining items were not analyzed.

Situational Momentary Meaningfulness. The proposed scale, the Situational Momentary Meaningfulness Questionnaire (SMMQ) was used to assess SM-Meaningfulness.

Life meaningfulness. The Meaning in Life Questionnaire (MLQ; Steger et al., 2006) was administered to measure life meaningfulness. The MLQ is a ten-item questionnaire that assesses presence of (MLQ-P) and search for (MLQ-S) life meaningfulness on two separate five-item subscales. Items such as "I understand my life's meaning" and "my life has a clear sense of purpose" are rated on a 7-point Likert-type rating scale ranging from "absolutely untrue" to "absolutely true." There is substantial evidence supporting the MLQ's validity and reliability. Strong construct validity of the MLQ-P has been demonstrated through positive relationships with life satisfaction, optimism, self-esteem, and intrinsic religiosity and expected negative relationships with criterion including depression and neuroticism (Steger et al., 2006). MLQ-S' construct validity has been shown through positive relationships with variables associated with both exploration (such as openness and investigative interests) and psychological distress such as depression and rumination (Steger, Kashdan, Sullivan, et al., 2008). Test-retest reliabilities of MLQ-P and MLQ-S suggest stability of the constructs over a one-month period of .70 and .73, respectively (Steger et al., 2006) and over a thirteen-month period of .41 and .50, respectively (Steger & Kashdan, 2007). Steger and colleagues (2006) found the questionnaire to have strong internal consistency reliability for both the MLQ-P (α = .81-.86) and MLQ-S (α = .84-.92). In the present study, internal consistency reliability was acceptable for MLQ-P (α = .87) and MLQ-S (α = .89).

Self-Determined Motivation. Self-determined motivation was assessed using the Situational Motivation Scale (SIMS; Guay et al., 2000). The SIMS is a situation-level questionnaire designed to capture the extent to which individuals choose to participate in

situations or activities for self-determined reasons. This questionnaire is based upon self-determination theory (Deci & Ryan, 1985) and consists of 16 items preceded by the question: "Why are you currently engaged in this activity?" The items are rated across a 7-point Likert-type rating scale ranging from "corresponds not at all" to "corresponds exactly."

The SIMS has four subscales, each represented by four items on the scale. These dimensions are intrinsic motivation (IM; e.g., "because I think that this activity is interesting"), identified regulation (IR; e.g., "because I am doing it for my own good"), external regulation (ER; e.g., "because it is something that I have to do"), and amotivation (AM; e.g., "there may be good reasons to do this activity, but personally I don't see any"). Past studies (e.g., Blanchard et al., 2007) have formed a self-determination index (SDI) composite score using the following formula: SDI = + 2*(intrinsic motivation) + 1*(identified regulation) - 1*(external regulation) - 2*(amotivation). Guay and colleagues (2000) demonstrated construct validity of the subscales through finding relationships in the theorized directions with perceived competence, concentration, and persistence as well as showing the subscales' capability of measuring intraindividual differences between situations. The total SDI score of this scale has also been shown to have a positive relationship with concurrently measured personal and team performance among a sample of collegiate basketball athletes (Blanchard et al., 2007). In the present study, the overall internal consistency reliability of the scale was acceptable ($\alpha = .85$).

Situation Characteristics. The S8* (Rauthmann & Sherman, 2016) was used to assess individuals' perceptions of the characteristics of the situations they engaged in across the DIAMONDS dimensions (Rauthmann et al., 2014) of Duty, Intellect, Adversity, Mating, pOsitivity, Negativity, Deception, and Sociality. The S8* is a 24-item questionnaire in which three items are associated with each situation characteristic. These items are rated on a 1-7

Likert-type scale that asks participants to assess how characteristic statements are of the situation in question (1= *extremely uncharacteristic*, 7 = *extremely characteristic*). In Sherman and colleagues' (2015) examination of characteristics of situations using the DIAMONDS taxonomy, findings demonstrated that perceptions of characteristics of situations vary to a greater extent within person than they do between people. Sherman and colleagues also found that these characteristics of situation perception influence behavior, supporting the use of the DIAMONDS as a valid set of situation characteristics. In the current study, internal consistency reliability was acceptable across all dimensions of Duty (α = .92), Intellect (α = .93), Adversity (α = .91), Mating (α = .86), pOsitivity (α = .92), Negativity (α = .92), Deception (α = .90), and Sociality (α = .89).

Situational Behavior. Behavior within situations was assessed using an adapted version of the items administered in past situation-level studies (Jones et al., 2017; Sherman et al., 2015). The items assess behavior across the dimensions of honesty/humility, emotionality/neuroticism, extraversion, agreeableness, conscientiousness, and openness. Items ask individuals to self-report their within-situation behavior in respect to alignment with adjectives designed to assess each dimension. Abovementioned studies have used the adjectives as anchors of a seven-point bipolar scale (e.g., for conscientiousness, 1 = *lazy, procrastinating* and 7 = *focused, diligent*). The present study separated the scale's adjective anchors into distinct items in which participants were asked to rate the extent to which the descriptors are accurate representations of their behaviors within the situation in question using a seven-point Likert-type rating scale (e.g., for conscientiousness, *Focused, Diligent*; 1 = *not at all an accurate description of my behavior in this situation* and 7 = *absolutely an accurate description of my behavior in this situation*). This alteration of the scale allowed for each dimension to exceed the three items necessary to form a

stable factor (Dawis, 2000; DeVellis, 2016), enabling examination of the alpha coefficient internal consistency reliability of the subscales as well as factor structure. This alteration may also have reduced participant burden by maintaining a similar style to other scales administered. Internal consistency reliability was acceptable for Openness (α = .89) and Honesty/Humility (α = .90); however, alpha was below typical thresholds for acceptability for Neuroticism (α = .63), Agreeableness, (α = .56), Conscientiousness (α = .55), and Extraversion (α = .50). Examinations of alpha if each item were dropped among these subscales, suggested that none of them could be altered to be above the typical acceptability threshold of .70 via dropping an item.

Mood. Mood experienced within situations was assessed using the emotion assessment adjectives created by Kahneman and colleagues (2004). Typically, this scale contains 12 items in which participant rate the degree to which they felt particular emotions on a seven-point scale ranging from *not at all* to *very much.* Nine of these items can be made into two subscales: positive affect (comprised by the three items of *happy, enjoying myself,* and *warm/friendly*) and negative affect (*depressed/blue, hassled/pushed around, criticized/put down, worried/anxious, frustrated/annoyed,* and *angry/hostile*). The remaining three items (*impatient, competent,* and *tired*) are single-item assessments conventionally assessed individually. As competence was assessed with multiple items (see "Situational Need Satisfaction" in the Instruments section of Study 2), the competence item of the emotion assessment was deemed redundant and was not administered. Additional items designed to assess constructs deemed relevant to SM-Meaningfulness were administered (e.g., how engaging, interesting, and satisfying the situation is felt to be). Participants were asked to assess these constructs as if they were completing the sentence "During this situation I felt…" The positive affect and negative affect subscales both

showed acceptable internal consistency reliability in the current study (α's = .89 and .90, respectively).

Situational Need Satisfaction. Situational need satisfaction was measured using Martela and Ryan's (2016) adapted version of Sheldon et al.'s (2001) situation-level need-satisfaction questionnaire. Building upon Sheldon and colleagues' identification of competence, autonomy, and relatedness as key psychological needs, this version added situational beneficence (i.e., the degree to which one's behavior within a situation is perceived as being prosocial in nature) and demonstrated its incremental importance beyond that of the other three psychological needs in capability of predicting situational well-being. As the scale used the prompt "During this event I felt…," the present study sought to reduce participant burden by listing the items below the same prompt used in the aforementioned instructions of mood within the present study ("During this situation, I felt…") and asked participants to respond to a 7-point Likert-type rating scale ranging from 1 = *not at all how I felt* to 7 = *very much how I felt.* Martela and Ryan (2016) found all four scales to have strong internal consistency reliability (α ≥ .82). The present study found acceptable internal consistency reliability for competence (α = .80), autonomy (α = .87), relatedness (α = .94), and beneficence (α = .91).

CHAPTER 3: RESULTS

Study 1

Analysis Plan

The main analyses conducted in Study 1 related to factor analysis, beginning with exploratory factor analysis (EFA) and concluding with confirmatory factor analysis (CFA).

One of the first considerations in EFA is determining the number of factors to retain. In the extant literature, there are numerous suggested ways to discern how many factors are appropriate to extract. Scholars have suggested that only factors obtaining eigenvalues greater than one should be considered for a final model, as a lower eigenvalue would be indicative of a factor that provides less information than an average item in that respective scale (Guttman, 1954; Kaiser, 1960). Though this recommendation was originally intended as a lower-bound for how many factors a given scale *could* have, DeVellis (2016) asserted that a misinterpretation of this advice has engendered widespread treatment of the last eigenvalue above one as suggestive of a cutoff point for the optimal number of factors to retain. DeVellis adjured scholars to refrain from using this cutoff point and delineated more robust methods for discerning number of factors, such as use of scree plots. Scree plots graphically represent eigenvalues and can be used to determine the point in which the plot appears to drop-off dramatically (often referred to as the "elbow"), which is indicative of the point in which factors should no longer be retained, irrespective of the exact value associated with that eigenvalue. Furthermore, DeVellis recommended parallel analysis (PA), a method that uses a scree plot to graphically compare eigenvalues in a collected sample's data to a random matrix of identical size generated from simulated data. In this method, additional factors in the real data that fall below the line of the

simulated data are considered extraneous, as factors below this threshold are considered to be less informative than those acquired by random chance.

Steger (2006) suggested using PA for factor extraction, advising that "one should generally retain all of the factors for which the real eigenvalues exceed the random ones," while acknowledging that "...in cases in which additional factors are only slightly above chance levels...it is recommended that information from multiple procedures be used to determine the most likely dimensionality of the data" (p. 271). Based on Monte Carlo simulations, Lim and Jahng (2019) recommended that scholars retain a number of factors within ±1 of the traditional PA cutoff and suggested that this decision be supplemented by theory regarding the construct and/or interpretability of the scale. Indeed, best practice recommendations for EFA suggest synthesis of PA with other important considerations like theoretical concerns, fit indices, explained variance, etc. (Fabrigar et al., 1999; Goretzko et al., 2019). Based on this, the present studies integrated PA with considerations such as interpretability and conceptualization of the construct toward discerning the appropriate number of factors of the SMMQ.

As the SMMQ's dimensions were expected to load hierarchically onto a SM-Meaningfulness factor and substantially correlate with each other, oblique, direct oblimin rotation was used. Direct oblimin rotation is considered the best practices version of oblique rotations, a rotation method that allows for factors to correlate (Costello & Osborne, 2005). A cutoff point of lower than .32 on all factors was determined to signify insufficiently loading items, while loadings above .32 on multiple factors were considered indicative of a cross-loading item (Costello & Osborne, 2005; Tabachnik & Fidell, 2001). Removal of cross-loading and insufficiently loading items was deemed appropriate for the purposes of these studies. Further guidelines for removing items are provided by McDonald's (1999) suggestion to calculate item

information criteria to determine which items are most representative of true score variance. The formula for calculating item information involves squaring each respective item's standardized factor loading and dividing the result by that item's uniqueness ($I(x_i) = \lambda^2/\psi^2$). After each round of item removal, EFA was again conducted to determine if the same factor structure was maintained.

In factor analysis, goodness of fit indices can aid in interpretation of the appropriateness of a selected model. Fit indices used in the present study included chi-square test (χ^2), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Squared Error of Approximation (RMSEA), and standardized root mean squared residual (SRMR). Suggestions for appropriate cutoff points of RMSEA vary, ranging from < .10 (e.g., Browne & Cudeck, 1993) to stricter cutoff points, such as close to .06 (Hu & Bentler, 1999). Likewise, convention for CFI and TLI cutoff points range from > .90 (McDonald & Ho, 2002) to > .95 (Hu & Bentler, 1999). For SRMR, < .08 is typically considered an appropriate cutoff point. A significant χ^2 statistic may also signify a poorly-fitting model, but results of a chi-square test are highly influenced by sample size. Consequently, analyses conducted upon larger samples may find significant results to a χ^2 test even in acceptably fitting models (Fabrigar et al., 1999). Because of this limitation, a significant χ^2 was not considered necessarily indicative of a poorly fitting model for the present studies.

In EFA, researchers often do not report goodness of fit indices, typically reserving examination of model fit for CFA (e.g., Duffy et al., 2017). However, fit indices such as TLI, χ^2 test, and RMSEA can be obtained in EFA. Thus, these were deemed appropriate to aid in the evaluation of models determined through EFA in reference to the aforementioned cutoff point guidelines.

Some researchers warn against the rigid use of cutoff points and posit that goodness of fit indices are best interpreted in consideration of other factors relevant to the specific research question being evaluated (Marsh et al., 2004; Weston & Gore, 2006). Correspondingly, all of the proposed study's evaluation of goodness of fit indices will consider the abovementioned guidelines, while acknowledging matters of conceptualization of the construct, as well as practicality.

Based upon determinations made following EFA results and interpretation, a confirmatory factor analysis (CFA) was conducted to replicate the identified factor structure, using the *lavaan* package (Rosseel, 2012), which enables structural equation modeling (SEM) in R statistical software (R Core Team, 2017). Maximum likelihood estimation was used in the CFA, given its capability to provide a variety of goodness of fit indices and allowance of correlation between factors (Fabrigar et al., 1999). CFI, TLI, RMSEA, and SRMR were obtained and evaluated based on the above guidelines.

Internal consistency reliability of the SMMQ was evaluated using both alpha and omega coefficients. Cronbach's (1951) alpha coefficient (α) is a widely used metric of internal consistency reliability designed to assess the extent to which the items of a scale correspond with or interrelate to each other. Nunnaly (1978) suggested that an alpha coefficient of .70 or greater is representative of adequate internal consistency. This was used as a lower bound of acceptable internal consistency reliability in the present research. While alpha is frequently used as the sole measure of internal consistency in the extant literature, the coefficient has some shortcomings. Two of these shortcomings are (1) its inability to discriminate between unidimensional models and multidimensional models with internally consistent (but potentially orthogonal) factors and (2) its reliance on stringent assumptions that are rarely met in actual psychological research

(DeVellis, 2016; Dunn et al., 2014; Raykov & Marcoulides, 2011). McDonald's (1999) omega coefficient (ω) has been offered as an alternative to alpha. Omega allows for precise examination of scale unidimensionality and has more relaxed assumptions that are more likely to be met in social scientific research. Dunn and colleagues (2014) recommended each subscale in a multidimensional scale have a separate omega coefficient calculated. As the SMMQ is designed to have three subscales that load hierarchically onto a single factor, omega coefficient was calculated for each subscale and for the total scale, using a guideline of $\omega > .80$ as acceptable (Raykov & Marcoulides, 2011).

Exploratory Factor Analysis

PA and EFA with maximum likelihood estimation were conducted to determine the appropriate factor structure of the SMMQ. Among the 104 items administered, eleven items were found to be nonnormally distributed based on West et al.'s (1995) guidelines of skewness > 2 and kurtosis > 7, so these were removed prior to analysis. PA was conducted on the remaining 93 items (see Figure 1). Eigenvalues associated with this model and all subsequent EFA models are displayed in Table 3. The initial PA suggested four factors, so a four-factor model was examined. In the four-factor model, all of the reverse-coded items loaded well onto the fourth factor (i.e., > .32), but no regularly coded items loaded well on this factor. While this could be interpreted as representing a fourth factor of situational meaninglessness, theoretical considerations about the structure of meaningfulness (e.g., Martela & Steger, 2016) and empirical considerations showing the potentially problematic nature of reverse-coded items (Menold, 2020) suggested that the SMMQ would better represent the intended underlying construct without these items. All reverse-coded items and all cross-loading items were removed, and PA was conducted again on the 68 remaining items (see Figure 2). This solution appeared to

recommend a four-factor solution again; although, the fourth factor neared the cutoff point. Thus, the three-factor solution and four-factor solution were compared.

For the three-factor solution, RMSEA and TLI were both acceptable (RMSEA = .044; TLI = .932). The three factors combined to explain 62% of the variance in the data. In this model, items that loaded sufficiently (i.e., > .32) on the Factor 1 were as follow: 15/19 of the items designed to represent Purpose, two items designed to represent Significance, and one item designed to represent Coherence. Factor 2's sufficiently loading items were composed of 16/19 of the items designed to represent Significance, five items designed to represent Purpose, three items designed to represent Coherence, and all four face-valid meaningfulness items (e.g., "this situation is meaningful"). Factor 3 was comprised solely of 13/17 of the items designed to represent Coherence. One item cross-loaded, and no items failed to sufficiently load onto any factor.

The four-factor solution also had acceptable fit indices (RMSEA = .040; TLI = .946). The four factors explained a total of 63% of the variance in the data. In the four-factor solution, Factor 1 was constituted by 24/28 items designed to represent Purpose, one item designed to represent Coherence, and two items designed to represent Significance. Factor 2 of this solution included 16/19 of the items designed to represent Significance, the four-remaining face-valid meaningfulness items, five items designed to represent Purpose and one item designed to represent Coherence. Factor 3 only had 13/17 items designed to represent Coherence. Factor Four had four items load sufficiently on it: SMMQ 11, SMMQ 15, SMMQ 17, and SMMQ 25 (see Appendix B for item content). All of these items were designed to load onto the Coherence dimension of the SMMQ; however, they appeared to differentiate from most Coherence items, as they all explicitly reference broader life contexts/narratives (e.g., "This situation fits into my life

story" and "In the story of my life, this situation makes sense"), while most Coherence items in these data focused primarily on the content of the particular situation (e.g., "This situation makes sense"). Also, two of the four items that loaded well onto the fourth factor cross-loaded on other factors, indicating that they should be removed from the model. Removing these two items would leave the fourth factor with only two items, which is insufficient for a stable factor of a scale (DeVellis, 2016). In comparison to the three-factor model, the four-factor model also involved only slight increases in model fit (Δ TLI = .012; Δ RMSEA = .004) and amount of variance explained (i.e., an additional 1% explained variance). These considerations led to the removal of items associated with the fourth factor. Also, cross-loading and poorly loading items were removed, resulting in a total of nine items being removed prior to conducting another PA on the remaining items.

Another PA was conducted on the remaining 59 items (see Figure 3). This PA suggested that a three-factor model was appropriate. Fit indices of the three-factor model were examined, and both TLI and RMSEA were acceptable (TLI = .942; RMSEA = .044). In this model, all items loaded > .32 onto only one of the factors. Factor 1 consisted of 23/27 of the items designed to represent Purpose and two items designed to represent Significance. Both items designed to represent Significance that loaded onto Factor 1 appeared to evoke some sense of impact on future outcomes ("This situation is useful" and "It is vital that I participate in this situation"). Factor 2 consisted of 16/18 of the remaining items designed to represent Significance, four items designed to represent Purpose, all four-remaining face-valid meaningfulness items, and one item designed to represent Coherence ("I understand how I can find meaning in this situation"). Three of the four items designed to represent Purpose that loaded well onto Factor 3 appeared to reference affective content (e.g., This situation feels purposeful to me), while the last seemed to

refer to prosociality ("People will be better off because this situation occurred"). The third factor was exclusively constituted by 9/10 of the remaining items designed to measure Coherence. The pattern of these results generally indicated that the factors represent three dimensions of Purpose, Significance, and Coherence.

Given brevity of the eventual questionnaire was an emphasis at the outset of the SMMQ's development process, further reduction of the item pool was deemed appropriate, despite the 59-item three-factor solution's acceptable fit. Item information criteria was used as the primary determinant of which items to retain; although, theoretical and practical considerations were weighed as well. Factor loadings and item information for these 59 items are reported in Table 4. Five items were selected from each factor with the intention of further reduction of items as appropriate during Study 2's CFA process. For the Coherence dimension, the top five most informative items were retained, which consisted entirely of items originally designed to measure Coherence. Similarly, the top five most informative items were retained for the Purpose dimension, and all of these items were originally conceived as measuring Purpose. For the Significance dimension, three of the five retained items were among the top-five most informative items. Some of the most informative items on the Significance factor included those that were designed to be face-valid assessments of meaningfulness. Given concerns about overlap in phrasing leading to artificial inflation of relationships with other variables assessing meaning-related constructs (e.g., life meaningfulness as measured on the MLQ), the decision was made to not retain any of the items explicitly referencing meaning in favor of items that more directly reference aspects relevant to the operational definition of significance. These two remaining items that were retained for adherence to the operational definition were "This situation is significant" and "This situation matters to me."

A final EFA with PA was conducted on the remaining fifteen items. PA suggested a three-factor solution (see Figure 4). Fit statistics for the three-factor model indicated excellent fit (TLI = .976; RMSEA = .049). No items substantially cross-loaded. Regarding items that loaded well on each factor, Factor 1 was comprised of five items designed to represent Purpose, Factor 2 was constituted by five items designed to represent Significance, and Factor 3 was composed of five items designed to represent Coherence (i.e., all 15 items loaded well onto the factor corresponding to the dimension they were designed to measure). Factor loadings for each item can be found in Table 5. The three-factor solution explained 66% of the total variance in the data with all three factors explaining at least 20% of the variance (Factor 1 = 25%, Factor 2 = 21%, and Factor 3 = 20%). This model was then carried forth for evaluation through CFA.

Confirmatory Factor Analysis

CFA with robust maximum likelihood estimation was conducted to represent a correlated factors and higher-order models on the fifteen items selected from the EFA process, designating each item to load onto the factor it had previously been shown to load well on. The two models differed in the sense that the correlated factors model exclusively involved the items loading onto their respective oblique factors of SM-Coherence, SM-Purpose, or SM-Significance. The higher-order model included a more general factor that SM-Coherence, SM-Purpose, and SM-Significance loaded onto. Table 6 depicts factor loadings associated with these models in our data. It should be noted that regarding fit indices, the correlated factors model and higher-order model cannot differ, given that there are three first order factors in the model. This is substantiated by Credé and Harms' (2015) observation that "the χ^2 and degrees of freedom for a HOM [Higher-Order Model] with one higher-order factor and three first-order factors are always identical to the fit of the OblFOM [Oblique First-Order Model] because the relationship among

first-order factors is modeled using three parameters in each case...A comparison of χ^2 values or CFI values is therefore meaningless in these cases" (p. 849). Such considerations make distinctions between these two models conceptual, rather than statistical in nature. Still, the higher-order model allows for investigation of loading of first-order factors (i.e., Coherence, Purpose, and Significance) onto the second-order factor of Meaningfulness, so both models were conducted with results reported herein.

Correlated Factors Model and Higher-Order Model. The correlated factors model and the higher-order model demonstrated good fit across all indices: RMSEA = .056 (.046, .065), CFI = .975, TLI = .970, SRMR = .038. The chi-square test of model fit was significant ($\chi^2[87] = 204.75$, $p < .001$), suggesting that the model did not have perfect fit to the data. However, this may have been influenced by the large sample size ($n = 458$). Standardized factor loadings ranged from .69-.91 for each item loading onto its respective dimension of meaningfulness and are depicted in Table 6. In the higher-order model, all dimensions loaded well on the higher-order meaningfulness factor with SM-Coherence loading at .65, Purpose loading at .80, and Significance loading at .90.

Internal Consistency Reliability

Internal consistency reliability of the SMMQ was examined through alpha and omega. Both measures of internal consistency reliability were strong across the dimensions of SM-Coherence ($\alpha = .88$, $\omega = .88$), SM-Purpose ($\alpha = .93$, $\omega = .94$), and SM-Significance ($\alpha = .90$, $\omega = .91$). Internal consistency reliability of the total scale (i.e., an overall SM-Meaningfulness score comprised of all fifteen items) was strong ($\alpha = .93$, $\omega = .96$).

Descriptive Statistics and Correlations Between Dimensions

Descriptive statistics and correlations were calculated for each dimension of the scale and a total meaningfulness score. Correlations, means, and standard deviations are presented in Table 7. All dimensions and the total scale score were relatively normally distributed as skewness was between -1 and 1 for each, and kurtosis ranged from -1.07 – -.43. All dimensions demonstrated significant positive correlations, ranging from r = .48 - .66.

Study 2

Analysis Plan

The analyses from Study 2 involved further examination and refinement of psychometric properties of the fifteen-item SMMQ (see Table 5 for item content) that was discerned from Study 1. In Study 2, Hypothesis 1 was that the factor structure of the SMMQ from Study 1 would replicate by showing acceptable fit in a separate sample. To test this, a CFA on a separate sample's administration of the fifteen-item SMMQ was conducted using similar processes and criteria for fit as those applied in Study 1. Next, given the importance of the SMMQ's scale brevity, further reduction of the scale was sought.

The process for item reduction was guided by theoretical/practical considerations in addition to McDonald's (1999) suggestion for identifying items causing misfit based on the matrix of residual discrepancies between the correlation observed in our data and the expected matrix provided by the CFA model. In other words, the values of the correlations between items that most differed from the values that would be indicative of perfect adherence to the model specified by the CFA would be used to signal items that may be most problematic. McDonald provided a discrepancy > |.10| as exemplifying a potentially problematic item pairing. In the case that a model is already demonstrating good fit, it may be the case that few item pairs demonstrate problematic discrepancies, so in such cases it is particularly important to consider practical and

theoretical matters in reducing the number of items in the model.

Hypotheses 2-4 regarded examination of convergent and discriminant validity, and these were assessed through correlations between SM-Meaningfulness and its dimensions with other constructs. Hypothesis 5 supposed that the SMMQ and its dimensions would be significantly higher when filled out in reference to students' self-reported most meaningful situation since arriving at CSU than scores on the SMMQ filled out in reference to a situation at one of the three randomly assigned times from the day before completing the survey. This was examined using a paired sample t-test to account for comparison of two observations derived from the same subjects.

Preliminary Analyses

Descriptive statistics for all study variables were examined and are reported in Table 8. Based on West et al.'s (1995) cutoff points of nonnormally distributed variables (i.e., skewness > |2| and/or kurtosis > |7|), only one variable showed evidence of nonnormality based on these criteria, which was the Adversity subscale of the S8* (skewness = 2.16; kurtosis = 3.98).

Given the low internal consistency reliability demonstrated by most of the PASS subscales (see Instrument section), CFA was conducted on the scale in which items loaded on the factor it was designed to load onto. The model demonstrated poor fit across all indices. For all subscales except Neuroticism and Extraversion, two items on each subscale loaded well onto the underlying factor (>|.32|), while two items loaded poorly (<|.32|). For Neuroticism, all items loaded well, while Extraversion had only one poorly loading item. Elimination of poorly loading items and conducting an additional CFA on remaining items did not result in a stable factor, as attempts to conduct this model resulted in a non-positive definite covariance matrix. Attempts to maintain the six-factor structure of the PASS scale, while producing a model that met cutoff

points were unsuccessful. Still, all hypothesized analyses involving this scale with both the full intended version of each subscale and an abbreviated version in which only items that loaded well in our CFA were aggregated to create each subscale. Regarding matters of significance and direction of relationships, the two versions of these analyses yielded identical results, so the full version of the scale was maintained for purposes of content validity. Still, results derived from analyses featuring the PASS subscales should be interpreted with greater caution than other results.

Confirmatory Factor Analysis

A CFA with maximum likelihood estimation was used to examine fit of the fifteen-item SMMQ derived from Study 1. As with Study 1, a correlated factors model and a higher order model were both conducted using the *lavaan* package (Rosseel, 2012) in R Studio (R Core Team, 2017); however, as expected for situations in which there are three-first order factors (cf. Credé & Harms, 2015), fit indices for the two models were identical. These models demonstrated acceptable-excellent fit to the data across all examined fit indices: RMSEA = .065 (.056, .074), CFI = .968, TLI = .962, SRMR = .048. Still, the chi-square test was significant ($\chi^2[87] = 255.984$, $p < .001$). All items loaded > .74 on their respective factor, indicating strong loading on the underlying factor. Item loadings are reported in Table 9.

Despite the fifteen-item SSMQ's strong fit to the data, further item elimination to reach the desired length of the final scale (i.e., 9 items) was deemed appropriate to ensure that the scale had appropriate brevity for applications where reducing participant burden is of high priority (e.g., ESM). Examination of the discrepancy matrix based on McDonald's (1999) guidelines suggested that Item 7 ("This situation will make the future more in line with what I would like it to be") and Item 15 ("It is situations like this one that make life worth living") were the only

items with problematic relationships with multiple other items, so these items were removed. Still, to reach the desired length two more items would need to be eliminated from the Coherence dimension, while one item would need to be removed from each of the Purpose and Significance dimensions. These decisions were made in reference to the operational definition of these dimensions, as well as in consideration of important item-writing guidelines, such as avoiding redundancy and maximizing concision (DeVellis, 2016). The two items that were eliminated from the Coherence dimension were Item 3 ("I can make sense of this situation"), given its redundancy with Item 1 ("This situation makes sense"), which appeared to be more straightforward. Item 4 ("It is easy for me to see what is going on in this situation") was also eliminated, as it appeared to have a relative lack of concision, used colloquial language with substantial potential for misinterpretation (i.e., "going on"), and implied a degree of a capability component that may be extraneous to the operational definition (i.e., in the operational definition, the ease with which one can comprehend a situation is not relevant; all that matters is the extent to which one does comprehend the situation). Item 9 ("This situation allows me to work on my goals") was extricated from the Purpose dimension in reference to the operational definition, as it appeared to allow for high endorsement in the case that an individual does not actually subjectively believe the situation to be advancing them toward their objectives but merely sees *the potential for* goal pursuit in the situation (i.e., the situation may allow one to work toward their goals without one actually believing the situation will result in advancement toward goals). Lastly, the final item dropped from the Significance dimension was Item 12 "This situation is important to me," as the remaining items address significance, mattering, and value from situational experiences, which are all explicitly referenced in the operational definition of

SM-Significance, while importance is not explicitly referenced. This resulted in a nine-item version of the SMMQ (see Appendix E) to be further examined through CFA.

The nine-item version of the SMMQ was tested using CFA with maximum likelihood estimation. This model demonstrated acceptable-excellent fit to the data across all examined indices: RMSEA = .067 (.050, .084), CFI = .981, TLI = .971, SRMR = .035. The chi-square test was significant ($\chi^2[24] = 74.117$, $p < .001$). All items loaded onto their respective factor strongly (> .75) and there were no apparent problematic item pairings based on the discrepancy matrix. The factor loadings for both the higher-order model and correlated factors model are depicted in Table 10. As this model demonstrated strong fit and was sufficiently brief, this version of the scale was accepted to examine reliability and test hypotheses about construct validity in the present study.

Internal Consistency Reliability

The nine-item SMMQ's internal consistency reliability was strong across both measures for the overall SM-Meaningfulness composite score ($\alpha = .89$, $\omega = .94$), the SM-Coherence subscale ($\alpha = .83$, $\omega = .84$), the SM-Purpose subscale ($\alpha = .90$, $\omega = .90$), and the SM-Significance subscale ($\alpha = .88$, $\omega = .88$).

Examining Construct Validity

Construct validity was examined through two main processes. First, validity was examined through correlations with other variables to determine convergent and discriminant validity. Proposed relationships are provided by Hypotheses 2-4 of Study 2. The second method for examining construct validity involved using paired t-tests to determine if the SMMQ provides significantly different scores between those provided in reference to randomly selected

situations from participants' prior days and those provided in reference to self-reported most meaningful situations.

Correlations with Other Variables. The SMMQ's relationship with other variables was examined (see Table 11 and Table 12). It was hypothesized that the SMMQ and its dimensions would demonstrate positive relationships with self-determined motivation, expression of openness and extraversion behaviors, positive affect, situational characteristics of sociality, intellect, duty, and positivity, as well as satisfaction of situational needs for beneficence, autonomy, competence, and relatedness. Without exception, these hypothesized relationships were supported by significant, positive relationships between each of these variables and SM-Meaningfulness, SM-Coherence, SM-Purpose, and SM-Significance.

It was hypothesized that the SMMQ and its dimensions would show negative relationships with the following variables: negative affect, boredom, expression of neuroticism behaviors, and perceived characteristics of deception, adversity, and negativity of situations. The hypotheses regarding negative affect were partially supported, as SM-Coherence had a negative relationship with negative affect ($r = -.18$, $p < .001$), SM-Purpose displayed a positive relationship with negative affect ($r = .14$, $p < .01$), and negative affect was found to have nonsignificant relationships with SM-Meaningfulness ($r = -.01$, $p = .81$) and SM-Significance ($r = .00$, $p = .92$). The hypothesized relationships regarding boredom were mostly supported, as negative relationships were found between boredom and SM-Meaningfulness ($r = -.22$, $p < .001$), SM-Coherence ($r = -.18$, $p < .001$), and SM-Significance ($r = -.32$, $p < .001$); however, SM-Purpose displayed a non-significant relationship with boredom ($r = -.04$, $p = .33$). Hypotheses regarding expression of neuroticism behaviors were partially supported as SM-Coherence was negatively associated with neuroticism behaviors ($r = -.20$, $p < .001$), but SM-

Meaningfulness (r = -.08, p = .06), SM-Purpose, (r = .06, p = .22), and SM-Significance (r = -.08, p = .08) all showed nonsignificant relationships with this variable. Hypothesized relationships regarding perceived deception within situations were not supported, as nonsignificant relationships were found between deception and SM-Meaningfulness (r = .07, p = .12), as well as SM-Coherence (r = -.05, p = .25), while positive relationships were found between deception and SM-Purpose (r = .12, p < .01) and SM-Significance (r = .10, p < .05). Hypothesized relationships regarding perceived negativity within situations were not supported, as this variable was found to have positive associations with SM-Meaningfulness (r = .15, p < .01) and SM-Purpose (r = .28, p < .001).

Hypothesized negative correlations between adversity and SM-Meaningfulness and its dimensions were assessed using Spearman's rank correlation coefficient (ρ) to account for the adversity variable's violation of normality assumption of parametric tests, such as the Pearson correlation (r). The Spearman correlation does not make distributional assumptions, rather it is monotonic, denoting that it involves ranking all scores and correlating the new ranked variable. As a non-parametric test, it does not hold the same assumptions of normality that parametric tests hold. In line with hypothesis, the relationship between adversity and SM-Coherence was negative (ρ = -.20, p < .001). All other relationships with adversity did not support hypotheses, as SM-Purpose positively related to adversity (ρ = .13, p < .01), and no significant relationships were found between adversity and SM-Significance (ρ = .08, p = .07), as well as SM-Meaningfulness (ρ = .01, p = .76).

It was also hypothesized that SM-Meaningfulness and its dimensions would display weak or nonsignificant relationships with presence of and search for life meaningfulness. These hypotheses were mostly supported. Presence of life meaningfulness displayed positive

associations with SM-Meaningfulness (r = .29 p < .001), SM-Coherence (r = .19 p < .001), SM-Purpose (r = .25, p < .001), and SM-Significance (r = .25, p < .001). Search for life meaningfulness displayed nonsignificant relationships with SM-Meaningfulness (r = .06, p = .20), SM-Coherence (r = .08, p = .07), SM-Purpose (r = .05, p = .29), and SM-Significance (r = .02, p = .63).

There were no hypotheses specified regarding relationships between SM-Meaningfulness and its dimensions with memory of situation. Still, these results are reported herein. Memory of situation displayed significant relationships with SM-Meaningfulness (r = .24, p < .001), SM-Coherence (r = .19, p < .001), SM-Purpose (r = .15, p < .001), and SM-Significance (r = .27, p < .001).

Discriminating Typical Situations from Self-reported Meaningful Situations. It was hypothesized that scores provided by the SMMQ would be significantly higher in reference to a prompt that asks individuals to report a highly meaningful situation than scores provided in reference to a randomly selected situation from the prior day, which likely represented more quotidian situations. In total, four paired t-tests were conducted, comparing scores across situations for each of the three dimensions and the composite SM-Meaningfulness score. Prior to analyses, participants who did not list a situation in response to this prompt or explicitly noted that they could not think of an appropriate situation (e.g., "None that I can think of currently") were removed from the sample. Similar to previous analyses, each analysis only included those who met the cutoff point used above for item-level missing data (i.e., 80% of scale or subscale completed), resulting in a sample of 462 participants used for comparisons of SM-Meaningfulness, SM-Coherence and SM-Significance and a sample of 461 participants used for comparison of SM-Purpose scores. Effect size is reported in the form of Cohen's d and evaluated

using Cohen's (1988) guidelines of interpreting effect size around .2 as small, .5 as medium, and .8 or greater as large; although, it warrants mention that broadly applying these guidelines without consideration of context can lead to overgeneralizations (Funder & Ozer, 2019; Lakens, 2013).

The t-test comparing SM-Meaningfulness across situations was significant, $t(461) = -15.49$, $p < .001$, suggesting that SM-Meaningfulness from the prior day situation ($M = 3.51$, $SD = 1.27$) was lower than SM-Meaningfulness corresponding to the most meaningful situation participants had experienced since arriving at CSU ($M = 4.61$, $SD = 1.19$). The effect size for SM-Meaningfulness ($d = .77$) neared Cohen's (1988) guideline for a large effect size. The t-test examining differences in SM-Coherence between prior day situations ($M = 4.31$, $SD = 1.44$) and most meaningful situations since arriving at CSU ($M = 4.75$, $SD = 1.27$) was significant $t(461) = -6.14$, $p < .001$. The effect size for SM-Coherence was small ($d = .25$). The t-test investigating differences between SM-Purpose of prior day situations ($M = 3.01$, $SD = 1.62$) and most meaningful situations since arriving at CSU ($M = 4.16$, $SD = 1.56$) was significant $t(460) = -11.97$, $p < .001$. The effect size for SM-Purpose was medium ($d = .58$). The t-test comparing scores on SM-Significance from prior day situations ($M = 3.22$, $SD = 1.56$) and most meaningful situations since arriving at CSU ($M = 4.94$, $SD = 1.24$) was statistically significant $t(461) = -19.42$, $p < .001$. The effect size associated with SM-Significance was large ($d = 1.14$).

CHAPTER 4: DISCUSSION

Study 1

The main objective of this research was to develop a questionnaire designed to measure SM-Meaningfulness and its components and gather preliminary evidence of the scale's reliability and validity across two student samples. Study 1 involved the development of an initial item pool, receiving feedback from SMEs on this item pool, distribution of the resulting item pool to participants, examination of factor structure through EFA, refinement of the questionnaire, confirmation of factor structure through CFA, and examination of internal consistency reliability. These processes were guided by theoretical considerations outlined by prominent scholars regarding the dimensions of meaning (George & Park, 2016; Heintzelman & King, 2014a; Martela & Steger, 2016; Steger, 2009). Particularly, the understanding of meaning as composed of three constructs of Coherence, Purpose, and Significance served as a guiding framework in the item development process, development of operational definitions, and eventual determination of factor structure of the SMMQ.

Study 1 resulted in the creation of a 15-item questionnaire with good fit as a correlated factors model exclusively comprised of three first-order factors of SM-Coherence, SM-Purpose, and SM-Significance or a higher order model with SM-Coherence, SM-Purpose, and SM-Significance loading onto a second-order SM-Meaningfulness factor. As previously noted, a correlated factors model and higher-order model will have identical fit when there are three first-order factors (Credé & Harms, 2015). Indeed, George and Park (2017) faced similar restrictions in creating a scale that assesses the tripartite conceptualization of life meaningfulness and included a footnote conveying that they did not examine a higher order model, given that "a

comparison of the fit of the two models would not be possible" (p. 625). The present study conducted both correlated factors and higher-order models for the purpose of examining the loadings of the three dimensions onto a higher-order factor in addition to item loadings onto the first-order factors; however, discerning which of the two models has better fit to the data remains unfeasible through statistical means. All three dimensions and the composite score demonstrated acceptable internal consistency reliability, which suggests that use of the overall scale score or the subscale scores may be appropriate, and which of these options is used may depend on the particular research question.

Though the pattern of results from factor analyses in Study 1 were generally aligned with the framework and operational definitions derived through literature review prior to collecting data, several considerations warrant acknowledgement. One such consideration is that the initial PA identified four factors, which essentially appeared to resemble the three dimensions outlined through operational definitions and a fourth factor involving all reverse-coded items. The reverse-coded items were discarded, and the fourth factor's appearance was attributed to shared variance manifested through their phrasing, rather than through the existence of an underlying fourth factor. Empirical considerations suggest that reverse-coded items are often difficult for participants to process effectively, which can negatively affect the quality of a psychometric instrument across numerous metrics. Indeed, Menold's (2020) eye-tracking experiment examining respondent's abilities to cognitively process reverse-keyed items resulted in the conclusion that "the use of reverse-keyed items should be questioned and avoided" (p. 155). Evidence such as this, coupled with considerations from literature on meaning led to the decision to not retain this fourth factor.

A second consideration of interest that emerged during the EFA was that face-valid items explicitly referencing meaningfulness (e.g., "this situation is meaningful") that were included in the larger item pool loaded well onto the factor that mostly consisted of items designed to measure SM-Significance. Such matters may be partially explained by Costin and Vignoles' (2019) research evaluating the respective roles of meaning's three dimensions. Drawing from both cross-sectional and longitudinal findings, they concluded that "in evaluating their life's meaningfulness, most people seemingly think about whether their lives matter..." (p. 879). These conclusions are sensible in light of their findings, such as correlations between their measure of mattering ("mattering" is often used as a corresponding dimension to "significance") and meaningfulness as high as .85 between the two, even when the two measures were administered a month apart from each other. Costin and Vignoles's findings on the role of mattering in life meaningfulness suggest that it's possible that when individuals are asked to make considerations toward answering items directly addressing meaningfulness, they draw most prominently from information derived through a sense of mattering or significance. An important line of future research administering the SMMQ will involve understanding relationships between the SMMQ dimensions and measures that explicitly reference meaningfulness (e.g., the MLQ; Steger et al., 2006), and in such cases it is optimal to avoid unnecessary overlap in the wording of items. Also, items explicitly phrased to address aspects of the operational definition of SM-Significance demonstrated strong loadings as well. Consequently, the determination was made to retain items with wording that more precisely addresses aspects such as significance and mattering for the SM-Significance dimension. Still, be it linguistically, psychologically, or both, the EFA process of this study may have evinced aspects displayed by previous findings that face-valid

meaningfulness evaluations may be primarily driven by significance/mattering (e.g., Costin & Vignoles, 2019), and this remains an area of exploration that future research should address.

Another similar area of future research illuminated by this study's findings regarding SM-Significance during the EFA process is that items prompting for affective content (e.g., using the word "feel" or referencing emotional experiences, such as fulfillment) overwhelmingly tended to load most highly onto the same factor as those designed to assess the SM-Significance dimension. Though consideration of the operational definition and psychometric properties of these items (e.g., factor loadings) did not suggest that these affective items were worth retaining for assessing the factor they loaded on, this aspect of the study does raise questions regarding affective notions of meaningfulness (e.g., Battista & Almond, 1973). Indeed, some scholars place affective aspects such as fulfillment as an inherent component of meaningfulness (e.g., Reker & Wong, 1988). The present framework drew from Heintzelman and King's (2014b) conception of the three components of meaningfulness eliciting identical feeling states; however, this seems dissonant with affective items consistently loading onto the SM-Significance dimension. Though the method used in the present study does not allow for robust investigation into which dimension, if any, are most associated with affective aspects of the experience of meaningfulness in general or SM-Meaningfulness in particular, the abovementioned aspects of the EFA process suggested that further research specifically designed to investigate which dimension is most affiliated with affective feelings of meaningfulness is warranted.

In all, Study 1 demonstrated a general pattern of results that could be appropriately interpreted as evincing an underlying factor structure that aligns with established theoretical considerations that position meaning as a construct composed of Coherence, Purpose, and Significance/Mattering (George & Park, 2016; Heintzelman & King, 2014a; Martela & Steger,

2016; Steger, 2009). The scale emerging from Study 1 exemplified these three dimensions, had good fit in both EFA and CFA, and showed strong internal consistency reliability. All of these considerations are promising toward the potential to adequately measure SM-Meaningfulness, but numerous matters remained unresolved. Perhaps most prominent among these regarded the extent to which the SMMQ's scores would relate to other criterion variables in a way that suggests construct validity for a measure of SM-Meaningfulness and its dimensions. Similarly, it remained unclear following Study 1 if scores on the SMMQ could distinguish between situations that would be expected to vary in their levels of SM-Meaningfulness. Also, the 15 items that remained on the SMMQ after Study 1 left the scale still longer than desired, given the importance of brevity for the intended future purposes of the scale (e.g., ESM). Study 2 was designed to further address these matters.

Study 2

Study 2 involved administration of the SMMQ derived from Study 1, alongside numerous other measures, to a new sample of undergraduate students. This study was designed to (1) determine if the acceptable fit shown for the factor structure from Study 1 replicated in CFA conducted on a separate sample, (2) further reduce of the number of items on the scale to create a nine-item SMMQ, (3) examine validity through relationships with other variables, and (4) test if the SMMQ can discriminate between scores provided in reference to situations that would be expected to significantly vary in their levels of SM-Meaningfulness.

The goals of determining if factor structure derived from Study 1 showed good fit in Study 2 and reducing the scale further were addressed with CFA. While the initial 15-item version of the SMMQ demonstrated good fit through models acknowledging the three dimensions as hierarchical or correlated first-order factors, so did the 9-item version that was

created by removing two items per factor. This aligned with the initial objective of creating a version of the SMMQ that had enough items for each factor to be stable (DeVellis, 2016), while minimizing participant burden. The scale's strong internal consistency for all dimensions across both alpha and omega also replicated in this study, which represents early demonstrations of the scale's reliability.

Numerous hypotheses were made prior to the study about how the SMMQ and its dimensions would relate to other constructs. SM-Meaningfulness and its dimensions were hypothesized to show positive relationships with self-determined motivation, openness behaviors, extraversion behaviors, positive affect, situational sociality, situational intellect, situational duty, situational positivity, and satisfaction of situational needs for beneficence, autonomy, competence, and relatedness. SM-Meaningfulness and its dimensions were hypothesized to have negative relationships with negative affect, boredom, expression of neuroticism behaviors, and perceived deception, adversity, and negativity of situations. SM-Meaningfulness and its dimensions were also hypothesized to have nonsignificant or weak relationships with presence of and search for life meaningfulness. Given the SMMQ had three dimensions and a composite score, this involved 84 total hypothesized relationships. 62[6] of these 84 hypothesized relationships were supported by the data. The pattern of results can be taken to be generally supportive of SMMQ scores' construct validity for measuring SM-Meaningfulness and its components, while pointing toward nuances that may exist.

[6] Eight hypotheses predicted "nonsignificant or weak" relationships between SM-Meaningfulness and its dimensions and life meaningfulness. Thus, the number of hypotheses that were supported depends on interpretation of what characterizes a "weak" relationship. The number of supported hypotheses reported herein is based on considering correlations ≤ .25 as meeting criteria for "weak" relationships based on Cohen's (1988) guidelines that effect size around .20 can be considered "small." All other relationships are based on direction and significance (i.e., the hypothesis was considered supported if the relationship was in the specified direction and was significant).

Broadly, the SMMQ's scores for SM-Meaningfulness and its dimensions significantly positively related to various constructs that support its construct validity, given existing research on meaningfulness. The general pattern of findings surrounding the SMMQ and its dimensions demonstrated that scores were higher in situations involving a greater degree of positive emotional experience based on positive associations with situational positivity and positive affect. Such findings align with consistent findings that presence of life meaningfulness is linked to greater positive affect and global happiness (e.g., L. A. King et al., 2006; Steger, Kawabata, Shimai, et al., 2008; Steger & Kashdan, 2013). Likewise, the few studies that have examined SE- and SM-Meaningfulness' connections to positive emotional experiences, have displayed that more positive affect-inducing situations can be expected to be perceived as more meaningful (Choi et al., 2017; Murphy & Bastian, 2019; Tov et al., 2019).

Several constructs that SMMQ scores demonstrated positive associations with are those focused on aspects of social interaction, such as extraverted behaviors and situational sociality. These fit sensibly with research establishing presence of life meaningfulness' relationship with trait extraversion (Steger et al., 2006), ESM research connecting socializing to higher levels of SM-Meaningfulness (Choi et al., 2017), and experimental manipulations associating social exclusion with decreased presence of life meaningfulness. Self-Determination Theory (Deci & Ryan, 1985) outlines that those who engage in more intrinsically motivating behaviors as well as those that fulfill one's basic psychological needs would be expected to experience greater meaningfulness (Ryan et al., 2008), which has been supported by empirical research (Eakman, 2013; Martela et al., 2018). Consequently, SMMQ scores showing positive associations with self-determined motivation and satisfaction of four basic needs of autonomy, competence, relatedness, and beneficence within situations all support the scale's validity.

Openness behaviors and situational intellect's positive links to SMMQ scores may be understood as supporting validity of the scale. Indeed, presence of life meaningfulness has shown associations with trait-level openness (Kashdan & Steger, 2007; Oishi et al., 2019); although, findings are mixed (see Steger, Kashdan, Sullivan, et al., 2008). Engagement in behaviors that express curiosity (a facet of openness) is associated with greater presence of life meaningfulness on a daily basis (Kashdan & Steger, 2007), and situations high in the situational characteristic of intellect may provide the opportunity to express curiosity, given the connection between intellect and curiosity (Kashdan et al., 2018).

The relationship demonstrated between duty and SM-Meaningfulness also provides evidence of construct validity, as research has demonstrated that situations that would be expected to have high sense of duty (e.g., working, taking a class, studying, and volunteering) are perceived as highly meaningful (Choi et al., 2017). Situational duty is denoted by the sense that work must be done in that situation (Rauthmann & Sherman, 2016). Given this, duty's association with SMMQ scores is promising for the scale's validity in light of research showing that work is a highly meaningful aspect of many individuals' lives (e.g., Steger et al., 2012; Delle Fave et al., 2013), and sense of duty plays is key to some conceptions of calling, a highly meaningful orientation toward work (Dik & Duffy, 2009; Thompson & Bunderson, 2019)

The SMMQ and its dimensions all showed positive relationships with memory of situation, and SM-Significance displayed the strongest relationship among the subscales. While there were no hypotheses made in reference to memory of situation, this finding warrants attention. There is a paucity of empirical work to draw from regarding the relationship between SM-Meaningfulness and memory of situation; although, it is intuitively sensible that situations that hold greater significance or importance would be more salient to the experiencing individual

and therefore more memorable to them. Additionally, research has suggested that those with higher purpose or meaning in life have greater episodic memory, which may help establish some connection between meaningfulness and memory at a different level of subjective experience (Sutin et al., 2022). Still, the mechanisms underlying the relationship shown in the present study remain to be illuminated by future research.

The pattern of relationships between the SMMQ's dimensions and several constructs that they were hypothesized to show negative relationships showed mixed support. Still, many of the findings that were counter to hypotheses can be sensibly interpreted in reference to extant research and theory.

The SM-Purpose dimension had numerous nonsignificant or even significant positive relationships with constructs that it was hypothesized to hold negative relationships with. Specifically, SM-Purpose positively related to situational negativity, negative affect, deception, and adversity, while showing a nonsignificant relationship with boredom and expression of neuroticism behaviors. Such findings may be explained by literature that posits that meaningful experiences, especially purposeful ones, can often be characterized by experiences that are difficult or perceived as negative in valence. Baumeister (2013) noted the present experience of the purpose dimension of meaning may be experienced "even though the present activities may be unpleasant" (p. 506). Murphy and Bastian's (2019) finding demonstrated that situations with more emotionally extreme events were deemed more meaningful, whether negative or positive, and this may also partially explain why SM-Purpose as a dimension on the SMMQ would show associations with variables that connote negative emotionality and subjective experience. In a study in which participants were asked to provide examples of negative events and rate a series of situation-level variables associated with those events, perceived potential future impact of

negative events has shown positive relationships with face-valid assessments of SM-Meaningfulness when controlling for affect and satisfaction (see Study 6; Tov & Lee, 2016). This finding may be explained by an underlying association between SM-Purpose and negativity of situations, given that events high in future potential impact would sensibly be higher in SM-Purpose as it was defined in the present study. While these findings may provide some guidance as to SM-Purpose's positive relationship with negative subjective experiences at the level of situations, the paucity of research specific to the purpose dimension leaves this finding as one best understood through future research.

The SM-Coherence dimension generally displayed a pattern of negative relationships with constructs it was hypothesized to have negative relationships with. SM-Coherence's negative relationship with negative affect, adversity, and expression of neuroticism behaviors all can be taken as supportive of construct validity, given that such experiences would be expected when individuals confront situations that are difficult to make sense of in consideration of their understandings about how the world works (Heine et al., 2006; Park, 2010). Meanwhile, SM-Significance generally did not show significant relationships with the abovementioned three variables. As significance remains the least researched and consequently the least well understood dimension of meaning (Martela & Steger, 2016), these results that did not support hypotheses remain topics for future research to discern. Still, all dimensions excluding SM-Purpose showed negative relationships with boredom, which are promising for the SMMQ's validity, given findings from ESM research demonstrating that lower SM-Meaningfulness is associated with greater boredom (Chan et al., 2018).

The above considerations display that different first-order dimensions of the SMMQ have some variety in how they relate to criterion variables, especially those that are considered

negative subjective experiences. This may point toward the value of using the SMMQ's three dimensions, rather than exclusively creating a higher-order SM-Meaningfulness composite score. As the pattern of findings regarding this set of variables typically involved negative correlations with SM-Coherence, positive correlations with SM-Purpose, and nonsignificant relationships with SM-Significance, it is unsurprising that many of these variables had nonsignificant relationships with SM-Meaningfulness as a composite score evenly weighing the three dimensions. Consequently, using the SMMQ to measure overall SM-Meaningfulness could obfuscate the actual underlying nature of some criterion variables' relationships with SM-Meaningfulness. For example, a researcher seeking to understand how SM-Meaningfulness relates to negative affect using the present data via the composite score would conclude that no relationship exists, given a correlation of r = -.01. However, examining the same research question through the three dimensions would elucidate that negative affect has a significant negative relationship with SM-Coherence and a significant positive association of similar strength with SM-Purpose, which may be masked when they are aggregated into a composite score. Nevertheless, these data had more criterion variables for which the three dimensions display similar patterns of results, and in such cases, the parsimony provided by the option to create composite SM-Meaningfulness scores may be warranted. For example, researchers investigating mechanisms surrounding SM-Meaningfulness' relationship with situational autonomy may be best served by prioritizing parsimony provided by composite scores, given all dimensions demonstrated positive relationships with the SMMQ's first-order dimensions. In all, these preliminary studies suggest the SMMQ may be best considered as having the capability to represent either the three first-order factors or one higher-order factor comprised of the three, dependent on the objective of one's research and criterion variables. Still, empirical investigation

into the SMMQ remains nascent, so it is crucial that recommendations for proper administration of the SMMQ continue to be clarified through future research.

In addition to considering the direction and statistical significance of relationships, it is vital to examine strength of relationships to better identify the nomological network surrounding a construct. Examining the pattern of results can provide some preliminary evidence of where SM-Meaningfulness fits among related or unrelated constructs. Such considerations regard matters of construct validity (e.g., convergent and discriminant validity).

Regarding discriminant validity, the SMMQ's scores for SM-Meaningfulness and its dimensions did not indicate enough overlap as to raise substantial concerns about an unacceptable degree of redundancy with other measures (i.e., the largest relationship was between SM-Significance and Situational Beneficence at $r = .59$). There were also some variables that displayed nonsignificant relationships in line with hypotheses regarding the SMMQ's dimensions (e.g., search for life meaningfulness). This is promising for matters of discriminant validity. Nevertheless, many other constructs and their relationships (or lack thereof) with the SMMQ and its dimensions remain to be examined for purposes of discriminant validity. The findings regarding SM-Meaningfulness and its dimensions' relationships to life meaningfulness are promising for demonstrating sufficient differences between these two levels of meaningfulness experience. All correlations being positive but < .30 suggest that a more meaningful overall life may be associated with more meaningful momentary situations, but the variety of different situations in individuals' daily lives provide a range of meaningfulness appraisals that contrast from their attempts to aggregate overall life meaningfulness. The lack of a strong relationship between SM-Meaningfulness and life meaningfulness aligns well with Kahneman's (1999) conceptions upon which the present study's framework was based,

particularly the distinctions between objective happiness as instant utility and overall ratings of subjective happiness.

Broadly, the SMMQ scores tended to show its strongest relationships with other situation-level constructs that are considered eudaimonic in nature. Indeed, the three variables that demonstrated the largest relationships with overall SM-Meaningfulness scores on the SMMQ were situational basic psychological needs of Beneficence (r = .56), Competence (r = .48), and Autonomy (r = .48). The strength of these relationships is auspicious for convergent validity considering meaningfulness and basic psychological needs may all be considered relevant to eudaimonic aspects of well-being (Martela et al., 2016; Ryan et al., 2008; Ryff, 1989). SM-Meaningfulness scores from the SMMQ showed relationships with aspects of situational hedonic experience (e.g., r = .33 for positive affect) and other situational characteristics (e.g., r = .29 with Duty) as well, but these tended to be weaker than its relationship with other eudaimonic-relevant constructs. In sum, the pattern of results suggest a nomological network that places SM-Meaningfulness closest to other situation-level eudaimonic constructs like beneficence, competence, and autonomy, and conceptual considerations from prior literature suggest this is an appropriate placement for a situation-level measure of momentary meaningfulness.

The aforementioned construct validity considerations are more generally appropriate to the SM-Meaningfulness composite score of the SMMQ, and more nuance appeared to exist at the level of its individual dimensions. While the dimensions of the SMMQ generally displayed a similar pattern of relationships with other variables it is important to consider which constructs showed strongest relationships to which dimensions, as well as how the dimensions differed in regard to strength of these relationships. SM-Purpose showed some of its strongest relationships

to constructs such as competence, duty, intellect, and conscientiousness behaviors. Indeed, the goal-driven and outcome-oriented way that SM-Purpose was defined appeared to demand a sense that one knows the objectives of the situation and perceives themselves as having the capability to elicit desired outcomes. Many of SM-Significance's strongest relationships were with variables that measured constructs relevant to connection to others, including relatedness, situational beneficence, sociality, and extraversion behaviors. Indeed, SM-Significance showed stronger relationships with these variables than did any of the other SMMQ dimensions. Likewise, self-determined motivation showed its strongest link to SM-Significance of any of the SMMQ dimensions, and the weakest relationship to SM-Purpose. This is sensible, given assertions from scholars like Martela and Steger (2016) who distinguished between purpose and significance by noting that the latter may be elicited by experiences that are viewed as ends to themselves, even in the absence of clear goals necessary for the experience of purpose. Lastly, SM-Significance's strongest relationships appeared to be with situational positivity and positive affect, which represent positive emotional experiences. SM-Coherence generally displayed a pattern of weaker correlations with other constructs than did the other two dimensions. Still, it is worth noting that SM-Coherence scores tended to show relationships of similar strength for hedonic markers of well-being (e.g., positive affect) as it did for eudaimonic markers (e.g., beneficence and autonomy), as all ranged between .27 and .32. This contrasts with SM-Purpose, which showed much stronger relationships with eudaimonic constructs like situation-level basic psychological needs (r's ranged from .44 - .59) than it did with hedonic constructs like positive affect (r = .11), as well as the finding that SM-Purpose was even associated with higher levels of negative affect (r = .14). SM-Coherence's relatively stronger relationship with hedonic markers may be explained through Heine et al.'s (2006) Meaning Maintenance Model, which would

suggest that the absence of threats to meaning as coherence would be associated with more positive subjective experience of situations. Steger (2018) asserted that meaningfulness "can be considered to be both hedonic and eudaimonic" (p. 5). It is possible that the extent to which the experience of meaningfulness is hedonic and the extent to which it is eudaimonic varies between dimensions (e.g., SM-Coherence may be more hedonic in nature than is SM-Purpose); although, this notion remains speculative in nature, and it remains an area for future research to address.

Study 2 also involved examining if scores on the SMMQ and its dimensions significantly differ between situations that should sensibly vary in their levels of SM-Meaningfulness, so participants were asked to report two situations. The first situation was a presumably quotidian situation that occurred at a randomly assigned time from the prior day. The second situation was the most meaningful situation that had occurred to them since they had arrived at their current university. It was hypothesized that the SMMQ would be capable of detecting significant differences in levels of meaningfulness between these two situations. In short, all SMMQ dimensions were found to show significant differences in the expected direction. There were some differences regarding effect size with SM-Meaningfulness and SM-Significance showing large effect sizes, while SM-Purpose and SM-Coherence showed medium and small effect sizes, respectively. It is important to consider that the prompt provided to participants asked in a face-valid manner for participants to provide the most meaningful situation since their arrivals at CSU. Research highlighting the significance/mattering dimension as potentially paramount in face-valid considerations of meaningfulness (Costin & Vignoles, 2019) may help explain this. Similarly, present findings from Study 1 showed that items that are phrased to explicitly address meaningfulness at the level of situations tended to load on the SM-Significance dimension. Consequently, it is perhaps unsurprising that SM-Significance displayed the largest effect size.

Nevertheless, the significantly higher scores found across all dimensions of the SMMQ support its construct validity for measuring SM-Meaningfulness and its components.

General Discussion

The present studies were designed to compile preliminary evidence surrounding the psychometric qualities of the SMMQ, a questionnaire designed to assess SM-Meaningfulness and its hypothesized components of SM-Purpose, SM-Coherence, and SM-Significance. Broadly, the present studies (1) evinced the viability of a factor structure of the SMMQ comprised of these components and (2) demonstrated promising (though preliminary) validity and reliability evidence of the SMMQ. More specifically, a model representing the hypothesized components emerged from EFA and replicated via CFA across two studies, and about 75% of the eighty hypothesized relationships in Study 2 were supported. This is promising, given that (1) a sparsely researched construct such as SM-Meaningfulness is likely to present with some results that may be difficult to predict based on prior literature and (2) the hypotheses were framed broadly as "how SM-Meaningfulness" and its dimensions would relate to criterion variables, rather than specifying particular relationships between each dimension and each other variable, since at the time of proposal it was unclear what dimensions would emerge. Future studies on the SMMQ may draw from the existing factor structure to discern more nuanced and specific hypothesized relationships between each of SM-Meaningfulness' dimensions and key criterion variables.

Practice Implications

While the development and validation process of the SMMQ has relatively few direct, immediate implications for practice, this research lay the groundwork for a variety of future possibilities surrounding intervention and assessment relevant to the experience of

meaningfulness. In the present studies, all dimensions of the SMMQ were shown to have a significant relationship with life meaningfulness. Life meaningfulness is considered to be a critical component in psychological well-being by many contemporary scholars (Diener et al., 2010; Ryff, 1989; Seligman, 2012), and it has been shown to relate to many other markers of psychological and physiological health (Roepke et al., 2014, Steger, 2017). Although any posited direction in relationships between SM-Meaningfulness and other variables remains highly speculative at this time, SM-Meaningfulness' association with life meaningfulness could be indicative of some degree of bottom-up relationship in which more meaningfulness experienced in situations comes over time to increase life meaningfulness. Indeed, other more momentary experiences, such as positive emotions, have been shown to have an influence on global well-being (Fredrickson, 2013). Still, more research is required before a bottom-up relationship between SM-Meaningfulness and life meaningfulness can be considered well-established.

The establishment of the SMMQ also allows for understanding of what types of situations produce the highest levels of the experience of meaningfulness. In previous research, Choi and colleagues (2017) distinguished between situations that appear to be high in meaningfulness (e.g., "taking a class") and low in meaningfulness (e.g., "watching TV"), but the SMMQ allows for more robust and multidimensional understanding of the extent to which SM-Meaningfulness tends to be experienced within separate kinds of situations. Within the present studies, associations demonstrated between particular situation-level characteristics such as higher sociality, extraverted behaviors, and beneficence may help illuminate what kinds of situations and behaviors practitioners may encourage clients choose to engage in so that they can, at least in the moment, increase their likelihood of improved eudaimonic well-being. For example, a counselor with a client who is seeking to increase meaningfulness in their daily life

may suggest that this client seek out more situations in which they can interact with other people and are able to engage in prosocial behaviors. Nevertheless, the correlational nature of the present data precludes conclusions about directional relationships between the abovementioned variables, and practitioners are advised to view these findings as preliminary.

Limitations and Future Directions

Despite the promising nature of the preliminary findings, it is vital that limitations of the present studies are acknowledged. Importantly, SM-Meaningfulness is designed to be a construct relevant to experiencing meaningfulness in the moment—not in retrospect; however, none of the methods used in this study assessed it in the present moment. As scholars have suggested (e.g., Kahneman, 1999), and the framework in the present paper acknowledges, recollections of past subjective experiences are prone to biases and memory failures. While the present study's administration of the SMMQ asked participants to answer items as though they were answering during the experience of the situation, participants' attempts to report these experiences are likely substantially impacted by biases and memory failures. SM-Meaningfulness would be ideally assessed through methods permitting more immediate assessment, such as ESM. As others have noted (e.g., Choi et al., 2017), ESM with many scales or long questionnaires is highly burdensome for participants. This can be discordant with early stages of scale construction that ideally involve administration of a version of an initial questionnaire that is much longer than the final version, alongside administration of numerous other questionnaires to establish validity evidence (DeVellis, 2016). The present studies used the methods herein to establish preliminary evidence that will lay the foundation for future investigation of the SMMQ that will examine it using more rigorous methodological techniques. Still, as Cronbach and Meehl (1955) noted that "the author has an ethical responsibility to prevent unsubstantiated interpretations from

appearing as truths" (p. 297), it is important that the present findings are interpreted with appropriate caution that weighs the limitations of the methods.

Several other limitations must be acknowledged. One of these limitations is the use of a convenience sample made up entirely of undergraduate students from a research participation pool at one university. The sample demographic characteristics are relatively homogenous, and this sample may not be generalizable to the population at large. Future research investigating the SMMQ's psychometric properties would benefit from examining this matter in additional and more diverse populations. The cross-sectional nature of these studies should also be noted. These studies were not designed to reveal the nature of relationships between variables over time, and the present method precludes any such interpretation. Additionally, all measures proposed within the current study are self-report measures, and they are prone to issues such as social desirability bias and acquiescence bias. In particular, results involving the PASS subscales should be interpreted with caution, given the low internal consistency reliability demonstrated by these scales. Future research seeking to examine the relationship between the SMMQ and behavioral expressions of personality would be advised to administer an alternative scale.

The most pressing next steps for research on the SMMQ involve continuing to accumulate evidence regarding reliability, validity, and other psychometric properties. Further investigation of the SMMQ's factor structure also warrants attention. Though statistical limitations of three-factor scales (cf. Credé & Harms, 2015) made model-fit differentiation between a higher-order and correlated factors model unfeasible, investigating other models, such as bifactor models (see Rodriguez et al., 2016) may help identify optimal measurement and analysis technique for the SMMQ. Indeed, the present research should be viewed as providing a preliminary factor structure, as researchers often reevaluate factor structure of established scales,

even long after a scale has been developed and widely used (e.g., Brouwer et al., 2008; Zanon et al., 2020).

Increased evidence of validity warrants substantial attention as an area for future research. For demonstrated relationships to be considered evidence of validity, it is important to have clearly delineated understanding of what a construct would be expected to relate to. For this reason, the creation of a more well-established nomological network of proposed related and unrelated constructs for each of the three dimensions of SM-Meaningfulness would be a crucial next step. Additionally, it is recommended that directionality of relationships is proposed in future literature (i.e., proposing if variables are antecedents, occur contemporaneously, and/or are outcomes). Following this, thorough examination of these proposed relationships will be necessary. Likewise, mechanisms underlying these relationships, such as mediating and moderating variables could be proposed and elucidated by further study on the SMMQ.

The SMMQ's applicability to methods such as ESM remains another area of future research that will allow for more immediate experiences relevant to SM-Meaningfulness to be investigated. The use of smartphone apps (e.g., Hofmann & Patel, 2016), narrative life-logging cameras (Brown et al., 2017), and other technological advances present fruitful opportunities to examine factor structure, reliability, and validity of the scale. Another line of inquiry regarding the SMMQ is testing if modifying the items of the questionnaire toward past tense could allow the questionnaire to assess SE-Meaningfulness, one of the other situation-level experiences of meaningfulness delineated in the present framework. In all, the current framework and research lay the foundation for the SMMQ as an instrument with potential to aid in expanding knowledge of more immediate experiences of meaningfulness.

TABLES

Table 1

Definitions of levels of meaningfulness experience

Level	*Definition*
1. Life Meaningfulness	The extent to which one's life as a whole is believed to be meaningful
2. Domain Meaningfulness	Cumulative assessments of meaningfulness at the level of any specific broad, continual subsets of life
3. Situational Episodic Meaningfulness	The evaluation of how meaningful a past situation is when viewed through the lens of one's current life narrative.
4. Situational Momentary Meaningfulness	How meaningful a current experience is believed to be while it is happening

Table 2

Definitions of the dimensions of SM-Meaningfulness

Dimension	Definition: *The degree to which a situation is perceived while it is occurring to...*
1. SM-Coherence	...make sense to the individual
2. SM-Purpose	...move the experiencing individual toward a desired future
3. SM-Significance	...hold subjective value/importance, matter, and be worthwhile

Table 3

Eigenvalues across EFA models: Study 1

Factor	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Factor 1	42.97	34.90	31.64	7.19
Factor 2	4.84	3.78	3.27	1.37
Factor 3	3.43	3.09	2.59	0.82
Factor 4	3.38	0.79	0.47	-0.00
Factor 5	0.82	0.45	0.36	-0.05
Factor 6	0.66	0.33	0.29	-0.11
Factor 7	0.48	0.28	0.24	-0.13
Factor 8	0.41	0.23	0.19	-0.16

Note. This represents the eigenvalues associated with each EFA model. Model 1 involved 93 items, and the associated Parallel Analysis (PA) is depicted in Figure 1**.** Model 2 involved 68 items and the corresponding PA is depicted in Figure 2. Model 3 involved 59 items and the corresponding PA is depicted in Figure 3. Model 4 involved 15 items and the corresponding PA is depicted in Figure 4. Only the first eight eigenvalues for each model are reported for parsimony

Table 4

Factor loadings and item information for 59-item SMMQ based on EFA: Study 1

Item Number	*Factor 1*	*Factor 2*	*Factor 3*	*Information*
SMMQ 1			.72	1.30
SMMQ 2			.56	0.67
SMMQ 3			.72	1.30
SMMQ 5			.77	1.45
SMMQ 7			.72	1.26
SMMQ 8			.70	0.98
SMMQ 9			.44	0.40
SMMQ 12			.70	1.07
SMMQ 13			.67	0.83
SMMQ 27		.45		0.56
SMMQ 33	.52			0.61
SMMQ 34	.72			1.44
SMMQ 35	.66			1.50
SMMQ 36	.95			3.47
SMMQ 37		.70		1.58
SMMQ 38	.84			2.52
SMMQ 39	.73			1.72
SMMQ 40	.85			2.41
SMMQ 41	.53			0.76
SMMQ 42		.59		1.12

SMMQ 43	.88		2.67
SMMQ 44	.75		1.76
SMMQ 45	.77		1.69
SMMQ 46	.70		1.36
SMMQ 47	.71		1.68
SMMQ 49	.81		2.19
SMMQ 50	.63		1.24
SMMQ 51	.82		1.77
SMMQ 52	.60		1.00
SMMQ 57	.73		1.67
SMMQ 58	.53		0.83
SMMQ 59	.66		1.06
SMMQ 62	.56		0.90
SMMQ 63		.45	0.34
SMMQ 65		.59	1.12
SMMQ 66	.92		3.68
SMMQ 67	.74		1.71
SMMQ 70		.70	1.20
SMMQ 71		.62	1.04
SMMQ 72		.67	1.40
SMMQ 73		.58	1.02
SMMQ 74		.55	0.58
SMMQ 75		.70	1.44

SMMQ 78		.79	2.08
SMMQ 81		.71	1.74
SMMQ 83		.66	1.32
SMMQ 86	.56		0.65
SMMQ 87		.73	1.61
SMMQ 89		.92	2.23
SMMQ 91		.77	1.56
SMMQ 92		.80	1.73
SMMQ 93	.56		0.83
SMMQ 94		.83	1.57
SMMQ 95		.73	0.90
SMMQ 96		.53	0.74
SMMQ 100		.80	2.67
SMMQ 101		.86	2.84
SMMQ 102		.71	1.29
SMMQ 103		.71	1.74

Note. This represents the factor loadings of the EFA model on the 59-item model for the three-factor model, as indicated by the associated PA. While items were free to load on all factors, no items cross-loaded based on the cutoff point of $> |.32|$ (Costello & Osborne, 2005; Tabachnik & Fidell, 2001). Given this, only the highest factor loading is presented for parsimony, and it can be assumed that every item loaded $< |.32|$ on all other factors. Loadings on all factors are available from the author upon request. Item information is calculated in association with the factor for which the item had the highest factor loading.

Table 5

Factor loadings for 15-item SMMQ based on EFA: Study 1

Item Number	*Item Content*	*Factor 1*	*Factor 2*	*Factor 3*
SMMQ 1	This situation makes sense.			.75
SMMQ 3	I know the reason why this situation is happening.			.73
SMMQ 5	I can grasp what this situation is about.			.81
SMMQ 7	It is easy for me to see what is going on in this situation			.75
SMMQ 12	I can grasp what this situation is about.			.74
SMMQ 36	I will be closer to reaching my goals after this situation.	.89		
SMMQ 38	This situation will make the future more in line with what I would like it to be.	.72		
SMMQ 40	This situation contributes to the key things that I am trying to achieve.	.82		
SMMQ 43	This situation allows me to work on my goals.	.86		
SMMQ 66	This situation involves me accomplishing goals that I value.	.90		
SMMQ 71	This situation is significant.		.63	
SMMQ 72	This situation matters to me.		.74	

SMMQ 78	This situation is important to me	.87
SMMQ 81	I value my experience from this situation.	.75
SMMQ 89	It is situations like this one that make life worth living.	.81

Note. This represents the factor loadings of the EFA model on the 15-item model for the three-factor model, as indicated by the associated PA. While items were free to load on all factors, no items cross-loaded based on the cutoff point of $> |.32|$ (Costello & Osborne, 2005; Tabachnik & Fidell, 2001). Given this, only the highest factor loading is presented for parsimony, and it can be assumed that every item loaded $< |.32|$ on all other factors. Loadings on all factors are available from the author upon request.

Table 6

Factor loadings for 15-item SMMQ based on CFA: Study 1

Item Number	*SM-Coherence*	*Factor 2*	*Factor 3*	*SM-Meaningfulness (HO Factor)*
SMMQ 1	.79			
SMMQ 3	.75			
SMMQ 5	.78			
SMMQ 7	.79			
SMMQ 12	.74			
SMMQ 36		.86		
SMMQ 38		.82		
SMMQ 40		.85		
SMMQ 43		.86		
SMMQ 66		.91		
SMMQ 71			.78	
SMMQ 72			.86	
SMMQ 78			.86	
SMMQ 81			.84	
SMMQ 89			.69	
SM-Coherence				.65
SM-Purpose				.80
SM-Significance				.90

Note. This represents factor loadings of the CFA model on the 15-item model for the three-factor correlated factors model in which three sets of five items loaded onto three first-order factors, as well as a higher-order model in which the first-order factors (i.e., SM-Coherence, SM-Purpose, and SM-Significance) were designated to load onto the higher-order SM-Meaningfulness factor.

Table 7

Study 1 means, standard deviations, and correlations with confidence intervals of the SMMQ and its dimensions

Variable	*M*	*SD*	1	2	3
1. Meaningfulness	3.51	1.19			
2. Coherence	4.37	1.32	.77* [.73, .81]		
3. Purpose	3.12	1.55	.87* [.84, .89]	.48* [.40, .54]	
4. Significance	3.04	1.41	.87* [.84, .89]	.51* [.44, .57]	.66* [.61, .71]

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). * $p < .001$.

Table 8

Study 2 Means and Standard Deviations

Study Variable	*Mean*	*Standard Deviation*
1. SM-Meaningfulness	3.53	1.27
2. SM-Coherence	4.32	1.44
3. SM-Purpose	3.03	1.61
4. SM-Significance	3.23	1.56
5. MLQP	4.75	1.24
6. MLQS	4.93	1.24
7. SDI	4.63	6.68
8. Duty	3.93	2.14
9. Intellect	3.55	2.03
10. Adversity	1.59	1.21
11. Mating	1.92	1.53

12. pOsitivity	3.97	1.98
13. Negativity	3.13	1.82
14. Deception	2.11	1.48
15. Sociality	3.68	2.03
16. Neuroticism	2.40	1.17
17. Agreeableness	5.44	1.07
18. Conscientiousness	4.94	1.29
19. Extraversion	4.43	1.30
20. Openness	4.71	1.20
21. Honesty/Humility	5.21	1.08
22. Boredom	3.03	2.00
23. Positive Affect	4.43	1.83

24. Negative Affect	1.98	1.27
25. Beneficence	3.51	1.87
26. Competence	3.70	1.78
27. Autonomy	4.09	1.87
28. Relatedness	3.68	2.22

Note. All study variable scores are averaged, rather than summed scores, except SDI for which scoring is reported in the Instruments section. MLQ-P = Presence subscale of the Meaning in Life Questionnaire, MLQ-S = Search subscale of the Meaning in Life Questionnaire, SDI = self-determination index

Table 9

Factor loadings for 15-item SMMQ based on CFA: Study 2

Item Number	*Item Content*	*SM-Coherence*	*SM-Purpose*	*SM-Significance*
SMMQ 1	This situation makes sense.	.78		
SMMQ 2	I know the reason why this situation is happening.	.76		
SMMQ 3	I can grasp what this situation is about.	.82		
SMMQ 4	It is easy for me to see what is going on in this situation	.79		
SMMQ 5	I can grasp what this situation is about.	.84		
SMMQ 6	I will be closer to reaching my goals after this situation.		.87	
SMMQ 7	This situation will make the future more in line with what I would like it to be.		.85	
SMMQ 8	This situation contributes to the key things that I am trying to achieve.		.85	
SMMQ 9	This situation allows me to work on my goals.		.85	

SMMQ 10	This situation involves me accomplishing goals that I value.	.87		
SMMQ 11	This situation is significant.		.83	
SMMQ 12	This situation matters to me.		.88	
SMMQ 13	This situation is important to me.		.87	
SMMQ 14	I value my experience from this situation.		.84	
SMMQ 15	It is situations like this one that make life worth living.		.74	

Note. This represents the factor loadings of a three-factor CFA model on the 15-item SMMQ prior to further reduction of the scale. Item numbers have been altered from their original item numbers to adhere to the new scale length.

Table 10

Factor loadings for nine-item SMMQ based on CFA: Study 2

Item Number	*SM-Coherence*	*Factor 2*	*Factor 3*	*SM-Meaningfulness (HO Factor)*
SMMQ 1	.81			
SMMQ 2	.76			
SMMQ 3	.82			
SMMQ 4		.88		
SMMQ 5		.86		
SMMQ 6		.85		
SMMQ 7			.84	
SMMQ 8			.85	
SMMQ 9			.84	
SM-Coherence				.57
SM-Purpose				.72
SM-Significance				1.05

Note. This represents the factor loadings of the CFA model on the nine-item model for the three-factor correlated factors model in which three sets of three items loaded onto three first-order factors, as well as a higher-order model in which the first-order factors (i.e., SM-Coherence, SM-Purpose, and SM-Significance) were designated to load onto the higher-order SM-Meaningfulness factor.

Table 11

Correlations between SMMQ and first half of Study 2 variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. SM-Meaning															
2. SM-Coherence	.74**														
3. SM-Purpose	.84**	.36**													
4. SM-Significance	.89**	.51**	.68**												
5. MLQ-P	.29**	.19**	.25**	.25**											
6. MLQ-S	.06	.08	.05	.02	-.00										
7. SDI	.35**	.34**	.12**	.42**	.25**	.04									
8. Duty	.29**	.16**	.43**	.13**	.08	.04	-.33**								
9. Intellect	.46**	.13**	.57**	.40**	.14**	.04	-.05	.59**							
10. Adversity	.01	-.20**	.13*	.08	-.15**	-.10*	-.34**	.14**	.25**						
11. Mating	.15**	-.02	.17**	.20**	-.04	-.07	-.06	.02	.12**	.58**					
12. pOsitivity	.34**	.25**	.14**	.44**	.17**	.05	.64**	-.16**	.08	.01	.22**				
13. Negativity	.15**	-.02	.28**	.08	-.07	.07	-.37**	.43**	.47**	.42**	.20**	-.17**			
14. Deception	.07	-.05	.12**	.10*	-.15**	.06	-.20**	.14**	.25**	.56**	.45**	.10*	.45**		
15. Sociality	.36**	.22**	.24**	.42**	.06	.03	.28**	-.02	.20**	.19**	.30**	.49**	.11*	.37**	
16. Memory	.24**	.19**	.15**	.27**	.09	.03	.12*	.09	.09	-.01	.04	.18**	-.02	.02	.16**

Note. SM-Meaning = SM-Meaningfulness composite score of SMMQ, MLQ-P = Presence subscale of the Meaning in Life Questionnaire, MLQ-S = Search subscale of the Meaning in Life Questionnaire, SDI = self-determination index. Memory = memory

of situation. All analyses involving Adversity are Spearman correlations (ρ), while all other analyses are Pearson correlations (*r*). * indicates $p < .05$. ** indicates $p < .01$.

Table 12

Correlations between SMMQ and second half of Study 2 variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. SM-Meaning																
2. SM-Coherence	.74**															
3. SM-Purpose	.84**	.36**														
4. SM-Significance	.89**	.51**	.68**													
5. Neuroticism	-.08	-.20**	.06	-.08												
6. Agreeable	.29**	.23**	.17**	.31**	-.57**											
7. Conscientious	.38**	.25**	.41**	.28**	-.34**	.42**										
8. Extraversion	.29**	.20**	.16**	.36**	-.31**	.41**	.30**									
9. Openness	.32**	.14**	.32**	.33**	-.29**	.43**	.46**	.53**								
10. Hon/Hum	.36**	.28**	.25**	.35**	-.41**	.66**	.43**	.30**	.39**							
11. Boredom	-.22**	-.18**	-.04	-.32**	.27**	-.28**	-.15**	-.43**	-.31**	-.21**						
12. Pos-Affect	.33**	.29**	.11*	.41**	-.52**	.54**	.18**	.55**	.39**	.41**	-.47**					
13. Neg-Affect	-.01	-.18**	.14**	.00	.62**	-.36**	-.22**	-.20**	-.19**	-.26**	.38**	-.32**				
14. Beneficence	.56**	.27**	.50**	.59**	-.18**	.47**	.36**	.44**	.41**	.39**	-.16**	.43**	.03			
15. Competence	.48**	.18**	.55**	.44**	-.06	.25**	.44**	.31**	.43**	.29**	-.05	.24**	.12**	.54**		
16. Autonomy	.48**	.32**	.35**	.51**	-.29**	.43**	.25**	.41**	.41**	.45**	-.29**	.60**	-.08	.57**	.56**	
17. Relatedness	.32**	.20**	.15**	.45**	-.15**	.42**	.03	.51**	.32**	.31**	-.34**	.58**	-.02	.52**	.31**	.53**

Note. SMMQ-M = SM-Meaningfulness composite score of SMMQ, Agreeable = Agreeableness, Conscientious = Conscientiousness, Hon/Hum = Honesty/Humility, Pos-Affect = Positive Affect, Neg-Affect = Negative Affect. * indicates $p < .05$. ** indicates $p < .01$.

FIGURES

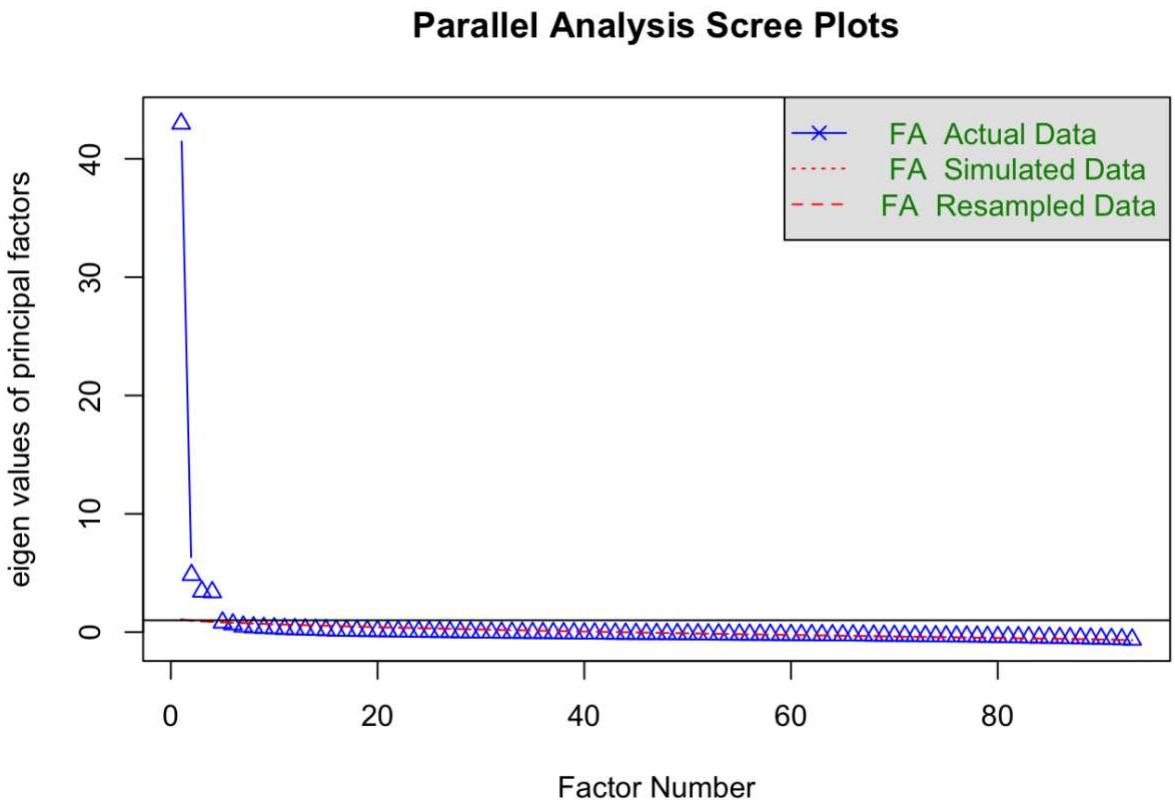

Figure 1. Study 1 parallel analysis model 1 on 93-item Situational Momentary Meaningfulness Questionnaire

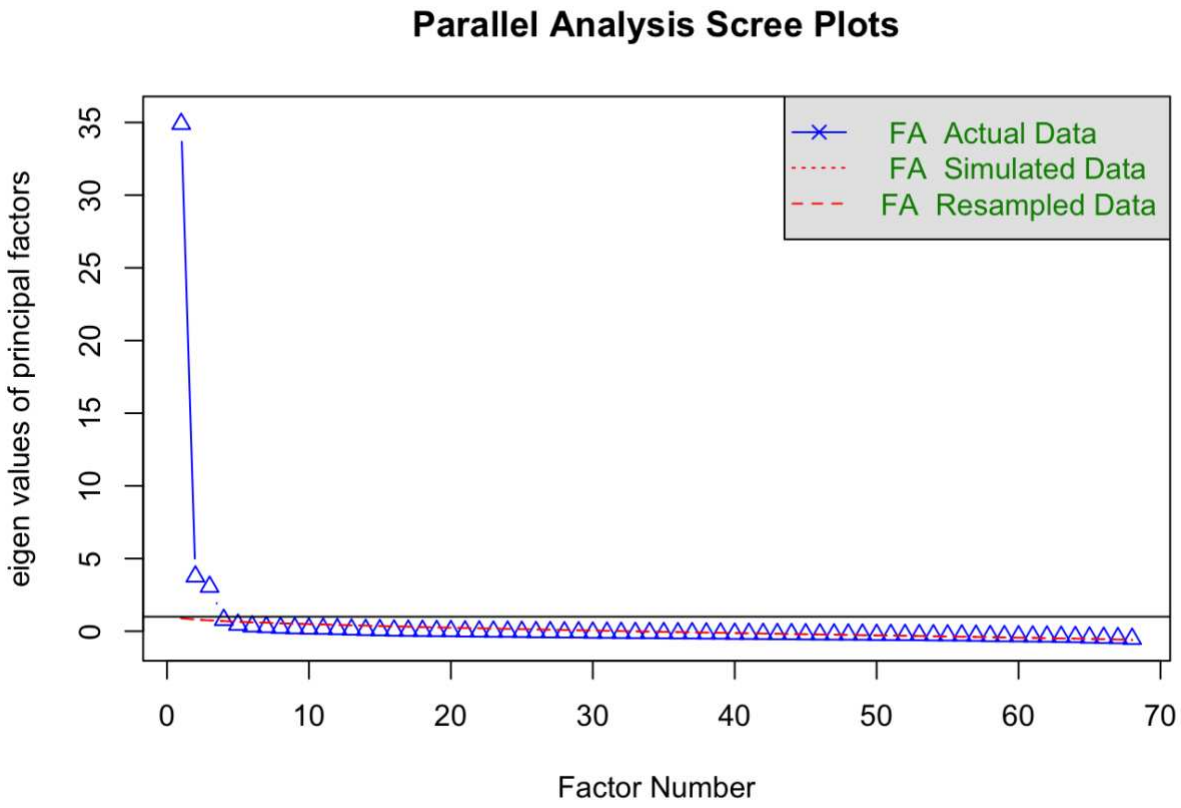

Figure 2. Study 1 parallel analysis model 2 on 68-item Situational Momentary Meaningfulness Questionnaire

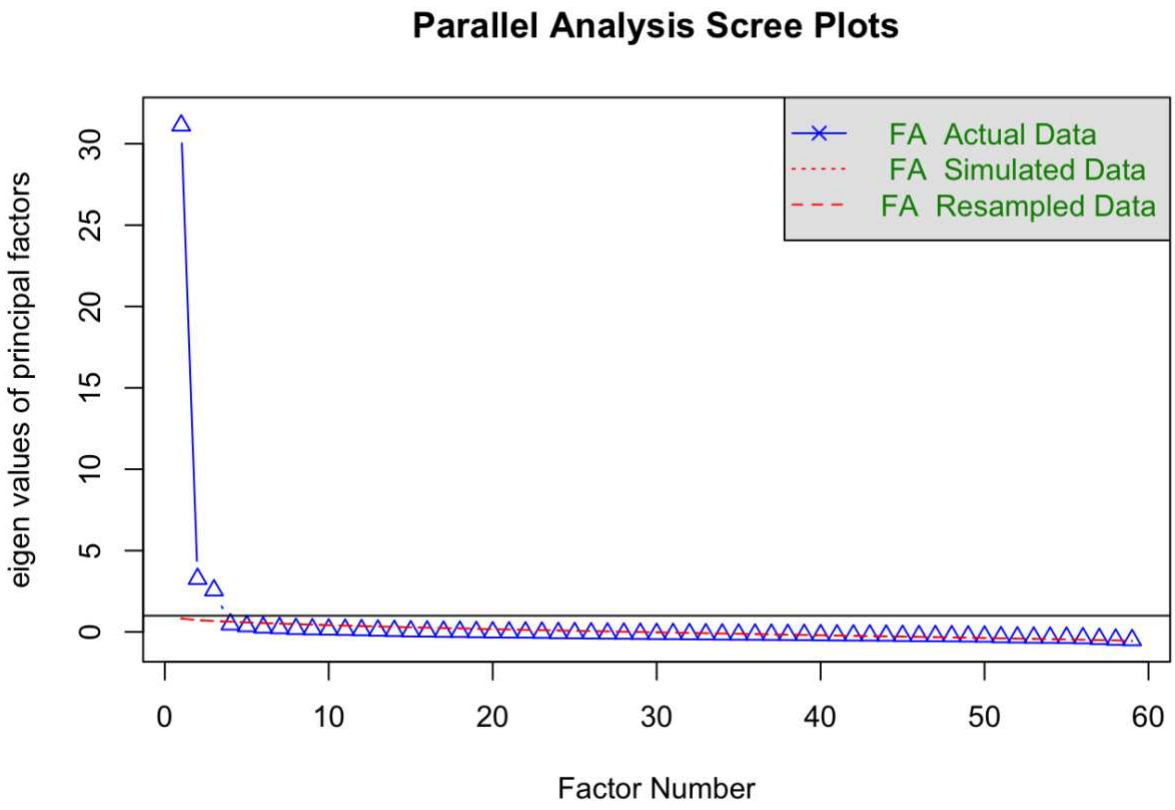

Figure 3. Study 1 parallel analysis model 3 on 59-item Situational Momentary Meaningfulness Questionnaire

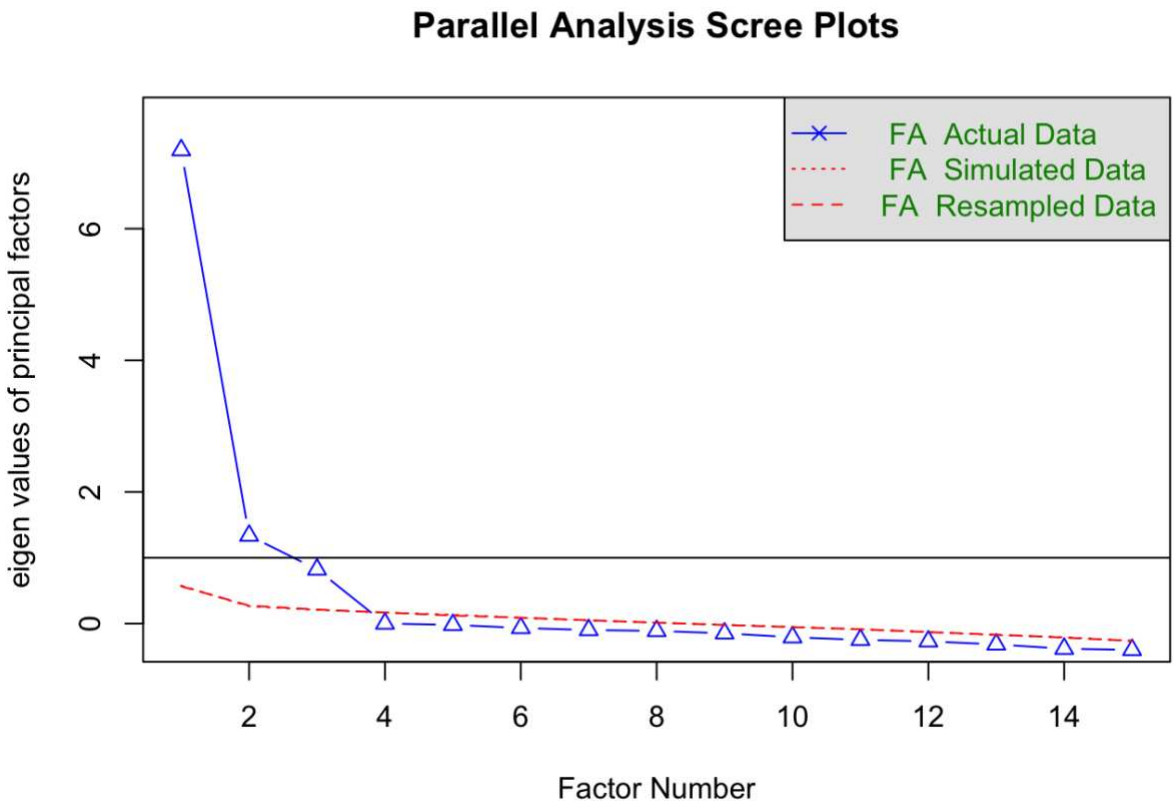

Figure 4. Study 1 parallel analysis model 4 on 15-item Situational Momentary Meaningfulness Questionnaire

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Appendix A

Study 1 Consent Form

Consent to Participate in a Research Study
Colorado State University

TITLE OF STUDY: Exploring Perceptions of Situations

PRINCIPAL INVESTIGATOR: Michael F. Steger, Ph.D., Professor, Department of Psychology, Colorado State University, USA; Michael.F.Steger@ColoState.EDU

CO-PRINCIPAL INVESTIGATOR: Dylan R. Marsh, Graduate Student, Department of Psychology, Colorado State University, USA; Dylan.Marsh@colostate.edu

WHY AM I BEING INVITED TO TAKE PART IN THIS RESEARCH? You are invited to participate in this study because you have been identified as someone who is at least 18 years old or older and is currently a student at Colorado State University.

WHO IS DOING THE STUDY? The researchers conducting this study are Michael F. Steger, Ph.D., and Dylan R. Marsh.

WHAT IS THE PURPOSE OF THIS STUDY? The purpose of this study is to better understand perceptions of situations, particularly situational experiences of meaningfulness.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST? You will be asked to complete the study online at a time and place that is convenient for you. Participation will initially take approximately 30 minutes of your time.

WHAT WILL I BE ASKED TO DO? You will be asked to fill out a series of questionnaires mainly related to your perceptions of a situation you've experienced recently. These questions will primarily focus on how meaningful this situation was to you. You may choose to skip any questions that you do not wish to answer.

ARE THERE REASONS WHY I SHOULD NOT TAKE PART IN THIS STUDY? You may not participate in the study if any of the following conditions apply to you: You (a) are under 18 years of age; or (b) are not a student at Colorado State University.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS? There are no foreseeable risks other than possible discomfort in answering personal questions. You may elect not to answer questions that cause you discomfort or stress. There will be no penalties to you for electing not to answer questions. There may also be unforeseen risks. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

ARE THERE ANY BENEFITS FROM TAKING PART IN THIS STUDY? There are no direct benefits to you for participating in this study.

DO I HAVE TO TAKE PART IN THE STUDY? Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop

participating at any time without penalty or loss of benefits to which you are otherwise entitled.

WHO WILL SEE THE INFORMATION THAT I GIVE? This study is anonymous. We are not obtaining your name or other identifiable data from you, so no one, not even members of the research team will view your data in any way linked to you. Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. We may publish the results of this study. You will not be identified in any of these written materials.

WILL I RECEIVE ANY COMPENSATION FOR TAKING PART IN THIS STUDY? If you are taking this survey to fulfill your PSY 100 or PSY210 requirement, you will receive .5 experimental credit for your participation.

WHAT IF I HAVE QUESTIONS? Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions about the study, you can contact the investigators using the contact information provided above. If you have any questions about your rights as a volunteer in this research, contact the CSU IRB at: RICRO_IRB@mail.colostate.edu; +1-970-491-1553.

You may print this form to keep for your records.

DO NOT PUT YOUR NAME ON ANY PART OF THE ONLINE SURVEY.

Please make sure you have 30 minutes to complete these surveys since you will not be able to stop and come back to the surveys at a later time.

If you have read and understood the above information and consent to participating in the study, please continue on to the survey. Otherwise close your browser now.

Appendix B

Study 1 Measures

How well do you remember this situation?

1 = I cannot remember this situation at all

2

3

4

5

6 = I can remember this situation extremely well

Directions: Please indicate the extent to which the following statements are true of the situation that you are currently experiencing. When responding to statements that refer to a situation, please remember that this includes what you are doing in addition to what is happening around you. Use the following scale to rate the extent to which each statement is true of the situation you are in:

1 = Not at all true

2 = Slightly true

3 = Somewhat true

4 = Moderately true

5 = Mostly true

6 = Absolutely true

1. This situation makes sense.
2. I understand the meaning of this situation.

3. I know the reason why this situation is happening.

4. Being in this situation is disorienting. (R)

5. I can make sense of this situation.

6. I do not know what is going on in this situation. (R)

7. It is easy for me to see what is going on in this situation.

8. I can comprehend every aspect of this situation.

9. It is easy to see how this situation fits into my life.

10. I have no idea what is happening in this situation. (R)

11. In the story of my life, this situation makes sense.

12. I can grasp what this situation is about.

13. I know why this situation is happening.

14. I do not understand why this situation is happening in the way that it is. (R)

15. When I think about my life as a whole, this situation belongs.

16. Given what I have come to understand about the world and my place in it, this situation makes sense.

17. This situation fits naturally within the broader context I am in.

18. This situation seems out of place (R)

19. There are some aspects of this situation that I cannot understand. (R)

20. This situation feels right.

21. This situation feels slightly off. (R)

22. I cannot figure out why this situation is occurring. (R)

23. This situation contradicts what I know about how the world works. (R)

24. This situation confirms what I know about the world.

25. This situation fits into my life story.
26. I do not see my place in what is happening in this situation. (R)
27. I understand how I can find meaning in this situation.
28. This situation is confusing to me (R)
29. I am in touch with what is going on in this situation
30. I know what I am doing in this situation.
31. I understand what is happening to me in this situation.
32. This situation is filled with purpose.
33. In this situation, I am pursuing something that I want
34. I am making progress in this situation.
35. Engaging in this situation helps me accomplish something that means a lot to me.
36. I will be closer to reaching my goals after this situation.
37. Being in this situation fills me with a sense of purpose.
38. This situation will make the future more in line with what I would like it to be.
39. This situation will shape a future that I desire.
40. This situation contributes to the key things that I am trying to achieve.
41. The outcome of this situation will be really great for me.
42. This situation feels purposeful to me.
43. This situation allows me to work on my goals.
44. I can see how this situation will lead to improvements.
45. This situation works toward producing an outcome that I want to happen.
46. This situation is connected to an outcome that I want to happen.
47. What will be achieved through this situation aligns with my desires."

48. Moving forward, things will be better because of this situation.
49. This situation brings me closer to my aims.
50. This situation will have a positive impact on the future.
51. I am completing objectives in this situation.
52. This situation has a greater purpose.
53. My participation in this situation contributes toward something larger than myself.
54. I will eventually end up wishing that this situation never took place. (R)
55. The impact of this situation will be relevant for a long time.
56. This situation will result in negative consequences. (R)
57. My participation in this situation contributes toward a greater purpose.
58. Things will be better because this situation occurred.
59. This situation serves a purpose beyond what is happening now.
60. This situation seems pointless. (R)
61. I do not believe that anything good will come from this situation. (R)
62. I will be better off because of this situation.
63. People will be better off because this situation occurred.
64. What I experience from this situation will help me grow as a person
65. I feel a sense of purpose from this situation
66. This situation involves me accomplishing goals that I value.
67. This situation is a part of what I am meant to accomplish with my life.
68. I do not see the value of being in this situation. (R)
69. This situation will be an important element of my life.
70. This situation is notable

71. This situation is significant.

72. This situation matters to me.

73. This situation feels worthwhile.

74. When I look back at my life, this situation will come to mind as being important.

75. I value the experience of this situation.

76. This situation is insignificant. (R)

77. In the grand scheme of things, this situation is irrelevant (R)

78. This situation is important to me

79. If I could go back in time, I would want to be in this situation again.

80. It feels like I am supposed to be in this situation.

81. I value my experience from this situation.

82. This situation is a critical aspect of my life.

83. What I am experiencing from this event is worthwhile

84. This situation is an essential aspect of my life.

85. By the next day, it will not matter that this situation took place. (R)

86. It is vital that I participate in this situation.

87. The role I play in situations like this one makes my life matter.

88. I do not see any value in this situation. (R)

89. It is situations like this one that make life worth living.

90. It is crucial that I experience this situation.

91. I appreciate the experience of being in this situation.

92. This situation is part of what makes my life valuable.

93. This situation is useful.

94. This situation reminds me that I matter.

95. Even months from now, I will remember that this situation occurred.

96. This situation is worthwhile.

97. This situation is important for its own sake.

98. This situation is worth engaging in.

99. Being in this situation is not worth it. (R)

100. This situation is meaningful

101. This situation is meaningful to me.

102. This situation is fulfilling.

103. I feel that this situation is meaningful.

104. This situation is meaningless to me. (R)

Key:

Items 1-31 = Coherence/Comprehension

Items 32-67 = Purpose

Items 68-99 = Significance/Mattering

Items 100-104 = Not adhering to any dimension

(R) = Reverse-coded

What is your gender? Male Female Other (specify) _____

What is your age? _____

What year of college are you in?

Freshman Sophomore Junior Senior Other (specify) _____

What is your major? _____

What is your cumulative GPA? _____

What was the annual household income in the home where you grew up?

$19,999 or less $20,000-34,999 $35,000-49,999 $50,000-64,999 $65,000-79,999
$80,000-99,999 $100,000 or above

Please indicate your ethnicity (indicate all that apply):

Black, African American, or African American Indian or Alaskan Native Asian or Pacific Islander
White or European

Hispanic or Central/South American Other (specify) _____

Thank you for taking the time to complete the survey. Your participation is very much appreciated.

Appendix C

Study 2 Consent Form

Consent to Participate in a Research Study

TITLE OF STUDY: Exploring Perceptions of Situations Part II

PRINCIPAL INVESTIGATOR: Michael F. Steger, Ph.D., Professor, Department of Psychology, Colorado State University, USA; Michael.F.Steger@ColoState.EDU

CO-PRINCIPAL INVESTIGATOR: Dylan R. Marsh, Graduate Student, Department of Psychology, Colorado State University, USA; Dylan.Marsh@colostate.edu

WHY AM I BEING INVITED TO TAKE PART IN THIS RESEARCH? You are invited to participate in this study because you have been identified as someone who is at least 18 years old or older and is currently a student at Colorado State University.

WHO IS DOING THE STUDY? The researchers conducting this study are Michael F. Steger, Ph.D., and Dylan R. Marsh.

WHAT IS THE PURPOSE OF THIS STUDY? The purpose of this study is to better understand perceptions of situations, particularly situational experiences of meaningfulness.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST? You will be asked to complete the study online at a time and place that is convenient for you. Participation will initially take approximately an hour of your time.

WHAT WILL I BE ASKED TO DO? You will be asked to fill out a series of questionnaires mainly related to your perceptions of two situations you've experienced recently. You may choose to skip any questions that you do not wish to answer.

ARE THERE REASONS WHY I SHOULD NOT TAKE PART IN THIS STUDY? You may not participate in the study if any of the following conditions apply to you: You (a) are under 18 years of age, (b) are not a student at Colorado State University, and/or (c) participated in Part I of this study.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS? There are no foreseeable risks other than possible discomfort in answering personal questions. You may elect not to answer questions that cause you discomfort or stress. There will be no penalties to you for electing not to answer questions. There may also be unforeseen risks. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

ARE THERE ANY BENEFITS FROM TAKING PART IN THIS STUDY? There are no direct benefits to you for participating in this study.

DO I HAVE TO TAKE PART IN THE STUDY? Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participating at any time without penalty or loss of benefits to which you are otherwise entitled.

WHO WILL SEE THE INFORMATION THAT I GIVE? This study is anonymous. We are not obtaining your name or other identifiable data from you, so no one, not even members of the research team will view your data in any way linked to you. Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. We may publish the results of this study. You will not be identified in any of these written materials.

WILL I RECEIVE ANY COMPENSATION FOR TAKING PART IN THIS STUDY? If you are taking this survey to fulfill your PSY 100 or PSY210 requirement, you will receive 1 experimental credit for your participation.

WHAT IF I HAVE QUESTIONS? Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions about the study, you can contact the investigators using the contact information provided above. If you have any questions about your rights as a volunteer in this research, contact the CSU IRB at: RICRO_IRB@mail.colostate.edu; +1-970-491-1553.

You may print this form to keep for your records.

DO NOT PUT YOUR NAME ON ANY PART OF THE ONLINE SURVEY.

Please make sure you have an hour to complete these surveys since you will not be able to stop and come back to the surveys at a later time.

If you have read and understood the above information and consent to participating in the study, please continue on to the survey. Otherwise close your browser now.

Appendix D

Study 2 New Measures

Directions: Please take a moment to think about what makes your life feel important to you. Please respond to the following statements as truthfully and accurately as you can, and also please remember that these are very subjective questions and that there are no right or wrong answers. Please answer according to the scale below:

	Absolutely Untrue	Mostly Untrue	Somewhat Untrue	Can't Say True or False	Somewhat True	Mostly True	Absolutely True
1. I understand my life's meaning.	1	2	3	4	5	6	7
2. I am looking for something that makes my life feel meaningful.	1	2	3	4	5	6	7
3. I am always looking to find my life's purpose.	1	2	3	4	5	6	7
4. My life has a clear sense of purpose.	1	2	3	4	5	6	7
5. I have a good sense of what makes my life meaningful.	1	2	3	4	5	6	7
6. I have discovered a satisfying life purpose.	1	2	3	4	5	6	7
7. I am always searching for something that makes my life feel significant.	1	2	3	4	5	6	7
8. I am seeking a purpose or mission for my life.	1	2	3	4	5	6	7
9. My life has no clear purpose.	1	2	3	4	5	6	7
10. I am searching for meaning in my life.	1	2	3	4	5	6	7

Directions: Read each item carefully. Using the scale below, please choose the number that best describes the reason why you were engaged in this activity. **Please respond as though you were currently in the situation**. Answer each item according to the following scale:

	Corresponds not at all	Corresponds a very little	Corresponds a little	Corresponds moderately	Corresponds enough	Corresponds a lot	Corresponds exactly
1. Because I think that this activity is interesting	1	2	3	4	5	6	7
2. Because I am doing it for my own good	1	2	3	4	5	6	7
3. Because I am supposed to do it	1	2	3	4	5	6	7
4. There may be good reasons to do this activity, but personally I don't see any	1	2	3	4	5	6	7
5. Because I think that this activity is pleasant	1	2	3	4	5	6	7
6. Because I think that this activity is good for me	1	2	3	4	5	6	7
7. Because it is something	1	2	3	4	5	6	7

that I have to do							
8. I do this activity but I am not sure if it is worth it	1	2	3	4	5	6	7
9. Because this activity is fun	1	2	3	4	5	6	7
10. By personal decision	1	2	3	4	5	6	7
11. Because I don't have any choice	1	2	3	4	5	6	7
12. I don't know; I don't see what this activity brings me	1	2	3	4	5	6	7
13. Because I feel good when doing this activity	1	2	3	4	5	6	7
14. Because I believe that this activity is important for me	1	2	3	4	5	6	7
15. Because I feel that I have to do it	1	2	3	4	5	6	7
16. I do this activity, but I am not sure it is a good thing to pursue it	1	2	3	4	5	6	7

Rate how **you behaved** in the situation you described above using the following items. Please indicate how accurate each of the following descriptors is of your behavior within the situation.

	Not at all an accurate description of my behavior in this situation						Absolutely an accurate description of my behavior in this situation
Calm, Peaceful	1	2	3	4	5	6	7
Upset, Angry	1	2	3	4	5	6	7
Confident, Unafraid	1	2	3	4	5	6	7
Discouraged, Worried	1	2	3	4	5	6	7
Cold-hearted, Uncaring	1	2	3	4	5	6	7
Sympathetic, Kind	1	2	3	4	5	6	7
Rude, Impolite	1	2	3	4	5	6	7
Polite, Courteous	1	2	3	4	5	6	7
Lazy, Procrastinating	1	2	3	4	5	6	7
Focused, Diligent	1	2	3	4	5	6	7
Disorganized, Messy	1	2	3	4	5	6	7
Organized, Neat	1	2	3	4	5	6	7
Unenthusiastic, Quiet	1	2	3	4	5	6	7
Enthusiastic, Sociable	1	2	3	4	5	6	7
Submissive, Unassertive	1	2	3	4	5	6	7

Dominant, Assertive	1	2	3	4	5	6	7
Unintellectual, Incurious	1	2	3	4	5	6	7
Intellectual, Philosophical	1	2	3	4	5	6	7
Uncreative, Unimaginative	1	2	3	4	5	6	7
Artistic, Imaginative	1	2	3	4	5	6	7
Dishonest, Deceptive	1	2	3	4	5	6	7
Honest, Truthful	1	2	3	4	5	6	7
Arrogant, Boastful	1	2	3	4	5	6	7
Humble, Modest	1	2	3	4	5	6	7

Directions: Please indicate how you felt while in this situation regarding how your behavior in this situation would impact other people.

	Not at all true						Very true
I feel that my actions in this situation have a positive impact on the people around me.	1	2	3	4	5	6	7
The things I am doing in this situation contribute to the betterment of society	1	2	3	4	5	6	7
In this situation, I am able to improve the welfare of other people	1	2	3	4	5	6	7

In this situation, my influence in the lives of other people is positive	1	2	3	4	5	6	7

Rate each item for the degree to which it was characteristic of the situation you described above using the following scale.

1 2 3 4 5 6 7

Extremely Uncharacteristic — Extremely Characteristic

1. A job needs to be done.
2. I have to fulfill my duties.
3. Task-oriented thinking is required.
4. The situation contains intellectual stimuli.
5. There is the opportunity to demonstrate intellectual capacities.
6. Information needs to be deeply processed.
7. I am being blamed for something.
8. I am being criticized.
9. I am being threatened by someone or something.
10. The situation is sexually charged.
11. Physical attractiveness is relevant.
12. Potential sexual or romantic partners are present.
13. Situation is joyous and exuberant.
14. The situation is pleasant.
15. The situation is playful.
16. The situation could entail frustration.
17. The situation could elicit stress.
18. The situation could elicit feelings of tension.
19. It is possible to deceive someone.
20. Not dealing with others in an honest way is possible.
21. Someone in this situation could be deceptive.
22. Communication with other people is important or desired.
23. Others show communicative signals.
24. Close personal relationships are important or can develop.

How did **you feel** during the situation you described above?

Directions: Please rate each feeling on the scale given. A rating of 1 means that you did not experience that feeling at all. A rating of 7 means that this feeling was a key part of the experience. Please circle the number between 1 and 7 that best describes how you felt.

During this situation I felt…	Not at all how I felt						Very much how I felt

Bored	1	2	3	4	5	6	7
Impatient for it to end	1	2	3	4	5	6	7
Happy	1	2	3	4	5	6	7
Frustrated/annoyed	1	2	3	4	5	6	7
Depressed/blue	1	2	3	4	5	6	7
Hassled/pushed around	1	2	3	4	5	6	7
Warm/friendly	1	2	3	4	5	6	7
Angry/hostile	1	2	3	4	5	6	7
Worried/anxious	1	2	3	4	5	6	7
Enjoying myself	1	2	3	4	5	6	7
Criticized/put down	1	2	3	4	5	6	7
Tired	1	2	3	4	5	6	7
Engaged	1	2	3	4	5	6	7
Interested	1	2	3	4	5	6	7
Satisfied	1	2	3	4	5	6	7
Very capable in what I did	1	2	3	4	5	6	7
That I was successfully completing difficult tasks and projects	1	2	3	4	5	6	7
That I was taking on and mastering hard challenges.	1	2	3	4	5	6	7
Free to do things my own way	1	2	3	4	5	6	7

That my choices expressed my true self	1	2	3	4	5	6	7
That my choices were based on my true interest and values	1	2	3	4	5	6	7
Close and connected with other people who are important to me	1	2	3	4	5	6	7
A strong sense of intimacy with the people I spent time with (choose "1" if no one else was in this situation)	1	2	3	4	5	6	7
A sense of contact with people who care for me, and whom I care for	1	2	3	4	5	6	7
Good about myself	1	2	3	4	5	6	7
Authentic (true to myself)	1	2	3	4	5	6	7

*Now, please recall the most meaningful situation that you have experienced since arriving at Colorado State University. Try to pick a situation that you knew was highly meaningful while you were experiencing it. Do your best to pick a specific situation of a relatively similar length to the situation you described earlier (i.e. pick an event that occurred a single day, rather than over the course of an extended period of your life). Provide a description of this situation in the space provided below. Please answer the following questions in your description. What was happening? Who was with you? What were you doing? Where were you? How long did the situation last? Please do not provide any personally identifying information, such as names. For example, if one of your friends was in the situation with you, please state that you were "with a friend," instead of referring to the individual by name. If it is important to specify which individuals are engaging in which actions, you may use monikers, such as "Person A" and "Person B." You will only be asked to fill out one questionnaire about this situation. *The SMMQ is administered again following this prompt

Appendix E

Nine-item SMMQ

Situational Momentary Meaningfulness Questionnaire (SMMQ)
Please indicate the extent to which the following statements are true of the situation that you are currently experiencing. When responding to statements that refer to a situation, please remember that this includes what you are doing in addition to what is happening around you. Use the following scale to rate the extent to which each statement is true of the situation you are in:

1 = Not at all true
2 = Slightly true
3 = Somewhat true
4 = Moderately true
5 = Mostly true
6 = Absolutely true

1. This situation makes sense.
2. I know the reason why this situation is happening.
3. I can grasp what this situation is about.
4. I will be closer to reaching my goals after this situation.
5. This situation contributes to the key things that I am trying to achieve.
6. This situation involves me accomplishing goals that I value.
7. This situation is significant.
8. This situation matters to me.
9. I value my experience from this situation.

Scoring instructions (items listed should be aggregated). None of the items are reverse-coded.

SM-Meaningfulness = 1, 2, 3, 4, 5, 6, 7, 8, 9

SM-Coherence = 1, 2, 3

SM-Purpose = 4, 5, 6

SM-Significance = 7, 8, 9