Redefining Situation Schema Under Chronic Stress:

A Mixed Methods Construct Validation of Positive Cognitive Shift

by

Crystal Rivers

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved May 2018 by the
Graduate Supervisory Committee:

Mary Davis, Chair
Linda Luecken
Frank Infurna
Sharon Robinson Kurpius

ARIZONA STATE UNIVERSITY

August 2018

ABSTRACT

Cognitive reappraisal, or redefining the meaning of a stressful circumstance, is useful in regulating emotional responses to acute stressors and may be mobilized to up- or down- regulate the stressors' emotional salience. A conceptually-related but more targeted emotion regulation strategy to that offered by cognitive reappraisal, termed positive cognitive shift, was examined in the current study. Positive cognitive shift ("PCS") is defined as a point of cognitive transformation during a chronic, stressful situation that alters the meaning and emotional salience of the situation for the individual. Key aspects of the PCS that differentiate it from the broader reappraisal construct are that it 1) is relevant to responses to chronic (versus acute) aversive events, 2) is deployed when there is a mismatch between coping and stressors, and 3) involves insight together with redefinition in meaning of the situation generating stress. The current study used qualitative and quantitative analyses to 1) examine whether PCS is an observable, reliable, and valid experience in response to a stressful event that occurred in the past year, and 2) test whether PCS moderates the relations between the number of past-year stressful life circumstances and subsequent emotional well-being and functional health. A community sample of 175 middle-aged individuals were interviewed regarded a past chronic stressor and completed questionnaires regarding number of past year stressors and health outcomes. Theory-based coding of interviews was conducted to derive reliable scores for PCS, and findings indicated that PCS was evident in 37.7 % of participant responses. Furthermore, PCS scores were related positively to openness, personal growth from one's most difficult lifetime event, and affect intensity-calm, in line with

predictions. Also in line with prediction, PCS moderated the relations between number of past-year life events and health outcomes, such that the deleterious relations between past year stressful events and cognitive functioning, wellbeing, positive affect, and negative affect were weaker among individuals higher versus lower in PCS. Of note, PCS moderation effects diminished as the number of stressful events increased.

DEDICATION

I dedicate this dissertation to the memory of Dr. Alex Zautra. He passed away in June 2016, just as we began working on the prospectus for this dissertation project. Positive cognitive shift was a construct that he held great enthusiasm for because of its theoretical connection to resilience. Dr. Zautra's support was instrumental to the achievements that I made in graduate school up to his passing and even now. As such, his influence will always be with me. His impact on me was one of setting the bar ever higher intellectually, and not to be afraid to grow. His incredible talent for seizing on the crux of the matter and then building a research program to investigate further inspired me both then and now. Dr. Zautra believed there was a unique aspect to resilience captured by the positive cognitive shift construct. When, typical of a graduate student, I doubted myself as a researcher or questioned the utility of a niche construct, he insisted that I see the research through until I had scientific answers. For that reason and others, I dedicate this dissertation to his memory.

ACKNOWLEDGMENTS

I would like to express my gratitude to my graduate advisor and dissertation chair, Dr. Mary Davis, for offering to mentor me when I needed support the most. She inspired me to stretch my abilities as a researcher. More broadly, Dr. Davis has been an encouraging, kind, and exemplary advisor and role model over the past seven years. I thank Dr. Sharon Robinson Kurpius for her support on the dissertation project. Her ability to inspire while driving my attention to details is uncanny. I am grateful to Dr. Luecken for assisting me in seeing the possibility that there might be negative as well as positive cognitive shifts. I thank Dr. Frank Infurna for advice and support he offered. His knowledge of methods and statistics was invaluable, especially as I made sense of my results.

Furthermore, I am indebted to the volunteers, students, staff, and faculty at Arizona State University who were instrumental in carrying out the dissertation study. This includes Giulia Weyrich, Graciela Marroquin, Chloe Shah, Anne Vogel, Jazmin Ramos, and Chris Siebel, and others that contributed to the study. Your commitment made this dissertation project possible.

I would like to thank my cohort because of the support we have provided one another. Thanks to Dhwani Kothari, MA, provides a calming presence and clear mind. Thanks to fellow intern Andrew Jeon, MA, JD, who helped with formatting my final document and provided a sounding board. It helped to have a friend going through his own dissertation process. I thank my unwaveringly supportive family. My mother, Sandy Truelove, has always been my greatest supporter, truest friend, and giver of unconditional

love. I am fortunate to have her influence in my life. I thank my friend, Yesenia Madrid, who provides laughter and calm as needed.

Finally, I thank my husband, Drew, who is everything I really need to persist and stay on track in this world. And that is saying a lot. His love and support have encouraged me to believe in myself in ways I would not have thought possible before I met him.

TABLE OF CONTENTS

Page

LIST OF TABLES viii

LIST OF FIGURES x

CHAPTER

1 INTRODUCTION 1

2 STATEMENT OF THE PROBLEM 23

3 PURPOSE OF THE STUDY 24

4 METHOD 25

Participants 25

Procedure 26

Parent Study Measures 28

Follow Up Study Measures 34

Data Reduction and Analytic Approach 36

Phase I: Qualitative Analysis 36

Phase II: Quantative Analysis 41

5 RESULTS 48

6 DISCUSSION 78

REFERENCES 94

APPENDIX

A CONSTRUCTS RELATED TO POSITIVE COGNITIVE SHIFT 109

APPENDIX Page

B MEASURES 115

C POSITIVE COGNITIVE SHIFT CODEBOOK 139

D SCORING SHEET 146

LIST OF TABLES

Table Page

1. Positive Cognitive Shift Qualitative Coding 40
2. Intraclass Correlation Coefficient 41
3. Intercorrelations of Positive Cognitive Shift with Demographics 48
4. Descriptive Statistics of Variables Coded from the Transcripts 50
5. Descriptive Statistics of Variables from Questionnaires and Phone Interview 52
6. Descriptive Statistics of Variables from Follow Up Phone Interview 53
7. Intercorrelations of Positive Cognitive Shift with Hypothesized Convergent Variable 54
8. Exploratory Convergent Variable Characteristics 55
9. Intercorrelations of Positive Cognitive Shift with Exploratory Convergent Variables. 55
10. Intercorrelations of Positive Cognitive Shift with Hypothesized Discriminant Variables 56
11. Findings of Regression Analyses for Hypothesis 1 With Past Year Stressful Events, Positive Cognitive Shift, and Their Interaction as Predictors of Cognitive Functioning 59
12. Findings of Regression Analyses for Hypothesis 1 With Past Year Stressful Events, Positive Cognitive Shift, Their Interaction, and Covariate as Predictors of Cognitive Functioning 60
13. Regions for Significance for Hypothesis 1: The Adjusted Effect of Past Year Stressful Events on Cognitive Functioning Across Levels of Positive Cognitive Shift 61

Table Page

14. Findings of Regression Analyses for Hypothesis 2 With Past Year Stressful Events, Positive Cognitive Shift, and Their Interaction as Predictors of Wellbeing 65

15. Regions for Significance for Hypothesis 2: The Adjusted Effect of Past Year Stressful Events on Wellbeing Across Levels of Positive Cognitive Shift 66

16. Findings of Regression Analyses for Hypothesis 3 With Past Year Stressful Events, Positive Cognitive Shift, and Their Interaction as Predictors of Positive Affect 70

17. Regions for Significance for Hypothesis 3: The Adjusted Effect of Past Year Stressful Events on Positive Affect Across Levels of Positive Cognitive Shift 71

18. Findings for Regression Analyses for Hypothesis 4 With Past Year Stressful Events, Positive Cognitive Shift, and Their Interaction as Predictors of Negative Affect 75

19. Regions for Significance for Hypothesis 4: The Adjusted Effect of Past Year Stressful Events on Negative Affect Across Levels of Positive Cognitive Shift 76

LIST OF FIGURES

Figure Page

1. The process model of emotion regulation (Gross, 2015; Ochsner et al., 2004)….. 4

2. Distribution of Stressful Life Events per Participant.....…… 53

3. Simple Slopes of Cognitive Functioning on Past Year Stressful Events at Low, Medium and High Values of Positive Cognitive Shift, With Full Sample (Left, n=140) and Outliers Excluded (Right, n=139) ..... ……..58

4. Johnson-Neyman Plot of Adjusted Effect of Past Year Stressful Events on Cognitive Functioning Across Levels of Positive Cognitive Shift ……. 62

5. Simple Slopes of Wellbeing on Past Year Stressful Events at Low, Medium and High Values of Positive Cognitive Shift, With Full Sample (Left, n=139) and Outliers Excluded (Right, n=137) 64

6. Johnson-Neyman Plot of Adjusted Effect of Past Year Stressful Events on Wellbeing Across Levels of Positive Cognitive Shift 67

7. Simple Slopes of Positive Affect on Past Year Stressful Events at Low, Neutral and High Values of Positive Cognitive Shift, With Full Sample (Left, n=140) and Outlier Excluded (Right, n=139) 70

8. Johnson-Neyman Plot of Adjusted Effect of Past Year Stressful Events on Positive Affect Across Levels of Positive Cognitive Shift 72

9. Simple Slopes of Negative Affect on Past Year Stressful Events at Low, Medium and High Values of Positive Cognitive Shift, With Full Sample (Left, n=140) and Outlier Excluded (Right, n=139) 74

Figure Page

10. Johnson-Neyman Plot of Adjusted Effect of Past Year Stressful Events on Negative Affect Across Levels of Positive Cognitive Shift.....77

CHAPTER 1

INTRODUCTION

Research suggests that cognitive reappraisal, which involves changing the way we think about a stimulus to adjust its affective impact (Gross, 2002; Ray, McRae, Ochsner, & Gross, 2010), is a commonly used emotional regulation strategy and is associated with positive health outcomes (Boden, Bonn-Miller, Kashdan, Alvarez, & Gross, 2012; Gyurak, Gross, & Etkin, 2011; Matsumoto, Yoo, & Nakagawa, 2008). Cognitive reappraisal has been investigated as a both state and trait-like ability, and is associated with psychophysiological wellbeing when reappraisal ability is at high levels (e.g., Mauss et al., 2007; Troy, Wilhelm, Shallcross, & Mauss, 2010). Reappraisal is an element of a number of therapies for psychopathology, including cognitive behavioral therapy (Butler, Chapman, Forman, & Beck, 2006) and dialectical behavioral therapy (Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006).

Despite its positive effects, cognitive reappraisal has not been found to be universally effective across all affective states, stressor types, perceived levels of stressor controllability, and levels of affective arousal (Folkman, 1984; Matsumoto et al., 2008; Suri, Whittaker, & Gross, 2015). The moderating effects of these contextual factors on the effectiveness of reappraisal may help to explain efforts to parse the broader reappraisal construct into various classifications. These classifications include detached reappraisal, or the shifting of attention to objective features of events or away from events, and positive reappraisal, or the focusing of attention on positive aspects of upsetting events (Garland, Gaylord, & Park, 2009; Solomon & Dekel, 2007). The

current study proposed that positive cognitive shift (PCS) is another variant of cognitive reappraisal, representing resilient adaptation that operates under real-life conditions of chronic or recurrent life stress. Delineating the features of a "resilient" variant to cognitive appraisal as an emotion regulation strategy in a context specific to *chronic* life events, to my knowledge, has not been attempted.

Below I first describe a process model of emotion regulation proposed by Gross (2015) and then focus explicitly on the role of cognitive reappraisal as a key element in emotion regulation. I then discuss how perceived stress controllability may alter the psychological benefits of reappraisal, and evidence suggesting that emotional intensity may predispose individuals to choose the strategy they will use to modulate their emotions. Because much of the statistical research uses laboratory stressors, I then discuss qualitative research on stressor events in which participants describe "turning points" in narratives following significant difficult events. I will then describe the theory of positive cognitive shift ("PCS"), a construct conceived as a resilient variant of cognitive reappraisal in which a personal undergoing chronic stressful events is able to redefine the situation in a way that assists with coping and identification with the situation in a more helpful fashion. Specific theoretical underpinnings are described. I relate cognitive reappraisal and PCS to adaptive outcomes. I explore existing research on frequent use of cognitive reappraisal, and how this may apply to PCS. Because I am interested in the adaptive outcomes of cognitive functioning, well-being, and positive and negative affect, I discuss the evidence linking cognitive reappraisal to those outcomes, and what they may suggest for PCS in an analysis. I note that PCS, because

of it theoretical relationship to cognitive reappraisal, may overlap other psychological constructs and highlight how a selection of the most well-known constructs from several disciplines are similar to and may differ from PCS. Finally, the document moves to the Statement of the Problem and Purpose of the Study.

What is Emotion Regulation?

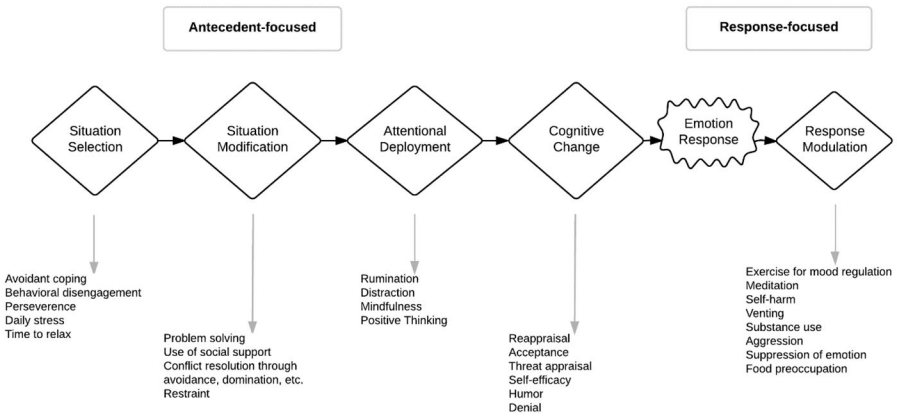
Emotions, which are short-lived alterations in how we feel and reflect activity of the brain and body in response to events, play an integral role in behavior cuing and response (Urry, van Reekum, Johnstone, & Davidson, 2009). Emotion regulation refers to implicit or explicit efforts to increase, maintain, or decrease positive and negative emotions that are not inherently good or bad; rather, the emotions are given their meaning through an individual's appraisal of the events that give rise to the emotions (Gross, 2002). Healthy adaptation under adverse circumstances requires effective emotion regulation (Gross, 2002; Mauss et al., 2007).

Gross (2015) has proposed an emotion regulation process model, depicted in Figure 1. According to the model, emotion regulation occurs via various strategies, ranging from strategies focused on the antecedents to emotion elicitation (antecedent-focused) to strategies focused on the responses to emotion (response-focused). Antecedent-focused strategies include situation selection, situation modification, attentional deployment, and cognitive reappraisal; response-focused strategies include suppression of emotion (Gross, 2015). Different strategies may be employed according to, among other considerations, the need to dampen, maintain, or bolster emotion, the

automaticity of one's reaction, or the time that has passed since the triggering event has occurred (Gross & Thompson, 2007).

Figure 1.

The process model of emotion regulation (Gross, 2015; Ochsner et al., 2004).



Generally, antecedent-focused strategies are considered more conscious and effortful. Situation selection, the first stage of Gross' process model, describes taking actions based on the likely features of a future situation that will promote the most favorable emotional outcome (Gross & Thompson, 2007). This skill requires predictive judgment. Situation modification is the second step in Gross' process model, and describes efforts to modify an external environment to adjust its emotional impact (Werner, Goldin, Ball, Heimberg, & Gross, 2011). Attentional deployment describes the strategy of directing one's attention to remove the emotional impact of the situation. This strategy can encompass distraction, which focuses attention away from or on different aspects of the situation, and concentration, which focuses attention on the emotional salience of the situation. Attentional deployment has been shown to have

negative consequences for emotion regulation, such as rumination (Gross & Thompson, 2007).

Cognitive reappraisal is an antecedent-focused emotion regulation strategy in Gross' framework, in which an individual changes the way he or she thinks about a stimulus to change its affective impact (Buhle et al., 2014; Ochsner et al., 2004). A key reappraisal strategy in Gross' emotion regulation model is cognitive change, in which effort is deployed to develop new or alternative interpretations, or to make different judgments, about emotional stimuli (Ochsner & Gross, 2005). Cognitive change has a role in generating an emotional response when there was none previously or when a triggered response needs regulating (Gross & Thompson, 2007; Ochsner & Gross, 2005).

Rounding out Gross' process model of emotion regulation is response modulation, which involves increasing or decreasing the expression of one's emotion (Werner et al., 2011). This includes the use of emotion suppression, a response-focused strategy that appears to be recruited more frequently for negative emotions than positive ones, and is generally used less frequently than reappraisal (Nezlek & Kuppens, 2008). Suppressing positive and negative emotions is associated with decreased self-esteem and negative affect (Nezlek & Kuppens, 2008).

How Does Cognitive Reappraisal Promote Emotion Regulation?

Gross' process model has many promising and integrative features, and reappraisal has been researched broadly because of its potential to explain how people adapt (Troy et al., 2010). Reappraisal tends to decrease negative emotional experience

and expression and increase positive emotion experience and expression (Gross, 2002). Reappraisal is used in therapeutic settings (e.g., Butler et al., 2006; Lynch et al., 2006) and appears to be a strategy that is employed by people in their daily lives for emotion regulation (Gross, Richards, & John, 2006). Interactionist models (e.g., Bonanno & Burton, 2013) and empirical evidence indicate that reappraisal is not always adaptive, however, in part because cognitive reappraisal has a dynamic relationship with person and situational factors (e.g., Troy, Shallcross, & Mauss, 2013). Person-situation interactionist models emphasize that there is not uniform consistency in the coping used by persons across situations, such that models of coping must assume flexibility of coping and emotion modulation (Bonanno & Burton, 2013). Important contextual variables that alter the adaptiveness of cognitive reappraisal include the affect that a person recruits during cognitive reappraisal (McRae, Jacobs, Ray, John, & Gross, 2012), the perceived controllability of the stressor (Park, Folkman, & Bostrom, 2001), and the level of emotional arousal associated with the stressor (Sheppes, Scheibe, Suri, & Gross, 2011).

Affective Recruitment during Cognitive Reappraisal

Regulating emotions effectively requires that an individual recruit an affective state most applicable to his or her goal-, task-, or context- relevant situation (Schore, 2015; Sheppes & Gross, 2011; Todd, Cunningham, Anderson, & Thompson, 2012). Most conceptualizations and studies of reappraisal focus on down-regulation of negative affect and up-regulation of positive affect (e.g., Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Shiota & Levenson, 2012). There are other classification

models of reappraisal. Positive reappraisal, in which a person focuses on positive aspects of an event, has been compared to detached reappraisal, in which an individual shifts attention to objective features of an event rather than its emotional aspects (Shiota & Levenson, 2012). Positive reappraisal produces more positive than negative emotions, and detached appraisal is more likely to reduce the overall intensity of emotions (Shiota & Levinson, 2012). McRae and colleagues divided reappraisal into attempts to increase positive emotions, arguably linked to activation of the ventral striatum, and attempts to decrease negative emotions, arguably linked to inhibition of the insula and amygdala (McRae, Ciesielski, & Gross, 2012). Their work established that there may be "several types of reappraisals" (McRae, Ciesielski, et al., 2012, p. 253), for different affective purposes and with differing physiological effects.

There is increasing evidence that cognitive reappraisal may be used to up- or down- regulate negative affect (Ray et al., 2010; Staudinger, Erk, Abler, & Walter, 2009). The effectiveness of reappraisal in regulating negative affect has been demonstrated in studies that bolstered participants' fear response in anticipation of a computer-based memory task involving uncovering problems (Tamir & Ford, 2009), attempted to influence participants' reward processing at the neural level through repeated reappraisal tasks (Staudinger et al., 2009), and shifted participants via reappraisal from a neutral or positive emotional state to a negative, arousal-based affective state for competitive purposes (Ochsner et al., 2004). There is also evidence that participants can be taught to up-regulate negative affect on demand through reappraisal, though the stimulus must be

perceived as negative in order to produce a startle response and self-reported increases in negative affect (Ray et al., 2010).

Contrary to the evidence that it promotes enhanced regulation, some evidence suggests that reappraisal may dysregulate a person's emotions (Ochsner et al., 2004; Segerstrom, Tsao, Alden, & Craske, 2000). This can occur in cases where the reappraisal of an event is worse than its initial appraisal, causing rumination and anxiety. One possible result is psychopathology (Ehlers & Clark, 2000). Similar variations in emotional outcomes have been demonstrated when stressor controllability is an issue.

Taken together, the evidence regarding the effectiveness of cognitive reappraisal in recruiting affect suggests that cognitive reappraisal is a broad construct that may be used to recruit positive or negative affective states, and that according to Gross' Emotion Regulation Model (Gross, 2015) and interactionist models (Bonanno & Burton, 2013), emotion may be differentially modulated depending on how the situation is perceived by the person.

How Stressor Controllability Changes the Usefulness of Cognitive Reappraisal

Cognitive reappraisal has been shown as particularly effective when individuals perceive the source of their stress as uncontrollable or something that cannot be resolved (Troy et al., 2013). However, for situations in which the stress is perceived as controllable, reappraisal is not as useful (Folkman, 1984; Troy et al., 2013). When reappraisal was used during controllable stressors, stress was more likely to coincide with

depression; in contrast, when reappraisal was used during uncontrollable stressors, stress was less likely to coincide with depression (Troy et al., 2013).

Research further indicates that people with chronically low levels of control over their environments, such as those with low socioeconomic status, are more likely to experience psychological benefits from reappraisal (McRae, 2016; Troy, Ford, McRae, Zarolia, & Mauss, 2016). All told, the available empirical evidence suggests that perceived stress controllability may be an important contextual moderator indicating when cognitive reappraisal will be more or less adaptive (Troy et al., 2016).

Strong Threat: Does Emotional Intensity Predispose to Reappraisal?

The intensity of people's emotion will predispose them toward the strategy they choose to regulate their emotions (Sheppes et al., 2011). Using emotional pictures (n = 20) or unexpected electrical stimulation (n = 16) to induce emotion, investigators found that when emotions are at a low-intensity, participants tended to use reappraisal. When emotions are high-intensity and negative, participants tended to disengage by distraction. However, such acute laboratory-based inductions do not address how people behave following exposure to chronic real-life stressors.

Chronic Stressor Events. There is evidence that the level of distress one feels from stressful life events may affect one's ability to engage in cognitive reappraisal. A study of 154 caregivers found that African-American caregivers (n = 44) of older relatives suffering from dementia experienced decreased heart rate reactivity following reappraisal while Caucasian caregivers (n = 110) experienced increased heart rate reactivity following reappraisal (Knight & McCallum, 1998). Though the basis for their

conclusions is methodologically thin, the researchers suggested that Caucasians may appraise caregiving as a greater life disruption, rendering it more difficult for them to engage in reappraisal. The supposition is supported by empirical findings indicating that African-American community norms support behaviors and attitudes that promote normalization of and finding satisfaction in caregiving (Haley et al., 1996; Morycz, Malloy, Bozich, & Martz, 1987). It is possible that reappraisal frequency is moderated by cultural norms, such that magnitude of physiological reactivity may be impacted by these norms; this is an area that is ripe for future research. Such research may benefit from a qualitative methodology in which the research design employs inductive insight, i.e., to maximize understanding of a phenomenon (Miles, Huberman, & Saldaña, 2013).

There is relatively little research examining whether emotional arousal in response to real-world chronic stressor events calibrates the use of cognitive reappraisal for emotional regulation. Qualitative methodologies, such as the one employed in the current study, may provide some insight into the process of cognitive reappraisal and meaning attached to outcomes of reappraisal. Qualitative research has already focused on the topic of stressful events and the journey people take to overcome difficulties arising from those events (e.g., Sutin, Costa, Jr., Wethington, & Eaton, 2010). Turning points, identified by individuals narrating their own events in retrospect as pivotal, may be a similar construct to reappraisal (McAdams & Bowman, 2001). Qualitative methods uniquely demonstrate through the concept of "redemption" and "contamination" sequences (McAdams & Bowman, 2001) how emotional arousal and interactionist models may operate antecedent to individuals determining how they will emotionally

modulate. Below, I discuss how turning points may be a reappraisal variant. The utility of qualitative methods to highlight the role of affective recruitment in appraisal processes is addressed. The framework is further fleshed out with a discussion of how turning points are connected to chronic events in redemption sequences. Discourse includes how adaptive outcomes may require that an individual perceive his or her challenges as significant. This redirects the reader's attention to the notion that the narrator must find the stressor event emotionally arousing and activating.

Turning Points: Reappraisal or a Reappraisal Variant?

Turning points, as described through qualitative research, are specific episodes in a person's life that are identified in narratives as having changed the course of his or her life (Sutin, Costa Jr., Wethington, & Eaton, 2010). Turning points are identified in retrospect and may be positive or negative episodes. Some turning point episodes are acute episodes, such as receiving a gift, while others may be recurring stressors, such as depression (McAdams & Bowman, 2001). The meaning attached to narrated episodes may be associated with growth, as is found in redemption narratives, or with negative outcomes, as found in contamination narratives (McAdams & Bowman, 2001).

McAdams and Bowman (2001) found that contamination narratives tended to be nongenerative and were more common in depressed people who were prone to narrating their lives in pessimistic terms, such that they tended to focus on negative event sequences as their "turning points." Redemption narratives were more generative and were common in individuals who chose narrative sequences that often reflected very difficult scenes in which a positive outcome resulted and demonstrated their enhanced

self-esteem (McAdams & Bowman, 2001). It is theoretically possible that cognitive reappraisal could yield a turning point. Since cognitive reappraisal may focus on up- or down- regulation of negative or positive affect, reappraisal might arguably be featured in either a redemption or contamination narrative.

McAdams and Bowman's (2001) redemption sequences tend to reflect chronic stressor events, while contamination sequences tend to reflect acute stressor events. Chronic events tend to provide more time to work through negative events, including failed coping attempts and the process of addressing goals and resources (Brandtstädter, 2009; Schulz & Heckhausen, 1996). Participants reporting both positive and negative adjustment-related changes tend to describe greater post-traumatic growth than participants with only positive changes (Tedeschi & Calhoun, 1996, 2004; Updegraff & Taylor, 2000). This suggests that people need to overcome *significant* challenges in order to perceive the extent of their growth. Further, definitions of resilience as a process of recovery, ability to sustain positive engagement during adversity, and growth following adversity (Rivers, Zautra, & Davis, 2015; Zautra, Arewasikporn, & Davis, 2010), suggest that time may be required for the unfolding of resilience.

Developing a Theory of a Positive Cognitive Shift as a Resilient Variant of Cognitive Reappraisal

The literature has pointed to specific contextual factors that determine whether cognitive reappraisal promotes good outcomes in the face of stress. Left unanswered is whether alternative variants of cognitive reappraisal, i.e., PCS, may be deployed in those circumstances that are not well-managed by cognitive reappraisal as it has been

traditionally defined. In a previous mixed methods study with goals of gaining a qualitative understanding of PCS and describing the essential characteristics of the construct (Rivers, 2014), PCS was described as a change in the trajectory of a person's situation, altering a person's schema for all such events in the future, and creating repercussions for the person's self-concept. PCS may be the result of a protracted time of recursive appraisal and coping attempts that are experienced as effortful and difficult. Insight that produces a PCS does not necessarily make the change easy, but the change breaks an unproductive cycle (Kent et al., 2015; Rivers, 2014).

Building on this earlier work, the current study conceived of PCS as a resilient variant of cognitive reappraisal, in which a person undergoing chronic or recurrent stressful events was able to redefine the situation in a more positive light. The key elements that distinguish a PCS, as originally conceptualized, from the broader cognitive reappraisal construct included: 1) encountering a situation that arouses emotion, possibly due to perceived self-relevance, 2) evidence of insight that promotes a reappraisal, 3) directionality of affect (negative to less negative/neutral/positive), and 4) the requirement of event chronicity. Situations antecedent to PCS are perceived as negative, whereas situational antecedents to cognitive reappraisal may be perceived across the affective range from strongly negative to strongly positive (Ochsner et al., 2004). In addition, reappraisal has typically been tested with lab conditions that tap into acute stressors with stimuli such as sad films that ultimately measure emotional processing under relatively mild conditions (Troy et al., 2010). PCS, on the other hand, is narrowly tailored to chronic life events. Two additional concepts distinguishing cognitive reappraisal and PCS

are considered below because they expand on the unique conceptual requirements of PCS: self-relevance and insight. These concepts are specifically considered in the context of chronic stressor events.

Self-Relevance

Because people have limits on their ability to process information at any given moment, they can attend to only a fraction of the information present in their environment (Bargh, 1982; Kahneman, 2011). Selective attention serves as a gating process and is guided by automatic and effortful thinking processes. We frame our notion of self through development of self-schemas, which are typically viewed as knowledge structures that are hierarchically organized and nested by domain and generated from experience, reflecting a person's interpretation of the experience (Stein, 1995). Once established in memory, self-schemas become the cognitive foundation for behavior and orient one's biases to pay attention to phenomena that is experienced as salient to self-schema.

The concept of self-relevance as it relates to PCS can be understood through the larger examination of how a person's attention shifts from stereotyped information to novel information under chronic stress. Research on influence has examined the differential effects of the divergent and convergent origin of thoughts in order to understand how a minority position might gain ground once a person's attention has narrowed (Nemeth, 1986). Findings indicate that minority viewpoints need time, consistency, and confidence to gain ground. In addition, the receiver needs to care about the issue (Nemeth, 1986).

The need for emotional arousal suggests that self-relevance, defined here as the interplay between the nature of the attentional object and the self-definition of the individual who is paying attention, is an important component of shifts in viewpoint (Gendolla, 1999). Influence takes incremental steps but also implies that one may need to receive discrepant information while under mental load (Allen, Sherman, Conrey, & Stroessner, 2009). It has been found that when people have stronger stereotypes and are operating under mental load, their stereotypes may operate as an information gathering mechanism for acquiring disconfirming or novel information (Allen et al., 2009). In essence, the more entrenched one's association with information is, the more attention one might pay to novel or discrepant information when under stress (Allen et al., 2009). As this applies to chronic stress, it suggests that as time passes and stress accumulates, the stage may be set for acquiring discrepant information.

Insight

Insight, also commonly referred to as the "aha!" moment, is a prominent concept in problem solving literature as denoting inspired creativity to find unusual solutions to problems (Dominowski, 1981). In social and clinical psychology contexts, the meaning of insight can be somewhat conflated with mindfulness, which enables a person to shift cognitive set by releasing attention away from mental attachments and becoming aware of other possible solutions (Garland et al., 2009). Garland and colleagues found support (n=17) for the role of mindfulness, as insight-based decentering, in positive reappraisal for a pilot study (Garland et al., 2009). The model of PCS is process-oriented, meaning that although there is a point at which a shift occurs there are identifiable markers within,

for example, a narrative that one can look for to determine whether a process leading to a PCS is transpiring. Just as chronic adversity is required as antecedent to PCS and an inability to easily manage the emotional, social, and practical sequalae from the adversity were expected to activate the construct, insight was also a marker expected to assist in identifying PCS, i.e., the shift from automated thinking to effortful thinking designed to produce novel solutions (Ash, Jee, & Wiley, 2012; Kahneman, 2011). Insight in PCS is conceptualized as occurring immediately prior to releasing attention away from prior attachments and shifting attention to new possible solutions (Ash et al., 2012; Dominowski, 1981). In a study that incorporated neuroimaging, Bowden and colleagues demonstrated through EEG readings that a dip occurred in mental processes immediately prior to participants reporting novel solutions to problems (Bowden, Jung-Beeman, Fleck, & Kounios, 2005). Certainly, there may be other explanations for the EEG result, but this interpretation was supported by evidence that participants were observed to deny knowledge of answers to problems, coming to an impasse, immediately prior to solving the problem (Bowden et al., 2005).

Relations of Cognitive Reappraisal and Positive Cognitive Shift to Adaptive Outcomes

Since PCS is conceptualized as a resilient variant of cognitive reappraisal, below is a brief review of empirical evidence supporting an association between cognitive reappraisal and adaptive outcomes. Where possible, studies focused on positive reappraisal, defined as focusing attention on positive aspects of an upsetting event (Garland et al., 2009; Shiota & Levenson, 2009).

Frequent Use of Cognitive Reappraisal

Cognitive reappraisal has frequently been studied as a trait or ability, gauged by self-reported frequency of use (e.g., Hopp, Troy, & Mauss, 2011) or through laboratory tests such as film clip ratings (e.g., Troy et al., 2010). Trait reappraisal has been associated with greater wellbeing, social adjustment, and lower depression symptoms for individuals who scored high in implicit valuing of emotion regulation, which was described as including unconscious goal pursuit and unconscious value placed on emotion-regulatory strategies and behaviors (Hopp et al., 2011). Troy and colleagues (Troy et al., 2010) found that individual differences in reappraisal ability moderated the association between stress and depression, with reappraisal behaving as a buffer. The study by Troy and colleagues underscores the need to distinguish between examination of state reappraisal and trait-like reappraisal ability, since reappraisal may behave differently at the state and trait levels.

Positive Cognitive Shift as Strategy and Ability. PCS was expected to operate, in general, as a strategy both generally (i.e., trait) and as an ability (i.e., state). The two aspects of PCS are not the same. A PCS general strategy reflects reframing one's identity with reference to a chronically stressful situation, while PCS ability refers to one's capacity to engage PCS when one needs to. Theoretically, greater capacity to engage PCS should be protective. It was, therefore, considered a *stress moderator* in the planned analyses. The operationalization of PCS is further described in Appendices C and D. PCS was coded from a single retrospective event in each participant's life, rather than from an instrument designed to capture reframing of situations during chronic stress.

Thus, an evaluator of such regressions must decide whether a qualitatively coded construct from a retrospective instrument captures an ability adequately, based on available evidence related to reappraisal ability theory and the evidence available from the coded construct and its validation.

Reappraisal and Cognitive Ability

Researchers believe that cognitive reappraisal relies on neural regions involved in cognitive control abilities such as cognitive set-shifting, working memory, and response inhibition (McRae, Jacobs, et al., 2012; Ochsner & Gross, 2005). As one ages, working memory is among the critical functions to measure because the ability to control attention in order to take in and manipulate information is important to completing tasks and other executive functions (Gevins & Smith, 2000). Reappraisal and working memory capacity were linked in a study of 89 community-based participants whose reappraisal ability was measured through a negative and neutral pictures task using the international affective pictures system and through the self-report Emotion Regulation Questionnaire (McRae, Jacobs, et al., 2012). The study measured reappraisal as the ability to successfully execute cognitive reappraisal. Working memory was assessed through a math task, set-shifting through a standard global/local task, and response inhibition through a Stroop test (Hedden & Yoon, 2006). Reappraisal ability was also associated with cognitive set-shifting and marginally associated with abstract reasoning, but a relation was not found with response inhibition (McRae, Jacobs, et al., 2012)

Working memory was related to the ability to reappraise disgusting images as neutral ones (Schmeichel, Volokhov, & Demaree, 2008). Andreotti and colleagues found

no association between working memory and reappraisal in their community sample of 124 undergraduates but found a modest correlation between working memory and cognitive restructuring, a construct that was correlated with reappraisal (Andreotti et al., 2013). The reappraisal items were not as robust as the cognitive restructuring items, suggesting that additional replication studies using sufficiently robust measures may be needed. Secondary control coping, which included cognitive restructuring, was also investigated in the study. Cognitive restructuring, though a coping construct, overlaps somewhat with cognitive reappraisal; cognitive restructuring was defined as one's attempts to reinterpret stressful events in more neutral or positive ways (Andreotti et al., 2013).

In a twin study of 2,386 male Vietnam-era twin veterans in which one twin was exposed to war trauma and a control twin was not, it was found that pre-exposure lower cognitive ability may be a marker for less adaptive post-exposure coping to potentially traumatic events (Kremen et al., 2007). The strength of association between pre-exposure lower cognitive ability and post-exposure coping remained similar after adjusting for potential confounders, including combat exposure, age at military entry, and having lower than high school education (Kremen et al., 2007). Although reappraisal was not specifically measured, the study highlights the importance of the issue of directionality of effects. One may, for example, be more likely to reappraise when one has higher cognitive ability, and reappraisal ability may also be predicted by cognitive ability.

Reappraisal and Psychological Well-being

In a study of 210 undergraduates, Gross and John (2003) found that participants self-reporting habitual use of reappraisal were more satisfied with life, had greater self-esteem, self-acceptance, clearer purpose in life, growth, mastery, and optimism. The frequent use of reappraisal also has been linked with general psychological well-being (Nezlek & Kuppens, 2008).

Reappraisal has also been linked to reduced negative symptoms (Troy et al., 2010). In a study that measured cognitive reappraisal ability using a behavioral challenge with 78 women aged 20 – 60 years, at high numbers of stressful events, the participants with high reappraisal ability exhibited fewer depressive symptoms than did those with low reappraisal ability (Troy et al., 2010). This suggests that reappraisal ability, viewed as an individual difference variable, may be an important moderator in the association between stressful events and depression.

Reappraisal and Affect

Older adults are more likely than younger adults to ignore negative information and pay attention to positive affective stimuli (Mather & Carstensen, 2005). Thus, while aging adults may demonstrate memory and attention deficits, there is often no corresponding impairment in emotional control or regulation. There is evidence that, in a roughly linear pattern, detached reappraisal ability – characterized by cognitively reducing one's negative experience and physiological reactivity – declines from youth through old age (Shiota & Levenson, 2009). However, the ability to positively reappraise a situation increases with age (Shiota & Levinson, 2009).

Use of cognitive reappraisal has been frequently linked to increased positive affect and reduced negative affect (Cutuli, 2014; Gross & John, 2003; McRae et al., 2009). There is also evidence that perceived defeat in completing the Remote Associates Test, a semantic retrieval task in which three cues are presented and a single target word has to be found, produced greater increases in sadness and negative affect for frequent reappraisers in an undergraduate (n = 120) sample (Johnson, Gooding, Wood, Taylor, & Tarrier, 2011). However, there was a question of whether acute or trait reappraisal or whether ruminativeness was being measured. In the aggregate, the empirical evidence supported the expectation that PCS, as an individual difference variable in the relationship between stressful life events and positive affect, should be linked to greater positive affect. In the relation between stressful life events and negative affect, PCS was expected to predict lower negative affect.

Does Positive Cognitive Shift Overlap with Other Psychological Constructs?

Because of its relation to reappraisal, PCS conceptually overlaps other psychological constructs that explain how we cope with stress. Appendix A highlights common constructs and theories that support them and how they relate to PCS. One point of differentiation between PCS and many of these constructs, as shown in Appendix A, is the focus of PCS on chronic stressors. Chronic stress, for purposes of this document, is defined as prolonged stress that may occur due to the nature of the stressor or because the stressor was ignored or not managed in a way that met the person's needs, resulting in additional stress. In general, chronic stress refers to ongoing situations that require additional coping. The constructs in Appendix A cross psychological disciplines and are

investigated through varying methodologies. For example, insight is commonly investigated through information processing laboratory paradigms (Ash et al., 2012; Dominowski, 1981), while research on emotion transformation is multi-method, using task analysis (Greenberg, 1986). What emerges from the cross-pollination of research is a different language describing similar ideas. Therefore, some of the cross-discipline constructs in Appendix A, Constructs Related to PCS, overlap with each other, as well as with PCS. A common theme among the constructs includes their embeddedness within larger theoretical processes; for example, cognitive change is positioned as a construct within the Emotion Regulation Model (Gross & Thompson, 2007).

CHAPTER 2

STATEMENT OF THE PROBLEM

Cognitive reappraisal has been associated with positive outcomes through the process of reinterpreting situation meaning and effectively modulating behavior through emotion regulation (Gross, 2002; Ochsner et al., 2004). Yet there is evidence that reappraisal, when it is used in response to controllable stress (Troy et al., 2013) or is used frequently with disappointing results (Hopp et al., 2011), can be unhelpful to emotion regulation and may produce negative psychological outcomes such as depression. Chronic or recurring adverse situations, such as chronic pain or domestic violence, have the potential to overwhelm resources (Seery, 2011). PCS, a variant of cognitive reappraisal, is a resilience construct with potential to add value to research because it may operate as a stress moderator in specific situations that challenge adaptation.

PCS was conceptualized as the transformation point in which an individual undergoing chronic stress redefines the situation in a way that alters the meaning and emotional salience of the situation, and similar future situations, for the individual. Key aspects of the PCS definition differentiating it from the broader reappraisal construct are: the aversiveness ascribed to the situation; situation chronicity; the directionality of the shift; and the requirement of insight experience.

CHAPTER 3

PURPOSE OF THE STUDY

This study drew on a community sample of middle-aged adults and utilized mixed methods to accomplish three main aims: (1) to investigate whether and how frequently PCS, a theoretical resilience-based variant of cognitive reappraisal, occurred in retrospective accounts of stressful life events; (2) to establish construct validity for PCS; and (3) to examine PCS as a moderator of the relations between stressful past year life events and health and wellbeing outcomes. The first aim was accomplished through theory-based coding of PCS in semi-structured telephone interviews. The second aim was addressed by examining the relations between PCS scores and self-report measures of similar and dissimilar constructs. The third aim was addressed by evaluating whether higher levels of PCS moderated the relations between stressful life and four health outcomes, reflecting resilient adaptation to adversity. The four outcomes were cognitive functioning, well-being, positive affect, and negative affect. It was hypothesized that the relations between the past year's stressful events and poor cognitive functioning, well-being, positive affect, and negative affect would be attenuated for those with high PCS ability versus those with low PCS ability.

CHAPTER 4

METHOD

Participants

The current study was based on a sample of 175 participants drawn from a community sample of 809 mid-aged (40 – 65 years of age) participants from a larger study ("parent study") of resilience in the metropolitan Phoenix area (NIA-R01 AG26006: Alex J. Zautra and John Hall, PIs). Participants in the parent study were recruited through purposive sampling strategies (Blankertz, 1998; Cook & Campbell, 1979) to 20 Census tracts selected for their representativeness of Maricopa County's population and with a goal of equal distribution of males and females. Inclusionary criteria for recruitment were: 40-65 years old, primary residence in Phoenix areas, and either English or Spanish speaking. Only one adult per household was recruited into the study. Exclusionary criteria were: physical, psychiatric, or cognitive impairments during initial recruitment contact, as measured by Mental Status Questionnaire (MSQ; Kahn & Miller, 1978).

Participants from the parent study sample were later recruited to participate in a separate follow up interview regarding mental and physical health (n = 582). The current study sample (n = 175) was drawn from among participants who participated in both the parent study and follow up study. While transcripts were generated for 226 of the 582 participants from both parts of the study, a sample of 175 was considered a reasonable balance between the needs for qualitative analysis and statistical power for the study (see data analysis section, below).

The sample of 175 adults in the current study had a mean age of 54.00 (*SD* = 6.82), was primarily female (54.9%), married (39.2%), and white (86%). On average, they reported an income of $50,001 - $100,000/year (33%) and had acquired 11 years of education.

Procedure

The study was approved by the Arizona State University Institutional Review Board. After being screened for eligibility, participants provided written informed consent for study participation. After consenting, participants were mailed self-report questionnaires regarding various domains of their lives (early life, current life, neighborhood, personality). Once questionnaires were completed, participants were interviewed by phone to assess their physical and mental health history.

During the phone interview, participants also underwent a semi-structured interview regarding their most stressful past event, which was used to derive the measure of PCS (described in Data Reduction and Analytic Approach section, below). This interview, which was audio-taped, asked participants to describe in detail the difficult event and any issues that arose as a result of the event, including problems with resources such as finances, family/ friends, work, spirituality, and health. Participants were asked whether any of these resources were helpful and what they learned from their attempts to cope with the difficult event. In addition, participants were asked to rate how well they handled they event, to what extent they recovered from the event, whether they were able to sustain their lives during the event, and whether they grew from the event. The format of the interview was largely open-ended, which allowed participants to determine what

the terms meant to them and use as much detail as they chose. Interviewers were able to prompt for additional information, using their judgment to gather additional details about timing of events, support systems, and coping efforts.

A home visit was also conducted to obtain biological samples and complete additional surveys (regarding substance use, cultural attitudes). Participants completing the questionnaire, home visit, and interview were paid $100 for their time. Twenty-five percent of the participants were randomly selected to complete daily diaries for 30 days and one- time laboratory visits. The diaries were kept on electronic tablets, and the data were downloaded for analysis during a follow-up home visit. Participants were compensated $3 per entry, up to $90.

A follow up phone interview assessment was approved by the Arizona State University Institutional Review Board in 2012. Parent study participants were contacted and re-consented to participate in the follow up phone interview. Inclusionary criteria required that a minimum of six months had transpired since a participant's last contact with the study. The time between completion of the last stage of the study and the follow-up phone interview ranged from six months to 4 years [M = 13.70 months, SD = 3.95]. Follow up data included: past year's stressful life events interview, cognitive ability by brief, telephone-based cognitive functioning assessment, and physical and psychological functioning outcomes through self-report. Participants were compensated $30 for participation in follow up interviews.

The current study used data from the parent study, including 1) the questionnaire assessment of personality and health behavior measures, 2) the semi-structured phone

interview about participants' most stressful life event (used to code for PCS), and 3) the follow up assessment of cognitive function, self-reported wellbeing items, positive affect, and negative affect.

Measures

All measures described below are presented in Appendix B.

Parent Study Measures

Past Year Stressor Events

Life experiences during the past year were measured by the Traumatic Stress Schedule for Past Year Events (TSS-Past Year; Carlson, 1997). The 10-item measure has a yes/no format and assesses domains such as loss (e.g., "In the past year, were you in a motor vehicle accident serious enough to cause injury to one or more passengers?"), threat and blame. Test-retest reliability has been reported at .88 for English and Spanish language versions of the TSS-Past Year (Carlson, 1997). Construct validity of the TSS-Past Year has been established by comparing the frequencies of events to those of purposive and random samples. Events were summed for analysis. Scores could range from 0 to 10, with higher numbers representing exposure to more stressful events over the past year.

Personality

The Big Five Inventory (John, Naumann, & Soto, 2008) assessed conscientiousness (9 items), openness (8 items), neuroticism (8 items), agreeableness (9 items), and extraversion (8 items). Items were rated on a 5-point scale, with responses ranging from "disagree strongly" (1) to "agree strongly" (5). In the current sample,

internal reliabilities were good for conscientiousness (α = .84), openness (α = .80), neuroticism (α = .84), extraversion (α = .86), and agreeableness (α = .78), and comparable to those reported in other samples (Soto, John, Gosling, & Potter, 2011). Items for each domain were summed to yield a total score (per domain), such that higher scores indicated higher levels of a trait.

Trait Hope

The Pathways subscale of the revised Trait Hope Scale (Snyder, Harris, Anderson, Holleran, & et al, 1991) was used to assess the goal appraisal facet hope (e.g., "I can think of many ways to get myself out of a jam"). Participants rate how true or false each of 18 statements is for them based an 8-point scale, ranging from "Definitely false" (1) to "Definitely true" (8). The pathways subscale showed good reliability in the current study sample (α = .85), similar to that observed in other samples (Snyder et al., 1991). Item ratings were summed to yield a total score; higher scores indicate higher levels of goal appraisal.

Attentional Control

Attentional control was measured by the Adult Temperament Questionnaire-Short Form- EC, a validated measure of adult temperament (Tortella-Feliu et al., 2013). The measure consists of five items that measure the subscale of attentional control, with seven response options ranging from "Extremely False" (1) to "Extremely True" (7). A sample item for attentional control is: "It is very hard for me to focus my attention when I am distressed." The present study sample reliability for the ATQ-EC attentional control subscale was adequate (α = .73) and comparable to that observed in others samples

(Tortella-Feliu et al., 2013). Items responses were summed and averaged, such that higher scores indicate poorer attentional control.

Physical Activity

The total activity score and sedentary activity were assessed in the current study via the 11-item International Physical Activity Questionnaire – Short Form (IPAQ-SF). This instrument was designed to measure physical activity in adults aged 15-69 years old in the domains of walking, moderate-intensity activity, and vigorous-intensity activity. Total activity scores were computed by summing the walking, moderate, and vigorous activity scores, which are based on MET-minutes per week. MET minutes are continuous variables that equal the amount of energy expended on physical activity (Lee, MacFarlane, Lam, & Stewart, 2011). The two items related to sitting or sedentary activity were also summed and analyzed separately from the total activity scores. Higher scores for total activity and sedentary activity represent higher levels of these behaviors. The testing protocol recommends reporting the sedentary data as median values and interquartile ranges. IPAQ-SF has consistently demonstrated a high reliability, ranging from 0.66 to 0.88 (Lee et al., 2011). The current study sample alpha coefficient for total physical activity ($\alpha = .45$) and inter-item correlation for sedentary activity ($r = .49$) were low.

Pain Interference

The Profile of Chronic Pain: Screen (PCP:S) contains a subscale that measures pain interference. The PCP:S was designed to survey pain severity, interference, and emotional status during the prior four weeks (Karoly, Ruehlman, Aiken, Todd, &

Newton, 2006). The survey was designed for administration via telephone, but its authors suggest that it may be appropriate for in person or self-administration with adults. The pain interference scale is comprised of five items, three of which were used in the present study. The items included in the study measured the interference of pain with enjoyable activities, responsibilities at home, and personal goals. Items were measured on an 8-point scale ranging from "Never" (0) to "Daily" (6), with an additional option of (7) indicating "DK/Refused." The average item score was computed to yield a mean item score, with higher scores reflecting higher pain interference. Internal reliability in the current study sample was good ($\alpha = .92$), similar to that observed in other samples (Karoly et al., 2006).

Growth (Lifetime)

Growth was measured twice, once in the parent study, and once in the followup study (described below). Growth over the lifetime was measured during the phone interview as growth in response to the most difficult event a person had ever experienced (Parent Study; Lifetime Growth measure). For the Parent Study, the instruction was, "I would like you to think about what we just talked about and the most stressful event you have experienced. Now, I'm going to ask you to recall what actually happened during that event and how you responded. I will be asking you some personal questions about this event." The item regarding personal growth asked, "To what extent were you able to learn from and grow stronger from this experience?" The 5-point scale ranged from "Not at all" (1) to "Extremely" (5). Higher scores indicate greater perception of lifetime growth following the most difficult stressful event of a participant's lifetime.

Hostility

Hostility was measured by a modified version of the Cook-Medley Hostility scale (Smith, Sanders, & Alexander, 1990). The modified measure consists of 5 items, each rated on a 5-point Likert scale ranging from "Disagree Strongly" (1) to "Agree Strongly" (5). The current study sample alpha coefficient for hostility was adequate ($\alpha = .74$), similar to that observed in other samples (Smith et al., 1990). Item responses were summed to yield a total score; higher scores indicate greater hostility.

Affect Intensity

Affect Intensity - Calm subscale was measured by the Affect Intensity Measure (AIM; Rubin et al, 2012), which asks participants to rate how often they typically react to situations with strong emotions. Eight of the original 20 items from the AIM were used in the current study. These items were selected based on an exploratory factor analysis of the parent study data to identify an affect intensity-calm subscale (Arewasikporn & Zautra, 2013). Each item was rated on a 6-point Likert scale ranging from "Never" (1) to "Always" (6). Sample items include, "I would characterize my happy moods as closer to contentment than to joy," and, "My emotions tend to be more intense than those of most people." The current study sample alpha coefficient for the affect intensity- calm subscale was adequate ($\alpha = .70$). Affect Intensity-Calm subscale questions were reverse coded, as needed, and summed to a total score. Higher scores indicate greater levels of calm.

Emotion Approach Coping

Emotion processing, or active attempts to acknowledge and understand emotions, was measured by select items of the Emotion Approach Coping scale (Stanton et al,

2000). The scale measures two domains, emotion processing and emotion expression. The original measure consists of 94 items, each rated on a 4-point Likert scale that ranged from "I don't do this at all" (1) to "I do this a lot" (4). A sample item is, "I take time to figure out what I'm really feeling." The parent study used a total of eight items drawn from the emotion processing and emotional expression subscales. The current study sample alpha coefficient for the emotion approach coping items ($\alpha = .88$) and the emotion processing subscale ($\alpha = .81$) were excellent. Ratings of items on each subscale were summed to yield total scores; higher scores indicate greater attempts to acknowledge and understand one's emotions.

Perceived Health and Pain

Perceived general health and pain were assessed via the General Health subscale (5 items) and the Bodily Pain (2 items) subscales of the 36-Item Short Form Survey (SF-36) (Ware & Sherbourne, 1992). Participants were given the SF-36 and asked in general how their health was on a 4-point scale, ranging from "Excellent" (1) to "Poor" (5), and were asked to rate how 4 true or false statements related to general health were on a 5-point scale, ranging from "Definitely true" (1) to "Definitely false"[1] (4), with options to indicate "Refused" (5) (Ware & Sherbourne, 1992). Participants were also asked two questions regarding how much bodily pain they had experienced during the past four weeks on a 6-point scale, ranging from "None" (1) to "Very Severe" (6), and how much pain had interfered with normal work, on a 5-point scale, ranging from "Not at all" (1) to

[1] Note that while the parent study's Spanish language questionnaires were missing the "Definitely false" option, this discrepancy does not affect the current study because the present study participants completed English language questionnaires.

"Extremely" (5) (Ware & Sherbourne, 1992). The current study sample alpha coefficients for the SF-36 General Health subscale (α = .81) and Bodily Pain subscale (α = .87) were good, and comparable to or better than those observed in other samples (Ware, Snow, Kosinski, & Gandek, 1993). The general health scale was reverse coded, and then items were summed such that higher scores indicated better health. The bodily pain scales were recoded to reflect a six-point scale and were summed such that higher numbers reflect greater bodily pain.

Follow Up Study Measures

Cognitive Function

Cognitive function was measured by the 13-item Modified Telephone Interview for Cognitive Status (TICS-M; Cook, Marsiske, & McCoy, 2009). Questions of orientation, calculation, repetition, and motor skills ("With your finger, tap five times on the part of the phone you are speaking into") were used to globally assess cognitive ability. The TICS-M has been previously validated with a high sensitivity in the detection of dementia but a low positive predictive value (Crooks, Clark, Petitti, Chui, & Chiu, 2005). TICS-M correctly classified 85.9% of participants into the mild cognitive impairment (MCI) diagnostic classification assigned by a neurologist, sensitivity = 82.4%, specificity = 87.0% (Cook, Marsiske, & McCoy, 2009). Higher summed scores denote higher cognitive function.

Well Being

Wellbeing was measured by the five-item World Health Organization Well Being Index (WHO-5; Bech, Olsen, Kjoller, & Rasmussen, 2003), a valid and reliable measure

(Newnham, Hooke, & Page, 2010). Items are rated on a 6-point scale ranging from "None of the Time" (1) to "All of the time" (6), with an additional option for "Refused" (7). The five-item measure has been shown to have good internal consistency (Cronbach's α = .91) The current study sample alpha coefficient for the WHO-5 Well Being Index was excellent (α = .90), and comparable to that observed in other samples (Newnham, Hooke, & Page, 2010). A mean item score was computed, with higher scores denoting higher wellbeing.

Positive and Negative Affect

Positive and negative affect were measured via the Positive and Negative Affect Schedule (PANAS). Participants were presented with 10 positive and 10 negative adjectives about mood at the present moment and asked to rate the extent to which they felt each mood on a 5-point scale, ranging from "Very Slightly/ Not At All" (1) to "Extremely" (5) (Watson, Clark, & Tellegen, 1988). The current study sample alpha coefficient for PANAS positive affect scale (α = .91) and for PANAS negative affect scale (α = .90) were excellent and comparable to those observed in other studies (Watson et al., 1988). Items within the subscales were summed and averaged such that higher scores reflected higher levels of that affect.

Growth (Six Months)

Growth (Six Months) was measured by one item in the Follow Up Study that paralleled the item that assessed lifetime growth in the parent study phone interview. The instruction was, "Think of the most stressful aspect of your life over the past six months, even if it may not have been very stressful." The item regarding growth for an event that

occurred during the prior six months asked, “To what extent were you able to learn from and grow stronger from this experience?” The 5-point scale ranged from “Not at all” (1) to “Extremely” (5). Higher scores indicate greater perception of growth following the most stressful event experienced during the prior six months.

Data Reduction and Analytic Approach

Interview Transcription and Coding

Interview data from the parent study recordings of the semi-structured interviews of stressful past events (n = 226) were transcribed verbatim. The recordings were randomly assigned for transcription to research assistants who were trained in the lab’s transcription protocol and use of the transcription technology.

Phase I: Qualitative Analysis

The purpose of Phase I was to perform theory-driven qualitative coding for PCS. Generally, this phase required data selection, team training in data coding, performance of the coding, and iterative data analysis as part of the qualitative analytical process (Miles, Huberman, & Saldaña, 2013).

Data Selection. Current study participants (*n* = 175) were randomly drawn from the pool of 226 available transcripts of English-speaking participants who participated in the parent and follow up studies. Randomization was performed using the Randomizer application at Random.org. Ten participants were dropped from an initial pool of 185 participants because the events they described were not chronic. Transcripts were examined to ensure that they represented complete interviews and that there were at least 12 minutes of interview data to review, which was suggestive of a minimally thorough

interview. Sixteen transcripts fell below the minimal time threshold, one transcript was incomplete, and one transcript was missing. In all, eighteen (18) transcripts were replaced because they did not meet minimal requirements. Each replacement was made from the remaining pool of available transcripts according to the original randomly generated order for the transcripts produced at Random.org. The decision to eliminate the transcripts of participants whose events were determined not to be chronic (n = 10) was made at the end of the coding process. No substitution of transcripts was made for these eliminated transcripts.

Coding Team Training. In addition to the graduate student in charge of the project, a small team of five research assistants was trained to code the semi-structured interview transcripts, making a total of six qualitative coders on the project. The research assistants were trained to qualitatively code with a codebook (see Appendix C) and scoring sheet (see Appendix D) by the graduate student researcher. Five transcripts were coded by the entire group to increase their coding reliability during their training period. All coding choices were discussed in detail to facilitate deep understanding of qualitative coding method and the codebook and to encourage challenges to the PCS construct's theoretical underpinnings in light of case scenarios presented by the narrative data. In other words, while the coding process was theoretically based (i.e., the codes were determined prior to the team's formation), the intention was to allow for the coding process to generate ongoing insights about the codes as they related to chronic events and PCS. Collecting data until no new data appear to alter one's idea about a construct is a sign of intellectual rigor in qualitative research (Miles, Huberman, & Saldaña, 2013).

Coding. The research assistants were randomly assigned transcripts to code. Twenty percent of the transcripts were coded by two coders to assess intercoder reliability. The coding team met regularly to discuss the coding process, concerns, and any codes that presented inconsistent or confusing patterns as they related to narratives. The coding process produced a quantifiable score for PCS on an anchored scale. The original scale ranged from (1) no evidence of PCS; (2) negative event was not self-relevant, (3) insight that change is needed and awareness of a mismatch between coping skills and stressors, (4) oscillatory shifting of awareness, and (5) PCS (which was a full shift based on mismatch, insight, self-relevance, and chronicity of event).

The coding team made several alterations to the initial set of codes. The first coding alteration was to participants coded as "emotional arousal only." In practical terms, all narratives portraying chronic events were emotionally arousing. This discovery was made early in the coding process, though it was not until about one-third of the way through the coding process that we understood how to apply the insight to scoring the construct. This required recoding transcripts coded up to that point. What was salient for purposes of PCS was whether the emotional arousal generated a positive or negative response from the participant. The coders called this phenomenon "positive arousal" if the stressors arising from the event did not spoil the participant's ability to see possibilities, such as resources for coping. The term "negative arousal" was used to describe an emotional state that blocked the participant's ability to cope in any way with the stressors arising from the event. Essentially, negative arousal was a block to PCS or even "coping as usual."

Insight, combined with arousal and use of coping, became crucial in the coding "1" or "2" against the newly defined and articulated criteria. In the new criteria, the narrative was coded as a "1" when the participant evidenced negative arousal and no use of coping. The narrative was coded as a "2" when the participant evidenced negative arousal, with some coping indicated but no clear indication of insight. The narrative was coded as a "3" when the participants evidenced 1) coping attempts that allowed them to move on despite marginally success, 2) engagement of coping skills that participants already knew how to employ, or 3) redemption narratives (McAdams & Bowman, 2001) with positive arousal and insight into mismatch of coping skills and stressors. The narrative was coded as a "4" when the participant evidenced transition in the direction of PCS without evidence in the narrative that a PCS was finally or actually achieved. These instances including those participants describing relatively recent events or those who were continuing to struggle with redefinition of situations. The narrative was coded as a "5," or full PCS, when the participant evidenced positive directionality of emotional arousal, which may otherwise be thought of as affect intensity (e.g., Larsen, Diener, & Emmons, 1986), as well as the ability to regulate emotion in order to redirect attention in the midst of chaos (e.g., Kahneman, 2011; Kahneman & Tversky, 1984). In addition, a complete PCS included insight into mismatch between existing coping skills and the stressors arising from the chronic situation such that the participant described redefining the situation giving rise to the stressor so as to reduce their chronic stress. Table 1 presents the final qualitative code classifications of PCS.

The PCS variable was analyzed to examine its distributional properties and relation to demographics, as well as to gain understanding of how each code correlated with other variables of interest in the narrative data (i.e., number of supportive people, number of coping methods employed, and the timing and duration of the event).

Table 1.

Positive Cognitive Shift Qualitative Coding (*N*=175).

Positive Cognitive Shift Code	*% of Sample*	*Definition*
1. Neg Arousal, No Resources	23.4%	The participant describes **recursive or chronic** events leading to alteration of how the situation is defined with reference to the person's self-identity with the event. Criteria for PCS include: • positive arousal, • recognition that existing resources are a mismatch to existing stressors, • insight about need for change, • reframing of identity with reference to situation.
2. Neg Arousal, Some Resources	10.3%	
3. Neutral or Pos. Arousal, Use of Resources, insight unclear	13.7%	
4. Pos. Arousal, Resources used but insufficient. mismatch clearly indicated, insight not clearly indicated	14.9%	
5. Pos. Arousal, Resources used but insufficient, mismatch clearly indicated, insight and reframing of identity with reference to situation clearly indicated	37.7%	

Interrater Reliability

The transcripts were coded by research assistants blind to the coding of other coders. Twenty percent of the transcripts were randomly assigned to two coders so that intercoder reliability, based on the coding of the PCS variable 1-5 scoring, could be measured. Cronbach's alpha was used to measure internal consistency ($\alpha = .87$) and an intraclass correlation based on coders' ratings of PCS from transcripts to parse within-

versus between-person variability in coding was examined based on the PCS variable. The intraclass correlation is presented in Table 2. Both indicators suggest that acceptable coding reliability was achieved. The average measures (ICC = .87, p<.01) indicator provides the reliability of a scale as the average of the two raters, while the single measures (ICC = .77, p< .01) indicator provides the reliability of a single rater, i.e., their mean.

Table 2.

Intraclass Correlation Coefficient.

	Intraclass Correlation[b]	*95% Confidence Interval*		*F Test with True Value 0*			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.77[a]	.63	.86	7.52	51	52	.00
Average Measures	.87[c]	.77	.92	7.52	51	52	.00

One-way mixed effects model where people effects are random.

a. The estimator is the same, whether the interaction effect is present or not.

b. Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.

c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

Phase II: Quantitative Data Analysis

Due to the mixed methods study design, the sample size was determined from balancing both quantitative and qualitative methodological priorities, i.e., balancing a need for statistical power with the time-intensive coding that multiple-case sampling requires. The sample size for the current study is based on a linear multiple regression, r^2 deviation model, using G*Power analysis and assuming medium effect sizes with 3 predictors (assuming the possibility of covariates), in anticipation of using past year

stressful events, positive cognitive shift, and education, an alpha level of 0.05, and power of 0.95. The power analysis suggested that a sample of 119 participants would be sufficient to detect medium effects. Thus, the current study was well-powered to detect effects of the expected magnitude.

Step 1: Descriptive Statistics/ Assumptions Validation

Data were analyzed for consistency with principal assumptions for multiple linear regression (Cohen et al., 2002). Scatterplots of residuals were generated to assess for deviation from assumptions of heteroscedasticity, linearity, and independence. Coefficient alphas were produced to estimate the internal consistency of the measures. Means and standard deviations were examined for all continuous variables, including whether measures are normally distributed as judged by skewness and kurtosis. Histograms were used to examine normality of study variables. Frequencies were also examined to investigate how common PCS was in the stressful past event interviews. PCS intercorrelations with demographics were examined to determine whether it occurred more commonly among any groups. An ANOVA was run to compare the prevalence of PCS with type of stressor events described in the narratives.

Step 2: Convergent and Discriminant Validities

To test convergent validity in the proposed study, correlations were examined between PCS and conscientiousness, openness, trait hope-pathways, attentional control, and growth (past six months and lifetime), as well as neuroticism and hostility. To examine discriminant validity, correlations were examined between PCS and constructs that positive shift was not expected to share significant variance with. The constructs

selected for analysis were extraversion, agreeableness, bodily pain, general health, time spent in sedentary activity, and total activity. Based on the qualitative coding process, two additional variables were selected for exploratory post hoc analysis: affect intensity-calm and emotion approach coping – processing.

Step 3: Multiple Linear Regressions

PCS was expected to moderate the relations of the past year's stressful events to each of four outcomes: cognitive functioning, positive affect, negative affect, and well-being. Specifically, the relations between stressful events and poor outcomes were expected to be attenuated for those with high PCS versus those with low PCS. The following is a sample model estimation for the first model, indicating the moderation of PCS ability on the relationship of past year's stressful events and cognitive functioning.

$$Cognitive\ functioning = B_0 + B_1 YrEvts + B_2 PosCogShft + B_3(YrEvts * PosCogShft) + \varepsilon$$

The equation represents the change in slope of cognitive functioning on past year's stressful events, given a unit change in PCS, as represented by B_3. The interpretation of B_3 may also be made such that it also represents the change in slope of cognitive functioning on PCS (as a stress moderator), given a unit change in past year's stressful events.

The independent variable and moderator were centered prior to forming interaction terms, as previously noted (Cohen et al., 2002). Moderation was tested by forming product terms using the past year's stressful events (TSS-Year) and PCS variables and estimating the increment in variance explained by the product terms after the lower-order terms that the interaction term is comprised of have been controlled for.

All moderation analyses were run in both Model 1 of the PROCESS macro (Version 2.16.2) for SPSS (e.g., Ali, Seitz-Brown, & Daughters, 2015; Hayes, 2013) and SPSS Linear Regression syntax. This was necessary because traditional linear regression syntax provided the necessary scatterplots and calculated values to make determinations about outliers, leverage, influence, and independence of data. The PROCESS macro provided a double-check on the regression coefficients, since the results should be the same if the operations were performed correctly, and also provided two estimates of effects when a moderated effect is found.

Of note, PCS was being used as a stress moderator signifying an ability to use PCS under stress. The PROCESS macro is well-known for its use of bootstrapping by default with 5,000 iterations to determine a 95% confidence interval for each unstandardized regression coefficient and for confidence intervals of indirect effects; however, it should be noted that bootstrapping does not operate on moderation-only models such as Model 1 in PROCESS (Hayes, 2015).

The first estimated effect is simple slopes, with the default method estimating conditional effects at the sample mean of the moderator and at one standard deviation above the moderator mean and at one standard deviation below the moderator mean. This standard deviation method for simple slopes is consistent with the method traditionally recommended for probing interactions (e.g., Cohen, Cohen, West, & Aiken, 2002). The macro produces the syntax for generating a graphic representation of the slopes, which are the graphics used for this project.

In addition, PROCESS produces values on the moderator at which the effect of the focal predictor (past year stressful events) on the outcome transitions from being statistically significant to not statistically significant, using the α-level (0.05 by default) of significance as the criterion (Hayes & Matthes, 2009; Hayes & Montoya, 2017). This Johnson-Neyman technique produces a table of confidence intervals that assist in identifying the regions of significance for the moderator. Graphics based on the regions of significance are produced using CAHOST version 1.0, an Excel workbook macro created by researchers for Johnson-Neyman multiple regression interactions (Carden, Holtzman, & Strube, 2017). In the results presented throughout this document, lower level confidence intervals (LLCI) and upper level confidence intervals (ULCI) are reported. In spite in the increasingly wide use of PROCESS in current literature for moderation analyses (e.g., Ali, Seitz-Brown, & Daughters, 2015; Klaczynski, 2014; Norman, Moreau, Welker, & Carré, 2015), SPSS syntax was used to confirm the accuracy of the simple slopes generated by the PROCESS macro for one interaction prior to proceeding with the remaining analyses. The accuracy was confirmed through analysis of generated standard deviations, *t* test, and *p*-values. Although no exact standards for accuracy were set in advance, it was generally expected that positive values above 1, for example, should remain above 1. A significant *p*-value should remain at the same level of significance. The Johnson-Neyman regions of significance were examined for all significant interactions during post hoc analyses.

PROCESS model 1 performs the moderation model in the form $\hat{Y} = i_1 + b_1X + b_2M + b_3XM,$ in which X's effect on Y and the influence of M on X's effect on Y is

constrained to be linear. Significant interactions were analyzed with PROCESS for SPSS. Interactions were probed using simple slopes of the dependent variable on past year stressful events at standard deviations above or below the mean of PCS. Regions of significance are recommended by Preacher and Hayes to probe significant interactions because the output provide the full range of continuous values for the effect of PCS, along with 95% confidence intervals through the Johnson Neyman approach (Preacher, Curran, & Bauer, 2006). Notably, Johnson Neyman relies on traditional null hypothesis testing logic and produces confidence bands, which are recommended as an adjunct to or in place of hypothesis tests (Preacher et al, 2006; Wilkinson & APA Task Force, 1999). In compliance with this scientific evolution, both simple slopes and regions of significance are presented for significant interactions. The graphics for regions of significance were produced using CAHOST version 1.0, an Excel workbook designed by researchers for facilitating Johnson-Neyman multiple regression interaction graphics (Carden et al, 2017).

Regression Diagnostics. Five participants (Participant IDs 1846, 1835, 1728, 1948, 1775) consistently produced high leverage values, as measured by Mahalanobis Distance (range 15.68 to 42.27), which an analysis of raw data confirmed was due to high endorsement of past year traumatic events relative to the remaining sample and receiving either a "5" or "1" on the PCS scale. Leverage value was also analyzed for extremity on the independent variables and, using a cutoff of 3(k+1)/n (Cohen et al, 2003), there were frequently five or more participants with high leverage values. Cooks distance was calculated to detect influential observations measured as aggregate change if a case was

omitted from an estimate, such that values above the *F* distribution value for α=.50 were considered problematic (Cohen et al, 2003). DFFITS and DFBETAS were analyzed for influential change if a case was omitted from the estimate, using ±1 as a benchmark for removing cases (Cohen et al, 2003). Studentized residuals were analyzed for discrepancy from the regression line. Means and their standard errors were analyzed with confidence intervals to examine the data distribution. Durbin-Watson was analyzed for independence of observations. Discussion of the basis for any outlier exclusion is included within the description of the results of each hypothesis. Results of analyses with and without outlier exclusions are reported.

Covariate Selection. The impact of potentially confounding variables was assessed for each analysis, taking into account prior established risk factors and biological mechanisms for the outcomes of interest. Based on findings in the literature, a covariate was included in a model based on its independent association with the predictor and outcome at $p < .05$. Only education correlated with both PCS and an outcome of interest, cognitive functioning.

Exploratory Analyses. In addition to examining the main effects of past year stressful events and moderating effects of PCS ability on health and well-being outcomes, exploratory analyses were performed based on hypotheses generated through the qualitative data analyses. Specifically, the association between PCS and affect intensity-calm and emotion approach coping-processing variables were explored based on findings in the qualitative phase of the study.

CHAPTER 5

RESULTS

Preliminary Analyses

Table 3 depicts the intercorrelations of PCS with demographic variables. PCS was related to education (r = .17, p < .05), but was unrelated to income, age, race/ ethnicity, marital status, and gender (rs < |.13|, ns).

Table 3.

Intercorrelations of Positive Cognitive Shift with Demographics.

Measures		*1*	*2*	*3*	*4*	*5*	*6*	*7*
1.Positive Cognitive Shift	Corr.	1.00	-.13	.17*	.09	.08	-.04	.04
	Sig.	-	.09	.03	.25	.29	.65	.58
	N	175	175	175	175	167	171	175
2.Gender	Corr.		1.00	-.09	-.05	.12	-.11	.17*
	Sig.		-	.24	.53	.12	.16	.11
	N		175	173	175	167	171	175
3.Education	Corr.			1.00	.149	.22**	.06	.02
	Sig.			-	.051	.01	.43	.77
	N			173	173	165	169	173
4.Age	Corr.				1.00	-.02	.05	-.04
	Sig.				-	.78	.52	.61
	N				175	167	171	173
5.Income	Corr.					1.00	-.39**	-.065
	Sig.					-	.01	.40
	N					167	167	167
6.Marital status	Corr.						1.00	.05
	Sig.						-	.55
	N						171	171
7.Race/ Ethnicity	Corr.							1.00
	Sig.							-
	N							175

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

Sample Characteristics

The sample (n = 175) was primarily female (54.9%), entirely English speaking (100%), and predominantly White (86%). A small percentage identified as Hispanic (13%) or Native American (18%). Participants were permitted to identify as multiple races and ethnicities. The educational composition if the sample was split between those

with 2-8 years of education (38.7%), 9 -12 years with no diploma (12.7%), high school diploma (17.3%), and college degree or higher (31.3%). Income was also split between those earning $0-$50,000 (47.4%), $50,001-$100,000 (33%), and $150,001 or higher (19.6%). Participants were most likely to be married (39.2%) or divorced/ separated (32.2%). Participants were unevenly represented across age groups: 40-50 (31.5%); 51-60 (47.5%); 61-65 (21.0), with a mean age of 54 (SD=6.82).

Descriptives

Positive Cognitive Shift. The means, standard deviations, ranges, skewness, kurtosis, and distribution information for the variables derived from the coded transcripts are presented in Table 4. Slightly over half of the sample were divided between those identified as either experiencing a PCS (37.7%) in response to chronic stress, or as experiencing chronic stress not requiring PCS to cope (13.7%) because their existing coping repertoire appeared well-matched to the situation or they maintained positive wellbeing in spite of unsuccessful coping attempts. The remaining sample was split between (1) participants whose chronic stressors resulted in negative arousal with an inability to use coping resources or social supports (23.4%) despite need, (2) those that were in a negative state of arousal but nonetheless attempted to cope with their chronic circumstances using existing skills and social supports (10.3%), and (3) participants that appeared on the "cusp" of a PCS, i.e. in a transitional state in which they indicated some insight or preparation leading to PCS (14.9%). On average, the sample reported relying on two to three close relationships for support during stressful events and attempting three to four different ways to cope with the difficulties arising from stressors.

Table 4.

Descriptive Statistics of Variables Coded from the Transcripts (*N*=175).

Measures	*Mean (SE) or %*	*Standard Deviation*	*Range*	*Skewness (SE)*	*Kurtosis (SE)*
PCS	3.33 (.12)	1.61	1-5	-.34 (.18)	-1.48 (.37)
1- Neg Arous, No Coping	23.4%				
2- Neg Arous, Some Coping	10.3%				
3- Neut/ Pos Arous, Some Coping	13.7%				
4- Transition to Pos Cog Shift	14.9%				
5- Pos Cog Shift	37.7%				
Event Categories (for narratives)			1-9		
(1) Accident	5.7%				
(2) Family Stress	15.4%				
(3) Job Loss/ Stress	5.7%				
(4) Financial Events	4.6%				
(5) Divorce	10.9%				
(6) Addiction/ Legal	6.3%				
(7) Grief	27.4%				
(8) Illness/ Health	9.7%				
(9) Trauma	14.3%				
Timing of Event*	3.63 (.12)	1.56	1-6	-.26 (.19)	-1.15 (.37)
(1) Within 1 year	11.7%				
(2) Within 5 years	18.7%				
(3) 5-10 years	11.1%				
(4) 10-20 years	21.6%				
(5) 20+ years	27.5%				
(6) Event occurred in childhood (before 18 years)	9.4%				
Event Duration	3.26 (.11)	1.47	1-5	-.33 (.18)	-1.28 (.37)
(1) Event brief	20.0%				
(2) 1 month to 6 months	11.4%				
(3) 6 months to 1 year	17.7%				
(4) 1 – 5 years	24.0%				
(5) 5+ years	26.9%				
Supportive People** (count)	2.16 (.08)	1.06	1-5	-.18 (.19)	-.39 (.37)
Coping Methods Attempted*** (count)	3.49 (.14)	1.80	1-9	.64 (.19)	.38 (.37)

* Timing of event missing four cases (n=171)
** Number of supportive people missing three cases (n=172)
*** Number of coping methods missing 8 cases (n=167)

Relation Between Stressful Event Categories and Positive Cognitive Shift. A one-way analysis of variance was conducted on the relation of stressful event type (coded into 9 categories; See Table 5) and PCS. A significant effect of stressful events on PCS was

found [F (8, 165) = 2.16, p = .03]. However, post hoc analyses comparisons conducted to identify differences in PCS between event types indicated no significant differences. Mean scores for the sample indicated that the highest level of PCS was associated with addiction (M = 4.45, SD = 1.21), whereas the lowest was associated with accidents (M = 2.70, SD = 1.16).

Self-report and phone interview variables. Table 5 depicts the means, standard deviations, ranges, skewness and kurtosis information for the variables derived from self-report questionnaires and phone interview. Variables were normally distributed with the exception of total physical activity, which was highly kurtotic. A natural log transformation was performed on the variable, and the data for both are presented in the table for reference. The log-transformed variable was used for correlations.

Table 5.

Descriptive Statistics of Variables from Questionnaires and Phone Interview (N=175).

Measures	*Mean (SE) or %*	*Standard Deviation*	*Range*	*Alpha*	*Skewness (SE)*	*Kurtosis (SE)*
Conscientiousness	35.43 (.51)	6.69	16-45	.84	-.67 (.18)	-.05 (.37)
Openness	37.73 (.53)	6.94	15-50	.80	-.46 (.18)	. 04 (.37)
Neuroticism	22.26 (.53)	7.04	8-40	.74	-.05 (.18)	-.68 (.37)
Extraversion	26.18 (.55)	7.31	8-56	.86	.14 (.18)	.78 (.37)
Agreeableness	35.78 (.45)	6.01	19-45	.78	-.38 (.18)	-.56 (.37)
ATQ- Attentional Control	4.83 (.09)	1.19	2-7	.73	-.36 (.18)	-.53 (.37)
Hostility	3.025 (.07)	0.87	1-5	.74	-.21 (.18)	-.35 (.37)
SF36- Bodily Pain	8.481 (.20)	2.66	2-12	.87	-.56 (.18)	-.34 (.37)
SF36- General Health	3.674 (.07)	0.97	1-5	.81	-.62 (.18)	-.47 (.37)
IPAQ-SF Sedentary*	432.41 (16.85)	222.24	60-1440	.05	1.17 (.18)	2.31 (.37)
IPAQ-SF Total activity*	4156.82 (407.01)	5368.79	1-36720.	.45	3.20 (.18)	13.67 (.37)
IPAQ-SF Total activity* (with log transformation)	3.265 (.058)	.766	1-5	^	-2.23(.18)	7.58 (.37)
Growth (Lifetime)**	4.02 (.08)	1.08	1-5	^	-1.10 (.19)	.54 (.37)
Trait Hope – Pathways**	6.08 (.09)	1.22	2-8	.85	-.45 (.19)	-.11 (.37)
Stressful Life Events– Year	.25 (.05)	.59	0-3	^	2.56 (.18)	6.47 (.37)
0	81.7%					
1	12.6%					
2	4.6%					
3	1.1%					
4-10	0.0%					

* Sedentary activity and Total activity are missing one case (n=174). Total activity with log transformation used for correlations.
**Trait hope – pathways and Personal Growth are missing two cases (n=173)
^ Alphas were not run for variables that consisted of single items, counts, or were log transformations of original variables.

Table 6 depicts the means, standard deviations, ranges, skewness and kurtosis information for the variables derived from the follow up telephone interview. Variables were normally distributed. Past year stressful life events were relatively low for the sample, with 81.7% reporting zero stressful life events in the past year during the follow up interview.

Table 6.

Descriptive Statistics of Variables from Follow Up Phone Interview (N=140).

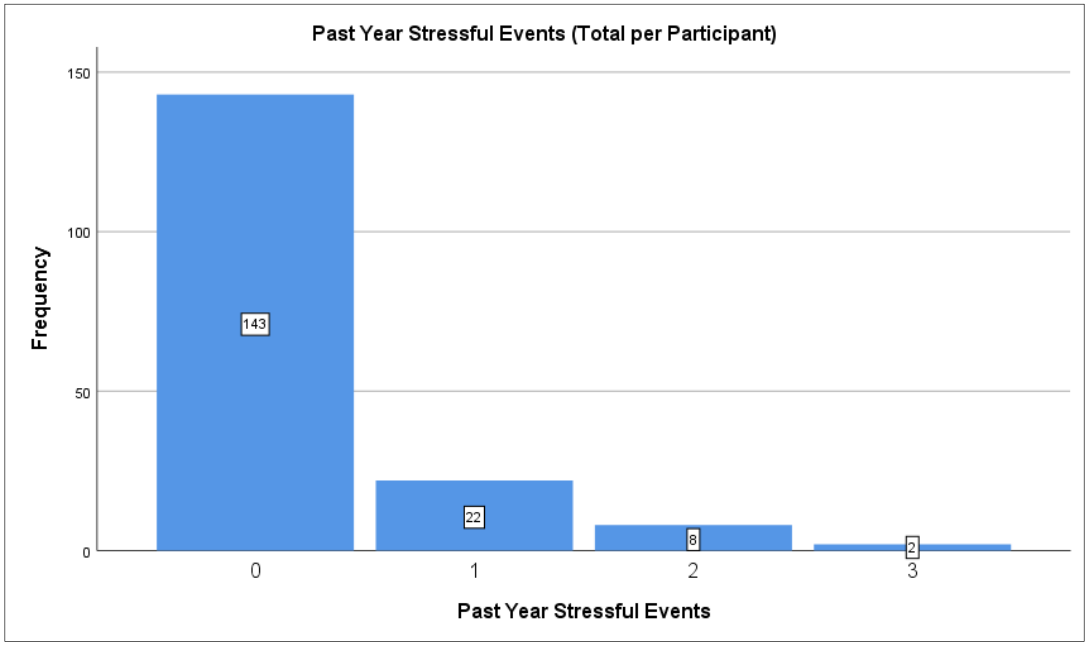
Measures	*Mean (SE) or %*	*Standard Deviation*	*Range*	*Alpha*	*Skewness (SE)*	*Kurtosis (SE)*
Growth (Past 6 Months)	3.71 (.09)	1.07	1-5	^	-.75 (.21)	.08 (.41)
TICS-M	34.16 (.25)	2.97	23-40	.31	-.82 (.21)	.92 (.41)
WHO Well-Being	3.84 (.10)	1.20	1-6	.90	-.44 (.21)	-.94 (.41)
Positive Affect	3.34 (.07)	.79	1-5	.91	-.59 (.21)	-.04 (.41)
Negative Affect	.21 (.01)	.15	1-4	.90	.60 (.21)	-.18 (.41)

^ Alphas were not run for variables that consisted of single items or counts.

Figure 2 presents the distribution of stressful life events in the current study taken from the Traumatic Stress Schedule (Year).

Figure 2.

Distribution of Stressful Life Events per Participant.



Correlations Between Positive Cognitive Shift and Conceptually Related Measures

Table 7 presents intercorrelations of PCS with measures of constructs hypothesized as convergent with PCS (i.e., conscientiousness, openness, neuroticism, the

pathways subscale of trait hope, attentional control, and perception of growth). PCS was significantly correlated with openness (p <.05) and lifetime personal growth (p< .01).

Table 7.

Intercorrelations of Positive Cognitive Shift with Hypothesized Convergent Variables.

Measures		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.Positive Cognitive Shift	Corr.	1.00	.09	.03	.15*	.01	-.02	-.09	-.00	.29*
	Sig.	-	.23	.65	.05	.86	.80	.26	.96	.00
	N	175	175	175	175	173	175	174	139	173
2.Neuroti-cism	Corr.		1.00	-.43**	.53**	-.53**	-.54**	-.12	-.15	-.04
	Sig.		-	.00	.00	.00	.00	.11	.09	.61
	N		175	175	175	173	175	175	139	173
3.Consci-entious-ness	Corr.			1.00	.26**	.55**	.56**	-.22**	.23**	.21*
	Sig.			-	.01	.01	.01	.01	.01	.01
	N			175	175	173	175	174	139	173
4.Open-ness	Corr.				1.00	.41**	.14	-.12	.14	.18*
	Sig.				-	.00	.07	.11	.10	.02
	N				175	173	175	174	139	173
5.Trait Hope - Pathways	Corr.					1.00	.59**	-.32**	.34**	.09
	Sig.					-	.00	.01	.00	.22
	N					173	173	172	138	173
6.Attent-ional Control	Corr.						1.00	-.26**	.25**	.00
	Sig.						-	.01	.00	.97
	N						175	174	139	173
7.Hostili-ty	Corr.							1.00	-.08	-.08
	Sig.							-	.34	.30
	N							174	138	174
8.Growth, Past 6 Months Event	Corr.								1.00	25**
	Sig.								-	.00
	N								139	138
9.Growth, Lifetime Event	Corr.									1.00
	Sig.									-
	N									173

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Exploratory Analyses. Mixed methods allows problem-centered or pragmatic strategies of inquiry in data analysis, given the nature of data collection from both emerging and predetermined methods (Creswell, 2003). Coding PCS generated additional constructions on the code meanings that led to exploratory analyses of constructs for theoretical alignment with PCS. Based on the qualitative coding, two additional variables were selected for exploratory analysis that reflect emotion processing and the calm aspects of positive affect intensity. These variables were selected because

coders noted the importance of participants' ability to modulate emotions in the narratives when handling difficult events. Those who experience intense emotional states tend to catastrophize or generalize issues and can become less effective in the midst of the feeling while those able to modulate that intensity may have more positive outcomes (Rubin et al, 2012). Table 8 contains the descriptive statistics for emotion processing and affect intensity – calm and Table 9 the intercorrelations of PCS with Affect Intensity – calm and Emotion Approach Coping.

Table 8.

Exploratory Convergent Variable Characteristics (N=175).

Measures	*Mean (SE) or %*	*Standard Deviation*	*Range*	*Skewness (SE)*	*Kurtosis (SE)*
Affect Intensity - Calm	2.911 (.065)	.857	1-6	. 074 (.184)	-.100 (.365)
Emotion Approach Coping - Processing	12.47 (.193)	2.546	5-16	-.620 (.184)	.048 (.366)

N=174.

The correlational analysis indicated a significant relationship between PCS and affect intensity – calm (r = .19).

Table 9.

Intercorrelations of Positive Cognitive Shift with Exploratory Convergent Variables.

Measures		*1*	*2*	*3*
1.Positive Cognitive Shift	Corr.	1.00	.19*	.07
	Sig.	-	.01	.37
	N	175	175	174
2.Affect Intensity - Calm	Corr.		1.00	-.05
	Sig.		-	.49
	N		175	174
3.Emotion Approach Coping - Processing	Corr.			1.00
	Sig.			-
	N			174

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Correlations Between Positive Cognitive Shift and Conceptually Unrelated Measures

Intercorrelations of variables hypothesized as discriminant (uncorrelated) with PCS are presented in Table 10. The constructs tested included extroversion, agreeableness, bodily pain, general health, sitting/ sedentary activity, and total activity. As expected, there were no significant correlations between PCS and any of these variables.

Table 10.

Intercorrelations of Positive Cognitive Shift with Hypothesized Discriminant Variables.

Measures		*1*	*2*	*3*	*4*	*5*	*6*	*7*
1.Positive Cognitive Shift	Corr.	1.00	.09	.00	.10	-.02	.12	.01
	Sig.	-	.25	.99	.17	.81	.11	.87
	N	175	175	175	175	175	174	174
2.Extroversion	Corr.		1.00	-.18*	.15*	.24**	-.22**	.23**
	Sig.		-	.02	.05	.00	.00	.00
	N		175	175	175	175	174	174
3.Agreeable-ness	Corr.			1.00	.15*	.15	-.11	.06
	Sig.			-	.04	.05	.15	.47
	N			175	175	175	174	174
4.SF36 - Bodily Pain	Corr.				1.00	.56**	-.19*	.06
	Sig.				-	.00	.01	.42
	N				175	175	174	174
5.SF36 – General Health	Corr.					1.00	-.12	.00
	Sig.					-	.13	.99
	N					175	174	174
6.International Physical Activity Questionnaire - Sedentary activity	Corr.						1.00	-.37**
	Sig.						-	.00
	N						174	173
7.International Physical Activity Questionnaire -Total activity	Corr.							1.00
	Sig.							-
	N							174

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

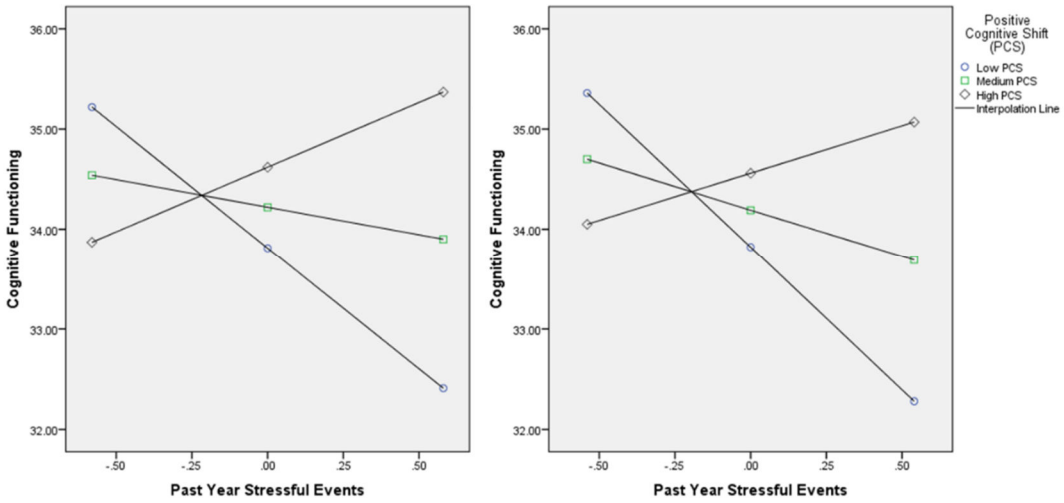
Positive Cognitive Shift, Events, and Their Interaction Predicting Cognitive Functioning, Well-Being, and Affect

The main study hypotheses were tested with regression models that included PCS, negative life events, and their interaction in the prediction of each of the four outcomes: cognitive functioning, well-being, positive affect, and negative affect.

Hypothesis 1. The first hypothesis predicted that PCS, as an ability, would moderate the relation between previous year's stressful events and subsequent cognitive functioning. For the model predicting cognitive functioning, there were no main effects of past year stressful events (t = -.91, p = .36) or PCS (t = 1.65, p = .10), but the interaction term was significant, (t = 4.98, p = .01). (See Table 11, left side of table for results.) Thus, PCS ability moderates the relationship between past year stressful events and cognitive functioning. Figure 3 below presents the simple slopes of the findings, with the full sample (n=140) on the left side and the sample with an outlier omitted (n=139) on the right side of the figure. The analysis of regression diagnostics follows below.

Figure 3.

Simple Slopes of Cognitive Functioning on Past Year Stressful Events at Low, Medium and High Values of Positive Cognitive Shift, With Full Sample (Left, n=140) and Outliers Excluded (Right, n = 139).



Casewise diagnostics and an analysis of scatterplots confirmed suspected influence of one outlier.[2] The analysis was rerun excluding the outlier and findings are presented on the right side of Table 11 below. There were non-significant main effects of past year stressful events (t = -1.80, p = .07) and PCS (t = 1.50, p = .14), but the interaction was still significant, (t = 5.08, p = .01). Thus, with the outlier removed from the analysis, PCS ability moderated the relation between past year stressful events and cognitive functioning.

[2] Participant 1948 considered as a candidate outlier indicated extreme scores in all variables, including high cognitive functioning scores, high past year stressful events relative to other participants, and low positive cognitive shift.

Table 11.

Findings of Regression Analyses for Hypothesis 1 With Past Year Stressful Events, Positive Cognitive Shift, and Their Interaction as Predictors of Cognitive Functioning.

	With Outlier		Without Outliers	
Model 1	**(N=140)**		**(N=139)**	
Predictors	***B***	**SE**	***B***	**SE**
Constant	34.22	.24	34.19	.23
Stressful Events	-.55	.60	-.94	.52
Positive Cognitive Shift (PCS)	.26	.16	.24	.16
Events X PCS	1.19**	.24	1.22**	.24
R^2	.11		.11	
F for R^2	24.81**		25.82**	

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

Simple slopes analysis was performed on the data with outlier removed (*N*=139), and findings are presented in Figure 1. The analysis yielded non-significant results when past year stressful events were regressed at one standard deviation above (t = 1.63, p = .10, LLCI= -.20, ULCI= 2.10) but significant results when regressed at one standard deviation below the mean (t = -4.08, p = .01, LLCI= -4.26, ULCI= -1.48) of PCS. As noted, the regression analysis tested the relation between cognitive functioning and past year stressful events at one standard deviation below the mean of PCS, at the mean of cognitive shift, and at one standard deviation above the mean of PCS.

To control for other factors that may explain cognitive functioning, the analysis was re-run controlling for education (see Table 12). Including this covariate did not alter the pattern of findings.

Table 12.

Findings of Regression Analyses for Hypothesis 1: Past Year Stressful Events, Positive Cognitive Shift, Their Interaction, and Education Covariate as Predictors of Cognitive Functioning.

Model 1	***(N=137)***	
Predictors	***B***	**SE**
Constant	33.13	.54
Stressful Events	-.61	.56
Positive Cognitive Shift (PCS)	.18	.16
Events X PCS	1.12**	.24
Education	.26*	.12
R^2	.09	
F for R^2	20.92**	

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

Regions of Significance. The regions of significance were explored using the Johnson Neyman technique. The variables in the model were the dependent variable (cognitive functioning), independent variable (past year stressful events), and moderator (PCS). The moderator value and the conditional effect of the past year's stressful events on cognitive functioning across levels of the moderator, PCS, is shown in Table 13.

Table 13.

Regions of Significance for Hypothesis 1: The Adjusted Effect of Past Year Stressful Events on Cognitive Functioning Across Levels of Positive Cognitive Shift.

POS COG SHIFT	Effect	se	t	p	LLCI	ULCI
-2.45	-3.95	0.86	-4.58	0.01	-5.65	-2.24
-2.25	-3.70	0.82	-4.49	0.01	-5.33	-2.07
-2.05	-3.46	0.79	-4.39	0.01	-5.01	-1.90
-1.85	-3.21	0.75	-4.28	0.01	-4.70	-1.73
-1.65	-2.97	0.72	-4.14	0.01	-4.38	-1.55
-1.45	-2.72	0.68	-3.98	0.01	-4.07	-1.37
-1.25	-2.48	0.65	-3.80	0.01	-3.77	-1.19
-1.05	-2.23	0.62	-3.58	0.01	-3.47	-1.00
-0.85	-1.99	0.60	-3.32	0.01	-3.17	-0.81
-0.65	-1.74	0.58	-3.03	0.01	-2.88	-0.61
-0.45	-1.50	0.56	-2.70	0.01	-2.60	-0.40
-0.25	-1.25	0.54	-2.33	0.02	-2.32	-0.19
-0.08	-1.04	0.53	-1.98	0.05	-2.09	0.01
-0.05	-1.01	0.53	-1.92	0.06	-2.05	0.03
0.15	-0.76	0.52	-1.48	0.14	-1.79	0.26
0.35	-0.52	0.51	-1.01	0.31	-1.54	0.50
0.55	-0.27	0.51	-0.53	0.59	-1.29	0.74
0.75	-0.03	0.52	-0.06	0.95	-1.06	1.00
0.95	0.21	0.53	0.41	0.69	-0.83	1.26
1.15	0.46	0.54	0.85	0.40	-0.61	1.53
1.35	0.70	0.56	1.26	0.21	-0.40	1.81
1.55	0.95	0.58	1.63	0.10	-0.20	2.10

The plot in Figure 4 provides the benefit of using the Johnson-Neyman procedure, which is the confidence bands around "Stressful Events_*B*" such that one can understand the values (i.e., regions) of PCS in which the effect of past year stressful events on cognitive functioning are meaningful. These are areas in which the confidence bands do not include the possibility of Stressful Events_*B*=0. Where the confidence bands include the possibility of crossing zero, the effect is not likely to be meaningful. The plot

presented in Figure 4 has been modified to clarify the regions of significance. The X-axis presents a continuous range of the moderator, PCS. The Y-axis presents a continuous range of values representing the adjusted effect of past year stressful events on cognitive functioning (Stressful Events_*B*). The straight plot line represents values of the adjusted effect ("Stressful Events_*B*") that correspond to the range of all continuous values of PCS in the model. The curved lines above and below the straight line are the 95% confidence bands.

Figure 4.

Johnson-Neyman Plot of Adjusted Effect of Past Year Stressful Events on Cognitive Functioning Across Levels of Positive Cognitive Shift.

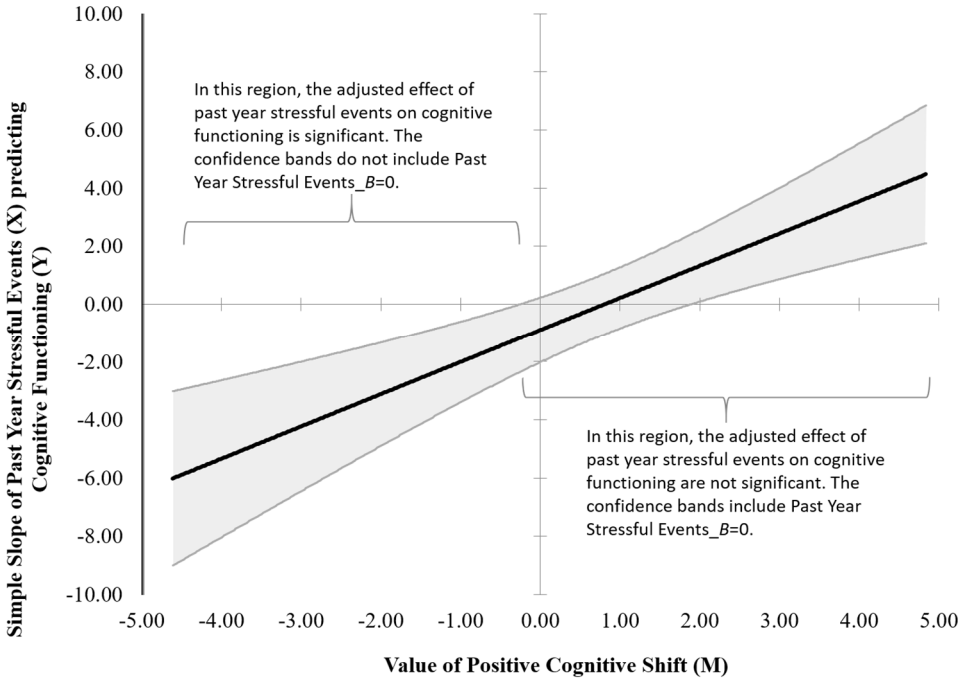


Figure 4 indicates that for participants with less PCS (region of significance: PCS = -0.08, SE = 0.53, $p < .05$), endorsing more past year stressful events predicts poorer

cognitive functioning. Put another way, as one starts to experience a stress pileup, higher levels of PCS no longer protects against poorer cognitive functioning.

Hypothesis 2. The second hypothesis was that PCS ability would moderate the relation of the past year's stressful events to psychological well-being, such that well-being would be more evident for those with high PCS ability than for those with low PCS ability. Findings from the analyses are depicted in Table 14. There were no main effects for past year stressful events (t = -.81, p = .42) or PCS (t = .43, p = .66), nor an interaction effect (t = .92, p = .36). Thus, PCS ability did not moderate the relationship between past year stressful events and well-being for this sample.

Two participants exceeded the accepted cutoff for Cook's Distance and Mahalanobis Distance, suggesting that they may be outliers affecting the regression line. Casewise diagnostics and an analysis of scatterplots confirmed suspected influence.[3] The analysis was rerun without the outliers and is presented on the right side of Table 14 below. The pattern of findings excluding the outlier was altered with the outliers excluded from the analysis, such that no main effects for past year stressful events (t = -.62, p = .53) or PCS (t = .91, p = .36), but there was an interaction effect (t = 2.82, p = .01).

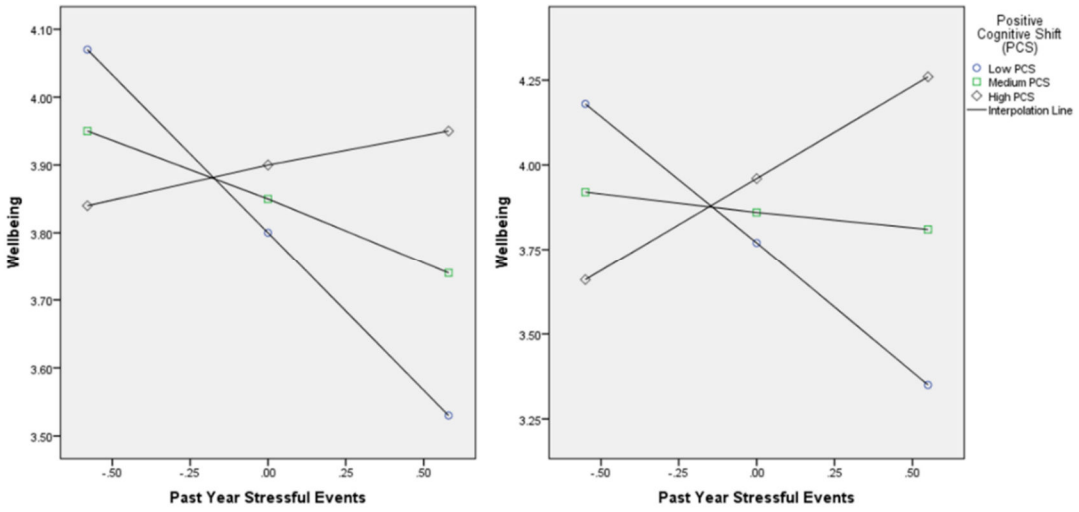
Simple slopes analysis on the data with two outliers deleted was performed, as shown in Figure 5. The analysis yielded significant results when past year stressful events were regressed at one standard deviation above (t = .55, p = .05, LLCI = -0.01,

[3] The participants, 1728 and 1835, analyzed as potential outliers both represented extreme scores on independent and dependent variables. 1835 scores indicated high wellbeing, medium-high stressful events relative to other participants, and low positive cognitive shift. 1728 scores indicated low wellbeing, medium-high stressful events, and high positive cognitive shift.

ULCI = 1.11) and one standard deviation below the mean (t = -.76, p = .01, LLCI = -1.32, ULCI = -0.20) of PCS. Figure 5 depicts the full sample (n = 139) on the left side and the results of a regression with two candidate outliers deleted (n = 137) on the right side.

Figure 5.

Simple Slopes of Wellbeing on Past Year Stressful Events at Low, Medium and High Values of Positive Cognitive Shift, With Full Sample (Left, n = 139) and Outliers Excluded (Right, n = 137).



In order to provide a side by side comparison of the data with and without the outlier, a simple slopes analysis was performed on the data with the full sample (though this would not typically be performed with a nonsignificant result), and findings are presented in Figure 5 (left panel). The analysis yielded non-significant results when past year stressful events were regressed at one standard deviation above (t = .24, p = .81, LLCI = -0.70, ULCI = 0.90) and one standard deviation below the mean (t = -1.33, p = 0.18, LLCI = -1.15, ULCI = 0.22) of PCS.

Table 14.

Hypothesis 2 With Past Year Stressful Events, Positive Cognitive Shift, and Their Interaction as Predictors of Well-Being.

	With Outlier		Without Outlier	
Model 2	**(N=139)**		**(N=138)**	
Predictors	***B***	**SE**	***B***	**SE**
Constant	-.00	.10	3.86	.10
Stressful Events	-.25	.22	-.10	.16
Positive Cognitive Shift (PCS)	.05	.07	.06	.07
Events X PCS	.29	.19	.42**	.15
R^2	.03		.06	
F for R^2	2.41		7.93**	

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

Regions of Significance. The regions of significance were explored using the Johnson Neyman technique. The variables in the model were the dependent variable (wellbeing), independent variable (past year stressful events), and moderator (PCS). The moderator and the conditional effect of the past year's stressful events on wellbeing at values of the moderator, PCS is shown in Table 15.

Table 15.

Regions of Significance for Hypothesis 2: The Adjusted Effect of Past Year Stressful Events on Wellbeing Across Levels of Positive Cognitive Shift.

POS COG SHIFT	Effect	se	t	p	LLCI	ULCI
-2.45	-1.13	0.40	-2.83	0.01	-1.92	-0.34
-2.25	-1.05	0.37	-2.81	0.01	-1.78	-0.31
-2.05	-0.96	0.35	-2.78	0.01	-1.65	-0.28
-1.85	-0.88	0.32	-2.74	0.01	-1.51	-0.25
-1.65	-0.80	0.30	-2.69	0.01	-1.38	-0.21
-1.45	-0.71	0.27	-2.63	0.01	-1.25	-0.18
-1.25	-0.63	0.25	-2.53	0.01	-1.12	-0.14
-1.05	-0.54	0.23	-2.40	0.02	-0.99	-0.10
-0.85	-0.46	0.21	-2.22	0.03	-0.87	-0.05
-0.65	-0.38	0.19	-1.98	0.05	-0.75	0.01
-0.45	-0.29	0.18	-1.65	0.10	-0.64	0.06
-0.25	-0.21	0.17	-1.24	0.22	-0.54	0.12
-0.05	-0.12	0.16	-0.76	0.45	-0.45	0.20
0.15	-0.04	0.16	-0.24	0.81	-0.37	0.29
0.35	0.04	0.17	0.26	0.80	-0.29	0.38
0.55	0.13	0.18	0.70	0.49	-0.23	0.49
0.75	0.21	0.20	1.07	0.29	-0.18	0.60
0.95	0.30	0.22	1.37	0.17	-0.13	0.72
1.15	0.38	0.24	1.61	0.11	-0.09	0.85
1.35	0.46	0.26	1.79	0.08	-0.05	0.97
1.55	0.55	0.28	1.94	0.05	-0.01	1.11

The plot in Figure 6 has been modified to clarify the regions of significance. The X-axis presents a continuous range of the moderator, PCS. The Y-axis presents a continuous range of values representing the adjusted effect of past year stressful events on wellbeing (Stressful Events_*B*). The straight plot line represents values of the adjusted effect ("Stressful Events_*B*") that correspond to the range of all continuous values of PCS

in the model. The curved lines above and below the straight line are the 95% confidence bands.

Figure 6.

Johnson-Neyman Plot of Adjusted Effect of Past Year Stressful Events on Wellbeing Across Levels of Positive Cognitive Shift.

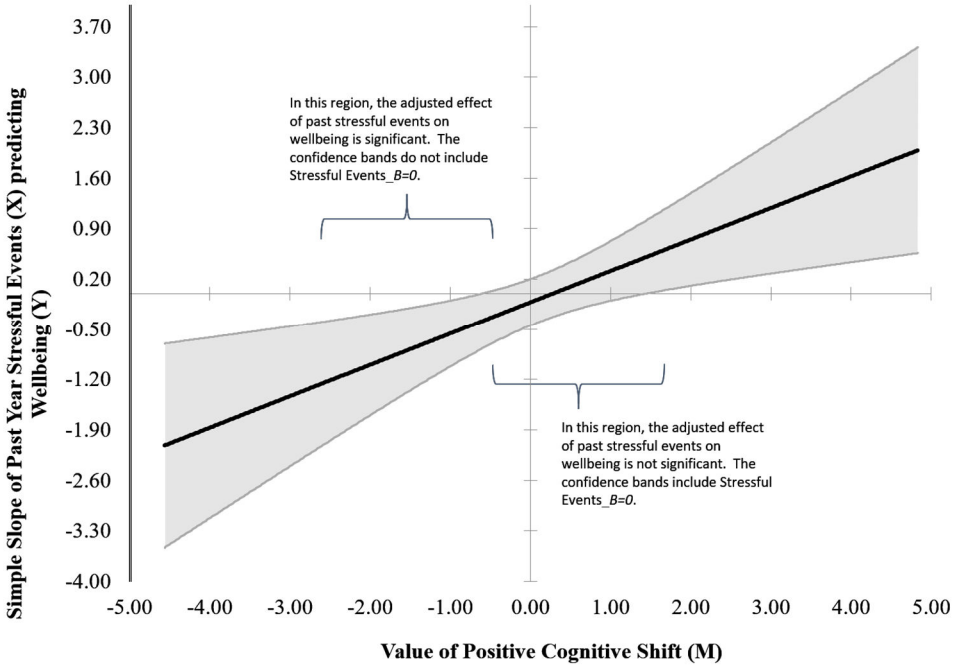


Figure 6 indicates that for participants with less PCS (region of significance: PCS = -0.65, SE = 0.19, $p < .05$), endorsing more past year stressful events predicts poorer wellbeing. Put another way, as one starts to experience a stress pileup, higher levels of PCS no longer protects against decreased wellbeing.

Hypothesis 3. The third hypothesis predicted that past year's stressful events would be less strongly linked to lower positive affect among individuals at higher versus lower levels of PCS ability. Findings of these analyses are presented in Table 16. There

was a significant main effect of past year stressful events (t = -2.03, p = .04) in the prediction of positive affect. However, neither PCS ability (t = .27, p = .78), nor the interaction of past stressful events X cognitive shift ability (t = 1.48, p = .14) predicted positive affect.

There was an influential case, based on Mahalanobis Distance, Cook's Distance, Leverage Value, DFFIT, and DFBETA for the interaction term. Casewise diagnostics and an analysis of scatterplots confirmed suspected influence.[4] The analysis was rerun excluding the influential case. Results are displayed on the right side of Table 16. There was a non-significant main effect of past year stressful events (t = -1.72, p = .09) and PCS (t = .50, p = .62) on positive affect. However, the past stressful events X cognitive shift ability interaction was significant (t = 2.61, p = .01). Thus, with the outlier removed from the analysis, PCS ability moderated the relationship between past year stressful events and positive affect.

Simple slopes analysis on the data was performed, as shown in Figure 6. In order to demonstrate a side-by-side comparison of the simple slopes with the full sample and excluding outliers, the simple slopes analyses were performed with the full sample. The analysis with the full sample (n = 140) yielded non-significant results when past year stressful events were regressed at one standard deviation above (t = -.18, p = .86, LLCI = -0.53, ULCI = 0.44) and significant results when regressed at one standard deviation below the mean (t = -3.13, p = .01, LLCI = -0.84, ULCI = -0.19) of PCS. Figure 7

[4] Participant 1728 considered as a candidate outlier presented with extreme scores on all variables, with low positive affect, medium-high stressful events, and high positive cognitive shift.

depicts the simple slopes results with the full sample (n = 140) on the left side and the sample with an outlier omitted from the analysis on the right side (n = 139). Simple slopes analysis was performed on data with outlier removed (n = 139), which yielded non-significant results when past year stressful events were regressed at one standard deviation above (t = .95, p = .34, LLCI = -0.18, ULCI = 0.51) the mean of PCS ability, but significant results at one standard deviation below (t = -3.12, p = .01, LLCI = -0.88, ULCI = -0.20) the mean of PCS ability. These simple slopes are depicted in Figure 7. The findings were consistent with Hypothesis 3.

Figure 7.

Simple Slopes of Positive Affect on Past Year Stressful Events at Low, Neutral and High Values of PCS, With Full Sample (Left, n = 140) and Outlier Excluded (Right, n = 139).

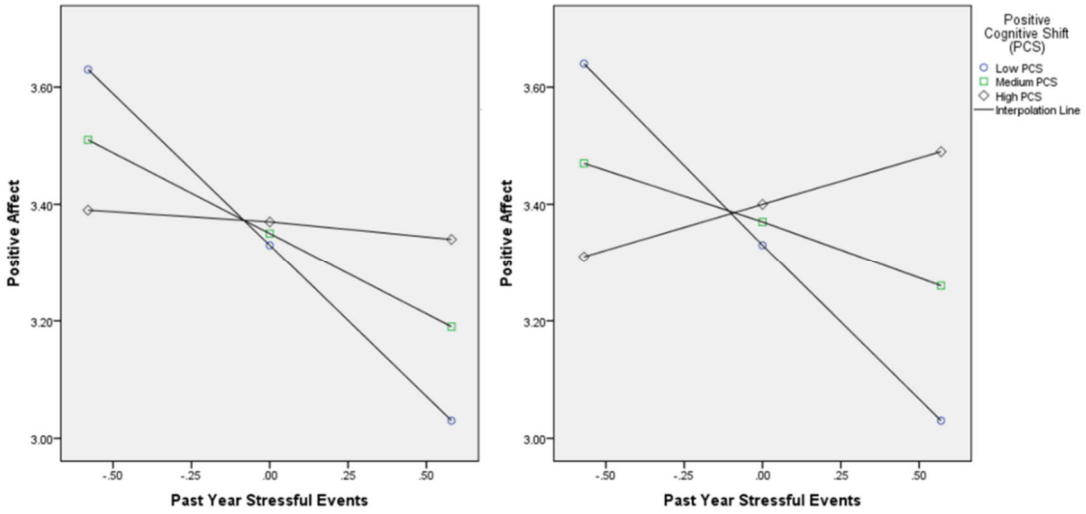


Table 16.

Hypothesis 3 With Past Year Stressful Events, Positive Cognitive Shift, and Their Interaction as Predictors of Positive Affect.

	With Outlier		Without Outlier	
Model 3	**(N=140)**		**(N=139)**	
Predictors	***B***	**SE**	***B***	**SE**
Constant	.01	.07	3.37	.06
Stressful Events	-.28*	.14	-.18	.11
Positive Cognitive Shift (PCS)	.01	.04	.02	.04
Events X PCS	.15	.10	.22*	.09
R^2	.01		.05	
F for R^2	2.21		6.79*	

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

Regions of Significance. The regions of significance were explored using the Johnson Neyman technique. The variables in the model were the dependent variable (positive affect), independent variable (past year stressful events), and moderator (PCS).

The moderator and the conditional effect of the past year's stressful events on positive affect at values of the moderator, PCS is shown in Table 17.

Table 17.

Regions of Significance for Hypothesis 3: The Adjusted Effect of Past Year Stressful Events on Positive Affect Across Levels of Positive Cognitive Shift.

POS COG SHIFT	Effect	se	t	p	LLCI	ULCI
-2.44	-0.73	0.23	-3.12	0.01	-1.19	-0.27
-2.24	-0.69	0.22	-3.13	0.01	-1.12	-0.25
-2.04	-0.64	0.20	-3.13	0.01	-1.05	-0.24
-1.84	-0.60	0.19	-3.14	0.01	-0.97	-0.22
-1.64	-0.55	0.18	-3.13	0.01	-0.90	-0.20
-1.44	-0.51	0.16	-3.11	0.01	-0.83	-0.18
-1.24	-0.46	0.15	-3.07	0.01	-0.76	-0.16
-1.04	-0.42	0.14	-3.01	0.01	-0.69	-0.14
-0.84	-0.37	0.13	-2.89	0.01	-0.63	-0.12
-0.64	-0.33	0.12	-2.73	0.01	-0.57	-0.09
-0.44	-0.28	0.11	-2.49	0.01	-0.51	-0.06
-0.24	-0.24	0.11	-2.18	0.03	-0.45	-0.02
-0.13	-0.21	0.11	-1.98	0.05	-0.43	0.01
-0.04	-0.19	0.11	-1.80	0.07	-0.41	0.02
0.16	-0.15	0.11	-1.37	0.17	-0.36	0.07
0.36	-0.10	0.11	-0.93	0.36	-0.33	0.12
0.56	-0.06	0.12	-0.50	0.62	-0.29	0.17
0.76	-0.01	0.13	-0.11	0.91	-0.26	0.24
0.96	0.03	0.14	0.22	0.82	-0.24	0.30
1.16	0.08	0.15	0.51	0.61	-0.22	0.37
1.36	0.12	0.16	0.75	0.45	-0.20	0.44
1.56	0.16	0.17	0.95	0.34	-0.18	0.51

The plot in Figure 8 has been modified to clarify the regions of significance. The X-axis presents a continuous range of the moderator, PCS. The Y-axis presents a continuous range of values representing the adjusted effect of past year stressful events

on positive affect (Stressful Events_*B*). The straight plot line represents values of the adjusted effect ("Stressful Events_*B*") that correspond to the range of all continuous values of PCS in the model. The curved lines above and below the straight line are the 95% confidence bands.

Figure 8.

Johnson-Neyman Plot of Adjusted Effect of Past Year Stressful Events on Positive Affect Across Levels of Positive Cognitive Shift.

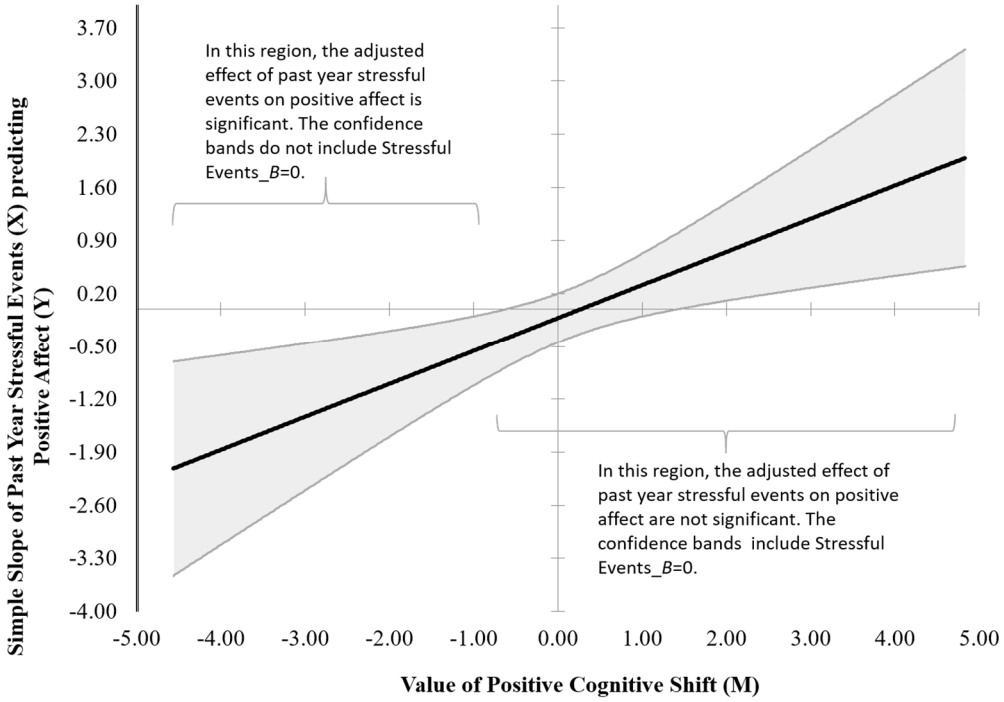


Figure 8 indicates that for participants with less PCS (region of significance: PCS = -0.13, SE = 0.11, $p < .05$), endorsing more past year stressful events predicts poorer positive affect. Put another way, as one starts to experience a stress pileup, higher levels of PCS no longer protect against poorer positive affect.

Hypothesis 4. The fourth hypothesis predicted that past year's stressful events would be less strongly linked to higher negative affect among individuals with higher versus lower levels of PCS ability. Regression analysis tested the hypothesis that higher PCS would moderate the negative effects of past year stressful events in generating negative affectivity. In the initial analysis, there was not significant main effects of past year stressful events (t = 1.20, p = .23) or of PCS ability (t = -.07, p = .94) on negative affect, nor was the interaction term significant (t = -1.21, p = .23). See Table 18, left side of table for results. Thus, PCS ability did not moderate the relationship between past year stressful events and negative affect.

One participant exceeded the accepted cutoff for Mahalanobis Distance, Cook's Distance, and DFFIT cutoffs, suggesting that the participant may be an outlier. Casewise diagnostics and an analysis of scatterplots also indicated influence.[5] Analyses testing Hypothesis 4 were rerun without the outlier and findings are presented on the right side of Table 18 below. There was a non-significant conditional effect of past year stressful events (t = 1.43, p = .15) and PCS (t = -.37, p = .71) on negative affect, but the interaction was significant, (t = -2.21, p = .03). Thus, with the outlier removed from the analysis, PCS ability moderated the relationship between past year stressful events and negative affect.

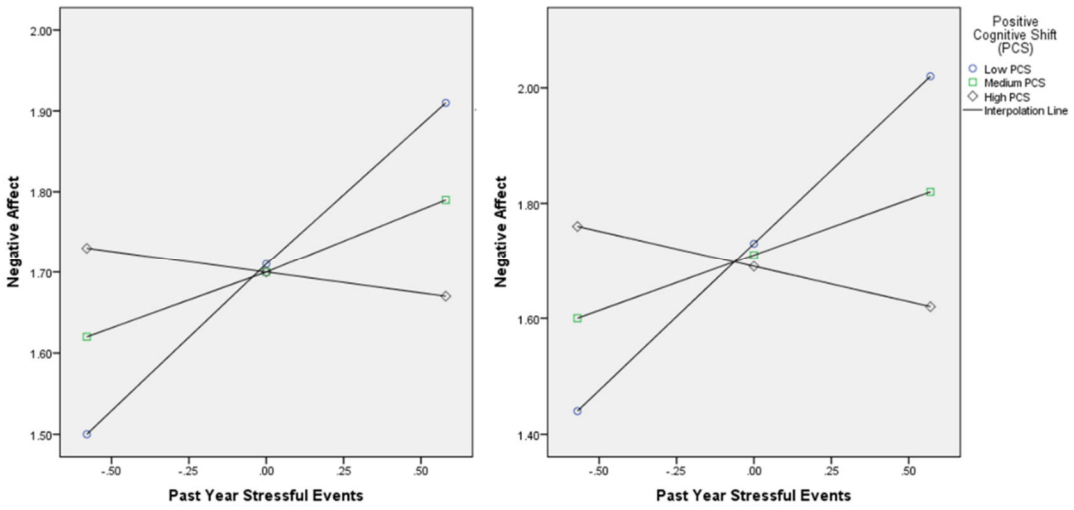
Simple slopes analysis was performed on data with outlier removed (n = 139), with findings depicted in Figure 9. Figure 9 depicts the full sample (n = 140) on the left

[5] Participant 1835 considered as a candidate outlier demonstrated scores with extreme values on all variables measured for the regression, including low negative affect, medium-high stressful events relative to other participants, and low positive cognitive shift.

side and the results of a regression with one candidate outlier deleted (n = 139) on the right side. The analyses yielded non-significant results when past year stressful events were regressed at one standard deviation above (t = -.67, p = .50, LLCI = -0.50, ULCI = 0.25) and significant results at one standard deviation below (t = 2.49, p = .01, LLCI = 0.11, ULCI = 0.93) the mean of PCS.

Figure 9.

Simple Slopes of Negative Affect on Past Year Stressful Events at Low, Medium and High Values of Positive Cognitive Shift, With Full Sample (Left, n = 140) and Outlier Excluded (Right, n = 139).



To provide the side-by-side comparison of data, simple slopes analysis was performed on the data with the full sample (n = 140), and findings are presented in Figure 9 on the left side. The analysis yielded non-significant results when past year stressful events were regressed at one standard deviation above (t = -.30, p = .76, LLCI = -0.42, ULCI = 0.31) and one standard deviation below the mean (t = 1.52, p = .13, LLCI = -0.11, ULCI = 0.82) of PCS.

Table 18.

Hypothesis 4 With Past Year Stressful Events, Positive Cognitive Shift, and Their Interaction as Predictors of Negative Affect.

	With Outlier		Without Outlier	
Model 4	**(N=140)**		**(N=139)**	
Predictors	***B***	**SE**	***B***	**SE**
Constant	-.01	.05	1.71	.06
Stressful Events	.15	.12	.19	.13
Positive Cognitive Shift (PCS)	-.01	.04	-.01	.04
Events X PCS	-.13	.11	-.21*	.09
R^2	.03		.05	
F for R^2	1.48		4.90*	

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

Regions of Significance. The regions of significance were explored using the Johnson Neyman technique. The variables in the model were the dependent variable (negative affect), independent variable (past year stressful events), and moderator (PCS). The moderator value and the conditional effect of the past year's stressful events on negative affect at values of the moderator, PCS is shown in Table 19.

Table 19.

Regions of Significance for Hypothesis 4: The Adjusted Effect of Past Year Stressful Events on Negative Affect Across Levels of Positive Cognitive Shift.

POS COG SHIFT	Effect	se	t	p	LLCI	ULCI
-2.47	0.71	0.28	2.53	0.01	0.15	1.26
-2.27	0.67	0.26	2.53	0.01	0.15	1.19
-2.07	0.62	0.25	2.53	0.01	0.14	1.11
-1.87	0.58	0.23	2.52	0.01	0.12	1.04
-1.67	0.54	0.22	2.50	0.01	0.11	0.97
-1.47	0.50	0.20	2.47	0.01	0.10	0.90
-1.27	0.46	0.19	2.43	0.02	0.08	0.83
-1.07	0.42	0.18	2.37	0.02	0.07	0.76
-0.87	0.37	0.16	2.28	0.02	0.05	0.70
-0.67	0.33	0.15	2.16	0.03	0.03	0.64
-0.47	0.29	0.15	1.99	0.05	0.01	0.58
-0.45	0.29	0.15	1.98	0.05	0.01	0.57
-0.27	0.25	0.14	1.78	0.08	-0.03	0.53
-0.07	0.21	0.14	1.53	0.13	-0.06	0.48
0.13	0.17	0.13	1.23	0.22	-0.10	0.43
0.33	0.12	0.14	0.91	0.36	-0.14	0.39
0.53	0.08	0.14	0.59	0.56	-0.19	0.36
0.73	0.04	0.15	0.28	0.78	-0.25	0.33
0.93	0.01	0.15	-0.01	0.99	-0.31	0.30
1.13	-0.04	0.16	-0.26	0.79	-0.37	0.28
1.33	-0.08	0.18	-0.48	0.63	-0.43	0.26
1.53	-0.13	0.19	-0.67	0.50	-0.50	0.25

The plot in Figure 10 has been modified to clarify the regions of significance. The X-axis presents a continuous range of the moderator, PCS. The Y-axis presents a continuous range of values representing the adjusted effect of past year stressful events on negative affect (Stressful Events_*B*). The straight plot line represents values of the adjusted effect ("Stressful Events_*B*") that correspond to the range of all continuous

values of PCS in the model. The curved lines above and below the straight line are the 95% confidence bands.

Figure 10.

Johnson-Neyman Plot of Adjusted Effect of Past Year Stressful Events on Negative Affect Across Levels of Positive Cognitive Shift.

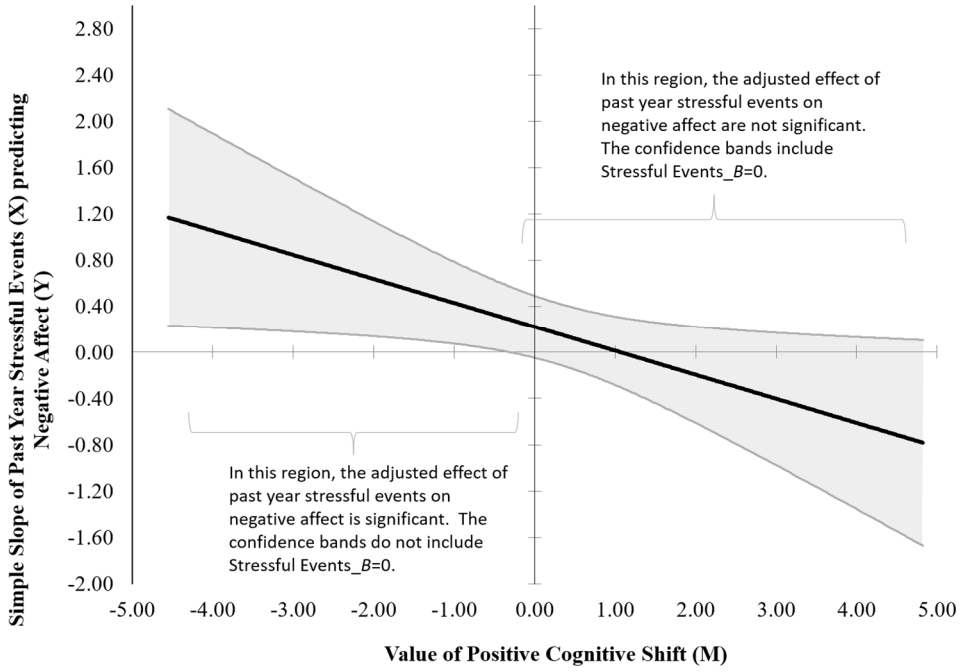


Figure 10 indicates that for participants with less PCS (region of significance: PCS = -0.47, SE = 0.15, $p < 0.05$), endorsing more past year stressful events predicts greater negative affect. Put another way, as one starts to experience a stress pileup, higher levels of PCS no longer protect against negative affect.

CHAPTER 6

DISCUSSION

There were two main aims to the study. The first aim was to determine the reliability and validity of PCS and determine how frequently it occurs in retrospective accounts of participants' most stressful life events. The second aim was to evaluate whether PCS served as a moderator between past year's stressful life events and emotional, cognitive, and physical health outcomes. With regard to the first aim, current findings point to the good reliability and adequate validity of the PCS measure and suggest that the variant of reappraisal is a common response to life stressors. The study narratives sampled a range of life stressor events, and PCS was utilized throughout the range of events. With regard to the second aim, findings indicated that PCS buffered the relations between past year's stressful events and (1) cognitive functioning, (2) wellbeing, (3) positive affect, and (4) negative affect, consistent with hypotheses. Taken together, the study results suggest that PCS may reflect individuals' capacity to navigate significant life events in a manner that helps to protect their health.

The current study is the first to establish a theoretical foundation for PCS, develop a method of assessing it, and evaluate its reliability and validity. PCS was reliably coded, and in its final form PCS was revealed by exploratory correlations to capture 1) aspects of recollected emotional intensity and 2) the ability to exercise affective flexibility in the midst of negative events that were interpreted by participants as chaotic and ongoing prior to reframing them. That is, PCS was positively related to openness, lifetime growth, and affect intensity-calm, as expected, and was not correlated

with measures selected because they were theorized to be unrelated. Taken together, the three variables that correlated with PCS were consistent with the dominant themes coded for PCS. It appears that PCS, as coded, reveals the ability to be reflective (openness), mindful or calm under chronically adverse situations (affect intensity-calm), and oriented toward growth (lifetime growth), but does not significantly reflect adaptation (trait hope-pathways), perseverance (conscientiousness), or the capacity to manage attention under stressful situations (attentional control). The discriminant validity analysis indicated that none of the measures tested was significantly related to PCS, suggesting that the constructs tapped by these measures are likely to have been both theoretically and empirically distinct from PCS.

The assessment of construct validity for PCS relied on looking for patterns of correlations among measures to determine whether inferences about PCS were appropriate. Among the planned convergent validity analyses, PCS was correlated with openness and lifetime growth. No other tested variables were correlated with PCS. Based on the qualitative coding, two variables were added for exploratory post hoc analysis (i.e., affect-intensity-calm, emotion approach coping – processing). Only affect intensity-calm correlated significantly and positively with PCS. There are several possibilities as to why PCS did not correlate with related constructs as expected. First, the constructs may have been chosen without fully attending to PCS's expected meaning or may have been the best available (but less than optimal) constructs from secondary data to approximate the meaning of PCS. Alternatively, it is possible that PCS was coded poorly for its theoretical meaning through use of a coding system that better captured the

meaning of related constructs rather than the full theoretical meaning of PCS. Finally, if PCS reflects a process rather than an individual difference, it may be difficult to code each element of the process as one construct, and future studies may need to focus on one aspect of the cognitive set-shifting process. In fact, some evidence points to the likelihood that cognitive shifts may occur as an integrated cognitive-emotional process. For example, studies of cognitive change have consistently demonstrated that emotion appraisal systems are modulated through the prefrontal cortex, orbitofrontal cortex, and cingulate control systems, and that these are put into motion by a person's interpretations or emotional responses to stimuli (Ochsner & Gross, 2005).

Evidence in the current study also suggests that PCS is common, occurring in roughly 40% of the narratives. Moreover, it was evident across all types of stressful life events, including addiction, trauma, and family stress. Of note, the study was not powered to detect differences in the extent of PCS across nine event types; thus, more research is needed to identify conditions in which PCS is most likely to be helpful and relevant in resilient coping. In the reappraisal literature, no studies have indicated how common positive reappraisal is, though reappraisal frequency has been linked to greater wellbeing (McRae et al, 2012). The plethora of studies measuring reappraisal, reappraisal frequency, and reappraisal ability (e.g., McRae et al, 2012; Ochsner et al., 2014) suggest that this is a coping method considered relatively common and available to those who seek to cultivate it. Research data suggests that those who use the positive reappraisal strategy frequently and seek to cultivate it may find it more available (McRae

et al., 2012). If this were true for PCS, as a proposed variant of positive reappraisal, this could be an area for future study in resilience.

Beyond demonstrating the reliability and validity of the measure of PCS, the current study also documents its ability to buffer the impact of stressful life events on individuals' cognitive and emotional health. Consistent with predictions laid out in Hypothesis 1, there was a significant interaction of PCS and past year stressful events in the model, indicating a significant conditional effect of past year stressful events on cognitive functioning at certain values of PCS ability. The data are consistent with the findings in the literature indicating that it is beneficial to experience fewer stressful events if one wishes to preserve cognitive functioning. Stressful life events may play a role as a risk factor for various cognitive processes, including dementia risk (Tschanz, Norton, Zandi, & Lyketsos, 2013), working memory (Klein & Boals, 2001), and problem solving (Klein & Barnes, 1994). In the event one experiences stressful events, the moderation model from this study suggests that it may be useful to have PCS ability. However, as one's stressor events begin to pile up, the buffer provided by PCS may become less useful in facilitating cognitive functioning, even though there is an overall significant interaction. These findings appear to be consistent with the idea that PCS may operate as a kind of reflective mindfulness, in which one is able to mindfully process and reframe unusual or difficult stressful circumstances in order to preserve cognitive functioning. The data provides a caution that as circumstances become more stressful one's ability to PCS may be of limited utility as a resource. Of note, these findings were independent of educational attainment, which may also account for significant variation

in cognitive functioning (e.g., van Hooren, Valentijn, Bosma, Ponds, van Boxtel, & Jolles, 2007).

There was an outlier in the analysis of Hypothesis 1, but the interaction was significant whether the outlier was included or left out. Regardless, it is useful to consider whether Participant 1948's data was plausible, despite having generated statistical indicators that it was an observation point that was distant from other observations. Participant 1948 endorsed experiencing higher numbers of stressful events than other participants, at three events, and scored well in cognitive functioning. The participant scored low on PCS, however, which created the outlier conditions in terms of the data presentation. The review of the transcript indicated that her chronic situation was resolved through existing coping resources, i.e., her husband was sick for months and with church and family support, she got through a tough time. Thus, the data for this participant is plausible.

Consistent with predictions laid out in Hypothesis 2, there was a significant interaction of PCS and past year stressful events for the prediction of well-being, indicating a significant conditional effect of past year stressful events on wellbeing at certain values of PCS ability. The data indicate that greater numbers of stressful events predict lower levels of wellbeing. Of note, PCS may be an effective buffer for individuals who confront fewer events, but not for individuals who experience the greater stress of multiple events. This would be consistent with literature on positive psychological wellbeing, which notes that the aggregation of biological, financial, and social stressor events can lead to shifts in affect, which are often strong indicators of wellbeing (Steptoe

et al., 2015). McRae and colleagues noted that reappraisal frequency had been previously found to tap into lower amygdala activation in response to affective tasks, suggesting that more frequent reappraisers may be more capable reappraisers (McRae et al., 2012). Though reappraisal ability and reappraisal frequency were not found to be overlapping constructs, they appeared nonetheless complementary insofar as practice at reappraisal generates facility at what is essentially a complex process of cognitive control and set-shifting (McRae et al., 2012). When one has more ability to do this type of set-shifting, one might speculate that – individual differences aside - one could more readily call upon this skill under stressful conditions than a person who finds this type of task performance difficult under typical circumstances. It is precisely this concept that Hypothesis 2 data may support, i.e., that those with the ability to engage a PCS could be able to buffer the detrimental effects of stressful life events and experience greater wellbeing. On the other hand, with greater events the data again indicates that PCS is of limited utility as a stress moderator.

There were two outliers for the Hypothesis 2 analysis, and again it is valuable to examine whether the participant patterns of data were plausible before accepting that the results are significant with the outliers removed. Participant 1728 endorsed two stressful events in the past year, which was relatively high for the sample, and scored low on well-being. The participant's most stressful lifetime event described in the narrative was her husband's death, and participant received a score indicating that she had experienced a PCS in relation to the event. A review of the items on the WHO well-being scale suggests that it would be too difficult to determine plausibility based on the existing data. The

participant may be continuing to grieve the loss of her husband in 2006, may struggle with depression, or this may be a coding error.

Participant 1835 endorsed two stressful events, scored high in well-being, and low PCS in response to a divorce in 1999. It appeared from the transcript that the participant had moved on, but that time played a larger role than any PCS. In this case, the real world certainly generated the data in this manner and it does not appear to be the product of a mistake.

Consistent with predictions laid out in Hypothesis 3, there was a significant interaction of PCS and past year stressful events for the prediction of positive affect, indicating a significant conditional effect of past year stressful events on positive affect at certain values of PCS ability. This means that, according to data for this sample, the fewer stressful events one experienced, the more likely a person was to preserve positive affect. Further, PCS may buffer the negative effects of stressful events to up-regulate positive affect, though the effectiveness of this was diluted as events began to accumulate. These findings mirror those noted above for well-being. Prior research indicates that positive trait reappraisal predicts positive affective response to positive and negative events, as well as a person's level of reactivity to accumulated stressors over a period of days (Gunaydin, Selcuk, & Ong, 2016). The authors noted that the effect of positive trait reappraisal was to dampen emotional response rather than generate positive response. This is consistent with the qualitative observations of coders in the present study that PCS does not appear to imply an "easier" coping path as much as a modulation of negative arousal at chronic adversity.

Participant 1728 was an outlier in the analysis for Hypothesis 3, endorsing two stressful events, low positive affect, and high PCS in response to her husband's death. As discussed above in the well-being results, it may be plausible to experience this pattern of results if one experiences grief or depression following the death of one's husband. There may be other explanations, of course, such as errors in data entry or carelessness on the part of the participant in answering the questionnaires.

Consistent with predictions laid out in Hypothesis 4, there was a significant interaction of PCS and past year stressful events for the prediction of negative affect, indicating a significant conditional effect of past year stressful events on negative affect at certain values of PCS ability. This means that the more stressful events one experienced, the more likely a person was to experience negative affect. PCS may buffer the negative effects of stressful events to down-regulate negative affect, though the effectiveness of this was diluted as events began to accumulate. Daily mindfulness has been found to be associated with lower negative affect (Brockman, Ciarrochi, Parker, & Kashdan, 2016), while cognitive reappraisal has shown no association (Brockman, et al., 2016) and positive reappraisal has shown inconsistent association with negative affect (Brans, Koval, Verduyn, Lim, & Kuppens, 2013). PCS appears most closely aligned with the meaning of mindfulness and positive reappraisal constructs, suggesting that the results of the study are appropriately consistent with prior research. Another way of slicing the analysis is to look at the constructs that PCS correlated with the construct validity analysis. It has been reported that people with higher openness use less suppression to regulate their emotions, such that they may be less likely to suffer from

negative affect and depressive consequences of this strategy (Sadr, 2016). If those with more openness are more likely to use PCS to modulate their emotions, then it makes sense that they are adjusting their emotional landscape in response to chronic adversity to enhance wellbeing and positive affect. The connection of personality to motivation for suppression vs. reappraisal in context of chronic adversity is an area that could provide rich information for resilience intervention research. A mindfulness study could be piloted with personality and trait/ momentary suppression vs. reappraisal measures to determine participants' propensities for reappraisal vs. suppression and whether the intervention assisted participants in learning emotional modulation skills.

In Hypothesis 4 analyses, one influential outlier emerged. Participant 1835 endorsed two stressful events, low negative affect, and low PCS in response to divorce. As discussed above with regards to Hypothesis 2, this pattern of results may be plausible. The transcript indicates that participant used more existing coping skills than most, which suggests someone well-equipped to handle adversity. Thus, though they experienced multiple stressful events in the past year and their divorce in 1999 produced no PCS, this individual may not have need a PCS to cope. Indeed, this person may be an outlier from most people dealing with a chronic stressor by virtue of having available resources. One question a researcher must ask when faced with outliers such as this one is where it is reasonable to make the cut point when there are several indicators that a case may generate bias in the statistics. While an extraordinary person may be notable and plausible, she may make it difficult to extrapolate meaningful conclusions from the overall sample if her data deviates too far from the average.

Across the four regression analyses, there was a unifying pattern. PCS appeared to buffer outcomes at the lower ends of stress but not at the higher ends of stress. As events begin to pile up, as measured by number of stressful life events, it appears less likely that participants can use PCS to effectively resolve difficulties. It is unknown at this time whether: (1) our resources become overwhelmed at the higher ends of stress such that we just need to wait out the difficult times and preserve existing resources, (2) PCS is not possible at certain extremes, (3) this is an artifact of this sample, or (4) there is another explanation rooted in coping or evolutionary theory that better explains the data.

The outliers in the study deserve special comment precisely because the data associated with the outliers may be plausible. For that reason, these individuals inform the analysis of positive cognitive shift because by going back to the transcripts to understand why these outliers emerged I was able to formulate a better understanding of why they may exhibit their pattern of results. For example, in some instances a person may have a PCS yet continue to experience emotional difficulties arising from the event. Another person may have ample coping skills already and not need a PCS to handle a divorce. Time may also be a contributing factor. As a result of believing the outlier data to be accurate, I can express confidence in the results of the first regression analysis since it was significant with and without the presence of the outlier. The remaining analyses were all related to emotion and were significant only where the outliers were removed. Less confidence can be expressed in the buffering effect of positive cognitive shift on these aspects of emotion (i.e., well being, positive affect, and negative affect) in the face of past year stressful life events.

Strengths and Limitations of the Study

The study had many strengths. It used a relatively large community sample (N = 175), which aimed to be a representative sample of a generalizable population. The mixed methods study included theory-based qualitative evaluation of narratives and quantitative test of hypotheses. Mixed methods studies can address a broader set of research questions than a single method study. Generally, mixed methodology provides more robust and diverse evidence for understanding the phenomenon in question because it taps into the strengths of qualitative and quantitative findings. In spite of its observational design, the study was able to provide some temporal ordering of variables. In addition, measures used for the study were a combination of self-report, other-coded, and performance measures. The coding team was diverse and trained to be reliable. This was helpful because a diverse team provides multiple perspectives on the themes identified in the transcripts. It is also relevant to note that research assistants from diverse backgrounds were able to be trained reliably to identify the PCS construct.

Although the study had strengths, there were several limitations that should be considered when interpreting the results. The regression models were examined in a manner that suggested that past year stressful events and PCS ability preceded the outcomes of cognitive functioning (model 1), well-being (model 2), positive affect (model 3), and negative affect (model 4). However, causality could not be inferred both because of a lack of strong temporal precedence and because the data are correlational. It is possible that the outcome caused the focal predictor or that the focal predictor should

be the moderator. It is even possible that some of the models are bidirectional, such as the relationship between positive affect and PCS ability and past year stressful events.

An additional limitation is that the coding system was revised multiple times during the coding process to reflect team findings, which shifted the hypothesized meaning of the construct. This required post hoc analyses, and it should be noted that the choice to analyze the outcomes separately increased the chances of a multiple comparisons problem (e.g., Curran-Everett, 2000; for contrary perspective, Perneger, 1998). Moreover, ten narratives were removed from the sample because they did not represent chronic lifetime events. Given the relatively small sample, it is also possible that the study was slightly underpowered. If further studies are conducted, they should endeavor to use larger, more diverse samples.

Another important limitation of the present study was the use of narratives that were not originally intended to probe for the existence of a PCS. Though the study followed the participants for an average of 13 months, the study questions were not created to study PCS. Future studies could benefit from examining a sample with chronic life events that could be followed reliably across multiple time points to gauge whether there is an evolution from assumptive world view to PCS across time, whether patterns of this evolution can be identified and whether a PCS for one event is iterative, would be generalized to similar events, or generalized to other domains of life experience. Variables of interest can be contemporaneously measured, including biological measures such as pain intensity, activity, and sleep, emotion/ affect intensity measures and social measures. Daily diaries could be used to examine the causal relations between variables.

While this project analyzed questions of "when" PCS might be useful (i.e. moderation effects), future studies may benefit from examining questions of "how" and more complicated questions of conditional processes (Preacher, Rucker, & Hayes, 2007).

Implications and Future Directions

This study has provided information that may be useful, with implications for future research and clinical practice. This is the first study, to my knowledge, to examine the construct validity of PCS and analyze PCS ability as a moderator in a series of regression analyses. Results from this study provide valuable information about reframing one's self-identity with reference to a situation following chronically aversive situations. It was shown that PCS, or constructs similar to it, should be considered in determining future interventions for cognitive functioning in the face of stressful life events. In addition, PCS was shown to moderate the effects of past year stressful events on wellbeing, positive affect, and negative affect. Depending on the types of adversities that cause the stress, PCS ability may be enhanced through interventions such as Cognitive Behavioral Therapy for Chronic Pain (Lohnberg, 2007) and with mindfulness therapies (Garland et al., 2009), both of which emphasize mindfulness skills and embodied cognition. Use of these interventions for research to determine whether PCS can be cultivated as an ability for those experiencing chronic adversity is a ripe area for study. The relationship of PCS to openness to experience and affect intensity -calm indicate that the process of teaching PCS as an ability may lie in an approach similar to Leslie Greenberg's emotion-focused therapy (Greenberg, 2004). Interventions that reduce emotional intensity, such as Mindfulness-Based Stress Reduction (Salmon,

Sephton, & Dreeben, 2011), could be useful for assisting people in learning how to regulate their emotions. Framed another way, being able to self-regulate may assist one in transition from System 1 heuristic thinking to System 2 effortful thinking under conditions of chronic adversity (Kahneman, 2011).

At present, the evidence does not indicate that PCS, as coded, represents an adaptation *point* or *shift* as much as an ability or mindset for facilitating such a transition. This would suggest that the construct is one part of a coping process rather than a shift point or that more research is needed to understand its staging and whether it is, indeed, distinct from other coping constructs. The next step may be to measure PCS through a daily diary study in which participants, possibly from a population with high levels of adversity such as LGBTQ or ethnic minorities, select a chronic stressor event on which to focus over a period of months and track how the adversity and factors related to the adversity are appraised at three time points during the day. The diary would have to detail whether the stressor was viewed more or less positively than at previous time points, and what factors were attributed to any alterations in viewpoint. The purpose of the study would be to determine whether PCS unfolds over time into its fullest expression, which would support the notion that it is more of a process than an acute shift. A complementary approach could include standardized manipulation of stress to evaluate whether positive shift is a common response. For example, participants could be brought into a controlled laboratory environment and exposed to a laboratory stressor (e.g., induced negative affect) to measure momentary positive reappraisal and shift as well as heart rate variability. Prior studies have shown that positive reappraisal during challenge

was associated with physical activation rather than dampening down of emotionality (McRae & Mauss, 2016). The measures of PCS and positive reappraisal could be correlated to determine how much variance they share.

Frequency of PCS ability is an area of research that may be rewarding for further pursuit in understanding PCS: Do those with more frequently used PCS ability readily call upon the skill under conditions of chronic adversity, such that those skills are further honed for future adversities? Can those who have never had a PCS experience one under chronically adverse conditions? Can a novice be trained to experience a PCS? Are there existing mindfulness-based interventions that could facilitate PCS?

Conclusion

Resilience has been described as comprised of recovery, sustainability and growth (Zautra et al., 2010). In times of chronic adversity, the search for meaning tends to follow two distinct paths (Davis et al., 1998). The first path reflects one's need to make sense of life events and is antecedent to outcomes; this is the process of sense-making. The second path reflects people's need to grow from difficult experiences. The narratives from the present study and those from other studies demonstrate that these two paths are extricable. PCS addresses the first path, which involves making sense of threatened or assumptive world views. Indeed, the current findings indicate that PCS reflects a process of mindful self-modulation that includes attending to inner feelings and reframing one's worldview or self-identity, to better align them with a new understanding of the requirements of the chronic adversity. Further, the findings indicated that a person engaging PCS is likely to find benefits or growth in the face of difficulty or trauma (e.g.,

Affleck, Tennen, Croog, & Levine, 1987; Davis et al., 1998; McAdams & Bowman, 2001). Growth may be an outcome or parallel process to PCS but would not be considered a theoretical part of the process.

The current findings should encourage others to pursue mixed methods research because of the hypothesis generation and refinement that the qualitative stage can offer, in addition to the generalizability and common scientific language offered by the quantitative stage of analysis. The results, depending on one's perspective, may discourage some from pursuing a construct that is so narrow in focus. On the other hand, PCS traverses the path trod in the prior literature across psychological disciplines to reach its resilient niche. In the midst of chronic adversity, one must be able to modulate affect so that one can direct attention to the reorienting one's assumptive worldview as it relates to the chronic issues at hand. Only then can one's self-identity be shifted to accommodate the needs of the chronic problem. Addressing failures in one's ability to engage PCS may prove critical to recovery during chronic adversity so that individuals in therapy can be assisted on their path towards recovery and growth.

REFERENCES

Affleck, G., Tennen, H., Croog, S., & Levine, S. (1987). Causal attribution, perceived benefits, and morbidity after a heart attack: An 8-year study. *Journal of Consulting and Clinical Psychology*, *55*(1), 29–35. https://doi.org/10.1037/0022-006X.55.1.29

Ali, B., Seitz-Brown, C. J., & Daughters, S. B. (2015). The interacting effect of depressive symptoms, gender, and distress tolerance on substance use problems among residential treatment-seeking substance users. *Drug and Alcohol Dependence*, *148*, 21–26. https://doi.org/10.1016/j.drugalcdep.2014.11.024

Allen, T. J., Sherman, J. W., Conrey, F. R., & Stroessner, S. J. (2009). Stereotype strength and attentional bias: Preference for confirming versus disconfirming information depends on processing capacity. *Journal of Experimental Social Psychology*, *45*(5), 1081–1087. https://doi.org/10.1016/j.jesp.2009.06.002

Allerhand, M., Gale, C. R., & Deary, I. J. (2014). The Dynamic Relationship Between Cognitive Function and Positive Well-Being in Older People: A Prospective Study Using the English Longitudinal Study of Aging. *Psychology and Aging*, *29*(2), 306–318. https://doi.org/10.1037/a0036551

Andreotti, C., Thigpen, J. E., Dunn, M. J., Watson, K., Potts, J., Reising, M. M., … Compas, B. E. (2013). Cognitive reappraisal and secondary control coping: associations with working memory, positive and negative affect, and symptoms of anxiety/depression. *Anxiety, Stress, & Coping*, *26*(1), 20–35. https://doi.org/10.1080/10615806.2011.631526

Arewasikporn, A. & Zautra, A.J. (2013). Exploratory Factor Analysis of Affect Intensity-Calm Subscale. Unpublished Raw Data.

Ash, I., Jee, B., & Wiley, J. (2012). Investigating Insight as Sudden Learning. *The Journal of Problem Solving*, *4*(2). https://doi.org/10.7771/1932-6246.1123

Babb, K. A., Levine, L. J., & Arseneault, J. M. (2010). Shifting gears: Coping flexibility in children with and without ADHD. *International Journal of Behavioral Development*, *34*(1), 10–23. https://doi.org/10.1177/0165025409345070

Bargh, J. A. (1982). Attention and automaticity in the processing of self-relevant information. *Journal of Personality and Social Psychology*, *43*(3), 425–436. https://doi.org/10.1037/0022-3514.43.3.425

Bech, P., Olsen, L. R., Kjoller, M., & Rasmussen, N. K. (2003). Measuring well-being rather than the absence of distress symptoms: a comparison of the SF-36 Mental

Health subscale and the WHO-Five well-being scale. *International Journal of Methods in Psychiatric Research*, *12*(2), 85–91. https://doi.org/10.1002/mpr.145

Blankertz, L. (1998). The Value and Practicality of Deliberate Sampling for Heterogeneity: A Critical Multiplist Perspective. *American Journal of Evaluation*, *19*(3), 307–324. https://doi.org/10.1177/109821409801900304

Bonanno, G. A. & Burton, C. L. (2013) Regulatory Flexibility: An Individual Differences Perspective on Coping and Emotion Regulation *J Perspectives on Psychological Science,* 8(6), 591-612. http://journals.sagepub.com/doi/abs/10.1177/1745691613504116

Boden, M. T., Bonn-Miller, M. O., Kashdan, T. B., Alvarez, J., & Gross, J. J. (2012). The interactive effects of emotional clarity and cognitive reappraisal in Posttraumatic Stress Disorder. *Journal of Anxiety Disorders*, *26*(1), 233–238. https://doi.org/10.1016/j.janxdis.2011.11.007

Bowden, E. M., Jung-Beeman, M., Fleck, J., & Kounios, J. (2005). New approaches to demystifying insight. *Trends in Cognitive Sciences*, *9*(7), 322–328. https://doi.org/10.1016/j.tics.2005.05.012

Brandtstädter, J. (2009). Goal pursuit and goal adjustment: Self-regulation and intentional self-development in changing developmental contexts. *Advances in Life Course Research*, *14*(1–2), 52–62. https://doi.org/10.1016/j.alcr.2009.03.002

Brans, K., Koval, P., Verduyn, P., Lim, Y.L., & Kuppens, P. (2013). The regulation of negative and positive affect in daily life. *Emotion*. *13*(5), 926-39. DOI: 10.1037/a0032400

Brockman, R., Ciarrochi, J., Parker, P., & Kashdan, T. (2016) Emotion regulation strategies in daily life: mindfulness, cognitive reappraisal and emotion suppression. *Cognitive Behaviour Therapy 46*(2):91-113. doi: 10.1080/16506073.2016.1218926

Buhle, J. T., Silvers, J. A., Wager, T. D., Lopez, R., Onyemekwu, C., Kober, H., … Ochsner, K. N. (2014). Cognitive Reappraisal of Emotion: A Meta-Analysis of Human Neuroimaging Studies. *Cerebral Cortex*, *24*(11), 2981–2990. https://doi.org/10.1093/cercor/bht154

Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clinical Psychology Review*, *26*(1), 17–31. https://doi.org/10.1016/j.cpr.2005.07.003

Carden, S. W., Holtzman, N. S., & Strube, M. J. (2017). CAHOST: An Excel Workbook for Facilitating the Johnson-Neyman Technique for Two-Way Interactions in Multiple Regression. *Frontiers in Psychology*, *8*, 1293. http://doi.org/10.3389/fpsyg.2017.01293

Carlson, E. B. (1997). *Trauma Assessments: A Clinician's Guide* (1st edition). New York: The Guilford Press.

Carroll, J. M. (1999). On the Psychometric Principles of Affect. *Review of General Psychology, 3*(1), 14-22.

Cheng, C. (2003). Cognitive and motivational processes underlying coping flexibility: A dual-process model. *Journal of Personality and Social Psychology*, *84*(2), 425–438. https://doi.org/10.1037/0022-3514.84.2.425

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2002). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences, 3rd Edition* (Third edition). Mahwah, N.J: Routledge.

Cook, S. E., Marsiske, M., & McCoy, K. J. M. (2009). The Use of the Modified Telephone Interview for Cognitive Status (TICS-M) in the Detection of Amnestic Mild Cognitive Impairment. *Journal of Geriatric Psychiatry and Neurology*, *22*(2), 103–109. https://doi.org/10.1177/0891988708328214

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis for field settings*. Rand McNally.

Creswell, J.W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (2nd ed.). Thousand Oaks, CA, US: SAGE Publications.

Crooks, V. C., Clark, L., Petitti, D. B., Chui, H., & Chiu, V. (2005). Validation of multi-stage telephone-based identification of cognitive impairment and dementia. *BMC Neurology*, *5*(1), 8. https://doi.org/10.1186/1471-2377-5-8

Curran-Everett, D. (2000). Multiple comparisons: philosophies and illustrations. *American Journal of Physiology - Regulatory, Integrative and Comparative Physiology*, *279*(1), R1–R8.

Cutuli, D. (2014). Cognitive reappraisal and expressive suppression strategies role in the emotion regulation: an overview on their modulatory effects and neural correlates. *Frontiers in Systems Neuroscience*, *8*, 175. https://doi.org/10.3389/fnsys.2014.00175

Davis, C. G., Nolen-Hoeksema, S., & Larson, J. (1998). Making sense of loss and benefiting from the experience: two construals of meaning. *Journal of Personality and Social Psychology*, *75*(2), 561–574.

Dominowski, R. L. (1981). Comment on "An examination of the alleged role of 'fixation' in the solution of several 'insight' problems" by Weisberg and Alba. *Journal of Experimental Psychology: General*, *110*(2), 193–198.

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*(4), 319–345. https://doi.org/10.1016/S0005-7967(99)00123-0

Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology*, *46*(4), 839–852. https://doi.org/10.1037/0022-3514.46.4.839

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, *50*(5), 992–1003. https://doi.org/10.1037/0022-3514.50.5.992

Gable, P., & Harmon-Jones, E. (2010). The motivational dimensional model of affect: Implications for breadth of attention, memory, and cognitive categorisation. *Cognition and Emotion*, *24*(2), 322–337. https://doi.org/10.1080/02699930903378305

Garland, E., Gaylord, S., & Park, J. (2009). The Role of Mindfulness in Positive Reappraisal. *EXPLORE: The Journal of Science and Healing*, *5*(1), 37–44. https://doi.org/10.1016/j.explore.2008.10.001

Gendolla, G. H. E. (1999). Self-Relevance of Performance, Task Difficulty, and Task Engagement Assessed as Cardiovascular Response. *Motivation and Emotion*, *23*(1), 45–66. https://doi.org/10.1023/A:1021331501833

Gevins, A., & Smith, M. E. (2000). Neurophysiological Measures of Working Memory and Individual Differences in Cognitive Ability and Cognitive Style. *Cerebral Cortex*, *10*(9), 829–839. https://doi.org/10.1093/cercor/10.9.829

Greenberg, L. S. (1986). Change process research. *Journal of Consulting and Clinical Psychology*, *54*(1), 4–9. https://doi.org/10.1037/0022-006X.54.1.4

Greenberg, L. s. (2004). Emotion–focused therapy. *Clinical Psychology & Psychotherapy*, *11*(1), 3–16. https://doi.org/10.1002/cpp.388

Greenberg, L. S., & Pascual-Leone, A. (2006). Emotion in psychotherapy: A practice-friendly research review. *Journal of Clinical Psychology*, *62*(5), 611–630. https://doi.org/10.1002/jclp.20252

Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, *39*(3), 281–291. https://doi.org/10.1017/S0048577201393198

Gross, J. J. (2015). Emotion Regulation: Current Status and Future Prospects. *Psychological Inquiry*, *26*(1), 1–26. https://doi.org/10.1080/1047840X.2014.940781

Gross, J. J. (2015). The Extended Process Model of Emotion Regulation: Elaborations, Applications, and Future Directions. *Psychological Inquiry*, *26*(1), 130–137. https://doi.org/10.1080/1047840X.2015.989751

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Gross, J. J., Richards, J. M., & John, O. P. (2006). Emotion Regulation in Everyday Life. In D. K. Snyder, J. Simpson, & J. N. Hughes (Eds.), *Emotion regulation in couples and families: Pathways to dysfunction and health* (pp. 13–35). Washington, DC, US: American Psychological Association.

Gross, J. J., & Thompson, R. A. (2007). Emotion Regulation: Conceptual Foundations. In *Handbook of emotion regulation* (pp. 3–24). New York, NY, US: Guilford Press.

Gunaydin G, Selcuk E and Ong AD (2016) Trait Reappraisal Predicts Affective Reactivity to Daily Positive and Negative Events. *Front. Psychol*. 7:1000. doi: 10.3389/fpsyg.2016.01000

Gureje, O., Korff, M. V., Simon, G. E., & Gater, R. (1998). Persistent Pain and Well-being: A World Health Organization Study in Primary Care. *JAMA*, *280*(2), 147–151. https://doi.org/10.1001/jama.280.2.147

Gyurak, A., Gross, J. J., & Etkin, A. (2011). Explicit and implicit emotion regulation: A dual-process framework. *Cognition and Emotion*, *25*(3), 400–412. https://doi.org/10.1080/02699931.2010.544160

Haley, W. E., Roth, D. L., Coleton, M. I., Ford, G. R., C, A., Colllins, R. P., & Isobe, T. L. (1996). Appraisal, coping, and social support as mediators of well-being in Black and White family caregivers of patients with Alzheimer's disease. *Journal*

of Consulting and Clinical Psychology, *64*(1), 121–129. https://doi.org/10.1037/0022-006X.64.1.121

Haring, M. J., Stock, W. A., & Okun, M. A. (1984). A Research Synthesis of Gender and Social Class as Correlates of Subjective Well-Being. *Human Relations*, *37*(8), 645–657. https://doi.org/10.1177/001872678403700805

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.

Hayes, A. F. (2015). Hacking PROCESS for bootstrap inference in moderation analysis. *Unpublished White Paper, Author*.

Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior Research Methods*, *41*(3), 924–936. https://doi.org/10.3758/BRM.41.3.924

Hayes, A. F., & Montoya, A. K. (2017). A Tutorial on Testing, Visualizing, and Probing an Interaction Involving a Multicategorical Variable in Linear Regression Analysis. *Communication Methods and Measures*, *11*(1), 1–30. https://doi.org/10.1080/19312458.2016.1271116

Hedden, T., & Yoon, C. (2006). Individual differences in executive processing predict susceptibility to interference in verbal working memory. *Neuropsychology*, *20*(5), 511–528. https://doi.org/10.1037/0894-4105.20.5.511

Hogan, M. J., Staff, R. T., Bunting, B. P., Deary, I. J., & Whalley, L. J. (2012). Openness to experience and activity engagement facilitate the maintenance of verbal ability in older adults. *Psychology and Aging*, *27*(4), 849–854. https://doi.org/10.1037/a0029066

Hopp, H., Troy, A. S., & Mauss, I. B. (2011). The unconscious pursuit of emotion regulation: Implications for psychological health. *Cognition and Emotion*, *25*(3), 532–545. https://doi.org/10.1080/02699931.2010.532606

John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research, 3rd ed* (pp. 114–158). New York, NY, US: Guilford Press.

Johns, M. W. (1992). Reliability and factor analysis of the Epworth Sleepiness Scale. *Sleep*, *15*(4), 376–381.

Johnson, J., Gooding, P. A., Wood, A. M., Taylor, P. J., & Tarrier, N. (2011). Trait reappraisal amplifies subjective defeat, sadness, and negative affect in response to failure versus success in nonclinical and psychosis populations. *Journal of Abnormal Psychology*, *120*(4), 922–934. https://doi.org/10.1037/a0023737

Johnston, L., & Hewstone, M. (1992). Cognitive models of stereotype change: 3. Subtyping and the perceived typicality of disconfirming group members. *Journal of Experimental Social Psychology*, *28*(4), 360–386. https://doi.org/10.1016/0022-1031(92)90051-K

Kahneman, D. (2011). *Thinking, fast and slow*. New York, NY, US: Farrar, Straus and Giroux.

Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American Psychologist*, *39*(4), 341–350. https://doi.org/10.1037/0003-066X.39.4.341

Karoly, P., Ruehlman, L. S., Aiken, L. S., Todd, M., & Newton, C. (2006). Evaluating Chronic Pain Impact among Patients in Primary Care: Further Validation of a Brief Assessment Instrument. *Pain Medicine*, *7*(4), 289–298. https://doi.org/10.1111/j.1526-4637.2006.00182.x

Kent, M., Rivers, C. T., & Wrenn, G. (2015). Goal-Directed Resilience in Training (GRIT): A Biopsychosocial Model of Self-Regulation, Executive Functions, and Personal Growth (Eudaimonia) in Evocative Contexts of PTSD, Obesity, and Chronic Pain. *Behavioral Sciences*, *5*(2), 264–304. https://doi.org/10.3390/bs5020264

Klaczynski, P. A. (2014). Heuristics and biases: interactions among numeracy, ability, and reflectiveness predict normative responding. *Frontiers in Psychology*, *5*. https://doi.org/10.3389/fpsyg.2014.00665

Klein, K., & Barnes, D. (1994). The Relationship of Life Stress to Problem Solving: Task Complexity and Individual Differences. *Social Cognition*, *12*(3), 187–204. https://doi.org/10.1521/soco.1994.12.3.187

Klein, K., & Boals, A. (2001). The relationship of life event stress and working memory capacity. *Applied Cognitive Psychology*, *15*(5), 565–579. https://doi.org/10.1002/acp.727

Knight, B. G., & McCallum, T. J. (1998). Heart rate reactivity and depression in African-American and white dementia caregivers: Reporting bias or positive coping? *Aging & Mental Health*, *2*(3), 212–221. https://doi.org/10.1080/13607869856696

Kremen, W. S., Koenen, K. C., Boake, C., Purcell, S., Eisen, S. A., Franz, C. E., … Lyons, M. J. (2007). Pretrauma cognitive ability and risk for posttraumatic stress disorder: a twin study. *Archives of General Psychiatry*, *64*(3), 361–368. https://doi.org/10.1001/archpsyc.64.3.361

Larsen, R. J., Diener, E., & Emmons, R. A. (1986). Affect intensity and reactions to daily life events. *Journal of Personality and Social Psychology*, *51*(4), 803.

Lee, P. H., Macfarlane, D. J., Lam, T. H., & Stewart, S. M. (2011). Validity of the international physical activity questionnaire short form (IPAQ-SF): A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, *8*(1), 115. https://doi.org/10.1186/1479-5868-8-115

Lezak, M. D., Howieson, D. B., Bigler, E. D., & Tranel, D. (2012). *Neuropsychological Assessment* (5 edition). Oxford ; New York: Oxford University Press.

Lohnberg, J. A. (2007). A Review of Outcome Studies on Cognitive-Behavioral Therapy for Reducing Fear-Avoidance Beliefs Among Individuals With Chronic Pain. *Journal of Clinical Psychology in Medical Settings*, *14*(2), 113–122. https://doi.org/10.1007/s10880-007-9062-y

Lynch, T. R., Chapman, A. L., Rosenthal, M. Z., Kuo, J. R., & Linehan, M. M. (2006). Mechanisms of change in dialectical behavior therapy: Theoretical and empirical observations. *Journal of Clinical Psychology*, *62*(4), 459–480. https://doi.org/10.1002/jclp.20243

Mather, M., & Carstensen, L. L. (2005). Aging and motivated cognition: the positivity effect in attention and memory. *Trends in Cognitive Sciences*, *9*(10), 496–502. https://doi.org/10.1016/j.tics.2005.08.005

Matsumoto, D., Yoo, S. H., & Nakagawa, S. (2008). Culture, emotion regulation, and adjustment. *Journal of Personality and Social Psychology*, *94*(6), 925–937. https://doi.org/10.1037/0022-3514.94.6.925

Mauss, I. B., Cook, C. L., Cheng, J. Y. J., & Gross, J. J. (2007). Individual differences in cognitive reappraisal: Experiential and physiological responses to an anger provocation. *International Journal of Psychophysiology*, *66*(2), 116–124. https://doi.org/10.1016/j.ijpsycho.2007.03.017

McAdams, D. P., & Bowman, P. J. (2001). Narrating life's turning points: Redemption and contamination. In D. P. McAdams, R. Josselson, & A. Lieblich (Eds.), *Turns in the road: Narrative studies of lives in transition* (pp. 3–34). Washington, DC, US: American Psychological Association.

McCrae, R. R., Kurtz, J. E., Yamagata, S., & Terracciano, A. (2011). Internal Consistency, Retest Reliability, and their Implications For Personality Scale Validity. *Personality and Social Psychology Review*, *15*(1), 28–50. http://doi.org/10.1177/1088868310366253

McRae, K. (2016). Cognitive emotion regulation: a review of theory and scientific findings. *Current Opinion in Behavioral Sciences*, *10*, 119–124. https://doi.org/10.1016/j.cobeha.2016.06.004

McRae, K., Ciesielski, B., & Gross, J. J. (2012). Unpacking cognitive reappraisal: Goals, tactics, and outcomes. *Emotion*, *12*(2), 250–255. https://doi.org/10.1037/a0026351

McRae, K., Hughes, B., Chopra, S., Gabrieli, J. D. E., Gross, J. J., & Ochsner, K. N. (2009). The Neural Bases of Distraction and Reappraisal. *Journal of Cognitive Neuroscience*, *22*(2), 248–262. https://doi.org/10.1162/jocn.2009.21243

McRae, K., Jacobs, S. E., Ray, R. D., John, O. P., & Gross, J. J. (2012). Individual differences in reappraisal ability: Links to reappraisal frequency, well-being, and cognitive control. *Journal of Research in Personality*, *46*(1), 2–7. https://doi.org/10.1016/j.jrp.2011.10.003

McRae, K., & Mauss, I. B. (2016). Increasing positive emotion in negative contexts: Emotional consequences, neural correlates, and implications for resilience. In J. D. Greene, I. Morrison, & M. E. P. Seligman (Eds.), *Positive neuroscience* (pp. 159-174). http://dx.doi.org/10.1093/acprof:oso/9780199977925.003.0011

McRae, K., Misra, S., Prasad, A. K., Pereira, S. C., & Gross, J. J. (2012). Bottom-up and top-down emotion generation: implications for emotion regulation. *Social Cognitive and Affective Neuroscience*, *7*(3), 253–262. https://doi.org/10.1093/scan/nsq103

Miles, M.B., Huberman, A.M., & Saldaña, J. (2013). *Qualitative Data Analysis* (3rd ed.). Thousand Oaks, CA, US: SAGE Publications, Inc.

Morycz, R., Malloy, J., Bozich, M., & Martz, P. (1987). Racial Differences in Family Burden. *Journal of Gerontological Social Work*, *10*(1–2), 133–154. https://doi.org/10.1300/J083V10N01_10

Nemeth, C. J. (1986). Differential contributions of majority and minority influence. *Psychological Review*, *93*(1), 23–32. https://doi.org/10.1037/0033-295X.93.1.23

Newnham, E. A., Hooke, G. R., & Page, A. C. (2010). Monitoring treatment response and outcomes using the World Health Organization's Wellbeing Index in

psychiatric care. *Journal of Affective Disorders*, *122*(1–2), 133–138. https://doi.org/10.1016/j.jad.2009.06.005

Nezlek, J. B., & Kuppens, P. (2008). Regulating Positive and Negative Emotions in Daily Life. *Journal of Personality*, *76*(3), 561–580. https://doi.org/10.1111/j.1467-6494.2008.00496.x

Norman, R. E., Moreau, B. J. P., Welker, K. M., & Carré, J. M. (2015). Trait Anxiety Moderates the Relationship Between Testosterone Responses to Competition and Aggressive Behavior. *Adaptive Human Behavior and Physiology*, *1*(3), 312–324. https://doi.org/10.1007/s40750-014-0016-y

Ochsner, K. N., & Gross, J. J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, *9*(5), 242–249. https://doi.org/10.1016/j.tics.2005.03.010

Ochsner, K. N., Ray, R. D., Cooper, J. C., Robertson, E. R., Chopra, S., Gabrieli, J. D. E., & Gross, J. J. (2004). For better or for worse: neural systems supporting the cognitive down- and up-regulation of negative emotion. *NeuroImage*, *23*(2), 483–499. https://doi.org/10.1016/j.neuroimage.2004.06.030

Park, C. L., Folkman, S., & Bostrom, A. (2001). Appraisals of controllability and coping in caregivers and HIV+ men: Testing the goodness-of-fit hypothesis. *Journal of Consulting and Clinical Psychology*, *69*(3), 481–488. https://doi.org/10.1037/0022-006X.69.3.481

Perneger, T. V. (1998). What's wrong with Bonferroni adjustments. *BMJ : British Medical Journal*, *316*(7139), 1236.

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing Moderated Mediation Hypotheses: Theory, Methods, and Prescriptions. *Multivariate Behavioral Research*, *42*(1), 185–227. https://doi.org/10.1080/00273170701341316

Ray, R. D., McRae, K., Ochsner, K. N., & Gross, J. J. (2010). Cognitive reappraisal of negative affect: Converging evidence from EMG and self-report. *Emotion*, *10*(4), 587–592. https://doi.org/10.1037/a0019015

Rivers, C. (2014). *Role of Cognitive Shift in Resilient Adaptation to Difficult Events*. Arizona State University. Retrieved from http://gradworks.umi.com.ezproxy1.lib.asu.edu/15/55/1555827.html

Rivers, C., Zautra, A. J., & Davis, M. (2015). Resilience. *The Encyclopedia of Mental Health 2nd Edition. Oxford: Elsevier*.

Rosenberg, P. P. (1984). Support Groups: A Special Therapeutic Entity. *Small Group Behavior*, *15*(2), 173–186. https://doi.org/10.1177/104649648401500202

Sadr, M. (2016). The role of personality traits predicting emotion regulation strategies. *International Academic Journal of Humanities, 3(4),* 13-24.

Salmon, P. G., Sephton, S. E., & Dreeben, S. J. (2011). Mindfulness-Based Stress Reduction. In J. D. Herbert & E. M. Forman (Eds.), *Acceptance and Mindfulness in Cognitive Behavior Therapy* (pp. 132–163). John Wiley & Sons, Inc. https://doi.org/10.1002/9781118001851.ch6

Schmeichel, B. J., Volokhov, R. N., & Demaree, H. A. (2008). Working memory capacity and the self-regulation of emotional expression and experience. *Journal of Personality and Social Psychology*, *95*(6), 1526–1540. https://doi.org/10.1037/a0013345

Schore, A. N. (2015). *Affect regulation and the origin of the self: The neurobiology of emotional development*. Routledge.

Schulz, R., & Heckhausen, J. (1996). A life span model of successful aging. *American Psychologist*, *51*(7), 702–714. https://doi.org/10.1037/0003-066X.51.7.702

Sears, S. R., Stanton, A. L., & Danoff-Burg, S. (2003). The yellow brick road and the emerald city: Benefit finding, positive reappraisal coping and posttraumatic growth in women with early-stage breast cancer. *Health Psychology*, *22*(5), 487–497. https://doi.org/10.1037/0278-6133.22.5.487

Seery, M. D. (2011). Resilience A Silver Lining to Experiencing Adverse Life Events? *Current Directions in Psychological Science*, *20*(6), 390–394. https://doi.org/10.1177/0963721411424740

Segerstrom, S. C., Tsao, J. C. I., Alden, L. E., & Craske, M. G. (2000). Worry and Rumination: Repetitive Thought as a Concomitant and Predictor of Negative Mood. *Cognitive Therapy and Research*, *24*(6), 671–688. https://doi.org/10.1023/A:1005587311498

Sheppes, G., & Gross, J. J. (2011). Is Timing Everything? Temporal Considerations in Emotion Regulation. *Personality and Social Psychology Review*, 1088868310395778. https://doi.org/10.1177/1088868310395778

Sheppes, G., Scheibe, S., Suri, G., & Gross, J. J. (2011). Emotion-Regulation Choice. *Psychological Science*, 0956797611418350. https://doi.org/10.1177/0956797611418350

Shiota, M. N., & Levenson, R. W. (2009). Effects of aging on experimentally instructed detached reappraisal, positive reappraisal, and emotional behavior suppression. *Psychology and Aging*, *24*(4), 890–900. https://doi.org/10.1037/a0017896

Shiota, M. N., & Levenson, R. W. (2012). Turn down the volume or change the channel? Emotional effects of detached versus positive reappraisal. *Journal of Personality and Social Psychology*, *103*(3), 416–429. https://doi.org/10.1037/a0029208

Smith, T. W., Sanders, J. D., & Alexander, J. F. (1990). What does the Cook and Medley Hostility scale measure? Affect, behavior, and attributions in the marital context. *Journal of Personality and Social Psychology*, *58*(4), 699–708. https://doi.org/10.1037/0022-3514.58.4.699

Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., & et al. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology*, *60*(4), 570–585. https://doi.org/10.1037//0022-3514.60.4.570

Solomon, Z., & Dekel, R. (2007). Posttraumatic stress disorder and posttraumatic growth among Israeli ex-pows. *Journal of Traumatic Stress*, *20*(3), 303–312. https://doi.org/10.1002/jts.20216

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology*, *100*(2), 330–348. https://doi.org/10.1037/a0021717

Spira, A. P., Chen-Edinboro, L. P., Wu, M. N., & Yaffe, K. (2014). Impact of Sleep on the Risk of Cognitive Decline and Dementia. *Current Opinion in Psychiatry*, *27*(6), 478–483. https://doi.org/10.1097/YCO.0000000000000106

Staud, R. (2005). Predictors of clinical pain intensity in patients with fibromyalgia syndrome. *Current Pain and Headache Reports*, *9*(5), 316–321. https://doi.org/10.1007/s11916-005-0006-7

Staudinger, M. R., Erk, S., Abler, B., & Walter, H. (2009). Cognitive reappraisal modulates expected value and prediction error encoding in the ventral striatum. *NeuroImage*, *47*(2), 713–721. https://doi.org/10.1016/j.neuroimage.2009.04.095

Stein, K. F. (1995). Schema Model of the Self-Concept. *Image: The Journal of Nursing Scholarship*, *27*(3), 187–193. https://doi.org/10.1111/j.1547-5069.1995.tb00857.x

Steinberg, L., & Jorgensen, R. S. (1996). Assessing the MMPI-based Cook-Medley Hostility Scale: The implications of dimensionality. *Journal of Personality and*

Social Psychology, *70*(6), 1281–1287. https://doi.org/10.1037/0022-3514.70.6.1281

Steptoe, A., Deaton, A., & Stone, A. A. (2015). Subjective wellbeing, health, and ageing. *The Lancet*, *385*(9968), 640–648. https://doi.org/10.1016/S0140-6736(13)61489-0

Suri, G., Whittaker, K., & Gross, J. J. (2015). Launching reappraisal: It's less common than you might think. *Emotion*, *15*(1), 73–77. https://doi.org/10.1037/emo0000011

Sutin, A. R., Costa Jr., P. T., Wethington, E., & Eaton, W. (2010). Turning points and lessons learned: Stressful life events and personality trait development across middle adulthood. *Psychology and Aging*, *25*(3), 524–533. https://doi.org/10.1037/a0018751

Tamir, M., & Ford, B. Q. (2009). Choosing to be afraid: Preferences for fear as a function of goal pursuit. *Emotion*, *9*(4), 488–497. https://doi.org/10.1037/a0015882

Taylor, S. E. (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist*, *38*(11), 1161–1173. https://doi.org/10.1037/0003-066X.38.11.1161

Tedeschi, R. G., & Calhoun, L. G. (2004). TARGET ARTICLE: "Posttraumatic Growth: Conceptual Foundations and Empirical Evidence." *Psychological Inquiry*, *15*(1), 1–18. https://doi.org/10.1207/s15327965pli1501_01

Todd, R. M., Cunningham, W. A., Anderson, A. K., & Thompson, E. (2012). Affect-biased attention as emotion regulation. *Trends in Cognitive Sciences*, *16*(7), 365–372. https://doi.org/10.1016/j.tics.2012.06.003

Tortella-Feliu, M., Ibáñez, I., Banda, G. G. de la, Balle, M., Aguayo-Siquier, B., Morillas-Romero, A., & Llabrés, J. (2013). The Effortful Control Scale for adults: psychometric properties of the Catalan version and its relationship to cognitive emotion regulation. Retrieved September 30, 2016, from http://www.redalyc.org/articulo.oa?id=16728244035

Troy, A. S., Ford, B. Q., McRae, K., Zarolia, P., & Mauss, I. B. (2016). Change the Things You Can: Emotion Regulation Is More Beneficial for People From Lower Than From Higher Socioeconomic Status. *Emotion (Washington, D.C.)*. https://doi.org/10.1037/emo0000210

Troy, A. S., Shallcross, A. J., & Mauss, I. B. (2013). A Person-by-Situation Approach to Emotion Regulation Cognitive Reappraisal Can Either Help or Hurt, Depending

on the Context. *Psychological Science*, *24*(12), 2505–2514. https://doi.org/10.1177/0956797613496434

Troy, A. S., Wilhelm, F. H., Shallcross, A. J., & Mauss, I. B. (2010). Seeing the silver lining: Cognitive reappraisal ability moderates the relationship between stress and depressive symptoms. *Emotion*, *10*(6), 783–795. https://doi.org/10.1037/a0020262

Tschanz, J. T., Norton, M. C., Zandi, P. P., & Lyketsos, C. G. (2013). The Cache County Study on Memory in Aging: Factors Affecting Risk of Alzheimer's disease and its Progression after Onset. *International Review of Psychiatry (Abingdon, England)*, *25*(6), 673–685. https://doi.org/10.3109/09540261.2013.849663

Urry, H. L., van Reekum, C. M., Johnstone, T., & Davidson, R. J. (2009). Individual differences in some (but not all) medial prefrontal regions reflect cognitive demand while regulating unpleasant emotion. *NeuroImage*, *47*(3), 852–863. https://doi.org/10.1016/j.neuroimage.2009.05.069

Van Hooren, S.A., Valentijn, A.M., Bosma, H., Ponds, R.W., van Boxtel, M.P., Jolles, J. (2007). Cognitive functioning in healthy older adults aged 64-81: A cohort study into the effects of age, sex, and education. *Aging, Neuropsychology, and Cognition*, *14*(1), 40-54. doi: 10.1080/138255890969483

Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual Framework and Item Selection. *Medical Care*, *30*(6), 473–483.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063–1070. https://doi.org/10.1037/0022-3514.54.6.1063

Watzlawick, P., Weakland, J. H., & Richard Fisch. (1974). *Change. Principles of problem formation and problem resolution. (By) P. Watzlawick, J.H. Weakland (and) R. Fisch*. New York: W. W. Norton.

Weber, R., & Crocker, J. (1983). Cognitive processes in the revision of stereotypic beliefs. *Journal of Personality and Social Psychology*, *45*(5), 961–977. https://doi.org/10.1037/0022-3514.45.5.961

Werner, K. H., Goldin, P. R., Ball, T. M., Heimberg, R. G., & Gross, J. J. (2011). Assessing Emotion Regulation in Social Anxiety Disorder: The Emotion Regulation Interview. *Journal of Psychopathology and Behavioral Assessment*, *33*(3), 346–354. https://doi.org/10.1007/s10862-011-9225-x

Wilson, R. S., Hebert, L. E., Scherr, P. A., Barnes, L. L., Mendes de Leon, C. F., & Evans, D. A. (2009). Educational attainment and cognitive decline in old age. *Neurology*, *72*(5), 460–465. https://doi.org/10.1212/01.wnl.0000341782.71418.6c

Yik, M. (2007). Culture, gender, and the bipolarity of momentary affect. *Cognition and Emotion*, *21*(3), 664–680. https://doi.org/10.1080/02699930600823702

Zahodne, L. B., Nowinski, C. J., Gershon, R. C., & Manly, J. J. (2014). Which Psychosocial Factors Best Predict Cognitive Performance in Older Adults? *Journal of the International Neuropsychological Society: JINS*, *20*(5), 487. https://doi.org/10.1017/S1355617714000186

Zautra, A. J., Arewasikporn, A., & Davis, M. C. (2010). Resilience: Promoting Well-Being Through Recovery, Sustainability, and Growth. *Research in Human Development*, *7*(3), 221–238. https://doi.org/10.1080/15427609.2010.504431

APPENDIX A

CONSTRUCTS RELATED TO POSITIVE COGNITIVE SHIFT

Construct	*Defining characteristics*	*Conceptual model*	*Example Citation*	*Similarity to Positive Cognitive Shift*	*Dissimilarity from Positive Cognitive Shift*
Benefit-Finding & Benefit-Reminding	"…we draw an unnoticed distinction between benefit-related cognitions that are adaptive *beliefs* about the consequences of adversity, which we label as benefit-*finding*, and those that serve as coping *strategies* during difficult times, which we call benefit-*reminding."*	Cognitive adaptation theory on illusory attributions of meaning, mastery, and self-enhancement (Taylor, 1983). Benefit-finding as adaptive and potentially leading to enduring perceptions of positive change over time (Sears, Stanton, & Danoff-Burg, 2003).	Affleck, G., & Tennen, H. (1996). Construing benefits from adversity: Adaptational significance and dispositional underpinnings. *Journal of personality*, *64*(4), 899-922.	Directionality of affect change; construct likely to be mobilized in low-control situations; has been studied as positive reappraisal in health populations	Benefit-finding focuses on consequences on adversity in one conceptualization, while other conceptualizations include lab stressors of acute situations such as viewing distressing film clips (Shiota & Levenson, 2012)
Reframe	"to reframe…means to change the conceptual and/or emotional setting or place it in another frame which fits the "facts" of the same concrete situation equally well or even better, and thereby changes its entire meaning," (Watzlawick, Weakland, & Fisch, 1974, p. 95).	Theory of persistence and change: human systems change in response to problems; change and system persistence are interdependent; people create and sustain their realities through communication.	Watzlawick, P., Weakland, J., & Fisch, R. (1974). The gentle art of reframing. *Change: Principles of Problem Formation and Problem Resolution. NY: WW Norton*.	Application of the construct for those problems described as impasses or deadlocks requiring reformulation. Often, problems are vicious cycle.	Broader construct than positive cognitive shift; can apply to acute situations that create emotional impasse.

Construct	*Defining characteristics*	*Conceptual model*	*Example Citation*	*Similarity to Positive Cognitive Shift*	*Dissimilarity from Positive Cognitive Shift*
Cognitive Change	"Cognitive change refers to modifying one's appraisal of a situation in order to alter its emotional impact" (Gross, 2015, p. 9).	Part of Emotion Regulation model (Gross 2015); aspect of reappraisal.	Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry*, *26*(1), 1-26.	Cognitive change can describe alterations in how a person thinks about their ability to handle situational demands.	Broader than positive cognitive shift: can include providing emotional content to a situation one does not feel strongly about and that is an isolated event.

Construct	*Defining characteristics*	*Conceptual model*	*Example Citation*	*Similarity to Positive Cognitive Shift*	*Dissimilarity from Positive Cognitive Shift*
Schema Change	"A prerequisite for changing schemata is that incongruent information is attended to and fully processed in order for it to be incorporated into the existing schema. Previous studies have reported longer processing times for stereotype-inconsistent than consistent information," (Johnston & Hewstone, 1992, p. 376). " In our conception of posttraumatic growth, there is the additional complication that people who report growth must disengage, or give up, certain goals and basic assumptions, at the same time persisting in an attempt at building new schemas, goals, and meanings," (Tedeschi & Calhoun, 2004, p. 9).	Conversion model (schema change in response to impactful events, but remain unchanged by minor disconfirming events), bookkeeping model (stereotype change as an incremental 'fine-tuning' process), and subtyping model (accumulation of events that are so incongruent that they cannot be assimilated by fine-tuning established stereotypes, so subtypes or new group schemata develop (Weber & Crocker, 1983); Model of posttraumatic growth (following seismic event, disengagement from previous goals leads to new narrative engagement and new schemas, as well as sense of growth; Tedeschi & Calhoun, 2004).	Johnston, L., & Hewstone, M. (1992). Cognitive models of stereotype change: 3. Subtyping and the perceived typicality of disconfirming group members. *Journal of Experimental Social Psychology*, *28*(4), 360-386. Tedeschi, R. G., & Calhoun, L. G. (2004). " Posttraumatic growth: Conceptual foundations and empirical evidence". *Psychological inquiry*, *15*(1), 1-18.	Johnston & Hewstone variation: Subtyping explains how positive cognitive shift results in new situation frame for all such similar situations. Tedeschi & Calhoun variation: Development of new schemas leads to sense of personal growth; ruminations and iterative nature of information processing likely to be the same.	Can follow a "seismic event" rather than chronic events *Note:* Specifying *situation schema change* may be a sufficient way to differentiate incremental models from the versions of schema change that share meaning with positive cognitive shift.

Construct	*Defining characteristics*	*Conceptual model*	*Example Citation*	*Similarity to Positive Cognitive Shift*	*Dissimilarity from Positive Cognitive Shift*
Emotion Transforma-tion	"This principle asserts that although thinking usually changes thoughts, only new feeling can fundamentally change emotions" (Greenberg & Pascual-Leone, 2006, p. 618).	Part of emotional processing model; final process or principle, representing culmination of previous processes.	Greenberg, L. S., & Pascual-Leone, A. (2006). Emotion in psychotherapy: A practice-friendly research review. *Journal of clinical psychology*, *62*(5), 611-630.	Addresses intransigent schema-driven thought content. Construct represents transformation and represents culmination of prior processes in model.	Emotion transformation focus is on therapy-induced emotional processing. Any event may produce emotion. Emphasizes that emotion change is distinct from mere emotion regulation, attenuation, or reflection. While change distinction holds for positive cognitive shift, the change observed is not focused on emotional content but on schematic content.
Insight	"Insight is thought to arise when a solver breaks free of unwarranted assumptions, or forms novel, task-related connections between existing concepts or skills," (Bowden, Jung-Beeman, Fleck, & Kounios, 2005, p. 322).	Representational-change theory (insight occurs when problem is re-represented or reinterpreted); Progress-monitoring theory (insight achieved by using new set of moves rather than trying to reformulate the problem).	Bowden, E. M., Jung-Beeman, M., Fleck, J., & Kounios, J. (2005). New approaches to demystifying insight. *Trends in cognitive sciences*, *9*(7), 322-328.	Formation of novel conceptualization of the situation. May be a sense of aha! to the moment in which novel connections are made.	The application of positive cognitive shift is to clinical psychology and life events research rather than lab-based cognitive judgment tasks. Neither model of insight represents emotional arousal or self-relevance aspects described in positive cognitive shift.

Construct	*Defining characteristics*	*Conceptual model*	*Example Citation*	*Similarity to Positive Cognitive Shift*	*Dissimilarity from Positive Cognitive Shift*
Coping flexibility	" coping flexibility is characterized by: (a) having a variety of coping strategies to choose from; (b) having individuals' strategy choices match the controllability of the situation; and (c) using strategies that are effective for achieving coping goals," (Babb, Levine, & Arseneault, 2010, p. 11).	Dual-process model (need for closure motivates executive functioning, which galvanizes coping flexibility); Interactionist-process model (those with lower need for closure and higher tolerance for ambiguity show greater coping flexibility) (Cheng, 2003).	Babb, K. A., Levine, L. J., & Arseneault, J. M. (2010). Shifting gears: Coping flexibility in children with and without ADHD. *International Journal of Behavioral Development*, *34*(1), 10-23.	Ability to utilize executive functioning to recognize when a strategy is not working.	Coping flexibility requires cognitive switching between coping strategies in response to the demands of the situation, but this does not necessarily imply generation of novel insights or schemata.
Turning point	"a specific episode or series of episodes, [that] appears to alter or redirect the ongoing flow of the life course… Turning points are not synonymous with major life events but rather reflect a significant psychological shift or change for the individual's life," (Sutin, Costa Jr., Wethington, & Eaton, 2010, p. 525).	Life story model of identity (qualitative research-based, theory-driven coding that requires participants to describe life events so that aspects of events that form the participants' identity can be coded; Sutin, *et al, 2010).*	Sutin, A. R., Costa Jr, P. T., Wethington, E., & Eaton, W. (2010). Turning points and lessons learned: stressful life events and personality trait development across middle adulthood. *Psychology and Aging*, *25*(3), 524.	Represents significant transformation as the result of events that are self-relevant and implicitly emotionally arousing.	Turning points may have negative outcomes, accompanied by negative affect; this is untrue of positive cognitive shift. Response-focused. Positive cognitive shift occurs following chronic stressors rather than specific episode.

APPENDIX B

MEASURES

Parent Study Measures

A. Measures from Questionnaire 4: Who Are You Now?

1- Big Five Inventory

2- Trait Hope

3- Adult Temperament Questionnaire (ATQ- Attentional Control)

4- Cook- Medley Hostility Scale

5- Affect Intensity Measure

6- Emotion Approach Coping Scale

B. Measures from Health History/ Phone Interview

1- Traumatic Stress Schedule/ Past Year

2- Profile of Chronic Pain: Screen (PCP:S)

3- Personal Growth (Lifetime)

4- International Physical Activity Questionnaire (IPAQ-SF)

5- 36-Item Short Form Survey (SF-36)

C. Follow Up Study Measures

1- Modified Telephone Interview for Cognitive Status (TICS-M)

2- WHO-5 Well Being Index

3- Positive and Negative Affect Schedule (PANAS)

4- Personal Growth (Past Six Months)

A. Items for Each Measure of Questionnaire 4

1. Personality – *Big Five Inventory*

Do you think that <u>you</u> are someone who:

		Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree Strongly
a.	Is talkative?	1	2	3	4	5
a.	Tends to find fault with others?	1	2	3	4	5
a.	Does a thorough job?	1	2	3	4	5
a.	Is depressed, blue?	1	2	3	4	5
a.	Is original, comes up with new ideas?	1	2	3	4	5
a.	Is reserved?	1	2	3	4	5
a.	Is helpful and unselfish with others?	1	2	3	4	5
a.	Can be somewhat careless?	1	2	3	4	5
a.	Is relaxed, handles stress well?	1	2	3	4	5
a.	Is curious about many different things?	1	2	3	4	5
a.	Is full of energy?	1	2	3	4	5
a.	Starts quarrels with others?	1	2	3	4	5
a.	Is a reliable worker?	1	2	3	4	5
a.	Can be tense?	1	2	3	4	5
a.	Is ingenious, a deep thinker?	1	2	3	4	5
a.	Generates a lot of enthusiasm?	1	2	3	4	5
a.	Has a forgiving nature?	1	2	3	4	5
a.	Tends to be disorganized?	1	2	3	4	5
a.	Worries a lot?	1	2	3	4	5
a.	Has an active imagination?	1	2	3	4	5
a.	Tends to be quiet?	1	2	3	4	5
a.	Is generally trusting?	1	2	3	4	5
a.	Tends to be lazy?	1	2	3	4	5
a.	Is emotionally stable, not easily upset?	1	2	3	4	5
a.	Is inventive?	1	2	3	4	5
a.	Has an assertive personality?	1	2	3	4	5

Do you think that <u>you</u> are someone who:

		Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree Strongly
a.	Can be cold and aloof?	1	2	3	4	5
a.	Perseveres until the task is finished?	1	2	3	4	5
a.	Can be moody?	1	2	3	4	5
a.	Values artistic, aesthetic experiences?	1	2	3	4	5
a.	Is sometimes shy, inhibited?	1	2	3	4	5
a.	Is considerate and kind to almost everyone?	1	2	3	4	5
a.	Does things efficiently?	1	2	3	4	5
a.	Remains calm in tense situations?	1	2	3	4	5
a.	Prefers work that is routine?	1	2	3	4	5
a.	Is outgoing, sociable?	1	2	3	4	5
a.	Is sometimes rude to others?	1	2	3	4	5
a.	Makes plans and follows through with them?	1	2	3	4	5
a.	Gets nervous easily?	1	2	3	4	5
a.	Likes to reflect, play with ideas?	1	2	3	4	5
a.	Has few artistic interests?	1	2	3	4	5
a.	Likes to cooperate with others?	1	2	3	4	5
a.	Is easily distracted?	1	2	3	4	5
a.	Is sophisticated in art, music, or literature?	1	2	3	4	5

Scale scoring (R denotes reverse scored item):
Extraversion: 3a, 3fR, 3k, 3p, 3uR, 3z, 4eR, 4j
Agreeableness: 3bR, 3g, 3lR, 3q, 3v, 4aR, 4f, 4kR, 4p
Conscientiousness: 3c, 3hR, 3m, 3rR, 3wR, 4b, 4g, 4l, 4qR
Neuroticism: 3d, 3iR, 3n, 3s, 3xR, 4c, 4hR, 4m
Openness: 3e, 3j, 3o, 3t, 3y, 4d, 4iR, 4r

2. Trait Hope (Revised)

How <u>true or false</u> is each statement about you, using the scale in the box below?

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
1	2	3	4	5	6	7	8

	False							True
I have trouble getting what I want in life.	1	2	3	4	5	6	7	8
I have found that I can overcome challenges.	1	2	3	4	5	6	7	8
I clearly define the goals that I pursue.	1	2	3	4	5	6	7	8
It is difficult to find ways to get what I want.	1	2	3	4	5	6	7	8
I can think of many ways to get out of a jam.	1	2	3	4	5	6	7	8
I have many goals that I am pursuing.	1	2	3	4	5	6	7	8
I prefer easy goals over hard goals.	1	2	3	4	5	6	7	8
I have what it takes to get the job done.	1	2	3	4	5	6	7	8
I have difficulty finding ways to solve problems.	1	2	3	4	5	6	7	8
I do not have very many goals.	1	2	3	4	5	6	7	8
I give up easily.	1	2	3	4	5	6	7	8
I'm not good at coming up with solutions.	1	2	3	4	5	6	7	8
I'm good at coming up with new ways to solve problems.	1	2	3	4	5	6	7	8
I'm successful at getting what I want.	1	2	3	4	5	6	7	8
I create alternate plans when blocked.	1	2	3	4	5	6	7	8
I do not try hard enough to overcome challenges.	1	2	3	4	5	6	7	8
I go after goals that are difficult and challenging.	1	2	3	4	5	6	7	8
I do not care about the goals I am pursuing.	1	2	3	4	5	6	7	8

Scoring ("R" denotes reverse coding):

Pathways scale: dR, e, iR, lR, m, o

Goals scale: c, f, gR, jR, q, rR

Agency scale: aR, b, h, kR, n, pR

3. Adult Temperament Questionnaire

How <u>true or false</u> is each statement about you, using the scale in the box below?

Extremely false	Quite false	Slightly false	Neither true not false	Slightly true	Quite true	Extremely true	Not applicable
1	2	3	4	5	6	7	X

	False			Neither true nor false			True
b. It's often hard for me to alternate between two different tasks.	1	2	3	4	5	6	7
h. When I am trying to focus my attention, I am easily distracted.	1	2	3	4	5	6	7
i. When interrupted or distracted, I usually can easily shift my attention back to whatever I was doing before.	1	2	3	4	5	6	7
j. It is very hard for me to focus my attention when I am distressed.	1	2	3	4	5	6	7

How <u>true or false</u> is each statement about you, using the scale in the box below?

Extremely false	Quite false	Slightly false	Neither true nor false	Slightly true	Quite true	Extremely true	Not applicable
1	2	3	4	5	6	7	X

	False			Neither true nor false			True
b. When I am happy and excited about an upcoming event, I have a hard time focusing my attention on tasks that require concentration.	1	2	3	4	5	6	7

Scoring: Total scores and reverse, then take mean. Higher scores indicate better attentional control.

4.Cook-Medley Hostility

How much do you <u>agree or disagree</u> with each statement?

	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree Strongly
a. I think most people would lie to get ahead.	1	2	3	4	5
b. Most people are honest chiefly through fear of being caught.	1	2	3	4	5
c. Most people will use somewhat unfair means to gain profit or an advantage rather than to lose it.	1	2	3	4	5
d. No one cares much what happens to you.	1	2	3	4	5
e. It is safer to trust nobody.	1	2	3	4	5

Scoring: Sum scores; higher scores indicate greater hostility.

5. Affect Intensity

How do you react when any of the following events happens? Please do *not* answer how you think others react or how you think a person should react; we are interested in how YOU react to these typical life-events.

Never	Almost never	Occasionally	Usually	Almost always	Always
1	2	3	4	5	6

		Never				Always
a.	If I complete a task I thought was impossible, I am ecstatic.	1	2	3	4	5
b.	When something good happens, I am usually much more jubilant than others.	1	2	3	4	5
c.	"Calm and cool" could easily describe me.	1	2	3	4	5
d.	When I'm happy I feel like I'm bursting with joy.	1	2	3	4	5
e.	I can remain calm even on the most trying days.	1	2	3	4	5
f.	When things are going good I feel "on top of the world".	1	2	3	4	5
g.	When I know I have done something very well, I feel relaxed and content rather than excited and elated.	1	2	3	4	5
h.	When I feel happiness, it is a quiet type of contentment.	1	2	3	4	5

Scoring (based on parent study exploratory factor analysis): Sum of items with higher score indicating higher levels of indicated quality.

Affect Intensity - Calm: c, e, g, h
Positive Reactivity: a, b, d, f

6. Emotion Approach Coping

<u>How often</u> you do these things?

	I don't do this at all			**I do this a lot**
I delve into my feelings to get a thorough understanding of them.	1	2	3	4
I realize that my feelings are valid and important.	1	2	3	4
I acknowledge my emotions.	1	2	3	4
I let my feelings come out freely.	1	2	3	4
I take time to express my emotions.	1	2	3	4
I allow myself to express my emotions.	1	2	3	4
I feel free to express my emotions.	1	2	3	4
I take time to figure out what I'm really feeling.	1	2	3	4

Scoring: Sum of items with higher score indicating higher levels of indicated quality.

Emotional Processing: a, b, c, h
Emotional Expression: d, e, f, g

B. Measures from Health History/ Phone Interview

1.*Past Year Stressor Events:* Traumatic Stress Schedule

The next series of questions asks about what may have been highly stressful events. For each item, I'd like you to tell me if it has ever happened to you.

1. Has anyone taken something from you by force or threat of force, such as in a robbery, mugging, or hold-up?	No *(skip to question 2)*	□*1*	Yes, once	□*2*	Yes, more than once	□*3*	Refused	□*4*

	Within the last 6 months	6 months to 1 year ago	1 to 2 years ago	2 to 5 years ago	More than 5 years ago
About when did this happen? Or When was the last time this happened?	□*1*	□*2*	□*3*	□*4*	□*5*

2. Has anyone beaten you up or attacked you?	No *(skip to question 3)*	□*1*	Yes, once	□*2*	Yes, more than once	□*3*	Refused	□*4*

	Within the last 6 months	6 months to 1 year ago	1 to 2 years ago	2 to 5 years ago	More than 5 years ago
About when did this happen? Or When was the last time this happened?	□*1*	□*2*	□*3*	□*4*	□*5*

3. Has anyone made you have sex by using force or threatening to harm you? This includes any type of unwanted sexual activity.	No *(skip to question 4)*	□*1*	Yes, once	□*2*	Yes, more than once	□*3*	Refused	□*4*

	Within the last 6 months	6 months to 1 year ago	1 to 2 years ago	2 to 5 years ago	More than 5 years ago
About when did this happen? Or When was the last time this happened?	□*1*	□*2*	□*3*	□*4*	□*5*

1. Has a loved one died suddenly because of an accident, homicide, or suicide?	No *(skip to question 6)*	☐*1*	Yes, once ☐*2*	Yes, more than once

	Within the last 6 months	6 months to 1 year ago	1 to 2 years ago	2 to 5 years ago	More than 5 years ago
About when did this happen? Or When was the last time this happened?	☐*1*	☐*2*	☐*3*	☐*4*	☐*5*

1. Did a spouse or child die after an extended or lengthy illness?	No *(skip to question 7)*	☐*1*	Yes, once ☐*2*	Yes, more than once

	Within the last 6 months	6 months to 1 year ago	1 to 2 years ago	2 to 5 years ago	More than 5 years ago
About when did this happen? Or When was the last time this happened?	☐*1*	☐*2*	☐*3*	☐*4*	☐*5*

1. Have you suffered injury or property damage because of fire, severe weather, or a natural or manmade disaster?	No *(skip to question 8)*	☐*1*	Yes, once ☐*2*	Yes, more than once

	Within the last 6 months	6 months to 1 year ago	1 to 2 years ago	2 to 5 years ago	More than 5 years ago
About when did this happen? Or When was the last time this happened?	□*1*	□*2*	□*3*	□*4*	□*5*

1. Were you ever forced to evacuate from your home or did you otherwise learn of an imminent hazard in your environment?	No *(skip to question 9)*	□*1*	Yes, once	□*2*	Yes, more than once	

	Within the last 6 months	6 months to 1 year ago	1 to 2 years ago	2 to 5 years ago	More than 5 years ago
About when did this happen? Or When was the last time this happened?	□*1*	□*2*	□*3*	□*4*	□*5*

	Within the last 6 months	6 months to 1 year ago	1 to 2 years ago	2 to 5 years ago	More than 5 years ago
About when did this happen? Or When was the last time this happened?	□*1*	□*2*	□*3*	□*4*	□*5*

1. Have you had some other terrifying or shocking experience?	No *(skip to next page)*	□*1*	Yes	□*2*	Refused	□*3*

b. **What** happened?

	Within the last 6 months	6 months to 1 year ago	1 to 2 years ago	2 to 5 years ago	More than 5 years ago
About when did this happen?	☐ *1*	☐ *2*	☐ *3*	☐ *4*	☐ *5*

Scoring: Sum the number of events
Past year scoring: Sum of events for 1 & 2 of timeframe (occurred within last 6 months and six months to one year).

2. Profile of Chronic Pain: Screen – Pain Interference Items

How often, if ever, in the past 4 weeks, have you had to give up enjoyable activities, such as hobbies, going to the movies or fun activities with friends or family because of your pain?

Never	Less than once a month	Once a month	Twice a month	Every week	Several times a week	Daily	DK/Refused
☐0	☐1	☐2	☐3	☐4	☐5	☐6	☐7

How often, if ever, in the past 4 weeks, have you not been able to fulfill your usual and expected responsibilities at home, such as chores, repair work, or cleaning because you were in pain?

Never	Less than once a month	Once a month	Twice a month	Every week	Several times a week	Daily	DK/Refused
☐0	☐1	☐2	☐3	☐4	☐5	☐6	☐7

How often, if ever, in the past 4 weeks, have you not been able to pursue personal goals because of your pain?

Never	Less than once a month	Once a month	Twice a month	Every week	Several times a week	Daily	DK/Refused
☐0	☐1	☐2	☐3	☐4	☐5	☐6	☐7

4. International Physical Activity Questionnaire (IPAQ-SF)

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

Days per week ☐ (No vigorous physical activities – enter "0" and skip next question)

How much time did you usually spend doing **vigorous** physical activities on one of those days?

Number of hours per day ☐ Don't know/not sure ☐

Number of minutes per day ☐

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

Days per week ☐ (No moderate physical activities – enter "0" and skip next question)

How much time did you usually spend doing **moderate** physical activities on one of those days?

Number of hours per day ☐ Don't know/not sure ☐

Number of minutes per day ☐

Think about the time you spent **walking** in the **last 7 days**.

during the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

Days per week ☐ (No walking physical activities – enter "0" and skip next question)

How much time did you usually spend **walking** on one of those days?

Number of hours per day		Don't know/not sure ☐
Number of minutes per day		

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

Number of hours per day		Don't know/not sure ☐
Number of minutes per day		

Scoring: Output can be in categories (low, moderate, high energy levels) or as a continuous variable (MET minutes per week). MET minutes = amount of energy expended on physical activity.
Walking MET-minutes/week = 3.3*walking minutes*walking days
Moderate MET-minutes/week= 4*moderate-intensity activity minutes*moderate-intensity days
Vigorous MET-minutes/week= 8*vigorous-intensity activity minutes*vigorous-intensity days
Total physical activity MET-minutes/week = sum of Walking + Moderate + Vigorous MET-minutes/week scores

5. 36-Item Short Form Survey (SF-36) – General Health

In general, would you say your health is:

Excellent	Very Good	Good	Fair	Poor
☐ *1*	☐ *2*	☐ *3*	☐ *4*	☐ *5*

How TRUE or FALSE is **each** of the following statements for you?

	Definitely true	Mostly true	Mostly false	Definitely false	Refused
I seem to get sick a little easier than other people.	☐1	☐2	☐3	☐4	☐5
I am as healthy as anybody I know.	☐1	☐2	☐3	☐4	☐5
I expect my health to get worse.	☐1	☐2	☐3	☐4	☐5
My health is excellent.	☐1	☐2	☐3	☐4	☐5

Scoring: Reverse code entire scale, then add a to total. Sum the items with higher score indicating better health.

6. SF-36 Bodily Pain

During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐1	☐2	☐3	☐4	☐5

How much bodily pain have you had during the past 4 weeks?

None	Very mild	Mild	Moderate	Severe	Very Severe
☐1	☐2	☐3	☐4	☐5	☐6

Scoring: Recode two scales to reflect 6-point scale and sum the items with higher score indicating higher bodily pain.

C. Follow Up Study Measures

1. ***Modified Telephone Interview for Cognitive Status (TICS-M)***

1. **<u>Please tell me your full name.</u>**

   First Name: _____1=correct, 2=incorrect

   Last Name: _____1=correct, 2=incorrect Score: _____

   (Maximum Score: 2, 1 pt for each correct answer)

   - Nickname acceptable for 'First Name'

2. **<u>What is today's date?</u>**

   Month: _____1=correct, 2=incorrect

   Date: _____1=correct, 2=incorrect

   Year: _____1=correct, 2=incorrect

   Day of the Week: _____1=correct, 2=incorrect

   Season: _____1=correct, 2=incorrect
   Score: _____

   (Maximum Score: 5, 1 pt for each correct answer)

   - Probe for any of these that are not provided spontaneously (e.g., "**What day of the week is it?"** or **"What season is it?"**).
   - Precisely correct answers are required (e.g., a hot day in early June is not summer).
   - Seasons: Winter runs approx. Dec 21 – Mar 20; Spring runs approx. Mar 21 – June 20; Summer runs approx. June 21 – Sept 22; Fall/ Autumn runs approx. Sept 23 – Dec 20.

3. **<u>Where are you right now?</u> (other possible probes: "What is your address?" or "What is the address of where you are right now?"**

   House Number: _____1=correct,

2=incorrect

Street: _____1=correct,
2=incorrect

City: _____1=correct,
2=incorrect

State: _____1=correct,
2=incorrect

Zipcode: _____1=correct,
2=incorrect Score: _____

(Maximum Score: 5, 1 pt for each correct answer)

- If any of the above are not given spontaneously, probe (e.g., **"What number is that"** or **"What is your zipcode?"**).
- If the examinee is in a facility with no house number (e.g., hospital or nursing home), the name of the facility may be substituted for the house number.

4. **<u>Please count backwards from 20 to 1.</u>**

20 1918 17 16 15 14 13 12 11
Correct on: first try: _____ OR second try: _____

10 9 8 7 6 5 4 3 2 1
Score: _____

(Maximum Score: 2)

- If examinee makes an error on the first try, ask him/ her to try again.
- Score 2 points if completely correct on 1st try.
- Score 1 point if completely correct on second try.
- Score 0 points if there are any errors on second try.

5. **I am going to read you a list of 10 words. Please listen carefully and try to remember them. Please do not write anything down. I will read the list only once. If you don't understand a word, that's alright, just try to repeat what you heard. When I am done, tell me as many words as you can, in any order. Ready?**

The words are (*The words should be read approximately every 2 seconds):*

Cabin . . . Pipe. . . Elephant . . . Chest . . . Silk . . .

Theater . . . Watch . . . Whip . . . Pillow . . . Giant . . . (*pause*)

Now tell me all of the words you can remember.

- No repetitions of the word list are permitted by the examiner.
- Score 1 point for each correctly recalled word.
- Score 0 points for incorrect responses (e.g., repetition of list words or intrusion of words not on the list).

6. **I would like you to take the number 100 and subtract 7 (pause for a response). Now keep subtracting 7 from the answer until I tell you to stop.** (No further prompts or instructions are given, except to "keep going")

- *Score 1 point for each correct subtraction.*
- *Correct answer: 93, 86, 79, 72, 65*
- *Do not inform the examinee of incorrect responses, but allow subtractions to be made from the last response. That is, score 1 point for a correct subtraction, even if the subtraction was a previously incorrect response (e.g., 93, 85, 78, 71, 65 would be awarded 3 points).*

7. **What do people usually use to cut paper?**
   [Accept only "scissors" or "shears" as correct (1 point)]

   How many things are in a dozen?
   [Accept only "12"as correct (1 point)]

   What do you call the prickly green plant that lives in the desert?
   [Accept only "cactus" or kind of cactus, e.g., "prickly pear" as correct (1 point)]

   What animal does wool come from?
   [Accept only "sheep" or "lamb" as correct (1 point)]

Score: _____

(Maximum Score: 4, 1 pt each correct answer)

8. **Repeat this after me:**

a) **No ifs, ands or buts.**

a) Correct: _____ *1* Incorrect: _____ *2*

Now repeat this after me:

b) **Methodist Episcopal.**

b) Correct: _____ *1* Incorrect: _____ *2*

Score: _____

(Maximum Score: 2)

- *No repetitions of the phrases for the examiner are permitted.*
- *Score 1 point for each correct repetition.*

9. **Who is President of the United States right now?**

Who is the Vice-President?

Score: _____

(Maximum Score: 2)

- *The examinee must provide both first and last name in order to receive credit for the question.*
- *If only last name is given, probe for the first name.*
- *Score 1 point for the current President's full name (i.e., first and last).*
- *Score 1 point for the current Vice-President's full name (i.e., first and last).*

10. **With your fingertip, tap five times on the part of the phone you speak into.**

a) 5 taps are clearly heard:
Score = 2 _____
b) More than OR fewer than 5 taps:
Score = 1 _____
c) No taps are heard:
Score = 0 _____

Score: _____

(Maximum Score: 2)

- *If participant is on a mobile phone: "If you are on a cell phone, the receiver may be at the bottom of the phone."*

11. <u>I am going to say a word and I want you to give me its opposite. For example, if I said 'hot' then you would say 'cold.'</u>

a) What is the opposite of West?
a) Correct: _____ 1 Incorrect: _____ 2

[Accept only "East" as correct (1 point)]

b) What is the opposite of generous?
b) Correct: _____ 1 Incorrect: _____ 2

[Accept any one of the following antonyms for 1 point or other correct antonym: Cheap, chintzy, frugal, greedy, hoarding, meager, mean, miserly, niggardly, penurious, restrictive, scotch, scrooge, selfish, skimpy, sparse, stingy, tight, tightwad, ungenerous (not generous)]

Score: _____

(Maximum Score: 2, 1 pt for each correct answer)

Total Scoring: To obtain the TICS total score, sum the number of points obtained for each of the preceding 11 items. A higher TICSM score denoted higher cognitive functioning.

2. *WHO Wellbeing Index*

How much time during the past 4 weeks . . .

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time	Refused
Have you felt cheerful and in good spirits.	☐6	☐5	☐4	☐3	☐2	☐1	☐7
Have you felt active and vigorous?	☐6	☐5	☐4	☐3	☐2	☐1	☐7
Have you awakened feeling fresh and rested?	☐6	☐5	☐4	☐3	☐2	☐1	☐7
Has your daily life been filled with things that interest you?	☐6	☐5	☐4	☐3	☐2	☐1	☐7
How often have you felt very healthy and full of energy?	☐6	☐5	☐4	☐3	☐2	☐1	☐7

Scoring: Items are summed and a mean score taken.

3.*Positive and Negative Affect Schedule (PANAS)*

The following words describe different feelings and emotions. How much have you felt this way **during the past 4 weeks**using this scale?

	Very slightly/ Not at all	A little	Moderately	Quite a bit	Extremely	Refused		Very slightly/ Not at all	A little	Moderately	Quite a bit	Extremely	Refused
Interested	☐1	☐2	☐3	☐4	☐5	☐6	Irritable	☐1	☐2	☐3	☐4	☐5	☐6
Distressed	☐1	☐2	☐3	☐4	☐5	☐6	Alert	☐1	☐2	☐3	☐4	☐5	☐6
Excited	☐1	☐2	☐3	☐4	☐5	☐6	Ashamed	☐1	☐2	☐3	☐4	☐5	☐6
Upset	☐1	☐2	☐3	☐4	☐5	☐6	Inspired	☐1	☐2	☐3	☐4	☐5	☐6
Strong	☐1	☐2	☐3	☐4	☐5	☐6	Nervous	☐1	☐2	☐3	☐4	☐5	☐6
Guilty	☐1	☐2	☐3	☐4	☐5	☐6	Determined	☐1	☐2	☐3	☐4	☐5	☐6
Scared	☐1	☐2	☐3	☐4	☐5	☐6	Attentive	☐1	☐2	☐3	☐4	☐5	☐6
Hostile	☐1	☐2	☐3	☐4	☐5	☐6	Jittery	☐1	☐2	☐3	☐4	☐5	☐6
Enthusiastic	☐1	☐2	☐3	☐4	☐5	☐6	Active	☐1	☐2	☐3	☐4	☐5	☐6
Proud	☐1	☐2	☐3	☐4	☐5	☐6	Afraid	☐1	☐2	☐3	☐4	☐5	☐6

Scoring:

Positive Affect: add scores of items 1,3, 5, 9, 10, 12, 14, 16, 17, and 19. Scores can range from 10-50, with higher scores representing higher levels of positive affect. Then take the mean score.

Negative Affect: add scores of items 2, 4, 6, 7, 8, 11, 13, 15, 18, and 20. Scores can range from 10-50, with lower scores representing lower levels of negative affect. Then take mean score.

4. ***Growth (Six Months)***

Instructions prior to item: Think of the most stressful aspect of your life over the past six months, even if it may not have been very stressful…

To what extent have you been able to learn from and grow stronger from this experience?

Not at all	**A little bit**	**Somewhat**	**Quite a bit**	**Extremely**
□*1*	□*2*	□*3*	□*4*	□*5*

Scoring: Higher scores indicate greater growth from the experience.

APPENDIX C

POSITIVE COGNITIVE SHIFT CODEBOOK

Operationalization of Code

Positive Cognitive Shift:

(1) There is emotional arousal, but there is negative emotional arousal and no evidence of resource usage toward resolution of problems arising from events.

(2) The participant describes events that are emotionally arousing, leading to negative arousal such that participant is minimally motivated to take action. May utilize some existing resources to address stressors arising out of situation.

(3) Participant transcript indicates arousal that motivates some action directed at use of resources to resolve problems arising from situation. Insight as to mismatch between goals and stressor may be unclear, but the narrative may suggest that such a mismatch existed but clarity may not be sufficient to justify a "4" rating.

(4) Participant indicates positive arousal, such that resources are used to resolve difficulties arising from stressor event. The transcript clearly outlines a mismatch between coping resources and stressor but participant's ability to identify the mismatch may be in question. Alternatively, participant identifies the mismatch and is attempting a reidentification of the situation and/or self with new coping resources but continues to oscillate back and forth between old and new resources when in similar situations (e.g., addiction). A related but alternative situation is the participant that experiences an incomplete reidentification of new coping such that there is a period of oscillation between old and new identities (e.g., coming to grips with a new diagnosis).

(5) The participant describes events leading to alteration of how the situation is defined that create a positive arousal, recognition that resources used are insufficient to address the stressor, that there is a mismatch between the resources participant has for coping and the stressors arising from the stressful situation. Participant clearly describes a reframing of identity with reference to the situation that caused the stress.

Definitions: these are themes that the coding team took into consideration as they coded positive cognitive shift

High-level theme: Emotional arousal

Brief definition: A strong emotional response that occurs in response to participant experiencing a challenge to self-concept or difficulty orienting to a situation.

Full definition: Participant may experience a situation as emotionally difficult to navigate, causing strong feelings in the positive or negative direction that alert him or her that the situation requires redress. It is important to identify whether the strong feelings are in the positive or negative direction for purposes of positive cognitive shift, as negative feelings may be more likely to curtail insight than positive feelings of arousal.

When to use: A chronic stressor may produce emotional arousal, and some participants may describe feelings in response to a situation and others may describe actions that clearly are indicative of emotional arousal (e.g., shouting at someone, racing away from a scary situation). Both descriptions fit the criteria, but the emotional arousal must be directed at the source of the chronic stress or stress that is logically connected to the chronic stressor event.

When not to use: Do not use when emotional arousal is not directed at a participant's chronic stress.

Example of Emotional arousal: "I did feel somewhat depressed and, you know, disillusioned depressed and, of course, uh, weeping… missing my mother, looking at, uh, some of the past things we had experienced together…."

High-level theme: Goal-Coping Mismatch (or Mismatch to Goals)

Brief definition: Recognition that previously employed coping failed to meet one's needs or goals.

Full definition: Participant describes employing a way of coping with a difficult event, and then describes how that coping method failed to meet needs or goals.

When to use: When participant describes how at least one previous way of coping did not yield satisfactory results. May be tied in narrative to when, how and why a new way of coping or thinking about the problem was adopted.

When not to use: When participant is simply saying that they had no support system or idea of how to deal with the situation that arose.

Example of Goal-Coping Mismatch (or Mismatch with Goals): "Well, I guess, what when we reached a point in time where we realized that we won a lot of battles but we weren't going to win the war. . . you know you're gonna lose and my wife was gonna die . . . I did everything I could to comfort her, in her final days."

Note that this example is fundamentally relevant to self-concept, as will be further described below. Most goal-coping mismatches are expected to be relevant to self-concept, as the very notion of fashioning goals suggests that they will be important to a person. However, a person might describe a work goal set by a third party that would have less relevance to the participant's self-concept. Similarly, a participant might have a relatively trivial goal that, in context of the narrative, clearly bears less relevance to the participant's self-concept than other goals the participant may have. These goal-coping mismatches would be coded differently from those that are important to self-concept.

High-level theme: Oscillation

Brief definition: Fluctuating in behavior or cognition from similar situation to situation following a reframing experience.

Full definition: Despite an awareness of the need for change and a previous reframing of their conceptualization of situation, participant describes fluctuating in behavior or cognition from similar situation to situation.

When to use: When participant describes having reframed a situation but continuing to struggle with their behavior or cognitions in recursive situations.

When not to use: When participant is describing new and different situations that they are applying different behaviors or cognitions to.

Example of Oscillation: "You know, drugs and alcohol are powerful unkind. And…once you quit one, you know, it took a while, but it did sneak up on me. And…hell, I was an alcoholic for twenty years."

High-level theme: Recursive or Chronic Events

Brief definition: Participant describes stressor situations that recurred or were chronic in nature.

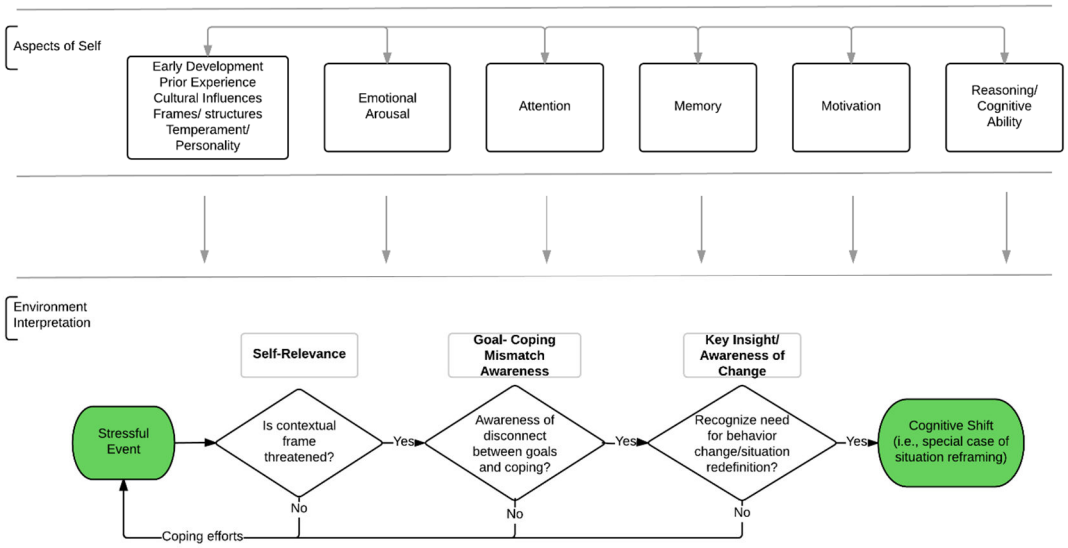
Full definition: Some events are not isolated or acute with a clear end point, but instead are the sorts of situations that do not actually have a clear end point and may be recurring. Situations that have no clear end point and continue persistently are chronic situations (e.g., disease). Situations that recur in a similar form over and again are recursive situations (e.g., abuse).

When to use: When participant describes being in either a chronic or recursive situation.

When not to use: When participant is describing a chronic or recursive situation, but it is not the subject of their awareness of the need for change. Also do not use when participant describes a situation that could be recursive or chronic, but occurs only once. Do not use for acute, isolated situations.

Example of Recursive or Chronic Events: "I think at first I was just trying to think what I did wrong to cause the problem and so I was just kinda like okay I'll fix whatever it is I did…abused women don't understand why they're being abused to begin with and so um… and you don't dare leave because they threaten you, if you leave you're gonna, they're gonna kill you or you're gonna get beaten to death or whatever. Pick or choose, or whatever, they brainwash you and so you just kinda don't know whay to do you're just kinda like okay I guess I gotta stay in this situation."

Figure depicting conceptual flow from event to cognitive shift:



Additional Coding - Counts

Coding of supportive people:

The following will be coded with a "0" indicating "no support" or a "1" indicating 'support" for the following support resources:

(1) resources in the community (e.g., friends, neighbors)
(2) helping services (e.g., medical)
(3) work (e.g., coworkers, supervisor)
(4) family

Count: Number of Supportive People

How to count: Sum the total number of "1's" counted in the coding of supportive people and report the raw score (no more than 4) on the spreadsheet.

Count: Number of Coping Methods Attempted

Brief definition: The number of separable coping methods or skills participant describes using.

Full definition: Coping methods or skills may be utilized in ways that exacerbate problems or provide relief to portions of a larger problem, or they may completely resolve one issue while leaving others unresolved.

When to use: When participant describes a coping method or skill utilized to resolve any aspect of a stressful event, each coping skill or method utilized should be counted as a separate coping method.

When not to use: When participant is reusing the same coping method to try to resolve the same issue repeatedly.

How to count: Sum the total number of events counted and report the raw score.

Examples of coping methods: avoidance, emotion regulation techniques (e.g., meditation, taking a walk), physical recreation, drinking, problem solving, sleep, sharing with others, releasing control, taking control, therapy

Decision Rules

Age Rules

1.) If the participant does not give an age but provides the number of years previously that the event occurred, calculate the age as follows:

[median age of 55 (present age)] – (# of years ago event occurred) = age at which event occurred

2.) If participant was drafted into a war and does not give age, use age 18

APPENDIX D

SCORING SHEET

SECTION 1: THEORY-DRIVEN CODES **Categories**	**Line Numbers –** If multiple sets of line numbers are identified as related to a given code, separate each instance below with semi-colons
Recursive or Chronic Events – Participant describes situations that are recurring, have no clear end point, and/ or are chronic.	
Emotional Arousal – Difficulty orienting to situation; strong emotional response; challenge to self-concept. Positive/ Negative	
Goal-Coping Mismatch – Describes how coping methods failed to meet needs or goals, not yielding satisfactory results. *Note: Not enough to say they had no idea how to deal with situation or had no support system.*	
Memo Space for Goal-Coping Mismatch –	
Key Insight – Participant describes an insight that about how they could frame the chronic situation. There should be some evidence that this is not "coping as usual" but a true shift in how the situation is framed and internalized.	
Memo Space for Key Insight –	
Oscillation – Evidence that participant continues to fluctuate in behavior in similar recursive/ chronic situations following a transformative experience.	
Flags -	
Memo Space for Flags	

SECTION 2: TIMING OF EVENT

When did the event begin? Choose only one option. If both "5" and "6" apply, select "6"

1. Event occurred within 1 year of interview date ☐
2. Event occurred within the past 5 years ☐
3. Event occurred 5 – 10 years ago ☐
4. Event occurred 10 -20 years ago ☐
5. Event occurred 20+ years ago ☐
6. Event occurred in childhood (participant was <18 years old) ☐

SECTION 3: DURATION OF EVENT

Over what period of time did the event/ crisis occur (how long)?

1. Event was brief, i.e., one month or less. ☐
2. Event lasted one month to 6 months. ☐
3. Event lasted 6 months to one year. ☐
4. Event lasted one year to five years. ☐
5. Event lasted five years or more. ☐

SECTION 4: PARTICIPANT'S AGE WHEN EVENT BEGAN _____

How old was the participant when the event began? Fill in the blank.

SECTION 5: SUPPORTIVE PEOPLE

Were any of the following indicated by the participant as sources of support?

Resources in the community (e.g., friends, neighbors)	(0) No	(1) Yes
Helping services (e.g., medical)	(0) No	(1) Yes
Work (e.g., coworkers, supervisor)	(0) No	(1) Yes
Family	(0) No	(1) Yes

SECTION 6: NUMBER OF COPING METHODS ATTEMPTED _____

How many separable coping methods or skills did the participant describe using to try to resolve issues arising from their difficult event? Sum the total number of methods counted and report the raw score.

SECTION 7: POSITIVE COGNITIVE SHIFT

Did participant experience a cognitive shift?

Neg Arousal, No Resources	Neg Arousal, Some Resources	Neutral/ Pos Arousal, Some Resources
1	2	3

Pos Arousal, Use Resources, Mismatch	PCS: Pos Arousal, Insuff Resources, Mismatch, Insight
4	5