2022

"Think of the Situation in a Positive Light": A Look at Cognitive Reappraisal, Affective Reactivity and Health

Jessica Chloe Maras
University of Kentucky, jessicachloe11@gmail.com
Author ORCID Identifier:
https://orcid.org/0000-0001-7148-9761
Digital Object Identifier: https://doi.org/10.13023/6etd.2022.205

STUDENT AGREEMENT:

I represent that my thesis or dissertation and abstract are my original work. Proper attribution has been given to all outside sources. I understand that I am solely responsible for obtaining any needed copyright permissions. I have obtained needed written permission statement(s) from the owner(s) of each third-party copyrighted matter to be included in my work, allowing electronic distribution (if such use is not permitted by the fair use doctrine) which will be submitted to UKnowledge as Additional File.

I hereby grant to The University of Kentucky and its agents the irrevocable, non-exclusive, and royalty-free license to archive and make accessible my work in whole or in part in all forms of media, now or hereafter known. I agree that the document mentioned above may be made available immediately for worldwide access unless an embargo applies.

I retain all other ownership rights to the copyright of my work. I also retain the right to use in future works (such as articles or books) all or part of my work. I understand that I am free to register the copyright to my work.

REVIEW, APPROVAL AND ACCEPTANCE

The document mentioned above has been reviewed and accepted by the student's advisor, on behalf of the advisory committee, and by the Director of Graduate Studies (DGS), on behalf of the program; we verify that this is the final, approved version of the student's thesis including all changes required by the advisory committee. The undersigned agree to abide by the statements above.

Jessica Chloe Maras, Student

Dr. Kate A. Leger, Major Professor

Dr. Mark Fillmore, Director of Graduate Studies

“Think of the Situation in a Positive Light”: A Look at Cognitive Reappraisal, Affective Reactivity and Health

---

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Arts and Sciences
at the University of Kentucky

By

Jessica Chloe Maras

Lexington, Kentucky

Director: Dr. Kate A. Leger, Professor of Psychology

Lexington, Kentucky

2022

https://orcid.org/0000-0001-7148-9761

ABSTRACT OF THESIS

"Think of the Situation in a Positive Light": A Look at Cognitive Reappraisal, Affective Reactivity and Health

How individuals regulate their emotions is critical for maintaining health and well-being. For example, reframing a stressful situation in a positive light, a form of cognitive reappraisal, is beneficial for health and well-being outcomes. However, it is currently unclear why this relationship exists. One potential mechanism could be how one emotionally reacts to stressors in daily life, termed affective reactivity. The current study examined longitudinal associations that spanned 20 years between cognitive reappraisal and health outcomes and subjective well-being and if affective reactivity mediated this relationship. Participants completed waves 1-3 of the Midlife in the United States (MIDUS) Survey series and were asked various questions about their general health and well-being. A subset of participants from MIDUS II completed the National Study of Daily Experiences (NSDE II), an 8-day daily diary asking about their everyday experiences. The final sample consisted of 1,814 participants. Results found that cognitive reappraisal was significantly associated with future health and well-being outcomes, and negative affective reactivity significantly mediated this relationship. Findings from this study could better inform stress and well-being interventions by strengthening cognitive reappraisal strategies to target reducing affective reactivity to stressors which should then benefit long-term health and well-being.

KEYWORDS: cognitive reappraisal, affective reactivity, health, stress

Jessica Chloe Maras

04/19/2022

Date

“Think of the Situation in a Positive Light”: A Look at Cognitive Reappraisal, Affective Reactivity and Health

By
Jessica Chloe Maras

Kate A. Leger
Director of Thesis

Mark Fillmore
Director of Graduate Studies

04/19/2022
Date

DEDICATION

To my friends and my family – thank you for always supporting me.

ACKNOWLEDGMENTS

The following thesis, while an individual work, benefited from the insights and direction of several people. A big thank you to my advisor, Dr. Kate Leger, who provided constructive feedback and mentorship throughout this process, substantially improving this thesis. Furthermore, I want to thank my Thesis Committee, Dr. Peggy Keller and Dr. Christal Badour, who helped strengthen my findings statistically and provided additional thoughts that guided the development of this thesis. I also want to thank the John D. and Catherine T. MacArthur Foundation for funding the MIDUS study that allowed me to complete my thesis.

TABLE OF CONTENTS

ACKNOWLEDGMENTS iii

LIST OF TABLES vi

LIST OF FIGURES vii

CHAPTER 1. LITERATURE REVIEW 1

1.1 Cognitive Reappraisal: An Emotion Regulation Strategy *2*

1.1.1 Cognitive Reappraisal and Association with Mental Health & Subjective Well-being 3

1.1.2 Cognitive Reappraisal and Association with Physical Health 4

1.2 Affective Reactivity *5*

1.2.1 Affective Reactivity and Association with Physical/Mental Health & Subjective Well-being 6

1.3 Affective Reactivity & Link to Cognitive Reappraisal *7*

1.4 Current Study *8*

CHAPTER 2. METHODS 8

2.1 Sample and Design *8*

2.2 Measures *9*

2.2.1 Wave 1 Cognitive Reappraisal 9

2.2.2 Wave 1 Demographics 10

2.2.3 Wave 2 Daily Stressors 10

2.2.4 Wave 2 Daily Negative Affect 11

2.2.5 Wave 2 Daily Positive Affect 11

2.2.6 Wave 2 Negative Affective Reactivity 12

2.2.7 Wave 2 Positive Affective Reactivity 12

2.2.8 Wave 1 and 3 Depression 12

2.2.9 Wave 1 and 3 Anxiety 13

2.2.10 Wave 1 and 3 Self-rated Mental Health 13

2.2.11 Wave 1 and 3 Subjective Well-being 13

2.2.12 Wave 1 and 3 Chronic Conditions 14

2.2.13 Wave 1 and 3 Functional Limitations 14

2.2.14 Wave 1 and 3 Self-rated Physical Health 15

2.3 Analysis Plan *15*

CHAPTER 3. RESULTS 16

3.1 Descriptive Statistics *16*

3.2 Cognitive Reappraisal and Health Outcomes *19*
3.2.1 Mediation Analyses: Negative Affective Reactivity 22
3.2.1.1 Mental Health and Well-being Outcomes 22
3.2.1.2 Physical Health Outcomes 22

3.3 Exploratory Analyses *25*
3.3.1 Mediation Analyses: Specific Negative Emotions 25
3.3.1.1 Restless/Fidgety 25
3.3.1.2 Nervous 25
3.3.1.3 Everything was an effort 26
3.3.1.4 Jittery 26
3.3.1.5 Irritable 27
3.3.1.6 Ashamed 27
3.3.1.7 Upset 27
3.3.1.8 Angry 28
3.3.1.9 Frustrated 28
3.3.1.10 Additional Specific Emotions 29
3.3.2 Mediation Analyses: Positive Affective Reactivity 29
3.3.2.1 Health and Well-being Outcomes 29

CHAPTER 4. DISCUSSION 30

4.1 General Discussion *30*

APPENDICES 36

APPENDIX 1. COGNITIVE REAPPRAISAL SCALE (WROSCH ET AL., 2000) *37*

APPENDIX 2. DAILY INVENTORY OF STRESSFUL EVENTS (DISE; ALMEIDA ET AL., 2002) *38*

APPENDIX 3. DAILY NEGATIVE AFFECT (WATSON AND CLARK, 1994) *39*

APPENDIX 4. DEPRESSION (KESSLER ET AL., 1998) *40*

APPENDIX 5. ANXIETY (CIDI-SF; KESSLER ET AL., 1998) *42*

APPENDIX 6. SELF-RATED HEALTH *44*

APPENDIX 7. SUBJECTIVE WELL-BEING SCALE (PRENDA & LACHMAN, 2001) *45*

APPENDIX 8. CHRONIC CONDITIONS (MARMOT ET AL., 1997) *47*

APPENDIX 9. FUNCTIONAL LIMITATIONS (KATZ ET AL., 1963) *49*

REFERENCES 50

VITA…..... 60

LIST OF TABLES

Table 3.1 Descriptive Statistics and Correlations Among Variables..... 18
Table 3.2 Ordinary Least Squares Regression Models Predicting Wave 3 Mental Health and Subjective Well-being Outcomes..... 20
Table 3.3 Ordinary Least Squares Regression Models Predicting Wave 3 Physical Health Outcomes 21

LIST OF FIGURES

Figure 3.1 Mediation Models of Cognitive Reappraisal, Affective Reactivity and Health and Well-being Outcomes..... 23

CHAPTER 1. LITERATURE REVIEW

Individuals navigating difficult situations are often told to "think of the situation in a positive light". This advice refers to a particular emotion regulation strategy within cognitive reappraisal that entails reframing a negative situation to be viewed more positively (Gross, 2001). Engaging in cognitive reappraisal has been shown to be associated with positive physical and mental health benefits such as lowered depression, better subjective well-being, and lower blood pressure (Garnefski & Kraaji, 2006; Gross & John, 2003; Haga et al., 2007; Nezlek & Kuppens, 2008; Shapero et al., 2019). One pathway that may explain the associations between cognitive reappraisal and health is how people react to daily stressors. People experience greater negative affect on days when they experience stressors compared to stressor free days, termed affective reactivity (Charles et al., 2009). Greater increases in negative affect on days with stressors is associated with both physical and mental health as well as subjective well-being (Charles et al., 2013; Piazza et al., 2013).

Individuals who engage in cognitive reappraisal strategies are better at regulating emotional responses to daily stressful events, but research has yet to determine if affective reactivity to daily stressful events is a pathway that explains the relationship between cognitive reappraisal strategies and better physical/mental health and subjective well-being. We proposed that affective reactivity would be a pathway linking cognitive reappraisal and physical/mental health and subjective well-being. The present study used three waves of a longitudinal study across 20 years to examine (1) the associations between cognitive reappraisal and future physical/mental health and subjective well-being and (2) affective reactivity as a pathway mediating this relationship.

1.1 Cognitive Reappraisal: An Emotion Regulation Strategy

People do not passively experience emotions. Instead, they act on them in an attempt to change the way they experience an emotional response (Gross, 1999). This process is called emotion regulation and it refers to how people try to shape and choose to express their emotions (Gross, 1998a). It can also be viewed as an action taken to shift current emotions towards a desired emotion (Tamir et al., 2020). Emotion regulation is integral to health functioning because how an individual chooses to regulate their emotions can have social and psychological consequences (Gross et al., 2006). For example, individuals who engage in cognitive reappraisal function better in emotional and interpersonal settings and show decreased emotional reactions in response to negative events changing their expressed behavior (Gross et al., 2006).

Within the umbrella of emotion regulation, there are many different strategies that can be used to regulate emotions. One strategy that is particularly beneficial is cognitive reappraisal (Gross, 2001). Cognitive reappraisal refers to altering emotions by changing the way one thinks about a potentially emotion-eliciting situation (Gross, 2008; McRae et al., 2012). As an antecedent-focused form of emotion regulation, we use cognitive reappraisal to shape our emotional responses to a situation before our responses become fully activated (Gross, 2001). Cognitive reappraisal is also considered to be a secondary control strategy which refers to altering the way one thinks about a situation instead of attempting to change the situation itself (Wrosch & Heckhausen, 2000). An individual experiencing a stressful event could reframe the situation in a more positive light which would then decrease the emotional response given to the stressful event, protecting their emotional health (Wrosch & Heckhausen, 2000). Cognitive reappraisal is also associated

with decreased physiological activation in response to a stressful event which provides positive benefits for an individual's physical health (Gross, 1998b; Gross & John, 2003).

1.1.1 Cognitive Reappraisal and Association with Mental Health & Subjective Well-being

Cognitive reappraisal is an important strategy involved in mental health. Stressful events tend to put strain on an individual's mental health due to the taxing nature of stressors on emotions (Cui & Vaillant, 1996; Thoits & Link, 2015). Stressful events are associated with increased depression, increased anxiety, and poorer subjective well-being (Brown & Harris, 1978; Denovan & Macaskill, 2017; Dohrenwend & Dohrenwend, 1974; Hetolang & Amone-P'Olak, 2017; Miloyan et al., 2018; Thoits, 1983). However, engaging in cognitive reappraisal can lessen the damaging emotional impact of a stressful event.

The tendency to engage in cognitive reappraisal is associated with better mental health and subjective well-being (Gross, 1998a). For example, individuals with high levels of cognitive reappraisal also exhibit lowered depression, increased positive affect, self-esteem, and psychological adjustment as well as better interpersonal functioning (Garnefski & Kraaji, 2006; Gross & John, 2003; Nezlek & Kuppens, 2008; Shapero et al., 2019). Furthermore, using cognitive reappraisal strategies is positively related to well-being and has been shown to predict higher levels of positive well-being outcomes (Gross & John, 2003; Haga et al., 2007). Research has also demonstrated that individuals high in cognitive reappraisal are more stress-resilient and experience less self-reported state anxiety while reporting higher self-reported state euphoria (Carlson et al., 2012).

1.1.2 Cognitive Reappraisal and Association with Physical Health

Cognitive reappraisal is also associated with physical health, although this relationship has been less studied. Stressful events lead to wear-and-tear on physiological processes due to negative emotional responses to stressful events (Hawkley et al., 2005). This wear-and-tear, also known as allostatic load, can result in the development of chronic health conditions (Mattei et al., 2010). Since cognitive reappraisal is associated with less negative emotional responses to stressful events, this could have positive physical health benefits. In fact, cognitive reappraisal is indirectly associated with lower allostatic load and less metabolic and inflammatory dysregulation (Ellis et al., 2019). Studies demonstrate that those high in cognitive reappraisal have attenuated blood pressure, increased heart rate variability, greater cardiac output and ventricular contractility, and less total peripheral resistance in response to an anger-inducing experiment (Denson et al., 2011; Mauss et al., 2007; Memedovic et al., 2010). These studies have established a link between cognitive reappraisal and concurrent physical health, but no study has examined longitudinal associations with future physical health. Cognitive reappraisal is associated with physical health indicators, but it is unknown if cognitive reappraisal is associated with future physical health outcomes later in life.

There are also specific times when engaging in cognitive reappraisal may be most beneficial. Cognitive reappraisal is beneficial for mental health and well-being for uncontrollable stressors in particular (Troy et al., 2013). If someone cannot change the situation they are in, it may be better for their emotional well-being to reframe the stressor in a more positive way. In line with this, engaging in cognitive reappraisal is associated with decreased depression specifically for those from lower SES backgrounds (Troy et al.,

2017). People from lower SES backgrounds have fewer resources available to cope with stressors and change negative circumstances. Consequently, thinking of a stressful event in a more positive way might be the only way a person with a low SES background can change how a negative situation impacts them emotionally. Another example that illustrates the benefits of engaging in cognitive reappraisal during uncontrollable stressors is older adulthood. Older adulthood is accompanied by both physical and developmental losses which can impact the amount of control older adults have over their circumstances. Older adults tend to use cognitive reappraisal more often than younger adults (Wrosch & Heckhausen, 2000). The use of cognitive reappraisal in older adulthood is particularly beneficial as an emotion regulation strategy because it protects emotional resources by shaping emotional reactions to stressful events without having to change the event itself (Wrosch & Heckhausen, 2000).

1.2 Affective Reactivity

Why might cognitive reappraisal be associated with physical and mental health outcomes? One mechanism that may account for the link between cognitive reappraisal and health outcomes is how an individual reacts to stressful events in their daily lives. Individuals tend to report increased negative affect on days when they experience a stressful event and this magnitude of change in affect on days when the stressor occurs is termed negative affective reactivity (Charles et al., 2009). For example, on days when a person experiences a stressor such as an argument with a loved one, their negative affect will likely increase in response to this event. Affect refers to the feeling a person is experiencing at any particular point in time (Larsen & Prizmic, 2004). Regulating an individual's affect in response to daily stressful events is beneficial because it can decrease

the impact of lingering emotions and moods on later behavior and experiences (Larsen & Prizmic, 2004). Decreasing negative reactions to daily stressors is important for health and well-being because having increased affective reactivity results in poorer physical/mental health and subjective well-being (Charles et al., 2013; Piazza et al., 2013).

1.2.1 Affective Reactivity and Association with Physical/Mental Health & Subjective Well-being

People who generally have greater affective reactions to stressful events in their daily lives have poorer mental health outcomes. For example, individuals with heightened affective reactivity to daily stressors show an increased likelihood of reporting an affective disorder and greater affective distress in general 10 years later (Charles et al., 2013). Furthermore, increased affective reactivity to daily interpersonal stressors is a predictor of depressive symptoms. (O'Neill et al., 2004). Experiencing negative affect frequently due to being reactive to stressful events is associated with decreased emotional well-being (Charles et al., 2013).

Likewise, people who generally have greater affective reactions to stressful events in their daily lives have poorer physical health outcomes. For example, greater affective reactivity to daily stressors is associated with an increased risk of having a chronic physical health condition 10 years later (Piazza et al., 2013). Women who experience greater negative affective reactivity when faced with minor daily stressors are at risk for increased inflammation (Sin et al., 2015). Negative affective reactivity also predicts mortality risk in individuals with at least one chronic illness (Chiang et al., 2018).

1.3 Affective Reactivity & Link to Cognitive Reappraisal

An affective reactivity view contends that if multiple individuals undergo the same stressful event, any individual differences in their negative affect reflects their differences in their reactions to that event (Gross et al., 1998). People can use cognitive reappraisal to down regulate emotional reactions (Gross & John, 2003). Laboratory studies have shown that individuals who engage in cognitive reappraisal have less negative reactivity to lab stressors and stimuli. For example, Wolgast and colleagues (2011) found that participants who were in either a reappraisal or acceptance condition instead of a control condition had significant reductions of subjective distress and physiological reactions from watching a film clip that elicited aversive emotional states. Furthermore, reappraisal during stressful speeches was examined in comparison to suppression and researchers found that reappraisal led to less anxiety expression and affect (Egloff et al., 2006).

The relationship between cognitive reappraisal and stress reactivity has also been demonstrated in naturalistic studies. For example, cognitive reappraisal is associated with decreased affective reactivity in response to a daily negative event (Gunaydin et al., 2016). Additionally, those who engage in reappraisal experience more positive affect and less negative affect in their daily lives (Richardson, 2017). A mixed methods study of both daily life and an in vivo lab experimental found that cognitive reappraisal attenuates the depressive symptoms that are associated with having increased emotional reactivity (Shapero et al., 2019). These studies demonstrate that people higher in cognitive reappraisal are less reactive to stressors both in the lab and in daily life, but it is unknown if reactions to daily stressors mediates the relationship between cognitive reappraisal and health outcomes.

1.4 Current Study

In the current study, we investigated associations between cognitive reappraisal and future physical and mental health and subjective well-being and if affective reactivity to daily stressors mediated that relationship in a longitudinal setting. There is a gap in the literature explaining why cognitive reappraisal is associated with health and well-being outcomes and this study examined affective reactivity as a potential pathway explaining this link. The present study used three waves of data to examine if cognitive reappraisal at Time 1 was associated with health and well-being outcomes at Time 3 (20 years after Time 1). We then examined if affective reactivity at Time 2 (10 years after Time I) mediated that relationship. We hypothesized that having higher cognitive reappraisal at Time I would predict better health and well-being outcomes 20 years later. Additionally, we hypothesized that negative affective reactivity would be a pathway that partially explained the relationship between cognitive reappraisal and future health outcomes. We also have some exploratory aims regarding positive affective reactivity, and specific negative affect emotions. Positive affective reactivity could be a pathway that might also explain the relationship between cognitive reappraisal and future health outcomes. Specific negative affect emotions that comprise negative affective reactivity (e.g., restless, nervous) may also individually on their own mediate this relationship between cognitive reappraisal and future health outcomes.

CHAPTER 2. METHODS

2.1 Sample and Design

Participants completed waves 1-3 of the Midlife in the United States (MIDUS) Survey, a nationally representative survey in which participants were recruited to answers

questions about their general health and well-being. This was a longitudinal study so that each wave of MIDUS was completed 10 years apart. The first wave (MIDUS I) was collected in 1995-1996, the second wave (MIDUS II) was collected in 2004-2006 and the third wave (MIDUS III) was collected in 2013-2014. The MIDUS was approved by the institutional review board of the University of Wisconsin. A subset of the MIDUS II participants participated in the National Study of Daily Experiences (NSDE II) at wave 2 of MIDUS which was a daily diary study in which participants were asked questions about their daily experiences for eight consecutive days. The NSDE was approved by the institutional review board of the Pennsylvania State University. Participants all provided informed consent prior to participating. The final sample consisted of 1,814 participants, with ages ranging from 24-74 (M = 46.8, SD = 12.2). Multiple imputation was used for this study to account for missing data due to attrition from the longitudinal design.

An a priori power analysis was conducted using G*Power 3.1.9.7 (Faul et al., 2009). Typical effect sizes in this area of research suggest we will find a small effect (f^2 = .02). Based on an alpha of 0.05 and 80% power, a sample size of 485 participants is needed to detect a small effect. Given that the final sample size for this study is 1,814 participants, we have sufficient power to detect small effects.

2.2 Measures

2.2.1 Wave 1 Cognitive Reappraisal

Cognitive reappraisal was measured using the 4-item Positive Reappraisal Scale (Wrosch et al., 2000). Participants answered questions about how often they used positive reappraisal strategies to cope with various difficult situations including: “I find I usually

learn something meaningful from a difficult situation"; "When I am faced with a bad situation, it helps to find a different way of looking at things"; "Even when everything seems to be going wrong, I can usually find a bright side to the situation"; and "I can find something positive, even in the worst situations". Participants responded to these questions on a 4-point Likert scale that ranged from 1 (*not at all*) to 4 (*a lot*). The cognitive reappraisal score was calculated by averaging participants' score across all items. This measure has been shown to have good internal consistency ($\alpha = 0.78$; Wrosch et al., 2000).

2.2.2 Wave 1 Demographics

Sociodemographic variables were included such as age, gender (0 = male, 1 = female), race (0 = Non-White, 1 = White), and education (0 = no college, 1 = college education).

2.2.3 Wave 2 Daily Stressors

Daily stressors were measured using the Daily Inventory of Stressful Events (DISE; Almeida et al., 2002). Participants were asked if they experienced any number of stressors in the past 24 hours including: having an argument or disagreement with anyone; avoiding an argument; having something stressful happen at work or school; having something stressful happen at home; experiencing discrimination; something stressful happening to a close friend or relative; and anything else that people would consider stressful. The number of daily stressors a participant had was summed for each day. Given the skewed nature of the data (participants reported experiencing two or more stressors on only 10% of days), participants were categorized as either having experienced a stressor on a given day (1) or not (0).

2.2.4 Wave 2 Daily Negative Affect

Daily negative affect was assessed using scales developed for the MIDUS study (Mroczek & Kolarz, 1998; Watson & Clark, 1994). Participants were asked how often they experienced different negative affective states each day. Specifically, participants were asked how much of the time over the past 24 hours they felt negative adjectives including: restless or fidgety, nervous, worthless, so sad nothing could cheer them up, everything was an effort, hopeless, lonely, afraid, jittery, irritable, ashamed, upset, angry, and frustrated to assess their daily negative affect. Participants rated their response to each item on a 5-point scale ranging from 0 (*none of the time*) to 4 (*all of the time*). Daily negative affect scores were averaged across these items. This measure has been shown to have good internal consistency (α ranged from .84 to .87; Watson et al., 1988).

2.2.5 Wave 2 Daily Positive Affect

Daily positive affect was measured using scales developed for the MIDUS study (Mroczek & Kolarz, 1998). Participants were asked questions about how much of the time over the past 24 hours they felt various positive affect adjectives such as: in good spirits, cheerful, extremely happy, calm and peaceful, satisfied, full of life, close to others, like you belong, enthusiastic, attentive, proud, active and confident to measure their daily positive affect. Participants rated their responses on a 5-point scale ranging from 0 (*none of the time*) to 4 (*all of the time*). Daily positive affect scores were calculated by averaging these items.

2.2.6 Wave 2 Negative Affective Reactivity

Negative affective reactivity was calculated based on the measures daily negative affect and daily stressors. Specifically, negative affective reactivity is the within-person slope that represents the difference in levels of negative affect on days with stressors versus days without stressors. In line with previous research, affective reactivity scores were calculated using a two-level multilevel model with days with stressors entered as a predictor of negative affect for each participant (e.g., Bolger et al., 1989; Leger et al., 2021). Level 2 models were adjusted for between-person stressor exposure. This method calculated each participant's negative affective reactivity slope while controlling for average stressor exposure. The following models were generated using SAS PROC MIXED:

Level 1: $NA_{ij} = \beta_{0j} + \beta_{1j}(\text{Stressor Day}_{ij}) + r_{ij}$

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Average Stress}_{j}) + \mu_{0j}$

$\beta_{1j} = \gamma_{10} + \mu_{1j}$

2.2.7 Wave 2 Positive Affective Reactivity

Positive affective reactivity was calculated using the measures daily positive affect and daily stressors, similarly to negative affective reactivity. Positive affective reactivity is the within-person slope that represents the difference in the amount of positive affect on days with stressors versus on days without stressors.

2.2.8 Wave 1 and 3 Depression

Depression was assessed using Composite International Diagnostic Interview Short From scales from MIDUS (CIDI-SF; Kessler et al., 1998; Wang et al., 2000). Participants

were asked if they felt sad, blue, or depressed and how often (*almost every day, for at least most of the day, for two weeks or more in a row*) during the past twelve months and were asked if they had experienced any depressed affect or anhedonia symptoms.

2.2.9 Wave 1 and 3 Anxiety

Anxiety was assessed using Composite International Diagnostic Interview Short From scales from MIDUS (CIDI-SF; Kessler et al., 1998; Wang et al., 2000). Participants were asked how much they worry (*every day, just about every day, or most days*) over the past twelve months. They were also asked about how many symptoms of anxiety they experienced on most days including: restless because of worry; keyed up or on edge; irritable because of worry; had trouble falling asleep; had trouble staying asleep because of worry; had trouble keeping focus on the task at hand; had trouble remembering things because of worry; low on energy; tired easily because of worry; and had sore or aching muscles because of tension.

2.2.10 Wave 1 and 3 Self-rated Mental Health

Participants were asked a question about their self-rated mental health "In general, would you say your mental or emotional health is excellent, very good, good, fair, or poor?" with the scale ranging from 1 (*excellent*) to 5 (*poor*). Higher numbers indicate poorer self-rated mental health.

2.2.11 Wave 1 and 3 Subjective Well-being

Subjective well-being was assessed via life satisfaction. Participants were asked to rate their satisfaction with their life overall, work, health, relationship with spouse/partner,

and relationship with their children (Prenda & Lachman, 2001). The scale ranged from 0 (*the worst possible*) to 10 (*the best possible*). All scores were averaged together.

2.2.12 Wave 1 and 3 Chronic Conditions

Individuals were asked if they had experienced 27 different chronic conditions including: asthma; tuberculosis; other lung problems; arthritis rheumatism, or other bone or joint disease; sciatica, lumbago, or recurring backache; persistent skin trouble; thyroid disease; hay fever; recurring stomach trouble, indigestion, or diarrhea; urinary or bladder problems; being constipated all or most of the time; gallbladder trouble; persistent foot trouble; trouble with varicose veins requiring medical treatment; AIDS or HIV infection; lupus or other autoimmune disorders; persistent trouble with your gums or mouth; persistent trouble with your teeth; high blood pressure; migraine headaches; chronic sleeping problems; diabetes or high blood sugar; multiple sclerosis, epilepsy, or other neurological disorders; stroke; ulcer; hernia or rupture; and piles or hemorrhoids in the past 12 months (Marmot et al., 1997). The number of chronic conditions a participant had was summed.

2.2.13 Wave 1 and 3 Functional Limitations

Individuals were also asked questions about their ability to perform tasks. Participants were asked questions about their basic activity of daily living including: bathing or dressing oneself; climbing one flight of stairs; and walking one block. Participants were also asked questions about their instrumental activity of daily living including: lifting or carrying groceries; climbing several flights of stairs; bending, kneeling, or stooping; walking more than a mile; walking several blocks; vigorous

activities such as running; and moderate activities such as bowling (Katz et al., 1963; Ware Jr & Sherbourne, 1992). Participants rated how their health affected their ability to perform the various tasks ranging from 1 (*not at all*) to 4 (*a lot*). Scores on activity and instrumental activity of daily living were averaged together to create one score per participant.

2.2.14 Wave 1 and 3 Self-rated Physical Health

Participants were asked a question about their self-rated physical health "In general, would you say your physical health is excellent, very good, good, fair, or poor?" with the scale ranging from 1 (*excellent*) to 5 (*poor*). Higher numbers indicate poorer self-rated physical health.

2.3 Analysis Plan

First, descriptive statistics and correlations among variables using bivariate correlations were calculated. All variables were checked for outliers. Assumptions were also checked and many variables violated the assumptions, but were unable to be corrected via nonlinear transformations thus original variables were retained for ease of interpretation. This will be addressed in the limitations section. To test our first hypothesis, linear regressions were conducted with cognitive reappraisal predicting self-rated mental health, depression, anxiety, subjective well-being, chronic conditions, functional limitations, and self-rated physical health. All models were adjusted for the sociodemographic variables (age, gender, race, education) as well as controlling for wave 1 health variables. To test our second hypothesis, mediation models were conducted for cognitive reappraisal, affective reactivity and health outcomes to determine if affective

reactivity mediated the relationship between cognitive reappraisal and physical/mental health and subjective well-being. Using Preacher & Hayes (2008) PROCESS macro, 10,000 bootstrapping tests were used to measure the indirect effect of affective reactivity on the association between cognitive reappraisal and health and well-being outcomes with 95% confidence intervals. If zero was not included in the confidence interval, the results were considered statistically significant.

We expected to find a relationship such that higher cognitive reappraisal would be associated with better physical/mental health and subjective well-being. We proposed that those higher in cognitive reappraisal would be less affectively reactive to daily stressors and consequently have better health outcomes and well-being. We predicted that those who were lower in cognitive reappraisal would be more affectively reactive to stressors, therefore having poorer health outcomes and well-being. We also proposed that affective reactivity would be a significant pathway that explained or mediated the association between cognitive reappraisal and health and well-being outcomes.

CHAPTER 3. RESULTS

3.1 Descriptive Statistics

Participants had to have participated in NSDE II and reported at least one stressor in order to have been included resulting in 1,814 participants. The participants were mostly White (95%), college educated (73%), and female (56%). Cognitive reappraisal was significantly negatively correlated with negative affective reactivity ($r = -0.14$, $p < 0.001$). Those who engaged more in cognitive reappraisal was associated with having decreased negative affective reactivity. Furthermore, those who engaged more in cognitive reappraisal at wave 1 were significantly associated with less depressive symptoms, less

anxiety, better self-rated mental health, better subjective well-being, fewer chronic conditions, fewer functional limitations and better self-rated physical health at wave 3. See Table 1 for further descriptive statistics and initial correlations among variables.

Table 3.1
Descriptive Statistics and Correlations Among Variables

	M%/ *SD*	2	3	4	5	6	7	8	9	10	11	12	13
1. Wave 1 Cognitive Reappraisal	3.17 *0.61*	-0.14	-0.18	-0.08	*-0.06*	-0.18	-0.11	-0.12	*-0.06*	0.04	*0.05*	-0.05	-0.02
2. Wave 2 Negative Affective Reactivity	0.17 *0.12*	-	0.34	0.31	0.31	-0.36	0.22	0.25	0.21	-0.11	0.05	0.03	0.11
3. Wave 3 Self-rated Mental Health	2.42 *0.99*		-	0.35	0.24	-0.51	0.59	0.36	0.36	0.00	**0.06**	-0.01	0.00
4. Wave 3 Depression	0.78 *1.72*			-	0.40	-0.35	0.27	0.29	0.22	-0.09	**0.08**	0.00	**0.08**
5. Wave 3 Anxiety	0.19 *0.79*				-	-0.23	0.14	0.22	0.15	**-0.07**	**0.07**	0.02	0.10
6. Wave 3 Subjective Well-being	7.71 *1.33*					-	-0.52	-0.38	-0.39	-0.14	0.02	0.01	-0.03
7. Wave 3 Self-rated Physical Health	2.60 *1.05*						-	0.44	0.57	**0.08**	0.02	-0.03	-0.02
8. Wave 3 Chronic Conditions	3.55 *3.17*							-	0.52	0.12	0.14	-0.01	0.02
9. Wave 3 Functional Limitations	1.74 *0.77*								-	0.31	0.16	0.00	-0.01
10. Age	46.8 *12.2*									-	-0.02	0.03	-0.03
11. Gender (ref = male)	57%										-	-0.00	-0.02
12. Race (ref = non-White)	95%											-	**0.15**
13. Education (ref = no college)	73%												-

Note. Italicized is significant at $p < .05$, bold is significant at $p < .01$, underlined is significant at $p < .001$.

3.2 Cognitive Reappraisal and Health Outcomes

To test our first hypothesis, linear regressions were conducted with cognitive reappraisal predicting each of the health outcomes. All models were adjusted for the sociodemographic variables as well as controlling for wave 1 health variables. Regression analyses indicated that greater engagement in cognitive reappraisal at wave 1 was significantly associated with self-rated mental health, depression, subjective well-being, self-rated physical health, chronic conditions, and functional limitations (see Table 2 and Table 3). Those who engaged in cognitive reappraisal at higher rates had better self-rated mental health, fewer depressive symptoms, better subjective well-being, better self-rated physical health, fewer chronic conditions and fewer functional limitations. In controlling for negative affective reactivity in addition to sociodemographic variables and wave 1 health variables, self-rated mental health, self-rated physical health and chronic conditions remained significant.

Table 3.2

Ordinary Least Squares Regression Models Predicting Wave 3 Mental Health and Subjective Well-being Outcomes

Variables	Self-rated Mental Health		Depression		Anxiety		Subjective well-being	
	b	*95% CI*	*b*	*95% CI*	*b*	*95% CI*	*b*	*95% CI*
Cognitive Reappraisal	-0.14	[-0.21, -0.06]	*-0.15*	[-0.28, -0.02]	-0.03	[-0.10, 0.03]	*0.12*	[0.01, 0.22]
Age	0	[-0.01, 0.004]	*-0.01*	[-0.02, 0]	-0.003	[-0.01, 0]	0.01	[-0.001, 0.01]
Gender (ref = male)	0.07	[-0.02, 0.17]	*0.19*	[0.02, 0.36]	0.07	[-0.004, 0.14]	0.07	[-0.06, 0.21]
Race (ref = non-White)	-0.06	[-0.24, 0.12]	-0.08	[-0.40, 0.24]	0.02	[-0.14, 0.18]	0.004	[-0.22, 0.23]
Education (ref = no college)	0.01	[-0.02, 0.04]	*0.06*	[0.01, 0.11]	*0.02*	[0.002, 0.05]	-0.004	[-0.04, 0.04]
Wave 1 Baseline	-0.40	[-0.45, -0.34]	0.24	[0.19, 0.29]	0.31	[0.26, 0.35]	0.50	[0.44, 0.57]

Note. Italicized is significant at $p < .05$, bold is significant at $p < .01$, underlined is significant at $p < .001$.

Table 3.3
Ordinary Least Squares Regression Models Predicting Wave 3 Physical Health Outcomes

Variables	Self-rated Physical Health		Chronic Conditions		Functional Limitations	
	b	*95% CI*	*b*	*95% CI*	*b*	*95% CI*
Cognitive Reappraisal	**-0.13**	[-0.21, -0.05]	**-0.35**	[-0.59, -0.12]	*-0.07*	[-0.13, -0.01]
Age	0.004	[-0.0001, 0.01]	*0.02*	[0.003, 0.03]	0.01	[0.01, 0.02]
Gender (ref = male)	-0.02	[-0.12, 0.09]	*0.40*	[0.09, 0.70]	0.14	[0.07, 0.21]
Race (ref = non-White)	-0.06	[-0.25, 0.13]	-0.19	[-0.74, 0.36]	0.03	[-0.08, 0.15]
Education (ref = no college)	0	[-0.03, 0.03]	0.01	[-0.08, 0.10]	-0.01	[-0.03, 0.01]
Wave 1 Baseline	-0.51	[-0.56, -0.45]	0.71	[0.65, 0.77]	0.75	[0.67, 0.83]

Note. Italicized is significant at $p < .05$, bold is significant at $p < .01$, underlined is significant at $p < .001$.

3.2.1 Mediation Analyses: Negative Affective Reactivity

3.2.1.1 Mental Health and Well-being Outcomes

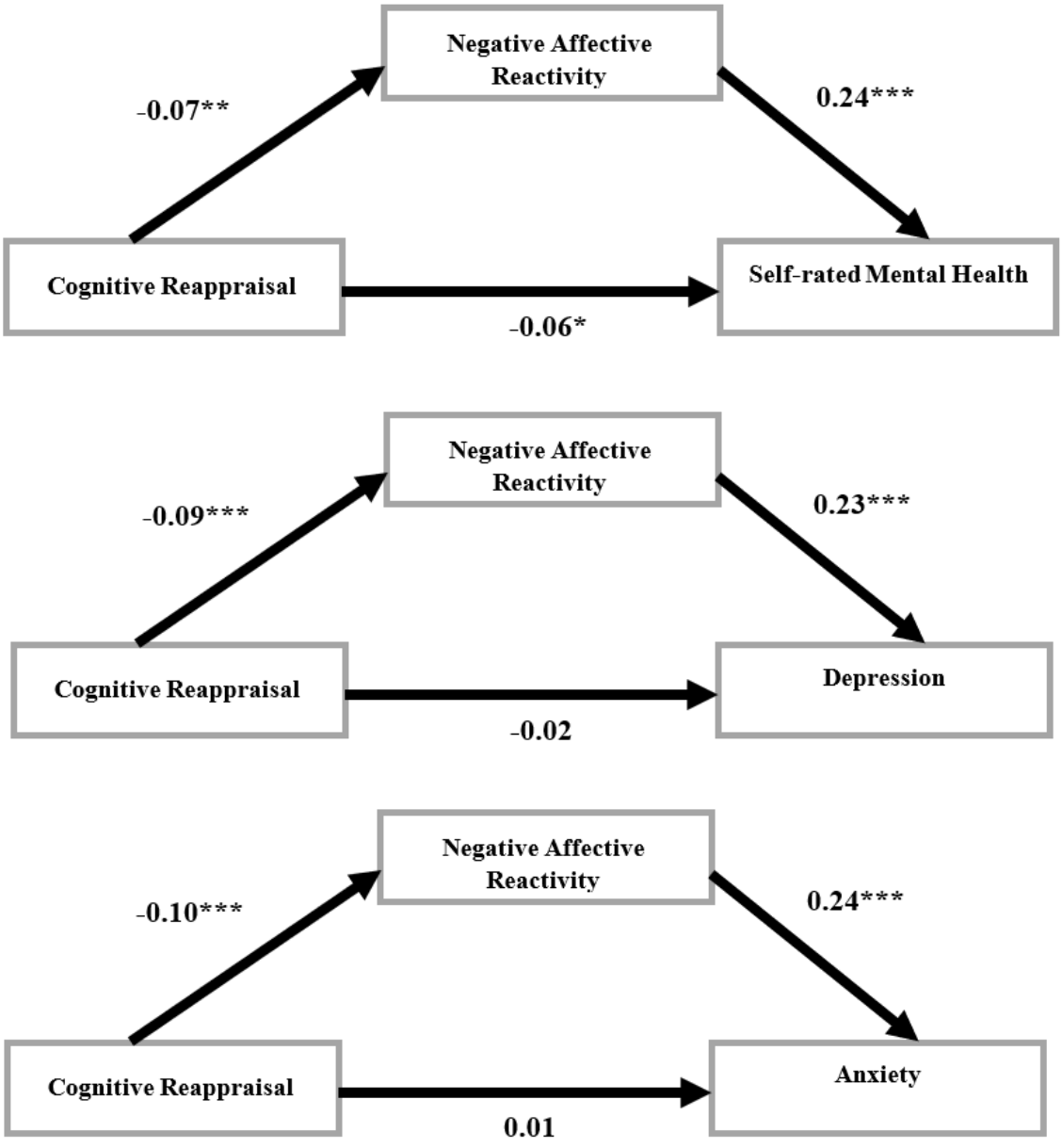
Four models of mental health and well-being were tested between cognitive reappraisal at wave 1 and self-rated mental health, anxiety, depression, and subjective well-being at wave 3 (see Figure 1). All models were adjusted for sociodemographic variables, baseline health and well-being outcomes and baseline negative affective reactivity. The indirect effect of cognitive reappraisal on all four mental health outcomes through negative affective reactivity was significant (self-rated mental health: b = -0.03, 95% CI [-0.05, -0.01], anxiety: b = -0.03, 95% CI [-0.05, -0.01], depression: b = -0.06, 95% CI [-0.10, -0.03], subjective well-being: b = 0.03, 95% CI [0.01, 0.05]). This indicates that the relationship between greater cognitive reappraisal and better self-rated mental health, less anxiety, fewer depressive symptoms, and greater subjective well-being were mediated by negative affective reactivity.

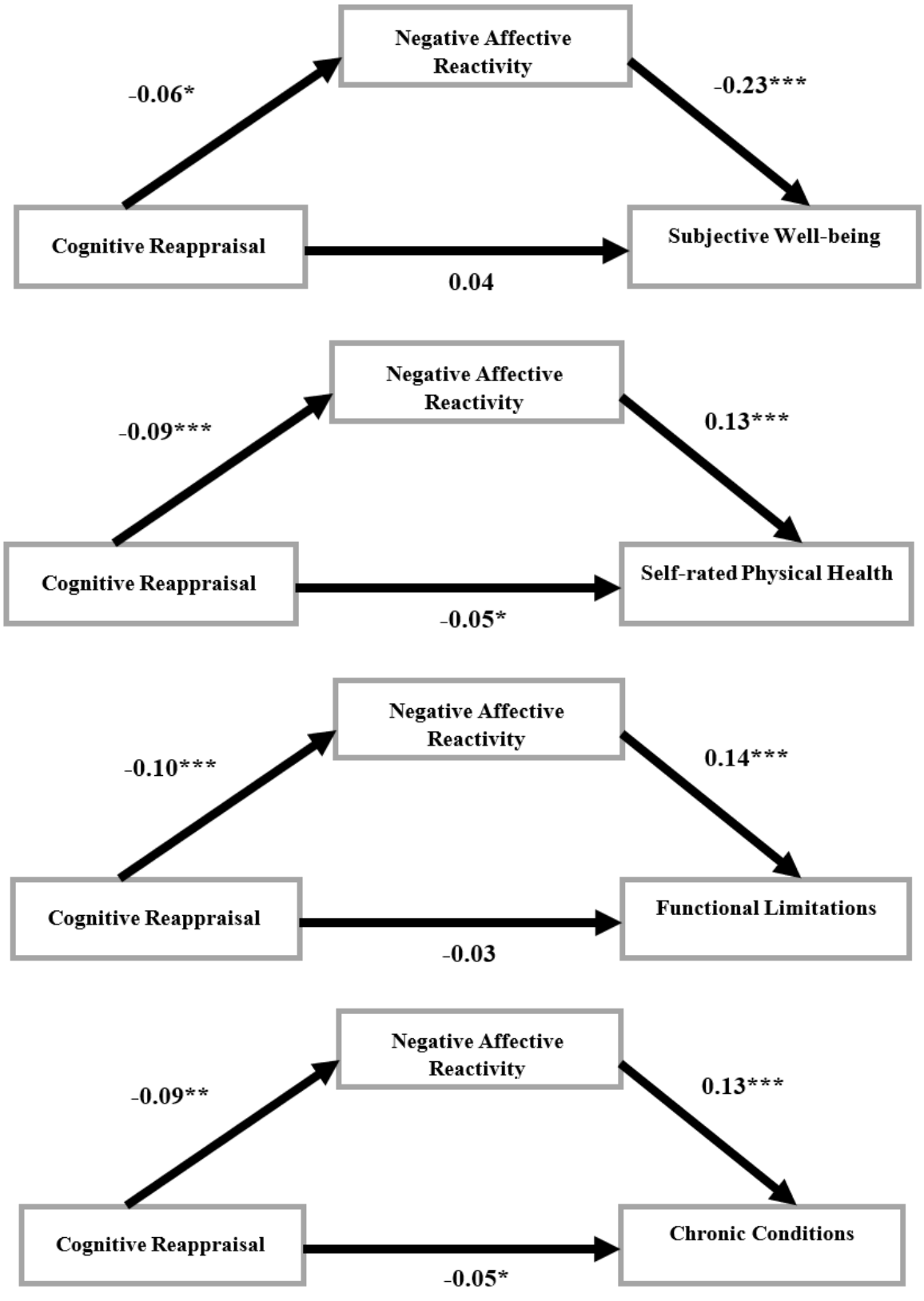
3.2.1.2 Physical Health Outcomes

Three models of physical health were tested between cognitive reappraisal at wave 1 and self-rated physical health, chronic conditions, and functional limitations at wave 3 (see Figure 1). The indirect effect of cognitive reappraisal on all three physical health outcomes through negative affective reactivity was significant (self-rated physical health: b = -0.02, 95% CI [-0.04, -0.01], chronic conditions: b = -0.06, 95% CI [-0.10, -0.02], and functional limitations: b = -0.02, 95% CI [-0.03, -0.01]). This indicates that the relationship between greater cognitive reappraisal and better self-rated physical health, fewer chronic

conditions and fewer functional limitations were significantly mediated by negative affective reactivity.

Figure 3.1
Mediation Models of Cognitive Reappraisal, Affective Reactivity, and Health and Well-being Outcomes





*Note. *p < .05, **p ≤ .01, ***p ≤ .001. All coefficients are standardized.*

3.3 Exploratory Analyses

3.3.1 Mediation Analyses: Specific Negative Emotions

3.3.1.1 Restless/Fidgety

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 with restless/fidgety as the mediator. Results indicated that feeling restless/fidgety significantly mediated the relationship between cognitive reappraisal and depression (*b* = -0.02, 95% CI [-0.04, -0.003]), self-rated physical health (*b* = -0.01, 95% CI [-0.02, -0.001]), chronic conditions (*b* = -0.03, 95% CI [-0.07, -0.003]) and functional limitations (*b* = -0.01, 95% CI [-0.02, -0.002]). This indicates that having greater cognitive reappraisal was associated with experiencing less of an increase in feeling restless/fidgety on days with stressors, indicating fewer depressive symptoms, better self-rated physical health, fewer chronic conditions and fewer functional limitations. However, once controlling for baseline feeling restless/fidgety, none of the results were significant.

3.3.1.2 Nervous

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 with nervous as the mediator. Results indicated that being nervous significantly mediated the relationship between cognitive reappraisal and self-rated mental health (*b* = -0.01, 95% CI [-0.02, -0.003]), subjective well-being (*b* = 0.01, 95% CI [0.001, 0.03]) and chronic conditions (*b* = -0.05, 95% CI [-0.10, -0.02]). This indicates that having greater cognitive reappraisal was associated with experiencing less of an increase in feeling nervous on days with stressors, indicating better self-rated mental health, better subjective well-being and fewer chronic conditions. However, after

controlling for baseline nervous symptoms, only chronic conditions remained significant (*b* = -0.07, 95% CI [-0.16, -0.003]).

3.3.1.3 Everything was an effort

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 with feeling everything was an effort as the mediator. Results indicated that feeling that everything was an effort significantly mediated the relationship between cognitive reappraisal and self-rated mental health (*b* = -0.01, 95% CI [-0.02, -0.001]), depression (*b* = -0.02, 95% CI [-0.05, -0.001]), self-rated physical health (*b* = -0.01, 95% CI [-0.02, -0.001]), chronic conditions (*b* = -0.03, 95% CI [-0.06, -0.001]) and functional limitations (*b* = -0.01, 95% CI [-0.02, -0.002]). This indicates that having greater cognitive reappraisal was associated with experiencing less of an increase in feeling like everything was an effort on days with stressors, indicating better self-rated mental health, fewer depressive symptoms, better self-rated physical health, fewer chronic conditions and fewer functional limitations. However, after controlling for baseline feeling that everything was an effort, nothing remained significant.

3.3.1.4 Jittery

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 with feeling jittery as the mediator. Results indicated that feeling jittery significantly mediated the relationship between cognitive reappraisal and depression (*b* = -0.02, 95% CI [-0.04, -0.002]) and functional limitations (*b* = -0.007, 95% CI [-0.02, -0.001]). This indicates that having greater cognitive reappraisal was associated with experiencing less of an increase in feeling jittery on days with stressors, indicating fewer depressive symptoms and fewer functional limitations.

3.3.1.5 Irritable

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 with feeling irritable as the mediator. Results indicated that feeling irritable significantly mediated the relationship between cognitive reappraisal and self-rated mental health (*b* = -0.02, 95% CI [-0.03, -0.004]), depression (*b* = -0.02, 95% CI [-0.05, -0.01]), anxiety (*b* = -0.01, 95% CI [-0.03, -0.001]), self-rated physical health (*b* = -0.01, 95% CI [-0.03, -0.01]), chronic conditions (*b* = -0.03, 95% CI [-0.06, -0.004]), and functional limitations (*b* = -0.008, 95% CI [-0.02, -0.002]). This indicates that having greater cognitive reappraisal was associated with experiencing less of an increase in feeling irritable on days with stressors, indicating better self-rated mental health, fewer depressive symptoms, fewer anxiety symptoms, better self-rated physical health, fewer chronic conditions and fewer functional limitations.

3.3.1.6 Ashamed

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 with feeling ashamed as the mediator. Results indicated that feeling ashamed significantly mediated the relationship between cognitive reappraisal and depression (*b* = -0.02, 95% CI [-0.04, -0.0002]). This indicates that having greater cognitive reappraisal was associated with experiencing less of an increase in feeling ashamed on days with stressors, indicating fewer depressive symptoms.

3.3.1.7 Upset

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 with feeling irritable as the mediator. Results indicated that

feeling upset significantly mediated the relationship between cognitive reappraisal and self-rated mental health (*b* = -0.02, 95% CI [-0.03, -0.01]), depression (*b* = -0.03, 95% CI [-0.06, -0.01]), subjective well-being (*b* = 0.01, 95% CI [0.003, 0.03]), self-rated physical health (*b* = -0.01, 95% CI [-0.03, -0.003]), and functional limitations (*b* = -0.01, 95% CI [-0.02, -0.003]). This indicates that having greater cognitive reappraisal was associated with experiencing less of an increase in feeling upset on days with stressors, indicating better self-rated mental health, fewer depressive symptoms, better subjective well-being, better self-rated physical health and fewer functional limitations.

3.3.1.8 Angry

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 with feeling angry as the mediator. Results indicated that feeling angry significantly mediated the relationship between cognitive reappraisal and self-rated mental health (*b* = -0.01, 95% CI [-0.03, -0.004]), depression (*b* = -0.02, 95% CI [-0.04, -0.002]), anxiety (*b* = -0.01, 95% CI [-0.02, -0.001]), subjective well-being (*b* = 0.01, 95% CI [0.001, 0.03]), self-rated physical health (*b* = -0.01, 95% CI [-0.02, -0.001]), and functional limitations (*b* = -0.01, 95% CI [-0.02, -0.001]). This indicates that having greater cognitive reappraisal was associated with experiencing less of an increase in feeling angry on days with stressors, indicating better self-rated mental health, fewer depressive symptoms, fewer anxiety symptoms, better subjective well-being, better self-rated physical health, and fewer functional limitations.

3.3.1.9 Frustrated

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 with feeling frustrated as the mediator. Results indicated

that feeling frustrated significantly mediated the relationship between cognitive reappraisal and self-rated mental health (*b* = -0.01, 95% CI [-0.02, -0.003]), chronic conditions (*b* = -0.03, 95% CI [-0.07, -0.001]), and functional limitations (*b* = -0.01, 95% CI [-0.02, -0.001]). This indicates that having greater cognitive reappraisal was associated with experiencing less of an increase in feeling frustrated on days with stressors, indicating better self-rated mental health, fewer chronic conditions and fewer functional limitations.

3.3.1.10 Additional Specific Emotions

Seven models were tested between cognitive reappraisal at wave 1 and health and well-being outcomes at wave 3 for each of the following emotions as mediators: feeling worthless, so sad nothing could cheer you up, hopeless, lonely, and afraid. Results indicated that feeling any of these emotions did not significantly mediate the relationship between cognitive reappraisal and any of the health and well-being outcomes.

3.3.2 Mediation Analyses: Positive Affective Reactivity

3.3.2.1 Health and Well-being Outcomes

Four models of mental health and well-being were tested between cognitive reappraisal at wave 1 and self-rated mental health, anxiety, depression, and subjective well-being at wave 3 with positive affective reactivity as the mediator. Three models of physical health were tested between cognitive reappraisal at wave 1 and self-rated physical health, chronic conditions, and functional limitations at wave 3 with positive affective reactivity as the mediator. There were no significant indirect effects indicating that positive affective reactivity did not mediate the relationship between cognitive reappraisal and health outcomes.

CHAPTER 4. DISCUSSION

4.1 General Discussion

Cognitive reappraisal is related to physical and mental health outcomes (Garnefski & Kraaji, 2006; Gross & John, 2003; Haga et al., 2007; Nezlek & Kuppens, 2008; Shapero et al., 2019) but a pathway explaining this link had yet to be tested. The current study looked at the role of negative affective reactivity as a possible pathway explaining the associations between cognitive reappraisal and health and well-being outcomes. Cognitive reappraisal was significantly associated with health and well-being outcomes longitudinally 20 years later. Greater engagement in cognitive reappraisal was associated with better self-rated mental health, fewer depressive symptoms, better subjective well-being, better self-rated physical health, fewer chronic conditions and fewer functional limitations. Furthermore, negative affective reactivity significantly mediated the relationship between cognitive reappraisal and self-rated mental health, anxiety, depression, subjective well-being, self-rated physical health, chronic conditions and functional limitations. These results indicate that those who were better at engaging in cognitive reappraisal were less reactive emotionally to stressful events 10 years later, leading to better health and well-being outcomes 20 years later.

We also explored the role of positive affective reactivity in mediating the relationship between cognitive reappraisal and health and well-being outcomes. We found that positive affective reactivity did not significantly mediate the relationship between cognitive reappraisal and health and well-being outcomes. Less work has examined positive affective reactivity and health and well-being outcomes, and the work that does exist has mixed findings (Chiang et al., 2018; Mroczek et al., 2015). One reason that may

explain our findings could be that positive affect fluctuates less in response to daily stressors and therefore may be less likely to account for the relationship between cognitive reappraisal and health outcomes (Sin et al., 2015). As suggested by previous literature (e.g., O'Neill et al., 2004), daily stressors have more of an impact on our negative emotions, whereas our daily positive affect may be more stable and less likely to fluctuate in response to daily stressful events. Adding further evidence to this, despite the fact that the correlation between cognitive reappraisal and positive affective reactivity was significant at the $p < .05$ level, the correlation ($r = -0.06$) is quite small and considered to be a very weak association. Furthermore, the correlation between cognitive reappraisal and negative affective reactivity ($r = -0.14$) was stronger than the correlation between cognitive reappraisal and positive affective reactivity ($r = -0.06$). These results indicate that positive affect is not simply the absence of negative affect, but they are separate constructs that have separate and distinct relationships with health and well-being. These results suggest that how an individual's negative emotions change in response to daily stressors may be a stronger determinant on health and well-being outcomes than daily changes in positive emotions.

In addition to examining the role of negative and positive affective reactivity, we also conducted an exploratory analysis on individual negative emotions. Results found that feeling restless/fidgety, nervous, that everything was an effort, jittery, irritable, ashamed, upset, angry and frustrated all significantly mediated the relationship between cognitive reappraisal and health and well-being outcomes. This suggests that these specific negative emotions may play an integral role in the development of future health conditions. Feeling worthless, so sad nothing could cheer you up, hopeless, lonely, and afraid did not mediate

the cognitive reappraisal/health relationship. A possible reason why certain negative emotions account for this relationship could be due to these emotions being more high arousal emotions that prepare one for action (i.e., being reactive; Russell, 2003). High arousal emotions may be driving the mediating role of negative affective reactivity because they are more likely to increase in response to a stressful event due to the energized nature of these emotions.

However, there are some limitations in that jittery, irritable, ashamed, upset, angry and frustrated were not completed during NSDE I, so we were unable to adjust for baseline levels of these emotions. Furthermore, only the relationship between cognitive reappraisal and health outcomes with feeling nervous as the mediator remained significant after controlling for specific emotions in NSDE I. This could be due to the significantly reduced sample size for those who completed NSDE I and NSDE II. While we had 1,814 participants included in our sample who experienced at least one stressor and completed NSDE II, only between 472-543 participants completed NSDE I depending on the emotion and health outcome. This is a decrease of over 3 times in sample size, leading to decreased power in finding significant results. Based on previous power calculations at just 80% power, 485 participants were needed to detect small effects, so it is possible that there was not sufficient power to detect a significant mediation between these individual negative emotions and cognitive reappraisal and health outcomes.

The current study adds support to the literature on the relationship between cognitive reappraisal and health outcomes. Those who engaged more in cognitive reappraisal were associated with having better health outcomes (Garnefski & Kraaji, 2006; Gross & John, 2003; Haga et al., 2007; Nezlek & Kuppens, 2008; Shapero et al., 2019).

However, one important distinction of this study is that it examined the role of cognitive reappraisal and health outcomes longitudinally. A majority of the existing research on cognitive reappraisal and physical health are lab-related tasks and the current study may be the first to examine how cognitive reappraisal is associated with physical health in the future 20 years later. Results demonstrated that cognitive reappraisal was significantly associated with long-term physical health outcomes and not only regarding immediate lab manipulations which is a novel finding.

Furthermore, the current study also provides a glimpse into why cognitive reappraisal might be related to health and well-being outcomes. Those who engaged more in cognitive reappraisal had less of an increase in negative emotions on days with stressful events. How one responds and reacts to stressful events can have a significant impact on their health and well-being (Charles et al., 2013; Piazza et al., 2013). Engaging in cognitive reappraisal may shape how one emotionally reacts to stressful events thus affecting the impact it has on their health and well-being. A potential reason why we see this relationship could be due to cognitive reappraisal being used to down-regulate negative emotions (Gross & John, 2003). Down-regulation occurs when one decreases their emotional reaction to an event (i.e., affective reactivity) potentially by reframing the event in a more positive way. Down-regulating emotional reactions to stressful events can be beneficial to health outcomes due to decreasing the impact of lingering emotions and moods that then play a role in future health outcomes (Larsen & Prizmic, 2004; Charles et al., 2013; Piazza et al., 2013).

There are some limitations of the current study that should be addressed. Most of the participants in the current study were White, well-educated and of middle-class income.

Due to this, the findings cannot be generalized among those of other races or those with lower education and lower socioeconomic standing. Future work would be wise to expand the current findings to underrepresented populations. Underrepresented populations tend to have less access to resources, so it could be that they engage more in cognitive reappraisal due to having less control over their situation, but future research would need to explore this further. Additionally, positive affective reactivity and some of the specific negative emotions were unable to be controlled for via NSDE I due to it not being included in the survey. Some assumption violations (e.g., residual normality, form of relation, homoscedasticity) were also reported particularly for negative affective reactivity, depression, anxiety, subjective well-being, chronic conditions, and functional limitations. However, these violations were unable to be corrected so results should be interpreted with caution.

The current study enhanced our understanding of the links between cognitive reappraisal and future health by examining the role of affective responses to daily stressful events. Utilizing longitudinal data also allowed us to examine how an individual's cognitive reappraisal is associated with physical/mental health and subjective well-being 20 years later through affective reactivity 10 years later. Using a daily diary design, we were able to see the dynamic nature of how one responds to stress on a day-to-day basis. Furthermore, baseline data from wave 1 of MIDUS allowed us to adjust for pre-existing physical and mental health outcomes as well as subjective well-being which strengthens the results of this study.

Results from this study may also inform stress and well-being interventions. For example, if an individual is high in cognitive reappraisal and is then more likely to reframe

a stressful event into a more positive way, they may be less affectively reactive to daily stressful events. Therefore, strengthening cognitive reappraisal strategies might be a good way for interventions to target reducing affective reactivity to stressors which should benefit long-term physical/mental health and subjective well-being.

Consistent with previous literature (Garnefski & Kraaji, 2006; Gross & John, 2003; Haga et al., 2007; Nezlek & Kuppens, 2008; Shapero et al., 2019), cognitive reappraisal was significantly associated with health and well-being outcomes. As a novel finding, negative affective reactivity mediated the relationship between cognitive reappraisal and future health and well-being outcomes. Furthermore, exploratory analyses revealed that positive affective reactivity did not significantly mediate this relationship, while some specific negative emotions did. Taking all of these results together, it shows that negative affective reactivity may be a more important determinant in health and well-being outcomes, and that there is value in examining specific negative emotions that may play a stronger role in health outcomes than others. In conclusion, those who engaged more in cognitive reappraisal tended to be less affectively reactive to stressful events 10 years later, leading to having better health and well-being outcomes 20 years later. The way in which one views and reacts to stressful events, both cognitively and emotionally, shape the development of future health outcomes.

APPENDICES

APPENDIX 1. COGNITIVE REAPPRAISAL SCALE (WROSCH ET AL., 2000)

Questions	Not at all	A little	Some	A lot
I find I usually learn something meaningful from a difficult situation	1	2	3	4
When I am faced with a bad situation, it helps to find a different way of looking at things	1	2	3	4
Even when everything seems to be going wrong, I can usually find a bright side to the situation	1	2	3	4
I can find something positive, even in the worst situations	1	2	3	4

APPENDIX 2. DAILY INVENTORY OF STRESSFUL EVENTS (DISE; ALMEIDA ET AL., 2002)

Questions	Yes	No
"Did you have an argument or disagreement with anyone since (this time/we spoke) yesterday?"	1	2
"Since (this time/we spoke) yesterday, did anything happen that you could have argued about but you decided to less pass in order to avoid a disagreement?"	1	2
"Since (this time/we spoke) yesterday, did anything happen at work or school (other than what you already mentioned) that most people would consider stressful?"	1	2
"Since (this time/we spoke) yesterday, did anything happen at home (other than what you already mentioned) that most people would consider stressful?"	1	2
"Many people experience discrimination on the basis of such things as race, sex, or age. Did anything like this happen to you since (this time/we spoke) yesterday?"	1	2
"Since (this time/we spoke) yesterday, did anything happen to a close friend or relative (other than what you've already mentioned) that turned out to be stressful for you?"	1	2
"Did anything else happen to you since (this time/we spoke) yesterday that people would consider stressful?"	1	2

APPENDIX 3. DAILY NEGATIVE AFFECT (WATSON AND CLARK, 1994)

How much of the time today did you feel…	None of the time	A little of the time	Some of the time	Most of the time	All of the time
“restless or fidgety?”	0	1	2	3	4
“nervous?”	0	1	2	3	4
“worthless?”	0	1	2	3	4
“so sad nothing could cheer you up?”	0	1	2	3	4
“everything was an effort?”	0	1	2	3	4
“hopeless?”	0	1	2	3	4
“lonely?”	0	1	2	3	4
“afraid?”	0	1	2	3	4
“jittery?”	0	1	2	3	4
“irritable?”	0	1	2	3	4
“ashamed?”	0	1	2	3	4
“upset?”	0	1	2	3	4
“angry?”	0	1	2	3	4
“frustrated?”	0	1	2	3	4

APPENDIX 4. DEPRESSION (KESSLER ET AL., 1998)

Question	All Day Long	Most of the Day	About Half the Day	Less than Half the Day
Please think of the two-week period during the past 12 months when these feelings were worst. During that time, did the feelings of being sad, blue, or depressed usually last…	1	2	3	4

Question	Every Day	Almost Every Day	Less Often Than That
During the two weeks when these feelings were worst, how often did you feel this way…	1	2	3

During two weeks in past 12 months, when you felt sad, blue, or depressed, did you…	Yes	No
"lose interest in most things?"	1	2
"feel more tired out or low on energy than is usual?"	1	2
"lose your appetite?"	1	2
"have more trouble falling asleep than usual?"	1	2
"have a lot more trouble concentrating than usual?"	1	2
"feel down on yourself, no good, or worthless?"	1	2
"think a lot about death?"	1	2

Question	All Day Long	Most of the Day	About Half the Day	Less than Half the Day
Please think of the two-week period during the past 12 months when you had the most complete loss of interest in things. During that time, did the loss of interest usually last…	1	2	3	4

Question	Every Day	Almost Every Day	Less Often Than That
During the two weeks when these feelings were worst, how often did you feel this way…	1	2	3

Questions	Yes	No
Thinking about those same two weeks, did you feel more tired out or low on energy than is usual for you?	1	2
During those same two weeks, did you lose your appetite?	1	2
Did your appetite INCREASE during those same two weeks?	1	2
Did you have more trouble falling asleep than you usually do during those two weeks?	1	2
During that same two week period, did you have a lot more trouble concentrating than usual?	1	2
People sometimes feel down on themselves, no good, or worthless. During that two week period, did you feel this way?	1	2
Did you think a lot about death – either your own, someone else's, or death in general – during those two weeks?	1	2

APPENDIX 5. ANXIETY (CIDI-SF; KESSLER ET AL., 1998)

Question	A Lot More	Somewhat	A Little
Would you say you worry A LOT MORE than most people, SOMEWHAT, or only A LITTLE?	1	2	3

Question	Every Day	Just About Every Day	Most Days	About Half the Days	Less than Half the Days
Thinking about the PAST 12 MONTHS, did you worry…	1	2	3	4	5

Question	One Thing	More than One
Do you usually worry about ONE particular thing or MORE THAN ONE thing?	1	2

Question	Yes	No
Do you ever have different worries on your mind AT THE SAME TIME?	1	2

How often over the past 12 months…	Most Days	About Half the Days	Less than Half the Days	Never
“were you restless because of your worry?”	1	2	3	4
“were you keyed up, on edge, or had a lot of nervous energy?”	1	2	3	4
“were you irritable because of your worry?”	1	2	3	4
“did you have trouble falling asleep?”	1	2	3	4
“did you have trouble falling asleep because of your worry?”	1	2	3	4
“did you have trouble keeping your mind on what you were doing?”	1	2	3	4
“did you have trouble remembering things because of your worry?”	1	2	3	4
“were you low on energy?”	1	2	3	4
“did you tire easily because of your worry?”	1	2	3	4
“did you have sore or aching muscles because of tension?”	1	2	3	4

APPENDIX 6. SELF-RATED HEALTH

Question	Poor	Fair	Good	Very Good	Excellent
In general, would you say your mental or emotional health is…	1	2	3	4	5

Question	Poor	Fair	Good	Very Good	Excellent
In general, would you say your physical health is…	1	2	3	4	5

APPENDIX 7. SUBJECTIVE WELL-BEING SCALE (PRENDA & LACHMAN, 2001)

Using a scale from 0 to 10 where 0 means…	Worst										Best
"the worst possible health" and 10 means "the best possible health," how would you rate your health these days?	0	1	2	3	4	5	6	7	8	9	10
"the worst possible work situation" and 10 means "the best possible work situation," how would you rate your work situation these days?	0	1	2	3	4	5	6	7	8	9	10
"the worst possible relationship" and 10 means "the best possible relationship," how would you rate your overall relationship with your children these days?	0	1	2	3	4	5	6	7	8	9	10
"the worst possible marriage or close relationship" and 10 means "the best possible marriage or close relationship," how would you rate your marriage or close relationship these days?	0	1	2	3	4	5	6	7	8	9	10
"the worst possible life overall" and 10 means "the best possible life overall," how would	0	1	2	3	4	5	6	7	8	9	10

you rate your life overall these days?

APPENDIX 8. CHRONIC CONDITIONS (MARMOT ET AL., 1997)

In the past 12 months, have you experienced or been treated for any of the following?	Yes	No
Asthma, bronchitis, or emphysema	1	5
Tuberculosis	1	5
Other lung problems	1	5
Arthritis, rheumatism, or other bone or joint diseases	1	5
Sciatica, lumbago, or recurring backache	1	5
Persistent skin trouble (e.g., eczema)	1	5
Thyroid disease	1	5
Hay fever	1	5
Recurring stomach problem, indigestion, or diarrhea	1	5
Urinary or bladder problems	1	5
Being constipated all or most of the time	1	5
Gall bladder trouble	1	5
Persistent foot trouble (e.g., bunions, ingrown toenails)	1	5
Trouble with varicose veins requiring medical treatment	1	5
AIDS or HIV infection	1	5
Lupus or other autoimmune disorders	1	5
Persistent trouble with your gums or mouth	1	5
Persistent trouble with your teeth	1	5
High blood pressure or hypertension	1	5
Migraine headaches	1	5
Chronic sleeping problems	1	5
Diabetes or high blood sugar	1	5
Multiple sclerosis, epilepsy, or other neurological disorders	1	5
Stroke	1	5
Ulcer	1	5

Hernia or rupture	1	5

APPENDIX 9. FUNCTIONAL LIMITATIONS (KATZ ET AL., 1963)

How much does your health limit you in doing each of the following?	Not at all	A little	Some	A lot
Lifting or carrying groceries	1	2	3	4
Bathing or dressing yourself	1	2	3	4
Climbing several flights of stairs	1	2	3	4
Bending, kneeling, or stooping	1	2	3	4
Walking more than a mile	1	2	3	4
Walking several blocks	1	2	3	4
Vigorous activities (e.g., running, lifting heavy objects)	1	2	3	4
Moderate activity (e.g., bowling, vacuuming)	1	2	3	4

REFERENCES

Almeida, D. M., Wethington, E., & Kessler, R. C. (2002). The daily inventory of stressful events: An interview-based approach for measuring daily stressors. *Assessment*, *9*(1), 41-55. https://doi.org/10.1177/1073191102091006

Bolger, N., DeLongis, A., Kessler, R. C., & Schilling, E. A. (1989). Effects of daily stress on negative mood. *Journal of Personality and Social Psychology*, *57*, 808-818. https://doi.org/10.1037/0022-3514.57.5.808

Brown, G. W., & Harris, T. (1978). Social origins of depression: A study of psychiatric disorders in women. *Social Forces*, *58*(1), 386-387. https://doi.org/10.1093/sf/58.1.386

Carlson, J. M., Dikecligil, G. N., Greenberg, T., & Mujica-Parodi, L. R. (2012). Trait reappraisal is associated with resilience to acute psychological stress. *Journal of Research in Personality*, *46*(5), 609-613. https://doi.org/10.1016/j.jrp.2012.05.003

Charles, S. T., Piazza, J. R., Luong, G., & Almeida, D. M. (2009). Now you see it, now you don't: Age differences in affective reactivity to social tensions. *Psychology and Aging*, *24*(3), 645-653. https://doi.org/10.1037/a0016673

Charles, S. T., Piazza, J. R., Mogle, J., Sliwinski, M. J., & Almeida, D. M. (2013). The wear and tear of daily stressors on mental health. *Psychological science*, *24*(5), 733-741. https://doi.org/10.1177/0956797612462222

Chiang, J. J., Turiano, N. A., Mroczek, D. K., & Miller, G. E. (2018) Affective reactivity to daily stress and 20-year mortality risk in adults with chronic illness: Findings

from the Nation Study of Daily Experiences. *Health Psychology, 37*(2), 170-178. https://doi.org/10.1037/hea0000567

Cui, X., & Vaillant, G. E. (1996). Antecedents and consequences of negative life events in adulthood: A longitudinal study. *The American Journal of Psychiatry, 153*(1), 21-26. https://doi.org/10.1176/ajp.153.1.21

Denovan, A., & Macaskill, A. (2017). Stress and subjective well-being among first year UK undergraduate students. *Journal of Happiness Studies, 18*, 505-525. https://doi.org/10.1007/s10902-016-9736-y

Denson, T. F., Grisham, J. R., & Moulds, M. L. (2011). Cognitive reappraisal increases heart rate variability in response to an anger provocation. *Motivation and Emotion, 35*, 14-22. https://doi.org/10.1007/s11031-011-9201-5

Dohrenwend, B. S., & Dohrenwend, B. P. (Eds.). (1974). *Stressful life events: Their nature and effects.* John Wiley & Sons.

Egloff, B., Schmukle, S. C., Burns, L. R., & Schwerdtfeger, A. (2006). Spontaneous emotion regulation during evaluated speaking tasks: Associations with negative affect, anxiety expression, memory, and physiological responding. *Emotion, 6*(3), 356-366. https://doi.org/10.1037/1528-3542.6.3.356

Ellis, E. M., Prather, A. A., Grenen, E. G., & Ferrer, R. A. (2019). Direct and indirect associations of cognitive reappraisal and suppression with disease biomarkers. *Psychology & Health, 34*(3), 336-354. https://doi.org/10.1080/08870446.2018.1529313

Faul, F., Erdfelder, E., Buchner, A., & Lang, Albert-Georg. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Garnefski, N., & Kraaij, V. (2006). Relationships between cognitive emotion regulation strategies and depressive symptoms: A comparative study of five specific samples. *Personality and Individual Differences, 40*(8), 1659-1669. https://doi.org/10.1016/j.paid.2005.12.009

Gross, J. J. (1998a). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271-299. https://doi.org/10.1037/1089-2680.2.3.271

Gross, J. J. (1998b). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*(1), 224-237. https://doi.org/10.1037/0022-3514.74.1.224

Gross, J. J. (1999). Emotion Regulation: Past, Present, Future. *Cognition and Emotion, 13*(5), 551-573. https://doi.org/10.1080/026999399379186

Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current Directions in Psychological Science, 10*(6), 214-219. https://doi.org/10.1111/1467-8721.00152

Gross, J. J. (2008). Emotion regulation. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (pp. 497-512). The Guilford Press.

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). American Psychological Association. https://doi.org/10.1037/11468-001

Gross, J. J., Sutton, S. K., & Ketelaar, T. (1998). Relations between affect and personality: Support for the affect-level and affective-reactivity views. *Personality and Social Psychology Bulletin, 24*(3), 279-288. https://doi.org/10.1177/0146167298243005

Gunaydin, G., Selcuk, E., & Ong, A. D. (2016). Trait reappraisal predicts affective reactivity to daily positive and negative events. *Frontiers in Psychology*, *7*(1000). https://doi.org/10.3389/fpsyg.2016.01000

Haga S. M., Kraft, P., & Corby, E. (2007). Emotion regulation: Antecedents and well-being outcomes of cognitive reappraisal and expressive suppression in cross-cultural samples. *Journal of Happiness Studies, 10*, 271-291. https://doi.org/10.1007/s10902-007-9080-3

Hawkley, L. C., Berntson, G. G., Engeland, C. G., Marucha, P. T., Masi, C. M., & Cacioppo, J. T. (2005). Stress, aging, and resilience: Can accrued wear and tear be

slowed? *Canadian Psychology/Psychologie Canadienne, 46*(3), 115-125. https://doi.org/10.1037/h0087015

Hetolang, L. T., & Amone-P'Olak, K. (2017). The associations between stressful life events and depression among students in a university. *South African Journal of Psychology, 48*(2), 255-267. https://doi.org/10.1177/0081246317711793

Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffe, M. W. (1963). Studies of illness in the aged: The index of ADL: A standardized measure of biological and psychosocial function. *Journal of the American Medical Association, 185*(12), 914-919. https://doi.org/10.1001/jama.1963.03060120024016

Kessler, R. C., Andrews, G., Mroczek, D., Ustun, B., & Wittchen, H. U. (1998). The world health organization composite international diagnostic interview short-form (CIDI-SF). *International Journal of Methods in Psychiatric Research, 7*(4), 171-185. https://doi.org/10.1002/mpr.47

Larsen, R. J., & Prizmic, Z. (2004). Affect regulation. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 40-61). New York, NY: Guilford Press.

Leger, K. A., Turiano, N. A., Bowling, W., Burris, J. L., & Almeida, D. M. (2021). Personality traits predict long-term physical health via affect reactivity to daily stressors. *Psychological Science, 32*(5), 755-765. https://doi.org/10.1177/0956797620980738

Marmot, M. G., Bosma, H., Hemingway, H., Brunner, E., & Stansfeld, S. (1997). Contribution of job control and other risk factors to social variations in coronary

heart disease incidence. *The Lancet*, *350*(9073), 235-239. https://doi.org/10.1016/S0140-6736(97)04244-X

Mattei, J., Demissie, S., Falcon, L. M., Ordovas, J. M., & Tucker, K. (2010). Allostatic load is associated with chronic conditions in the Boston Puerto Rican Health Study. *Social Science & Medicine, 70*(12), 1988-1996. https://doi.org/10.1016/j.socscimed.2010.02.024

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

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

Memedovic, S., Grisham, J. R., Denson, T. F., & Moulds, M. L. (2010). The effects of trait reappraisal and suppression on anger and blood pressure in response to provocation. *Journal of Research in Personality, 44*(4), 540-543. https://doi.org/10.1016/j.jrp.2010.05.002

Miloyan, B., Bienvenu, O. J., Brilot, B., & Eaton, W. W. (2018). Adverse life events and the onset of anxiety disorders. *Psychiatry Research, 259*¸488-492. https://doi.org/10.1016/j.psychres.2017.11.027

Mroczek, D. K., & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *Journal of Personality and*

Social Psychology, 75(5), 1333-1349. https://doi.org/10.1037/0022-3514.75.5.1333

Mroczek, D. K., Stawski, R. S., Turiano, N. A., Chan, W., Almeida, D. M., Neupert, S. D., & Sprio, A., III. (2015). Emotional reactivity and mortality: Longitudinal findings from the VA normative aging study. *The Journals of Gerontology: Series B, 70*(3), 398-406. https://doi.org/10.1093/geronb/gbt107

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

O'Neill, S. C., Cohen, L. H., Tolpin, L. H., & Gunthert, K. C. (2004). Affective reactivity to daily interpersonal stressors as a prospective predictor of depressive symptoms. *Journal of Social and Clinical Psychology, 23*(2). https://doi.org/10.1521/jscp.23.2.172.31015

Piazza, J. R., Charles, S. T., Sliwinski, M. J., Mogle, J., & Almeida, D. M. (2013). Affective reactivity to daily stressors and long-term risk of reporting a chronic physical health condition. *Annals of Behavioral Medicine, 45*(1), 110-120. https://doi.org/10.1007/s12160-012-9423-0

Preacher, K. J., & Hayes, A. F. (2008). *Assessing mediation in communication research* (pp. 13-54). London: The Sage sourcebook of advanced data analysis methods for communication research.

Prenda, K. M., & Lachman, M. E. (2001). Planning for the future: A life management strategy for increasing control and life satisfaction in adulthood. *Psychology and Aging, 16*(2), 206-216. https://doi.org/10.1037/0882-7974.16.2.206

Richardson, C. M. E. (2017). Emotion regulation in the context of daily stress: Impact on daily affect. *Personality and Individual Differences, 112*, 150-156. https://doi.org/10.1016/j.paid.2017.02.058

Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review, 110*(1), 145-172. https://doi.org/10.1037/0033-295X.110.1.145

Shapero, B. G., Stange, J. P., McArthur, B. A., Abramson, L. Y., & Alloy, L. B. (2019). Cognitive reappraisal attenuates the association between depressive symptoms and emotional response to stress during adolescence. *Cognition and Emotion, 33*(3), 524-535. https://doi.org/10.1080/02699931.2018.1462148

Sin, N. L., Graham-Engeland, J. E., Ong, A. D., & Almeida, D. M. (2015). Affective reactivity to daily stressors is associated with elevated inflammation. *Health Psychology, 34*(12), 1154-1165. https://doi.org/10.1037/hea0000240

Tamir, M., Vishkin, A., & Gutentag, T. (2020). Emotion regulation is motivated. *Emotion, 20*(1), 115-119. https://doi.org/10.1037/emo0000635

Thoits, P. A. (1983). Multiple identities and psychological well-being: A reformulation and test of the social isolation hypothesis. *American Sociological Review, 48*(2), 174-187. https://doi.org/10.2307/2095103

Thoits, P. A., & Link, B. G. (2015). Stigma resistance and well-being among people in treatment for psychosis. *Society and Mental Health, 6*(1), 1-20. https://doi.org/10.1177/2156869315591367

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., Ford, B. Q., McRae, K., Zarolia, P., & Mauss, I. B. (2017). Change the things you can: Emotion regulation is more beneficial for people from lower than from higher socioeconomic status. *Emotion, 17*(1), 141-154. https://doi.org/10.1037/emo0000210

Wang, P. S., Berglund, P., & Kessler, R. C. (2000). Recent care of common mental disorder in the United States: Prevalence and conformance with evidence-based recommendations. *Journal of General Internal Medicine, 15*(5), 284-292. https://doi.org/10.1046/j.1525-1497.2000.9908044.x

Ware Jr, 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. (1994). *The PANAS-X: Manual for the Positive and Negative Affect Schedule—Expanded Form.* The University of Iowa, Department of Psychological and Brain Sciences Publications.

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

Wolgast, M., Lundh, L., & Viborg, G. (2011). Cognitive reappraisal and acceptance: An experimental comparison of two emotion regulation strategies. *Behaviour Research and Therapy, 49*(12), 858-866. https://doi.org/10.1016/j.brat.2011.09.011

Wrosch, C., Heckhausen, J., & Lachman, M. E. (2000). Primary and secondary control strategies for managing health and financial stress across adulthood. *Psychology and Aging, 15*(3), 387-399. https://doi.org/10.1037/0882-7974.15.3.387

VITA
Jessica Chloe Maras

EDUCATION

B.A. in Psychology – May 2018
University of Toledo, Toledo, OH

PROFESSIONAL POSITIONS

Lab Coordinator – August 2020 to Present

Mentor for Undergraduate Senior Thesis – August 2021 to Present

Teaching Assistant – 2016 and Summer 2021

Data Researcher – November 2019 to May 2020

Data Specialist – October 2018 to April 2019

Psychometrist / Psychologist Assistant – April 2018 to September 2018

HONORS

University of Kentucky Lyman T. Johnson Fellowship – August 2020 to Present

Graduation with distinction, summa cum laude – May 2018

University of Toledo Outstand Senior Psychology Student Award – 2018

University of Toledo Honors Scholarship – 2014 to 2018

University of Toledo Francis D. Boyle & Katherine R. Maher Scholarship – 2016 to 2017

University of Toledo President's Honors List – 2015 to 2018

University of Toledo Dean's Honors List – 2014 to 2015

Phi Kappa Phi Honor Society – 2017 to 2018

Psi Chi International Honor Society – 2016 to 2018

Phi Eta Sigma National Honor Society – 2015 to 2018

PROFESSIONAL PUBLICATIONS

Leger, K. A., Gloger, E. M., **Maras, J.,** & Marshburn, C. K. (2022). Lifetime discrimination and health: The mediating role of daily stress processes. *Health Psychology, 41*(5), 332-342. https://doi.org/10.1037/hea0001173

Maras, J., Murray A. B., Boardley, D. J., Vanwasshenova, E. J., Tull, M. T., Tipton, J., & Geers, A. L. (2019). Assessing the relationship between implicit and explicit evaluations of fruit and vegetable consumption by cancer survivors. *International Journal of Behavioral Medicine, 26*(4), 365-371. https://doi.org/10.1007/s12529-019-09792-5