

May 2019

## Using a Stress Process Model to Examine Longitudinal Racial Differences in Well-Being and Health: Results from a Population-Based Study of Caregiving

Adrian N. S. Badana

University of South Florida, abadana@mail.usf.edu

Follow this and additional works at: <https://scholarcommons.usf.edu/etd>



Part of the [Other Medical Specialties Commons](#), and the [Public Health Commons](#)

---

### Scholar Commons Citation

Badana, Adrian N. S., "Using a Stress Process Model to Examine Longitudinal Racial Differences in Well-Being and Health: Results from a Population-Based Study of Caregiving" (2019). *Graduate Theses and Dissertations*.

<https://scholarcommons.usf.edu/etd/8333>

This Dissertation is brought to you for free and open access by the Graduate School at Scholar Commons. It has been accepted for inclusion in Graduate Theses and Dissertations by an authorized administrator of Scholar Commons. For more information, please contact [scholarcommons@usf.edu](mailto:scholarcommons@usf.edu).

Using a Stress Process Model to Examine Longitudinal Racial Differences in Well-Being and Health: Results from a Population-Based Study of Caregiving

by

Adrian N. S. Badana

A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
School of Aging Studies  
College of Behavioral and Community Sciences  
University of South Florida

Major Professor: William E. Haley, Ph.D.  
Ross Andel, Ph.D.  
Sara Green, Ph.D.  
Victor Molinari, Ph.D.  
David L. Roth, Ph.D.

Date of Approval:  
June 27, 2019

Keywords: Minority health, coping and appraisal, minority and diverse populations, psychological distress.

Copyright © 2019, Adrian N. S. Badana

## TABLE OF CONTENTS

List of Tables .....	v
List of Figures .....	vi
Abstract.....	vii
Chapter One: Introduction .....	1
Background .....	1
Family Caregiving Effects on Well-being, Burden, and Health .....	2
Individual Differences and Stress Process Model .....	4
Race/Ethnicity and Caregiving .....	7
Updates to Research .....	9
Summary .....	10
Background of the Dataset .....	11
Caregiving Research Using NSOC .....	13
Strengths of the Dataset.....	15
Limitations of the Dataset .....	16
Chapter Two: Study One.....	23
Introduction .....	23
Hypotheses .....	26
Method .....	26
Population and Sample .....	26
Primary Caregivers .....	26
Demographics .....	27
Measures .....	27
Caregiving stressors .....	27
Duration of care .....	27
Activities of daily living/instrumental activities of daily living (ADL/IADL) assistance .....	27
Hours of care per day .....	27
Dementia care status .....	27
Well-being and health .....	28
Positive well-being .....	28
Depression and anxiety .....	28
Health .....	28
Sample Characteristics .....	28
Data Analysis.....	29
Results .....	29
Caregiving Stressors.....	29

Duration of care.....	29
ADL/IADL assistance.....	30
Hours of care.....	30
Dementia care status.....	30
Positive Well-being .....	30
Depression and Anxiety .....	31
Health .....	31
Discussion.....	32
Chapter Three: Study Two .....	38
Introduction .....	38
Hypotheses .....	40
Method .....	40
Population and Sample .....	40
Demographics.....	41
Stress Process Model Measures .....	41
Stressors .....	41
Duration of care .....	41
Activities of daily living/instrumental activities of daily living (ADL/IADL) assistance .....	41
Hours of care per day .....	41
Dementia care status .....	41
Appraisals .....	42
Financial difficulty .....	42
Emotional difficulty .....	42
Physical difficulty .....	42
Role overload.....	42
Internal resources.....	42
Positive relationship .....	42
Caregiving mastery .....	43
Caregiving benefits .....	43
External resources .....	43
Support.....	43
Multiple caregivers.....	44
Well-being .....	44
Positive well-being .....	44
Depression and anxiety .....	44
Data Analyses.....	44
Results .....	46
Appraisals .....	46
Financial difficulty .....	46
Emotional difficulty .....	46
Physical difficulty .....	46
Role overload .....	46
Internal Resources.....	47
Positive relationship .....	47
Caregiving mastery .....	47

Caregiving benefits.....	47
External Resources.....	47
Support .....	47
Multiple caregivers .....	48
Hierarchical Multiple Regression Analyses.....	48
Positive well-being.....	48
Depression and anxiety .....	48
Mediation Analyses.....	49
Positive well-being.....	50
Depression and anxiety .....	50
Discussion.....	51
Chapter Four: Study Three.....	61
Introduction .....	61
Hypotheses .....	63
Method .....	63
Population and Sample .....	63
Demographics .....	64
Stress Process Model Measures .....	64
Stressors.....	65
Duration of care .....	65
Activities of daily living/instrumental activities of daily living (ADL/IADL) assistance .....	65
Hours of care per day .....	65
Dementia care status.....	65
Appraisals .....	65
Financial difficulty .....	65
Emotional difficulty.....	65
Physical difficulty .....	65
Role overload.....	66
Internal resources.....	66
Positive relationship.....	66
Caregiving mastery.....	66
Caregiving benefits .....	67
External resources .....	67
Support.....	67
Multiple caregivers.....	67
Well-being and health.....	67
Positive well-being .....	67
Depression and anxiety .....	68
Health .....	68
Data Analyses .....	68
Attrition Analyses .....	69
Still Caregiving Sample.....	69
Results .....	70
Stressors .....	70
Duration of care.....	70

Activities of daily living/instrumental activities of daily living (ADL/IADL) assistance.....	71
Hours of care per day .....	71
Appraisals .....	71
Financial difficulty .....	71
Emotional difficulty .....	72
Physical difficulty .....	72
Role overload .....	72
Internal Resources.....	72
Positive relationship .....	72
Caregiving mastery .....	73
Caregiving benefits .....	73
External Resources.....	73
Support .....	73
Multiple caregivers .....	73
Positive Well-being .....	73
Depression and Anxiety .....	74
Health .....	74
Discussion.....	75
Chapter Five: Conclusion.....	83
References .....	85
Appendix A: Institutional Review Board Letter.....	94
Appendix B: Stress Process Model Guide.....	96
Appendix C: Copyright Permissions .....	98
Appendix D: Additional Tables .....	109

## LIST OF TABLES

Table 1:	Demographic Statistics by Caregiver Race .....	36
Table 2:	Stressors, Well-being, and Health Measures by Caregiver Race and Relationship Type .....	37
Table 3:	Stress Process Descriptive Statistics by Caregiver Race .....	57
Table 4:	Hierarchical Multiple Regression Analyses for Positive Well-being .....	58
Table 5:	Hierarchical Multiple Regression Analyses for Depression and Anxiety .....	59
Table 6:	Mediation Results for Positive Well-being and Depression and Anxiety .....	60
Table 7:	Comparison of No Longer Caregivers and Still Caregivers Demographics .....	79
Table 8:	Stress Process Descriptive Statistics for No Longer Caregivers and Still Caregivers .....	80
Table 9:	Round 1 Still Caregivers Demographic Statistics by Race .....	81
Table 10:	Stress Process Descriptive Statistics for Still Caregivers Race and Time .....	82

## LIST OF FIGURES

Figure 1: Pearlin and colleagues' (1990) Stress Process Model .....	19
Figure 2: Stress and Coping model by Haley and colleagues (1987) .....	20
Figure 3: Revised Folkman (1997) Stress Appraisal Model .....	21
Figure 4: Simplified Stress Process Conceptual Model .....	22
Figure 5: Stress Process Mediation Conceptual Model .....	55
Figure 6: Stress Process Mediation Statistical Model .....	56
Figure 7: Flow Chart of No Longer Caregivers by Race .....	78



## ABSTRACT

As the older adult population of the United States increases over the next decade, many family caregivers will be needed to provide care for aging loved ones. The growing diversity of the population may also mean that more racial/ethnic minority caregivers will be providing care to older family members. Most of the studies examining race and caregiving have focused on racial differences in stress, coping, well-being and health among White and Black family caregivers. However, previous research examining racial differences in caregiving has often been limited to smaller convenience samples of caregivers, which limit generalizability of study findings. In this dissertation, a stress process model was used to investigate underlying mechanisms that may explain potential racial differences in family caregiving in a large, population-based sample of White and Black caregivers. The different components of the stress process model included caregiving stressors, appraisals, internal and external resources, and outcomes of well-being and health.

In the first study, we used factorial ANOVAs to examine main effects of relationship type (caregiving for a parent, a spouse, or other relationship) and race (White or Black) and any potential interactions on measures of caregiving stressors and outcomes of well-being and health before and after covariate adjustment. Results of the first study found that Black caregivers reported better levels of Positive Well-being and lower levels of Depression/Anxiety compared to White caregivers despite performing more assistance with care activities and hours of care. There were no significant two-way interactions of relationship x race and there was no significant association of relationship type on outcomes of well-being and health after accounting for covariates.

For the second study, we used a stress process model as a theoretical framework to examine racial differences in stressors, appraisals, internal and external resources, and their relationship to well-being. Initial ANOVA analyses examining the association of race on stress process measures found that White caregivers were more likely to experience emotional difficulty, reported lower internal and external resources, and reported worse levels of well-being compared to Black caregivers. We also conducted two multiple hierarchical regression analyses to examine significant predictors of well-being outcomes of positive well-being, and depression and anxiety. The stress process model variables used in the regression analyses helped explain individual differences in caregiver well-being. The internal resource measures of positive relationship and caregiving mastery were associated with better levels of Positive Well-being and lower levels of Depression/Anxiety. The purpose of the regression analyses was also to identify potential mediators on the association between race and well-being. After identifying potential mediators, we conducted mediation analyses using Hayes' PROCESS macros to determine significant mediation pathways on the association between race and outcomes of Positive Well-being and Depression/Anxiety. The regression analyses identified the constructs of Appraisals and Internal Resources as potential mediators. Results of the mediation analyses found that only the Internal Resources construct was a significant mediator on the association between race and both well-being outcomes.

Finally, in the third study we examined longitudinal changes in stress process model measures for White and Black caregivers from baseline to a follow-up interview conducted about four years later. We also examined potential main effects of relationship type, race, and time and any potential interactions of these three independent factors using both covariate adjusted and unadjusted factorial ANOVAs and repeated-measures logistic regression analyses. Results of the analyses showed that caregivers who were still providing care at the follow-up interview faced greater caregiving stressors and were at a greater likelihood of experiencing physical difficulty compared to baseline caregivers; however, there were no

changes in outcomes of well-being or health. Black caregivers reported more caregiving stressors and better internal resources compared to White caregivers. Reports of well-being and health remained relatively stable despite an increase in caregiving stressors over time.

Findings from this dissertation show the complex mechanisms that may explain racial differences among White and Black caregivers using stress process model measures. Potential racial differences in caregiving that have been previously reported mainly in small, convenience samples were generally replicated with this larger, population-based sample. Future research may use similar theoretical models to examine patterns of caregiving among diverse samples of family caregivers.

## **CHAPTER ONE: INTRODUCTION**

### **Background**

Family caregivers are receiving more attention as the older adult population of the United States (U.S.) continues to grow and policies and programs for caregivers are being developed to meet their needs. There are currently an estimated 17.7 million family caregivers providing assistance to an older adult, age 65 years or older in the U.S. (Schulz & Eden, 2016). Over the next decade, the need for caregivers for older adults will increase, as one in five U.S. residents will be aged 65 or older (Schulz & Eden, 2016). The increase in older adults may create a corresponding rise in the number of individuals who require assistance. The growth in diversity of the aging population will also require researchers to incorporate more diverse samples of older adults and their caregivers, such as Black Americans, to include in analyses. Caregiving stress has been presented as a major public health issue due to its impact on well-being and health. Previous research has often emphasized the negative effects of caregiving stress, such as: increased risk of mortality (Schulz & Beach, 1999), worse emotional and psychological well-being (Halpern, Fiero, & Bell, 2017), and worse physical strain when caring for a disabled older adult (Talley & Crews, 2007). However, there is also increasing evidence that the negative effects of caregiving have been overstated, with increased evidence showing positive aspects of caregiving, including: lowered risk of mortality (Fredman, Doros, Ensrud, Hochberg, & Cauley, 2009; Roth, Fredman, & Haley, 2015), mastery over life outcomes (Hansen, Slagsvold, & Ingebretsen, 2013), and a more positive outlook on life (Roth, Dilworth-Anderson, Huang, Gross, & Gitlin, 2015).

This dissertation proposal will focus on an important topic in the understanding of family caregiving: whether White and Black caregivers for older adults differ in their appraisals of caregiving stress, in their internal and external resources in coping with caregiving, and in the effects of caregiving on their mental and physical well-being and health. This dissertation will propose the use of a stress process model to understand individual differences in caregiving, including differences by race and ethnicity. Before advancing hypotheses and proposed methods for the study, we will review a number of important topics, including research on caregiver well-being and health, stress process models in caregiving research, racial differences in caregiving, and the National Health and Aging Trends/National Study of Caregiving datasets as a potential resource for studying these issues.

### **Family Caregiving Effects on Well-being, Burden, and Health**

Family caregiving research, focusing on the strains and stressors associated with assisting a loved one gained some attention in the mid-20<sup>th</sup> century (Grad & Sainsbury, 1963, 1968), but was catalyzed in the early 1980s by the landmark article by Zarit, Reever, and Bach-Peterson (1980). The seminal article in caregiving research emphasized the concept of caregiver burden, which became one of the main foci in the field. The publication of the Zarit Burden Inventory in Zarit and colleague's 1980 paper stimulated many studies that focused on this broad concept of caregiver burden (which includes caregiver reports of the impact of caregiving on their health, finances, family strain, and health). However, an alternative perspective was presented arguing that measures of burden had many serious limitations (George & Gwyther, 1986; Haley, Levine, Brown, & Bartolucci, 1987). Because burden is a multidimensional concept, it did not facilitate investigations of specific effects on mental and physical health, financial strain, or other caregiving outcomes. In addition, burden measures have limited utility in terms of public health, since they cannot be administered to non-caregivers. Many investigators began to conduct studies comparing caregivers and non-caregivers on these outcomes of well-being and this literature grew. One key finding in an early

meta-analysis was that family caregivers generally had higher levels of psychological distress, such as depression and anxiety, than non-caregivers, with especially high levels reported among dementia caregivers. Caregivers who reported higher strain and burden associated with caregiving tasks often reported worse outcomes of well-being and health compared to non-caregivers (Pinquart & Sörensen, 2003). More recent reports, such as the Families Caring for an Aging America report by Schultz and Eden (2016), summarized caregiving research and concluded that although caregivers tended to report worse psychological distress compared to non-caregivers, the negative effects were relatively small.

The effect of caregiving on a variety of health outcomes has also been a main focus of caregiving research. A meta-analysis by Pinquart and Sörensen (2003) reported that the physical health difference between caregivers and non-caregivers had a small effect size, with larger differences found between dementia and non-dementia caregivers; the effect sizes were also smaller in population-based samples. More recent research by Fredman and colleagues (2009) have suggested that, in contrast, caregivers may show health benefits from their activities. The study research by Fredman and colleagues (2009) found that caregivers who provided the more assistance with activities of daily living maintained higher physical performance in comparison to both non-caregivers and caregivers who provided lower assistance. Self-rated health is also an outcome that is often used in caregiving research. Haley and colleagues (1995) used self-rated health as an outcome in their study to examine differences among White and Black dementia family caregivers. The study found that race, and not caregiving, had a significant effect on health. Black participants had poorer self-rated health when compared to White participants. In another study, Roth and colleagues (2009), found poorer psychological health among caregivers compared to non-caregivers in a population-based sample; however, the effect size for the result was smaller than those reported by Pinquart and Sörensen (2003) in their meta-analysis. Moreover, when comparing all studies of caregivers and non-caregivers to those that used representative samples of caregivers and non-

caregivers, Pinquart and Sörensen (2003) identified that the effect size for health (.09) was smaller in representative samples compared to non-representative samples of caregivers and non-caregivers (.23). There tend to be greater differences in health among non-representative samples of caregivers and non-caregivers compared to nationally-representative samples of caregivers and non-caregivers. Self-rated health is often used as a valid measure of caregiver health in studies examining race/ethnicity and caregiving. The measure of self-rated health can be incorporated in research to examine potential racial/ethnic differences among caregivers.

Additional research has also examined the impact of caregiving on mortality risk among caregivers compared to non-caregivers. Although one early study found a greater risk of mortality only for caregivers who reported strain in helping a disabled spouse compared to non-caregivers, the study did not find an elevated risk of death for caregivers as a whole compared to non-caregivers (Schulz & Beach, 1999). Subsequent research has found the opposite mortality risk among caregivers, and that although caregivers reported higher stress than non-caregivers, they had a lower mortality risk (Fredman, Cauley, Hochberg, Ensrud, & Doros, 2010; Roth, Brown, Rhodes, & Haley, 2018). The lower mortality risk among caregivers may be explained by the Healthy Caregiver Hypothesis, which suggests that there is a self-selective bias in that healthy family members take on the caregiving role, and may therefore have a lower risk of mortality when compared to non-caregivers (Fredman, Lyons, Cauley, Hochberg, & Applebaum, 2015), and that caregiving may have both psychological and health benefits. The prosocial and stress-buffering impacts of caregiving may be a protective factor against the risk of mortality (Roth et al., 2018).

### **Individual Differences and Stress Process Model**

Beyond the study of average effects on caregivers, stress process models have been widely used to understand the individual differences in caregiver outcomes. Such theories focus on the inter-relationship of caregiving stressors, protective/risk factors, and outcomes of well-being and health. Stress process models incorporate how caregiving conditions are associated

with stress and can potentially be used to understand how these relationships develop and change over time. There are a variety of stress process models used in caregiving research that examine a range of factors to analyze different components of caregiving and capture the heterogeneity of the caregiving experience.

A stress process model presented by Pearlin, Mullan, Semple, and Skaff (1990) incorporated primary and secondary stressors of caregiving, secondary intrapsychic strains, as well as, sociodemographic characteristics of caregivers to examine how coping and social support may mediate the caregiving context and outcomes of well-being and health (Figure 1). The primary stressors of caregiving are the stressors associated with care provision, such as assistance with activities of daily living or instrumental activities of daily living. Secondary stressors are the 'spill-over' effects of caregiving into other aspects of life, such as family-life conflict or job conflict due to the strains of caregiving. Secondary intrapsychic strain is another component of the model, which incorporates both global and situational self-concepts, that are under that influence of secondary stressors and may be diminished by caregiving strains, making caregivers vulnerable (Pearlin et al., 1990). Mediators of coping and social support are also included in Pearlin and colleagues' (1990) model to explain variability in the caregiving experience because better coping strategies and improved social support may lead to better outcomes in caregivers who have sufficient coping strategies and adequate social support. The mediating variables of the model, along with sociodemographic factors, can help investigators explain variability in caregiver's well-being and health. Overall, Pearlin and colleagues' (1990) model provides a stress process model to examine differences in caregiving under various caregiving conditions and degrees of caregiving stressors. The model introduces primary and secondary stressors into the model, which is a unique aspect in studying stress, coping, and appraisal among caregivers.

A number of other researchers have developed stress process models that were based on the work by Lazarus and Folkman (1984), which emphasized the key roles of stressors,



stress appraisals, and the role of resources in altering the impact of caregiving stresses on outcomes such as mental and physical health. Haley and colleagues (1987) examined the impact of stress, coping, and appraisal among dementia caregivers. Haley and colleagues' (1987) tested a parsimonious stress process model that examined individual differences variation in primary caregiving stress, appraisals, coping, and social support and their impact on caregiver well-being and health (Figure 2). This stress process framework was also used by Haley and colleagues (1996) to evaluate the complex relationships of stress, coping, social support, appraisal, and mental and physical health using structural equation modeling. The model showed good fit and similar structure among Black and White caregivers. In the model by Haley and colleagues (1996), Black caregivers of dementia care recipients appraised caregiving stressors as less stressful and they reported better self-efficacy compared to White dementia caregivers. The model also showed that Black caregivers reported less psychological distress than White caregivers (Haley et al., 1996). Use of the stress process model demonstrated that racial differences in caregiver well-being were mediated by individual differences in appraisal of caregiving stressors.

Another related stress process model tested by Vitaliano, Russo, Young, Teri, and Maiuro (1991) examined how caregiver resources and vulnerability interplay in a dynamic balance of internal and external resources to interact with caregiving stressors and outcomes of caregiver distress. Results of the study showed that caregivers with fewer resources and greater vulnerability experienced greater distress (Vitaliano et al., 1991). Also, vulnerable caregivers without sufficient resources were at a greater disadvantage for future distress when compared to vulnerable caregivers with resources; thus, showing how individual variability in appraisal of resources are predictive of caregiver distress (Vitaliano et al., 1991). The concept of terming coping resources as either representing internal or external resources is a significant innovation that allows for a simplified conceptual structure for understanding how a variety of variables (personality, social support, spiritual beliefs, financial resources) can affect caregiving

outcomes. Through incorporating both internal and external resources, researchers may examine how resources are associated with stressors and outcomes of well-being and health among caregivers.

A revised stress process model incorporating positive appraisals of caregiving was presented by Folkman (1997) to allow researchers to examine how caregivers find meaning and benefits while caring for a relative. Folkman (1997) noted how previous stress process models focused primarily on distress and negative aspects of caregiver appraisal, yet there were positive aspects of caregiving reported by caregivers who reported concurrent high levels of psychological distress. The revised model by Folkman (1997) provides a balanced stress appraisal model by incorporating both positive and negative aspects of caregiving to analyze how they co-occur in the stress, coping, and appraisal process among family caregivers (Figure 3).

After reviewing prior stress process models in caregiving research, we aim to present a revised stress process model in this dissertation project. The proposed stress process model will utilize measures of stress and coping with data from a population-based sample of White and Black primary caregivers. The proposed model will build upon past stress process models by incorporating stressors, both internal and external resources, and outcome measures of well-being and health. Both positive and negative measures of caregiver appraisal will also be incorporated into the model to present a more complete view of the caregiving experience where previous models were deficient. The proposed model will aim to examine potential racial differences in well-being and health between White and Black caregivers. We present a simplified stress process model below (Figure 4).

### **Race/Ethnicity and Caregiving**

A widely cited review article on race, ethnicity and caregiving was written by Dilworth-Anderson, Williams, and Gibson (2002). This review has become a seminal article in the field of

caregiving and has offered a comprehensive overview of caregivers' social support, service use, and well-being and health in a variety of minority caregiving groups.

In the domain of negative effects of caregiving, Dilworth-Anderson et al. (2002) examined factors of depression, burden (distress), relationship strain, and role strain in caregivers. The lack of theory and consistent statistical techniques, embedded in the literature, made the different research articles difficult to directly compare in the review. Results clustered around the negative effects of caregiving domain, presented disparate findings. (Dilworth-Anderson et al., 2002). These inconsistencies shows how important it is to include theoretical frameworks in research to allow direct comparisons between studies and integration of study results. Dilworth-Anderson et al. (2002) recommended that future research incorporate stress and coping models or stress process models that utilize both negative and positive appraisals of caregiving to examine racial differences in caregiving.

Coping was another domain presented in the review. Most of the articles that found differences in coping and appraisal were studies that utilized a stress process model to examine racial differences. Research that used a stress process model uncovered racial differences in caregiving that were mostly attributed to differences in coping and subjective appraisals of caregiving stressors. Additional factors, such as socioeconomic status and educational status should also be considered in examining racial differences in caregiver well-being and health (Dilworth-Anderson et al., 2002).

Few studies in the Dilworth-Anderson and colleagues' (2002) review utilized population-based samples in their analyses. Convenience samples in caregiving research have limited generalizability and may provide different results when compared to randomized, population-level samples of caregivers (Pruchno et al., 2008). Incorporating population-based caregiving samples may help improve generalizability of findings for research focusing on racial differences in caregiving.

## **Updates to Research**

Shortly after the review article was published by Dilworth-Anderson et al. (2002), meta-analysis on ethnic differences in caregiving was published by Pinquart and Sörensen (2005). Results of the meta-analysis showed that ethnic minority caregivers were more likely to receive informal support than White caregivers, and that Black caregivers reported lower distress and depression than White caregivers (Pinquart & Sörensen, 2005). One area of significant disparity was in physical health where ethnic minority caregivers reported worse ratings of physical health in comparison to White caregivers (Pinquart & Sörensen, 2005). Poorer physical health among Black caregivers may be attributed to higher rates of disability that are often prominent among Black Americans and not attributed specifically to the role of caregiving (Freedman & Spillman, 2016; Schulz & Eden, 2016). A study by Haley and colleagues (1995) also found that caregiving was not associated with physical health differences between White and Black caregivers. Race was a significant predictor of physical health, with Black participants reporting worse self-rated health in comparison to White participants, regardless of caregiving status (Haley et al., 1995). Poorer physical health among Black Americans, compared to White Americans, was also found in another study to be a main effect of race and not associated with caregiving (Knight, Longmire, Dave, Kim, & David, 2007). Disability and poor physical health among Black caregivers may instead be attributed to factors such as access to health care and a lack of economic resources. The findings of the meta-analysis by Pinquart and Sörensen (2005) also showed that stress coping models were predominantly used in caregiving research, and that they are useful in cultural caregiving research to examine individual differences in various measures of caregiving.

More than a decade after the review article by Dilworth-Anderson et al. (2002) and the meta-analysis by Pinquart and Sörensen (2005), an additional review article was published by Apesoa-Varano, Tang-Feldman, Reinhard, Choula, and Young (2015). This review provided an update to research in the field of caregiving in racial and ethnic minority populations by

examining articles published from 1980 until 2013. Results of the (2015) review by Apesoa-Varano and colleagues were consistent with the other reviews that postulated that because Black caregivers tied family values to caregiving, they relied less on formal support, and they showed higher psychological resilience when compared to White caregivers (Apesoa-Varano et al., 2015). A unique contribution of the review article by Apesoa-Varano et al. (2015) is that the summary of research shows that there are few longitudinal research studies including Black caregiving families. In one of the few such longitudinal studies, Roth and colleagues (2001) reported that the finding of poorer well-being among White versus Black caregivers was sustained in a two-year follow-up. An additional concern this review raised is the need for multiple caregivers to be recognized in family caregiving research, since Black families are thought to involve extended family networks in caregiving, and researchers usually have information only on the primary caregiver. Incorporation of more longitudinal caregiving research can account for changes in caregiver well-being and health over time. The systematic review noted that population-based samples also should be used to enhance caregiving research design (Apesoa-Varano et al., 2015). Moreover, expanding on theoretical models in caregiving research can improve research centered on race and caregiving.

### **Summary**

Family caregiving among Black Americans is one of the most studied racial/ethnic groups in caregiving research. With Black Americans projected to become one of the largest and fastest-growing racial minority groups in the United States, more research is needed to investigate this select group of caregivers who will be more likely to care for someone with functional impairments (Schulz & Eden, 2016). Future research incorporating Black caregivers and their care recipients should utilize population-based samples of Black Americans and include theoretical models to capture the caregiving experience, enhance replication of the study, and improve external validity of study results (Capistrant, 2016).

A suitable theoretical framework to study racial differences in caregiving is a stress process model, which has been shown to be functional in research analyzing racial differences in caregiving (Dilworth-Anderson et al., 2002; Piquart & Sörensen, 2005). A stress process model can help explain mechanisms of racial differences among Black and White caregivers by accounting for individual differences in caregiver coping and appraisals of caregiver stress (Haley et al., 1996). Different factors, such as living arrangement, relationship type, and impact of sociodemographic factors should also be considered when examining racial differences in caregiving. Examining the impact of multiple caregivers for one care recipient may also provide valuable information into racial differences in caregiving because prior research in the field has been confined to mostly primary caregivers. The support network that multiple caregivers can provide, through either social support or assistance with caregiving activities, could explain racial differences in caregiving. Also, enhancing research methodology through embedding a stress process model in longitudinal analyses can account for change over time in stress, coping, and appraisal among White and Black caregivers. The availability of additional waves of the National Health and Aging Trends (NHATS) dataset and its supplemental dataset, the National Study of Caregiving (NSOC), allows researchers to examine potential racial differences in caregiving. The following chapter will examine research that utilized the NHATS and NSOC datasets to analyze racial differences.

### **Background of the Dataset**

The National Health and Aging Trends Study (NHATS) dataset was launched in 2010 to recruit older Medicare beneficiaries and interview them periodically to examine trends in disability and to study individual differences in trajectories and outcomes over time (Montaquila, Freedman, Edwards, & Kasper, 2012). A total of 8,245 Medicare beneficiaries were interviewed as participants for the NHATS initial interview at Round 1 and they were interviewed at subsequent one-year approximate interviews up to Round 5 (Montaquila et al., 2012). The National Study of Caregiving (NSOC) is the supplemental study to NHATS, where NHATS

participants identified up to five helpers who assisted the NHATS participant with any activity (household activity, mobility, or other activity) (Kasper, Freedman, & Spillman, 2016). There are currently two waves of NSOC; Wave 1 corresponds with NHATS Round 1 and Wave 2 corresponds with NHATS Round 5. The NSOC datasets include caregiving characteristics, as well as measures of positive and negative affect, which can be useful in examining various aspects of family caregiving. The intent of the datasets is to examine changes in disability and family caregiving in a nationally-representative sample of caregivers and their older care recipients across the United States (DeMatteis, Freedman, & Kasper, 2016). A novel aspect of the NSOC datasets is that up to five different caregivers are interviewed for one care recipient; thereby, allowing for multiple caregivers to be analyzed and incorporated as a factor in caregiving research. As indicated above, previous caregiving research has focused predominantly on one caregiver, or a primary caregiver, and did not consider the role of multiple caregivers in family caregiving.

A recent national report highlighted the need for population-based datasets in caregiving research due to the increase in diversity in the older adult population in the near future (Schulz & Eden, 2016). Previous family caregiving surveys were often plagued by small sample sizes and they did not have the ability to analyze important subgroups, such as racial/ethnic minority groups (Schulz & Eden, 2016). The NHATS and NSOC datasets have made an effort to overcome this lack of racial/ethnic diversity in prior surveys by oversampling Black, non-Hispanic older adults to allow for the analysis of a racial/ethnic subgroup and investigation of potential racial/ethnic differences. Other racial/ethnic groups were not oversampled for the datasets, therefore, they constituted relatively small samples for analyses. The national report on caregiving by Schulz and Eden (2016) also referenced the NHATS and NSOC datasets as exemplary datasets to be utilized by researchers when examining caregiving in the United States.

## Caregiving Research Using NSOC

Since Round 1 of NHATS was made publicly available to researchers in 2011, the supplemental Wave 1 of NSOC followed thereafter and facilitated caregiving research utilizing the datasets to examine well-being and health in older Americans and their caregivers. Care recipients from NHATS identified helpers who assisted them in activities, then up to five identified helpers were interviewed as caregivers for the NSOC dataset. Datasets with population-based samples, like NSOC and NHATS, are beneficial to the field of family caregiving because they allow for a nationally representative sample of caregivers to be examined. Prior family caregiving research has often relied heavily on small convenience samples of highly-strained caregivers (Roth, Fredman, et al., 2015). Using large datasets helps combat the methodological issues that former caregiving research using convenience samples have encountered, such as sampling bias and recruitment of more highly-strained caregivers.

A recent study utilized NSOC and the National Long Term Care Survey to examine longitudinal changes in the profile of family caregiving from 1999 to 2015 (Wolff et al., 2017). Results of the study found that caregivers reported less strain over time and that family caregivers were becoming more racially/ethnically diverse in comparison to caregivers examined in the past (Wolff et al., 2017). The finding that there is an increase in racial/ethnic diversity shows the need for research including racial/ethnic minority groups, like Black Americans, to examine potential racial differences in caregiving on a national level.

A study by Moon and Dilworth-Anderson (2015) used a stress process model to examine the effect of stressors and resources on baby boomer caregivers' well-being and health after accounting for dementia care status. Although the study did use a stress process model by examining primary/secondary stressors and informal support, the model did not include race or internal resources as a factors. Using the oversampled Black caregivers in the NSOC dataset will be advantageous to examine racial differences in caregiving. Moreover, including diverse



measures of caregiver well-being and positive appraisals of caregiving into the model may provide an enhanced representation of caregiving.

A study by Skolarus and colleagues (2017) examined racial differences in Black and White stroke caregivers from Wave 1 of NSOC. Results of the study found that Black stroke survivors were more likely to have a caregiver compared to White stroke survivors (Skolarus et al., 2017). Also, although Black stroke caregivers reported more positive aspects of caregiving than White stroke caregivers, there were no significant racial difference in negative aspects of caregiving, such as measures of role overload (Skolarus et al., 2017). The results of the study align with previous caregiving research where Blacks were more likely to use positive appraisal for caregiving activities compared to White caregivers (Pinquart & Sörensen, 2005; Roth, Dilworth-Anderson, et al., 2015). A limitation of the study by Skolarus et al. (2017) is that it was cross-sectional in design, was focused solely on stroke caregiving, and only examined Wave 1 of NSOC.

A recent study by Cook, Snellings, and Cohen (2018) examined the relationship of sociodemographic characteristics between caregiving intensity (activities of daily living (ADL)/instrumental activities of daily living (IADL) assistance, hour of care, and duration of care) and caregiver quality of life in White, Black, and other racial/ethnic caregivers. Results of the study found that White caregivers who provided high ADL assistance and high hours of care reported worse emotional outcomes in comparison to White caregivers who provided lower levels of care; however, Black caregivers tended to report better emotional outcomes than White caregivers despite performing high levels of care (Cook et al., 2018). The study used only NSOC Round 1 baseline data, confined analyses to only adult child caregivers, and did not examine any longitudinal changes over time in caregiver quality of life. Incorporating other relationship types, such as spousal or other family caregivers, could provide more meaningful information about racial/ethnic differences in caregiving. Also, accounting for stress appraisal measures and resources could explain potential racial/ethnic differences in caregiving.

An overarching limitation of previous research incorporating the NHATS and NSOC datasets is that most studies only examined caregivers cross-sectionally from the Wave 1 of NSOC. The newly available second NSOC wave, and additional NSOC waves in the future, can be used by researchers to examine longitudinal changes in caregiver well-being and health between White and Black caregivers and their care recipients. Moreover, the measures of stress appraisal, such as internal and external resources found in a stress process model, can be incorporated in research to explain potential racial/ethnic differences in caregiving. Research can also examine the role of multiple caregivers in care provision since NSOC provides up to five caregiver interviews per care recipient.

### **Strengths of the Dataset**

The NHATS and NSOC datasets provide a representative sample of older adults and their caregivers, which makes the datasets ideal for research purposes because samples are weighted to provide national estimates of caregivers and their care recipients (Wolff, Spillman, Freedman, & Kasper, 2016). Future waves of care recipient participants will continually be replenished to account for attrition of participants from the sample (Montaquila et al., 2012) and allow researchers to study caregivers and their care recipients longitudinally. The majority of caregiving research is cross-sectional and does not take into account the complexity of caregiving over time (Capistrant, 2016). The longitudinal, prospective design of NHATS and NSOC allows researchers to account for the complexity of caregiving over time. Initially, care recipients from NHATS were able to identify up to five different caregivers for NSOC and allow for multiple caregivers to be examined in caregiving research (Montaquila et al., 2012). Another strength of the study is that there are high response rates; Round 1 of NHATS had a high response rate of 71% (Montaquila et al., 2012), while Round 5 of NHATS had a high response rate of 76% (DeMatteis et al., 2016). There may be differences in well-being and health between sole caregivers and multiple caregivers due to the support that more than one caregiver can

provide in the care provision of a care recipient. The presence of multiple caregivers may buffer the negative effects of strain and stress associated with caregiving activities.

The NSOC and NHATS datasets have a variety of caregiving variables for research purposes (Halpern et al., 2017). For example, there are both negative aspects of caregiving (e.g. loss of free time, exhaustion before bedtime, disruption of daily routine, or an overload of tasks) and positive aspects of caregiving (e.g. greater confidence in caregiving ability, overcoming demanding situations, developing a closer connection with the care recipient, and satisfaction in the quality of care) that are incorporated in the datasets. Inclusion of both positive and negative aspects of caregiving are ideal in research to examine both positive and negative affect, which co-occur in caregiver stress and coping processes (Folkman, 1997). Caregivers report positive outcomes as well as negative outcomes when caring for a loved one (Schulz & Eden, 2016), which are important outcomes to consider when examining potential racial/ethnic differences in caregiving. Black caregivers often report more positive aspects of caregiving activities compared to White caregivers (Roth, Dilworth-Anderson, et al., 2015; Skolarus et al., 2017). It is important to consider both positive and negative appraisals of caregiving when analyzing changes in racial/ethnic differences in caregiving over time.

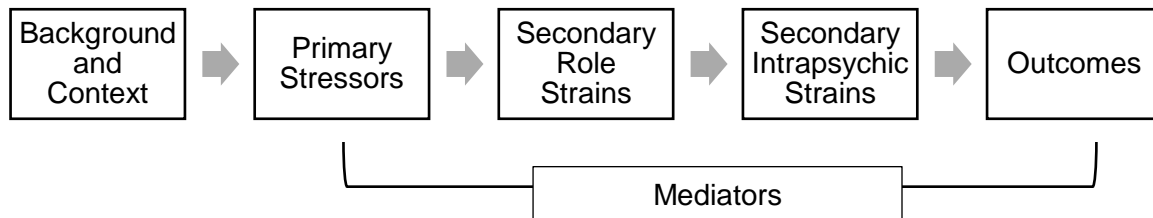
### **Limitations of the Dataset**

There are several limitations to the NSOC and NHATS datasets when considering family caregiving. Researchers who have used the NSOC and NHATS datasets attempted to account for the limitations of the single-item measurements by creating latent variables from measurements with similar constructs (Skolarus et al., 2017). Also, the NHATS dataset only focuses on community-dwelling individuals and does not include older adults who reside in institutional settings, who may be more impaired and may need more assistance compared to community-dwelling older adults. Since the samples are linked solely to community-dwelling older adults results from research utilizing the NHATS and NSOC databases can only be interpreted in the framework of older adults and their caregivers living in the community.

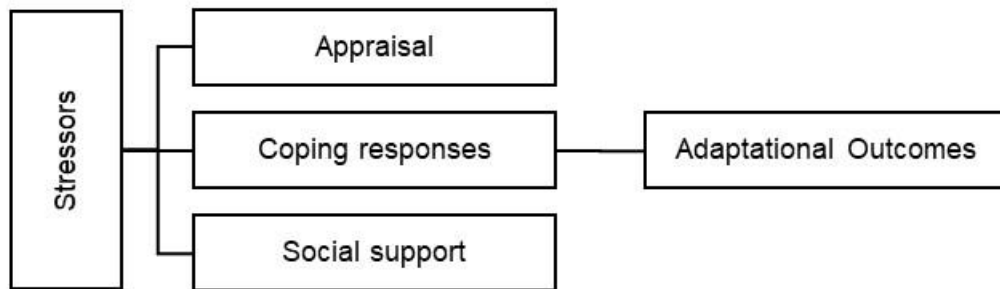
There are also limitations to the dataset when considering measurements associated with racial/ethnic differences in caregiving. For instance, there are a lack of measures in the NSOC dataset to capture an individual's decision to take on the caregiving role and provide care for a relative. Former research demonstrated how measures are related to familial obligation to provide care or cultural beliefs tied to family caregiving (Dilworth-Anderson et al., 2005; Dilworth-Anderson, Goodwin, & Williams, 2004), which are not included. There are also limited variables to assess the quality of social support available to the caregiver, which is an important factor predicting well-being in research examining racial/ethnic differences in Black and White caregivers (Clay, Roth, Wadley, & Haley, 2008). To compensate for the lack of diverse measures that may account for potential racial/ethnic differences, there are measures in the NSOC dataset that can serve as subjective appraisals of caregiving. The measures of negative and positive subjective appraisal found in the datasets can help researchers determine potential racial/ethnic differences in caregiving because Black caregivers often report more positive aspects of caregiving compared to White caregivers (Pinquart & Sörensen, 2005; Skolarus et al., 2017). As shown in research by Folkman (1997), both positive and negative aspects of caregiving co-occur and play an important role in investigating differences in coping and appraisal among caregivers.

Although there has been research published on Black Americans from the NHATS and NSOC, the research has predominantly focused on cross-sectional methodology and has not taken advantage of the longitudinal design that the datasets offer to researchers. The second wave of NSOC provides an opportunity for researchers to examine longitudinal changes in Black caregivers and their care recipients, as well as, analyze racial/ethnic differences in caregiving over time. The availability of both positive and negative measures of appraisal also is a strength of the NSOC datasets that researchers can use in research examining stress, coping, and appraisal in caregivers. The following chapters will present the three studies that will be conducted in this dissertation. In brief, these studies will propose: a.) To address differences at

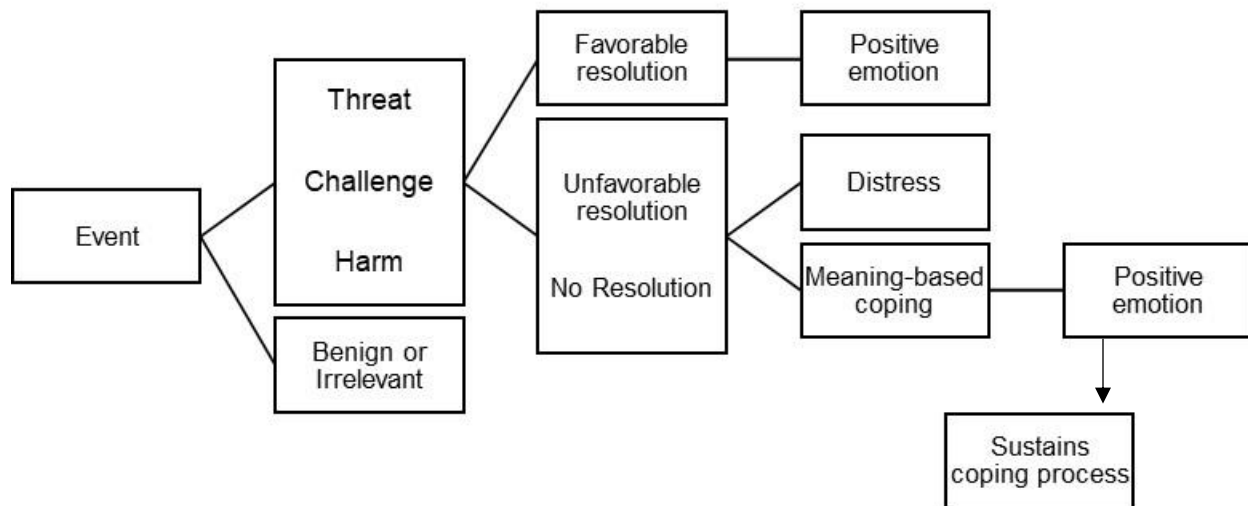
the baseline NSOC assessment between White and Black caregivers on caregiving stressors, well-being, and health outcomes, b.) To evaluate a stress process model to explain individual differences, including racial differences, in well-being outcomes, and c.) To conduct a longitudinal comparison of White and Black caregivers' changes in caregiving stressors, appraisals, resources, and well-being, and health outcomes, among NSOC participants who were still caregivers and who remained in the sample at a five-year follow-up assessment.



**Figure 1.** Pearlin and colleagues' (1990) Stress Process Model. Adapted from "Caregiving and the stress process: An overview of concepts and their measures" by L. I. Pearlin, J. T. Mullan, S. J. Semple, and M. M. Skaff, 1990, *The Gerontologist*, 30, p. 586. Copyright 1990 by Oxford University Press and The Gerontological Society of America. Used with Permission.

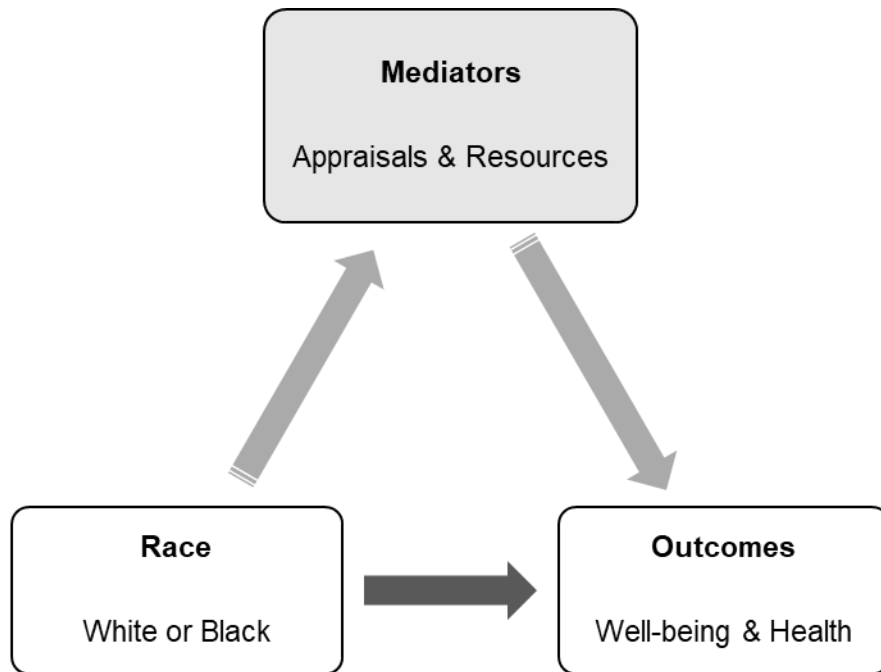


**Figure 2.** Stress and Coping model by Haley and colleagues (1987). Adapted from “Stress, appraisal, coping, and social support as predictors of adaptational outcome among dementia caregivers” by W. E. Haley, E. G. Levine, S. L. Brown, and A. A. Bartolucci, 1987, *Psychology and Aging*, 4, p. 324. Copyright 1987 by The American Psychological Association. Used with Permission.



**Figure 3.** Revised Folkman (1997) Stress Appraisal Model. Adapted from “Positive psychological states and coping with severe stress” by S. Folkman, 1997, *Social Science and Medicine*, 54, p. 1217. Copyright 1997 by Elsevier Science Ltd. Used with Permission.





**Figure 4.** Simplified Stress Process Conceptual Model

## CHAPTER TWO:

### STUDY ONE

#### Introduction

Family caregiving is a cornerstone of our long-term care system, allowing older adults with disabilities and impairments to remain in the community and avoid institutional care. Loyalty and motivation to care for family members is common in humans and may even be a part of our evolutionary heritage (Brown, Brown, & Preston, 2012; Roth et al., 2018). Many scholars have noted cultural variability in norms, values, and the impact of caregiving (Dilworth-Anderson et al., 2004; Knight & Sayegh, 2010). Caregiving within diverse American families will become more prominent as the older adult and racial/ethnic minority populations in the United States increase over the coming decades (Schulz & Eden, 2016).

Research comparing caregiving in White and Black families has been a major area of focus, with a heavy concentration on this topic in the 1990s, and reviewed by Dilworth-Anderson and colleagues in 2002. Many early studies suggested that, even though Black caregivers often reported similar or higher levels of caregiving stressors (e.g. hours per week of care, amount of activities of daily living (ADL) assistance provided), Black caregivers often reported better psychological well-being, and less psychological distress than White caregivers (Dilworth-Anderson et al., 2002). A recent review (Apesoa-Varano et al., 2015) came to similar conclusions about this area. However, the majority of research on the impact of caregiving stress on health and well-being, including research on racial/ethnic differences in caregiving, has been conducted with small convenience samples of family caregivers who are often highly strained and are not representative of the caregiving population (Roth, Fredman, et al., 2015).

There have only been a few population-based studies comparing stress, appraisals, resources, and well-being in Black and White caregivers. For example, the paper by Badana and colleagues (2017), using the AARP and National Alliance for Caregiving 2015 data set examined differences in strain, health, and service use among White and Black caregivers ( $n = 887$ ), and found that there were few racial differences even after covariate adjustment. A result worth noting is that there were significant three-way interactions of relationship type x race x dementia care status on outcomes of emotional and physical strain (Badana et al., 2017). Black adult child, non-dementia caregivers reported lower emotional stress compared to White adult child, non-dementia caregivers. However, the measures in the study were single item indicators with limited psychometric evidence and the sample size for Black spousal caregivers was too low to be incorporated in analyses. Another study by Knight and colleagues (2007) also used a population-based sample of White and Black caregivers, with random digit dialing to recruit Black and White participants in Los Angeles County. This study found no racial differences in physical health after controlling for education; also, there were no racial differences in mental health (2007). However, the study sample was small ( $n = 102$ ) and it was restricted to Southern California and was not a nationally-representative sample of White and Black caregivers. Other large, population-based studies, such as a study on Black and White stroke caregivers by Skolarus and colleagues (2017), found that there were racial differences in positive aspects of caregiving, but no significant differences in negative aspects. Black caregivers were more likely to report positive caregiving experiences compared to White caregivers.

Since previous research has shown that studies of caregiving based on convenience samples generally reveals larger effect sizes than representative samples of caregivers (Pinqart & Sörensen, 2003), and since convenience samples may recruit Whites and Blacks differently in order to maximize minority recruitment (Dilworth-Anderson & Williams, 2004), it is important to examine this topic using nationally-representative samples of White and Black

family caregivers and their care recipients, to provide a more ecologically valid view of caregiving.

Besides problems in use of convenience samples, the literature on racial/ethnic differences in caregiving has also generally not carefully examined the relationship of the caregiver to the care recipient and its impact on well-being and health. Many studies find that White older adults are predominantly cared for by spouses and adult children, while Black older adults are much less likely to have spouse caregivers, with a predominance of adult child caregivers and extended family serving as caregivers (Dilworth-Anderson et al., 2002). Spousal and adult child caregivers face unique stressors given their relationship to the care recipient and unique challenges often faced by adult child caregivers, such as work-caregiving conflict (Schulz & Eden, 2016). Many studies in this area report challenges in recruiting large numbers of Black caregivers, and thus subgroups of spousal, adult child, and other caregivers are not compared across race. We have found only one study (Badana et al., 2017) that used a population-based sample to compare White and Black caregivers, and that stratified caregivers by relationship type. However, this study had too few Black spousal caregivers to analyze this subgroup, leaving another major gap in the literature.

Finally, since Black and White caregivers are often found to vary considerably both in demographics (e.g. age and education) and in indicators of caregiving stressors (e.g. hours per week of care provided and extent of ADL assistance) it is important to ascertain not only whether racial differences occur, but also whether such differences may be explained by differences in demographics or stressors. Addressing this issue may be helpful in understanding the mechanisms that might explain any such racial differences.

The purpose of this study was to use a large, population-based sample of older adults and their family caregivers to examine racial differences in reports of caregiving stressors, well-being, and health among primary caregivers.

## **Hypotheses**

We predicted that: a.) Black caregivers would report better psychological well-being compared to White caregivers; b.) Spousal/partner caregivers would report poorer well-being compared to other relationship types; c.) We explored whether there were interaction effects between these major independent variables (relationship type and race); d.) We also explored whether those relationships are still significant after covariate analysis adjusting for differences in demographics and caregiving stressor variables.

## **Method**

### **Population and Sample**

Participants in the current study included White and Black primary caregivers, of Medicare beneficiary survey respondents aged 65 years and older, from Round 1 of the National Health and Aging Trends (NHATS) dataset and in the supplemental Wave 1 of the National Study of Caregiving (NSOC) dataset. NHATS participants were interviewed at approximately one-year intervals from 2011 (Round 1) with corresponding NSOC participants interviewed in 2011 (Wave 1). Combined, NSOC and NHATS datasets at NHATS Round 1 consisted of 2,100 caregivers, of which 214 were excluded because they did not identify as White or Black, leaving 1,263 White caregivers and 623 Black caregivers. We further refined the analytic sample by eliminating multiple caregivers to any care recipient, to only include 844 White primary caregivers and 389 Black primary caregivers. The University of South Florida Institutional Review Board certified this project as exempt from review (Pro00034601).

### **Primary Caregivers**

Since up to five caregivers were surveyed for each care recipient, we decided to identify and select primary caregivers as the focus of the analysis for Study 1. Caregivers were identified as being primary caregivers if the caregiver was the sole individual providing care, or if there were multiple caregivers, which caregiver reported performing the most hours of care per day (Wolff et al., 2017), followed by amount of ADL/IADL assistance, and then duration of care.

If multiple family caregivers reported equal hours of care, ADL/IADL assistance, and duration of care, then stratified random assignment was used to identify primary caregivers among multiple caregivers in the sample (SAS Institute, 2013). In the overall sample of Round 1 primary caregivers, there were 844 White primary caregivers and 389 Black primary caregivers.

### **Demographics**

NHATS and NSOC participants self-reported their race/ethnicity (Black, non-Hispanic or White, non-Hispanic), age, sex (Male or Female), income, relationship to their care recipient (recoded as adult child, spouse/partner, or other relationship), education (recoded as less than high school, High School/Vocational School, or University), and marital status (recoded as married/living with partner or other). Income and occupation were not included as demographic measures due to missing cases of data.

### **Measures**

#### **Caregiving stressors.**

*Duration of care.* Participants reported how many years they provided care to their care recipient.

*Activities of daily living/ Instrumental activities of daily living (ADL/IADL) assistance.* Participants reported any assistance (Yes) with six ADLs (bathing, cleaning, and assistance toileting) and five IADLs (medication management, managing finances, and transportation) were summed to create a summary variable of ADL/IADL assistance. The new variable had a reliability score of  $\alpha = .64$ .

*Hours of care per day.* Participants reported how many hours of care that they provided to a care recipient per day.

*Dementia care status.* Dementia care (Yes) was classified by either a) Participants reported if they were caring for an individual who was diagnosed with dementia b) An AD8 Dementia Screening Interview score that indicated that the care recipient had probable

dementia or c) Cognitive tests that evaluate the care recipient's memory, orientation, and executive function (Kasper, Freedman, & Spillman, 2013).

### **Well-being and health.**

*Positive well-being.* A measure of Positive Well-being was created from six survey items (Caregiver: Felt Cheerful, Felt Calm/Peaceful, Felt Full of Life, Felt bored, Felt lonely, Felt upset). Participants reported their score on a scale from 1 (every day) to 5 (never). The items, 'Felt Cheerful,' 'Felt Calm/Peaceful,' and 'Felt Full of Life' were reverse coded. Higher scores indicated better ratings of positive well-being. The summary positive well-being measure had an internal reliability score of  $\alpha = .80$ .

*Depression and anxiety.* A measure of Depression and Anxiety was created from four survey items (Caregiver Felt little interest, Felt down/depressed, Felt nervous/anxious, and Felt unable to stop worrying). Participants reported their score on a scale from 1 (Not at all) to 4 (nearly every day) as to how frequent they felt each item. Items were based off of similar constructs from the Patient Health Questionnaire-2 (PHQ-2) and the Generalized Anxiety Disorder-2 (GAD-2) scales (Kasper et al., 2016). Higher scores indicated worse ratings of depression and anxiety. The summary depression and anxiety measure had an internal reliability score of  $\alpha = .76$ .

*Health.* Participants self-reported their Health on a scale from 1 (excellent) to 5 (poor). Previous research has reported that self-rated health is a valid measurement of health (Mossey & Shapiro, 1982; Schnittker & Bacak, 2014). Lower scores indicated better health.

### **Sample Characteristics**

The overall analytic sample consisted of 1,233 primary caregivers (844 White caregivers and 389 Black caregivers). There were a number of significant racial differences found. Black caregivers were younger on average, were more likely to be female, less likely to have completed university, and less likely to be married or living with a partner compared to White caregivers (Table 1). For measures of caregiving stressors, Black caregivers reported higher

ADL/IADL assistance ( $t_{(1231)} = -2.84, p = .0046$ ) and more hours of care ( $t_{(1231)} = -3.95, p < .001$ ) compared to White caregivers. For the outcome measures of Well-being, White caregivers reported worse depression and anxiety compared to Black caregivers ( $t_{(1231)} = 2.09, p = .0369$ ). There were no significant univariate racial differences in duration of care, dementia care status, positive well-being or health.

### **Data Analysis**

We initially performed 3 x 2 (relationship type x race) factorial ANOVAs and logistic regression analyses to examine racial differences in measures of caregiving stressors, well-being, and health between White and Black primary caregivers. After conducting unadjusted analyses, we first incorporated covariates of demographic variables caregiver sex, marital status, education, and age. Then, in a second analysis, we added covariates for caregiving stressor variables of ADL/IADL assistance, hours of care, and dementia care status. This allowed us to determine whether any racial differences might be explained by either demographic or stressor differences by race. Covariate adjusted statistics for stressors, and covariate-adjusted statistics for well-being, and health, are reported in Table 2 by relationship type and race. Missing data was handled using the SAS multiple imputation module. Multiple imputation consisted of three steps: first estimates of missing data were generated, then 20 iterations of imputed data sets were analyzed, and finally data were pooled to obtain results (van Burren, 2007).

## **Results**

### **Caregiving Stressors**

**Duration of care.** There was a significant main effect of relationship type ( $F(2, 1227) = 11.78, p < .0001$ ) on Duration of Care. There was no significant main effect of race on duration of care and there was no significant two-way interaction. Post hoc analyses revealed that spousal/partner caregivers reported longer Duration of Care ( $M = 10.53$ ) compared to both adult child caregivers ( $M = 6.88$ ) and the Other Caregiver group ( $M = 7.12$ ).



**ADL/IADL assistance.** There were significant main effects of relationship type ( $F(2, 1227) = 19.83, p < .0001$ ) and race ( $F(1, 1227) = 11.08, p = .0009$ ) on ADL/IADL Assistance. Black caregivers reported more ADL/IADL assistance ( $M = 4.55$ ) compared to White caregivers ( $M = 4.01$ ). There was no significant two-way interaction. Post hoc analyses revealed that adult child caregivers reported more ADL/IADL assistance ( $M = 4.78$ ) compared to both spousal/partner caregivers ( $M = 4.46$ ) and the Other Caregiver group (3.61).

**Hours of care.** There were significant main effects of race ( $F(1, 1227) = 16.04, p < .0001$ ) on Hours of Care. Black caregivers reported more Hours of Care ( $M = 5.45$ ) on average compared to White caregivers ( $M = 4.16$ ). There was no significant main effect of relationship type or a significant two-way interaction.

**Dementia care status.** Results of the logistic regression analyses indicated that there were no significant associations of relationship type or race on Dementia Care Status. There was no significant two-way interaction.

### **Positive Well-being**

Unadjusted analyses showed a significant main effect of relationship type ( $F(2, 1227) = 3.85, p = .0216$ ) on Positive Well-being. There was no significant main effect of race or a significant two-way interaction. Post hoc analyses revealed that adult child caregivers reported worse Positive Well-being ( $M = 22.75$ ) compared to the Other Caregiver group ( $M = 23.53$ ).

Results of the adjusted analyses, for sociodemographic covariates, showed significant covariate effects of caregiver sex, marital status, and age. After covariate adjustment, the main effect of race ( $F(1, 1223) = 8.78, p = .0031$ ) on Positive Well-being became significant; however, the main effect of relationship type on Positive Well-Being was no longer significant. Black caregivers reported better ratings of Positive Well-being ( $M = 23.71$ ) compared to White caregivers ( $M = 22.87$ ). There was no significant two-way interaction.

Results of the adjusted analyses, after accounting for sociodemographic covariates and caregiving stressors, showed a significant covariate effect of caregiver sex, marital status, age,

caregiver ADL/IADL assistance, and hours of care. After covariate adjustment, the main effect of race ( $F(1, 1220) = 12.46, p = .0005$ ) on Positive Well-being remained significant. Black caregivers reported better ratings of Positive Well-being ( $M = 23.78$ ) compared to White caregivers ( $M = 22.79$ ). There was no significant main effect of relationship type or a significant two-way interaction.

### **Depression and Anxiety**

Unadjusted analyses showed no significant main effects of relationship type or race on Depression and Anxiety. There was no significant two-way interaction.

Results of the adjusted analyses, after accounting for sociodemographic covariates, showed significant covariate effects of caregiver sex and education. After covariate adjustment, race emerged as a significant main effect ( $F(1, 1223) = 4.82, p = .0283$ ) on Depression and Anxiety. White caregivers reported worse ratings of Depression and Anxiety caregivers ( $M = 6.23$ ) compared to Black caregivers ( $M = 5.84$ ). There was no significant main effect of relationship status or a significant two-way interaction.

Results of the adjusted analyses, after accounting for sociodemographic covariates and caregiving stressors, showed significant covariate effects of caregiver ADL/IADL assistance and hours of care. After covariate adjustment, the main effect of race ( $F(1, 1220) = 7.73, p = .0055$ ) on Depression and Anxiety remained significant. White caregivers reported worse ratings of Depression and Anxiety caregivers ( $M = 6.28$ ) compared to Black caregivers ( $M = 5.80$ ). There was no significant main effect of relationship type or a significant two-way interaction.

### **Health**

Unadjusted results showed a significant main effect of relationship type ( $F(2, 1227) = 14.73, p = <.0001$ ) and race ( $F(1, 1227) = 7.26, p = .0072$ ) on Health. White caregivers reported better ratings of Health ( $M = 2.56$ ) compared to Black caregivers ( $M = 2.76$ ). There was no significant two-way interaction. Post hoc analyses revealed that spousal/partner caregivers

reported worse ratings of Health ( $M = 2.97$ ) compared both to adult child caregivers ( $M = 2.50$ ) and the Other Caregiver group ( $M = 2.51$ ).

Results of the adjusted analyses, after accounting for sociodemographic covariates, showed significant covariate effects of caregiver education and age. After covariate adjustment, the main effects of relationship type and race were no longer significant. There was no significant two-way interaction.

Results of the adjusted analyses, after accounting for sociodemographic covariates and caregiving stressors, showed significant covariate effects of caregiver education, age, caregiver ADL/IADL assistance, and hours of care. After covariate adjustment, there were still no significant main effects of relationship type or race. There was no significant two-way interaction.

## **Discussion**

In this study we compared White and Black caregivers from a population-based sample of caregivers by examining the effect of relationship type and race on measures of stressors, well-being, and health. Our results are complex and illustrate the importance of considering racial differences in caregiver well-being within the context of both demographic factors and differences in care provided. Not surprisingly, we found that Black caregivers, consistent with previous findings, were generally younger, more likely to be female, and less likely to be married than White caregivers. In terms of differences in caregiving stressors, Black caregivers provided more hours of care, and more ADL/IADL assistance compared to White caregivers.

For the two measures of psychological well-being (Positive Well-Being and Depression/Anxiety), there were no significant differences by race in unadjusted analyses. However, Black caregivers reported higher Positive Well-being and lower Depression/Anxiety compared to White caregivers after accounting for covariates. In both cases, initial adjustment for sociodemographic factors led to these racial differences in depression becoming significant, and results remained significant after adjustment for caregiving stressor covariates. Within this

sample, the previously found effect of better psychological well-being in Black caregivers is only apparent after considering these background factors. Although Black caregivers reported more ADL/IADL assistance and hours of care on average, compared to White caregivers, they tended to report better psychological well-being.

An opposite pattern was found concerning racial differences in Health. Although there was a significant main effect of race on Health for the unadjusted analyses, after adjusting for sociodemographic covariates the main effect of race was no longer significant. One of the obvious explanations for the loss in significance for race might be explained by age since older caregivers generally report worse health compared to younger caregivers. Also, the measure of self-rated health was derived from a single-item measure that may not account for diversity in health assessment, such as mental and physical aspects of health. Utilizing a health measure with established psychometric validity may allow us to better understand differences in health between White and Black caregivers.

Concerning relationship type, again the pattern is complex and illustrates the difficulty of simple statements about which relationship type provides greater risk for negative well-being. For unadjusted analyses of well-being and health, spousal/partner caregivers reported worse ratings of Health compared to all other relationship types. After accounting for sociodemographic and caregiving stressor covariates, there was no significant effect of relationship type on Health. The loss in significance in the main effect of relationship type on Health may be again be largely attributed to caregivers age, which may explain why spousal/partner caregivers reported worse health compared to the other caregiver relationship types.

We explored whether there were any significant interactions between relationship type and race. The results of the analyses showed no significant interactions of relationship type x race on any of the caregiving stressor, well-being, or health measures. This is an important contribution in that many previous papers have combined relationship categories when making

racial comparisons, and this project is one of the few that have included sufficient numbers of Black spousal caregivers to make this comparison to other relationship types.

In summary, our study found several racial differences in caregiving among White and Black caregivers from a large, population-based sample in comparison to previous studies that were confined to smaller samples of White and Black caregivers. Although Black caregivers reported more caregiving stressors compared to White caregivers, they tended to report better well-being. Black caregivers reported better Positive Well-being and lower levels of Depression and Anxiety compared to White caregivers even after accounting for both sociodemographic and caregiving stressor covariates. Although there were no initial racial differences in well-being, accounting for sociodemographic characteristics provided insight into how White and Black caregivers may differ in reports of well-being due to Black caregivers being less likely to be married, more likely to be female, or being younger on average compared to White caregivers. These differences in sociodemographic characteristics may explain the apparent racial difference in well-being among White and Black caregivers. The reports of better well-being among Black caregivers shows resilience despite facing a higher amount of caregiving stressors. These results are consistent with previous research which showed higher well-being and psychological resilience among Black caregivers compared to White caregivers (Apeso-Varano et al., 2015; Dilworth-Anderson et al., 2002; Pinquart & Sörensen, 2005)

A unique finding from this study is the role of relationship type in terms of racial differences in caregiving. The majority of caregiving research that has examined racial differences in caregiving has not considered how different relationship types may be a factor in understanding differences in the caregiver role. Our study examined differences in stressors, well-being, and health among adult child caregivers, spousal/partner caregivers, and an Other Caregiver group (friends or other relatives). The current study found that relationship type was associated with a number of measures used in this study, more specifically that the Other Caregiver group provided shorter duration of care and less ADL/IADL assistance compared to

adult child caregivers and spousal/partner caregivers. While there was a significant main effect of relationship type on Positive Well-being and Health measures in unadjusted analyses, after covariate adjustment the effects were no longer significant. The lack of significant main effects of relationship type on well-being and health outcomes could suggest that all relationship types experience similar levels of well-being and health despite reporting different levels of caregiving stressors, once these complex factors are taken into account.

A limitation of the current study is the lack of measures that have established psychometric validity. To counter this issue, we combined single-item measures into summed measures with common themes and good internal validity. Despite the limitations of the current study, there are a number of notable strengths. The sample includes a larger number of Black spousal caregivers to analyze the role of relationship type in family caregiving. The study also has a number of positive and negative measures of caregiver well-being, which can offer a better overview of caregiving since previous research has predominantly focused on the negative aspects of caregiving. Inclusion of both positive and negative aspects of well-being also allowed us to examine if there were racial differences potential reasons for those differences.

Future research can examine explaining why these racial differences in well-being in caregiving occur. Stress process models have been proposed, suggesting potential mediators of appraisal and internal and external resources may explain racial differences in well-being and health between White and Black caregivers (Haley et al., 1996; Knight & Sayegh, 2010). It is also important to evaluate whether these differences are maintained over time. Additional research can also expand upon the results of this study by examining longitudinal differences in well-being and health between White and Black caregivers using a stress process theoretical model to guide analyses.

**Table 1.** Demographic Statistics by Caregiver Race

Variables	White Caregivers	Black Caregivers	<i>p</i>
	( <i>n</i> = 844)	( <i>n</i> = 389)	
	<i>n</i> (%)	<i>n</i> (%)	
<b>Caregiver Age</b>	60.55 (14.24)	56.27 (15.41)	<b>&lt;.0001 ***</b>
<b>Relationship Type</b>			<b>&lt;.0001 ***</b>
Adult Child	411 (48.70)	210 (53.98)	
Spouse/Partner	272 (32.23)	64 (16.45)	
Other	161 (19.08)	115 (29.56)	
<b>Caregiver Sex</b>			<b>.003**</b>
Female	551 (65.28)	287 (73.78)	
Male	293 (34.72)	102 (26.22)	
<b>Education</b>			<b>.0003**</b>
Less than High School	319 (37.80)	119 (30.59)	
High School/Vocational School	280 (33.18)	175 (44.99)	
University	245 (29.03)	95 (24.42)	
<b>Marital Status</b>			<b>&lt;.0001 ***</b>
Married/Living with partner	371 (43.96)	103 (26.48)	
Other	473 (56.04)	286 (73.52)	

Note. Bold numbers denote significant results. \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .001$ .

**Table 2.** Stressors, Well-being, and Health Measures by Caregiver Race and Relationship Type

Variables	White Caregivers			Black Caregivers		
	Adult Child ( <i>n</i> = 411)	Spouse/Partner ( <i>n</i> = 272)	Other ( <i>n</i> = 161)	Adult Child ( <i>n</i> = 210)	Spouse/Partner ( <i>n</i> = 64)	Other ( <i>n</i> = 115)
	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )
<b>Stressors</b>						
Duration of care (years)	6.09 (.46)	10.83 (.56)	7.24 (.73)	7.72 (.64)	8.68 (1.16)	7.63 (.87)
ADL/IADL assistance	4.55 (.13)	4.24 (.15)	3.24 (.20)	5.01 (.18)	4.67 (.32)	3.97 (.24)
Hours of care (per day)	4.37 (.23)	4.33 (.29)	3.77 (.37)	5.40 (.33)	5.18 (.44)	5.77 (.59)
Dementia care status (yes)	91 (22.14)	46 (16.91)	23 (14.29)	49 (23.33)	11 (17.19)	24 (20.87)
<b>Well-being and Health</b>						
Positive Well-being	22.24 (.23)	23.34 (.32)	22.78 (.33)	23.53 (.28)	23.94 (.54)	23.87 (.37)
Depression and Anxiety	6.57 (.14)	6.83 (.39)	6.21 (.20)	5.88 (.17)	5.79 (.23)	5.73 (.33)
Health	2.53 (.06)	2.61 (.09)	2.61 (.09)	2.53 (.08)	2.96 (.15)	2.57 (.10)

*Note.* ADL/IADL = activities of daily living/instrumental activities of daily living. Results are covariate adjusted for the three indicators of Well-being and Health.



## **CHAPTER THREE: STUDY TWO**

### **Introduction**

Family caregiving is an important component of long-term care in the United States. As the Baby Boomer population continues to age, family caregiving will become more prominent as more family members and friends care for their loved ones (Schulz & Eden, 2016). There is also diversity in family caregiving since cultural propensity to provide care may be emphasized more heavily in certain cultures compared to others, and culture can affect expectations about providing care (Dilworth-Anderson et al., 2005).

Previous research examining racial differences in caregiving among White and Black family caregivers has found that White caregivers often tend to report worse levels of well-being compared to Black caregivers (Dilworth-Anderson et al., 2002). However, most of the research on family caregiving, including studies investigating racial differences in caregiving, has often used smaller convenience samples of caregivers who are often highly-strained (Roth, Fredman, et al., 2015). Another limitation of previous using convenience sampling examining racial differences in caregiving is the different methods used to recruit minority caregivers (e.g. extensive outreach to recruit minority caregivers) (Dilworth-Anderson, 2011). Therefore, using larger, population-based samples of caregivers is needed in research to better understand underlying reasons for racial differences among family caregivers. Incorporating theoretical models to examine racial differences in caregiving may also help guide researchers and provide them with an analytic framework.

Stress process models have been widely used to study family caregiving (Folkman, 1997; Haley et al., 1987; Pearlin et al., 1990; Vitaliano et al., 1991). These models vary somewhat but a key theme is that caregiving stressors alone do not explain variability in outcomes such as caregiver psychological well-being and health. Depending on the model, variables such as secondary stressors, role overload, appraisal of stressors, and internal and external resources (such as caregiving mastery and social support) have been proposed as important in understanding outcomes of well-being and health in diverse populations of caregivers. The model has also been used in research examining stress, coping, and appraisal among White and Black caregivers (Haley et al., 1996) and has been considered as an important model in examining the impact of culture on stress and coping among diverse family caregivers (Knight & Sayegh, 2010). Stress and coping models are commonly used in research examining racial differences in family caregiving among White and Black caregivers (Dilworth-Anderson et al., 2002).

In this study, we incorporated different components of these previous stress process and stress coping models to include appraisals (such as primary appraisals of stressfulness and role overload) and internal resources including mastery and positive aspects of caregiving (Folkman, 1997) and external resources such as social support (Vitaliano et al., 1991) among White and Black caregivers.

In previous analyses from this project (Badana Study #1), we found that, consistent with much of the previous literature, White caregivers showed higher levels of depression and anxiety, and lower levels of positive well-being, compared to Black caregivers, after accounting for differences in demographics and caregiving stressors. In this study, we analyzed whether stress process variables, including caregiving stressors, appraisals, and resources, could be useful in accounting for individual differences in caregiver well-being, and for these racial differences. Utilizing a population-based sample of White and Black primary caregivers we used a stress process model to examine potential racial differences in stress appraisal, internal and

external resources as possible explanations for the better levels of well-being found in Black caregivers compared with White caregivers.

## **Hypotheses**

We predicted that: a.) Black caregivers would show more benign appraisals of caregiving stress, and report higher levels of internal and external resources relevant to coping with caregiving; b.) Race would have significant direct effects on outcomes of well-being, with better well-being in Black versus White caregivers; c.) More benign appraisals, and higher levels of internal and external resources, would be associated with higher levels of positive well-being and lower levels of depression and anxiety; and d.) Racial differences in well-being would be mediated by these stress process variables of appraisal, and internal and external resources.

## **Method**

### **Population and Sample**

Participants in the current study included White and Black primary caregivers, of Medicare beneficiary survey respondents aged 65 years and older, from Round 1 of the National Health and Aging Trends (NHATS) dataset and in the supplemental Wave 1 of the National Study of Caregiving (NSOC) dataset. NHATS participants were interviewed at approximately one-year intervals from 2011 (Round 1) with corresponding NSOC participants interviewed in 2011 (Wave 1). Combined, NSOC and NHATS datasets at NHATS Round 1 consisted of 2,100 caregivers, of which 214 were excluded because they did not identify as White or Black, leaving 1,263 White caregivers and 623 Black caregivers. We further refined the analytic sample by eliminating multiple caregivers to any care recipient, to only include 844 White primary caregivers and 389 Black primary caregivers. The University of South Florida Institutional Review Board certified this project as exempt from review (Pro00034601) (Appendix A).

## **Demographics**

NHATS and NSOC participants self-reported their race/ethnicity (Black, non-Hispanic or White, non-Hispanic), age, sex (Male or Female), income, relationship to their care recipient (recoded as adult child, spouse/partner, or other relationship), education (recoded as less than high school, High School/Vocational School, or University), and marital status (recoded as married/living with partner or other). Income and occupation were not included as demographic measures due to missing cases of data.

## **Stress Process Model Measures**

A detailed description of the measures in the proposed stress process model are described below grouped by stressors, potential mediators (appraisals, internal resources, and external resources), and outcomes (well-being and health). Figure 5 displays the stress process mediation conceptual model used in this study.

### **Stressors.**

*Duration of care.* Participants reported how many years they provided care to their care recipient.

*Activities of daily living/ Instrumental activities of daily living (ADL/IADL) assistance.* Participants reported any assistance (Yes) with six ADLs (bathing, cleaning, and assistance toileting) and five IADLs (medication management, managing finances, and transportation) were summed to create a summary variable of ADL/IADL assistance. The new variable had a reliability score of  $\alpha = .64$ .

*Hours of care per day.* Participants reported how many hours of care that they provided to a care recipient per day.

*Dementia care.* Dementia care (Yes) was classified by either a) Participants reported if they were caring for an individual who was diagnosed with dementia b) An AD8 Dementia Screening Interview score that indicated that the care recipient had probable dementia or c)

Cognitive tests that evaluate the care recipient's memory, orientation, and executive function (Kasper et al., 2013).

### **Appraisals.**

*Financial difficulty.* Participants reported if they experienced any Financial Difficulty on a scale from 1 (a little difficult) to 5 (very difficult). Inapplicable responses were coded as 0 (no difficulty).

*Emotional difficulty.* Participants reported if they experienced any Emotional Difficulty, on a scale from 1 (a little difficult) to 5 (very difficult). Inapplicable responses were coded as 0 (no difficulty).

*Physical Difficulty.* Participants reported if they experienced any Physical Difficulty on a scale from 1 (a little difficult) to 5 (very difficult). Inapplicable responses were coded as 0 (no difficulty).

All Appraisal variables of financial, emotional, and physical difficulty were collapsed into dichotomous variables (No Difficulty/ Difficulty) due to high levels of skewness in each of the original variables.

*Role overload.* A role overload measure (Pearlin et al., 1990) was created from summing four survey items (Caregiver felt exhausted at night, Care was more than the caregiver could handle, Caregiver had no time for himself/herself, Care routine changed). Participants reported their score on a scale from 1 (very much) to 3 (not so much). All items were reverse coded, with higher scores indicating worse role overload. The role overload measure had an internal reliability score of  $\alpha = .76$ .

### **Internal resources.**

*Positive relationship.* A measure of caregivers' perception of a Positive Relationship with their care recipient was created by summing four survey items (Caregiver enjoyed being with the care recipient, Care recipient appreciated the caregiver, Care recipient argues with the caregiver, Care recipient gets on the caregiver's nerves). Participants reported their score on a

scale from 1 (a lot) to 5 (not at all). The items 'Caregiver enjoyed being with the care recipient' and 'Care recipient appreciated the caregiver' were reverse coded, with higher scores indicating better ratings of positive relationship. The positive relationship measure had an internal reliability score of  $\alpha = .70$ .

*Caregiving mastery.* A measure of Caregiving Mastery was created by summing seven survey items (Caregiver: Felt that life has meaning/purpose, Felt confident, Gave up improving their lives, Liked their living situation, Felt lonely, Adjusted to change easily, and Recovered quickly). Participants reported their score on a scale from 1 (agree strongly) to 4 (disagree strongly) as to how they agreed to each item. The items, 'Felt that life has meaning/purpose,' 'Felt confident,' 'Liked their living situation,' 'Adjusted to change easily,' and 'Recovered quickly' were reverse coded, with higher scores indicating better caregiving mastery. The caregiving mastery measure had an internal reliability score of  $\alpha = .69$ .

*Caregiving benefits.* A measure of Caregiving Benefits was created from four survey items (Helping the care recipient: Made the caregiver more confident in his/her abilities, Allowed the caregiver to deal with difficult situations, Made the caregiver closer to him/her, Made the caregiver more satisfied in his/her care). Participants reported their score on a scale from 1 (very much) to 3 (not so much). All items were reverse coded, with higher scores indicating better ratings of caregiving benefits. The caregiving benefits measure had an internal reliability score of  $\alpha = .69$ .

### **External resources.**

*Support.* Participants reported any support (Yes) to four support variables (If the caregiver had: Friends/family to talk to, Friends/family to help with care acts, Friends/family to help with care recipient, Went to support group). Responses were summed to create a summary variable of support. Higher scores indicated more support use. The summary support measure had an internal reliability score of  $\alpha = .45$ .

*Multiple caregivers.* The multiple caregivers variable is a dichotomous (Yes/No) variable that represents whether there were multiple caregivers or not.

### **Well-being.**

*Positive well-being.* A measure of Positive Well-being was created from six survey items (Caregiver: Felt Cheerful, Felt Calm/Peaceful, Felt Full of Life, Felt bored, Felt lonely, Felt upset). Participants reported their score on a scale from 1 (every day) to 5 (never). The items, 'Felt Cheerful,' 'Felt Calm/Peaceful,' and 'Felt Full of Life' were reverse coded. Higher scores indicated better ratings of positive well-being. The summary positive well-being measure had an internal reliability score of  $\alpha = .80$ .

*Depression and anxiety.* A measure of Depression and Anxiety was created from four survey items (Caregiver Felt little interest, Felt down/depressed, Felt nervous/anxious, and Felt unable to stop worrying). Participants reported their score on a scale from 1 (Not at all) to 4 (nearly every day) as to how frequent they felt each item. Items were based off of similar constructs from the Patient Health Questionnaire-2 (PHQ-2) and the Generalized Anxiety Disorder-2 (GAD-2) scales (Kasper et al., 2016). Higher scores indicated worse ratings of depression and anxiety. The summary depression and anxiety measure had an internal reliability score of  $\alpha = .76$ .

### **Data Analysis**

We performed ANOVAs and logistic regression analyses to examine racial differences on individual measures of appraisals, internal resources, and external resources between White and Black primary caregivers. After conducting unadjusted analyses, we also incorporated covariates of caregiver sex, marital status, education, and age in supplementary adjusted analyses to determine if other factors may explain potential racial differences in these aspects of caregiving.

We then conducted hierarchical multiple regression analyses to examine the predictor variable of demographics, caregiving stressors, and potential mediators of appraisals and

internal and external resources on well-being outcomes. We first entered race and sociodemographic background characteristics, followed second by stressors, third by the appraisal variables, fourth by the internal resources variables, and finally fifth by external resources. We performed hierarchical multiple regression analyses on each of the two well-being outcomes.

We also analyzed the impact of potential mediators of appraisal and resource measures on the association between race and each of the two outcomes of well-being using mediation analyses. Mediation analyses were conducted using Hayes' PROCESS macros version 3.3 (2012) to determine significant indirect pathways, as well determine significant direct effects of the independent variable of race on the dependent outcomes (Positive Well-being, Depression and Anxiety). Using a stress process model as a guiding framework, we used Hayes' PROCESS macros (2012) and the Model 4 template (Hayes, 2013) to examine the direct effect of race on each of the outcomes, as well as the extent to which the effects were mediated through the appraisal and resource variables. Significance for all analyses was established at the  $\alpha = .05$  level and the mediation analyses used 10,000 bootstrapped estimates, as recommended by Hayes (2012). Figure 6 shows the stress process mediation statistical model. Multiple imputation was used for missing data. Multiple imputation consisted of three steps: first estimates of missing data were generated, then 20 iterations of imputed data sets were analyzed, and finally data were pooled to obtain results (van Burren, 2007).

For these mediation models, we used composite variables that represented key concepts in the stress process model. We created composite variables in order to avoid using multiple indicators of the same construct and to prevent completing many potentially overlapping analyses. A composite variable of Appraisal was created by summing the z scores for the measures of Financial Difficulty, Emotional Difficulty, Physical Difficulty, and Role Overload. The Role Overload measure was collapsed into a dichotomous variable to allow consistency across all appraisal measures in order to create an overall composite variable of



Appraisal. The individual appraisal measures were all significantly correlated with each other ( $r_{(1233)} = .263 - .370, p < .0001$ ). A composite variable of Internal Resources was also created by summing the z scores for the individual measures of Positive Relationship, Caregiving Mastery, and Caregiving Benefits. The individual internal resource measures were all significantly correlated with each other ( $r_{(1233)} = .119 - .259, p < .0001$ ).

## Results

### Appraisals

**Financial difficulty.** Results of the unadjusted logistic regression indicated that there was a significant association between race and Financial Difficulty, with higher difficulty in Black caregivers. Adjusted analyses showed significant covariate effects of marital status and age. After covariate adjustment, the association between race ( $\chi^2(1) = 3.68, p = .0552$ ) and Financial Difficulty was no longer significant (Table 3).

**Emotional difficulty.** Results of the unadjusted logistic regression indicated that there was a significant association between race and Emotional Difficulty. Adjusted analyses showed significant covariate effects of caregiver sex, marital status, and education. After covariate adjustment, the association between race ( $\chi^2(1) = 16.52, p = <.0001$ ) and Emotional Difficulty remained significant. White caregivers were 1.70 times more likely to report experiencing Emotional Difficulty compared to Black caregivers.

**Physical difficulty.** Results of the unadjusted logistic regression indicated that there was no significant association of race and Physical Difficulty. Adjusted analyses showed significant covariate effects of caregiver sex, marital status, education, and age. After covariate adjustment, the association between race and Physical Difficulty was still not significant ( $\chi^2(1) = 3.27, p = .070$ ).

**Role overload.** Results of the unadjusted showed no significant main effect of race on Role Overload. Adjusted analyses showed a significant covariate effect of caregiver sex. After

covariate adjustment, there was still no significant main effect of race on Role Overload ( $F(1, 1227) = 2.09, p = .1489$ ).

### **Internal Resources**

**Positive relationship.** Results of the unadjusted analyses showed no significant main effect of race on Positive Relationship. Adjusted analyses showed significant covariate effects for caregiver sex and marital status. After covariate adjustment, there was still no significant main effect of race on Positive Relationship ( $F(1, 1227) = 2.02, p = .1556$ ).

**Caregiving mastery.** Results of the unadjusted analyses showed main effect of race ( $F(1, 1231) = 5.70, p = .0171$ ) on Caregiving Mastery. Adjusted analyses showed a significant covariate effect of sex, marital status, and age. After covariate adjustment, the main effect of race ( $F(1, 1227) = 14.00, p = .0002$ ) on Caregiving Mastery remained significant. Black caregivers reported better Caregiving Mastery ( $M = 24.59$ ) compared to White caregivers ( $M = 23.77$ ) (Table 3).

**Caregiving benefits.** Results of the unadjusted analyses showed a significant main effect of race ( $F(1, 1231) = 46.04, p < .0001$ ) on Caregiving Benefits. Adjusted analyses showed a significant covariate effect of caregiver sex and education. After covariate adjustment, the main effect of race ( $F(1, 1227) = 40.79, p < .0001$ ) on Caregiving Benefits remained significant. Black caregivers reported better Caregiving Benefits ( $M = 10.78$ ) compared to White caregivers ( $M = 10.06$ ) (Table 3).

### **External Resources**

**Support.** Unadjusted analyses showed a significant main effect of race ( $F(1, 1231) = 6.11, p = .0136$ ) on Support. Adjusted analyses showed significant covariate effects of caregiver marital status, education, and age. After covariate adjustment, the main effect of race ( $F(1, 1227) = 12.28, p = .0005$ ) on Support remained significant. Black caregivers reported more Support use ( $M = 2.18$ ) compared to White caregivers ( $M = 1.97$ ) (Table 3).

**Multiple caregivers.** Results of the unadjusted logistic regression indicated that there was a significant association between race and having multiple caregivers ( $\chi^2(1) = 8.44, p = .0037$ ). Adjusted analyses showed significant covariate effects of marital status and age on having multiple caregivers. After covariate adjustment, the association between race and having multiple caregivers remained significant ( $\chi^2(1) = 12.07, p = .0005$ ). Black caregivers were 4.30 times more likely to have multiple caregivers compared to White caregivers.

### **Hierarchical Multiple Regression Analyses**

We conducted multiple hierarchical regression analyses to examine significant predictors of race and background sociodemographic characteristics, caregiving stressors, appraisals, internal and external resources on outcomes of well-being. We wanted to determine if there were any potential mediators of appraisal or internal/external resources on the associations between caregiving stressors and outcomes of well-being.

**Positive well-being.** The hierarchical multiple regression revealed that at Step One, sociodemographic characteristics accounted for significant variation in Positive Well-being. Introducing caregiving stressors in Step Two accounted for significant variation in Positive Well-being. Adding measures of Appraisal in Step Three accounted for significant the variation in Positive Well-being. The addition of Internal Resources in Step Four accounted for significant variation in Positive Well-being and race was no longer a significant predictor of Positive Well-being. Finally, the addition of External Resources in Step Five accounted for no significant variation in Positive Well-being. When all independent variables were included in Step Five, caregiver age, emotional difficulty, positive relationship, and caregiving mastery were significant predictors of Positive Well-being. Results of the hierarchical multiple regression for Positive Well-being are displayed in Table 4.

**Depression and anxiety.** The hierarchical multiple regression revealed that introducing sociodemographic characteristics at Step One accounted for significant variation in Depression and Anxiety. Introducing caregiving stressors in Step Two accounted for significant variation in

Depression and Anxiety. Adding measures of Appraisal in Step Three accounted for significant variation in Depression and Anxiety. The addition of Internal Resources in Step Four accounted for significant variation in Depression and Anxiety and race was no longer a significant predictor of Depression and Anxiety. Finally, the addition of External Resources in Step Five accounted for no significant variation in Depression and Anxiety. When all independent variables were included in Step Five, emotional difficulty, role overload, positive relationship, caregiving mastery, and caregiving benefits were significant predictors of Depression and Anxiety. Results of the unadjusted hierarchical multiple regression for Depression and Anxiety is displayed in Table 5.

### **Mediation Analyses**

Following the hierarchical multiple regression analyses, we conducted mediation analyses to examine significant mediation pathways of the significant appraisal and internal resource variables separately for each of the well-being outcomes. We chose appraisal measures and internal resource measures to analyze as potential mediators because many of their individual construct measures remained significant predictors of both well-being outcomes even after account for all independent variables, and when introduced in the hierarchical regression analysis, they reduced the effect of race on well-being. To have a parsimonious mediation model, we created composite variables by summing the z scores for the appraisal measures of Financial Difficulty, Emotional Difficulty, Physical Difficulty, and Role Overload to create an Appraisal composite variable. We also created a composite variable of Internal Resources by summing the z scores for the individual measures of Positive Relationship, Caregiving Mastery, and Caregiving Benefits. Creating composite variables allowed us to avoid using multiple indicators of the same construct and prevented us from completing many potentially overlapping analyses.

Figure 6 displays the mediation stress process statistical model used for this study. Table 6 displays the estimates and statistical significance of the indirect and direct paths for the

outcomes of Positive Well-being and Depression and Anxiety, respectively. As a guide to this table, the “a” paths represent the effect of race on the mediators (e.g., appraisals and internal resources) and the “b” paths represent the effect of the mediators on the well-being outcomes. Direct effects, shown in the c’ path (Figure 6) denote a direct association from race to the outcome variable that is independent of the mediating variable. The results of the mediating relationships for each of the five outcome measures are shown below. Figure 6 displays the statistical mediation model and Figure 5 displays the conceptual mediation model.

**Positive well-being.** For the outcome of Positive Well-being, appraisals and internal resources were significant predictors in the hierarchical multiple regression analyses reported above, and these were candidates for mediation because they remained significant predictors of Depression and Anxiety after accounting for all independent variables. External resources were not significant predictors in the hierarchical multiple regression analysis, so we did not conduct mediation analyses on measures of support or multiple caregivers.

Mediation analysis showed that the mediated path between race, appraisals, and positive well-being was not statistically significant. There was no significant mediation effect of Appraisals on the association between Race and Positive Well-being. There was no significant direct effect of race on Positive Well-being independent of the mediated association.

Mediation analysis showed that the mediated path between Race, Internal Resources, and Positive Well-being was statistically significant ( $\beta = .633$ ,  $SE = .129$ ,  $CI [.387, .893]$ ). There was a significant mediation effect of Internal Resources on the association between Race and Positive Well-being. Black caregivers reported better Internal Resources and better Positive Well-being. There was no significant direct effect of race on Positive Well-being independent of the mediated association.

**Depression and anxiety.** For the outcome of Depression and Anxiety, appraisals and internal resources were significant predictors in the regression analyses reported above, and these were candidates for mediation because they remained significant predictors of

Depression and Anxiety after accounting for all independent variables. External resources were not a significant predictor of depression and anxiety in the hierarchical multiple regression analysis, so we did not conduct mediation analyses on measures of support or multiple caregivers.

Mediation analysis showed that the mediated path between Race, Appraisals, and Depression and Anxiety was not statistically significant. There was no significant mediation effect of Appraisals on the association between Race and Depression and Anxiety. There was a significant direct effect of race on Depression and Anxiety ( $\beta = -.288$ ,  $SE = .142$ ,  $CI [-.567, -.009]$ ) independent of the mediated association. Black caregivers reported lower Depression and Anxiety.

Mediation analysis showed that the mediated path between Race, Internal Resources, and Depression and Anxiety was statistically significant ( $\beta = -.295$ ,  $SE = .064$ ,  $CI [-.426, -.174]$ ). There was a significant mediation effect of Internal Resources on the association between Race and Depression and Anxiety. Black caregivers reported better Internal Resources and lower Depression and Anxiety. There was no significant direct effect of race on Depression and Anxiety independent of the mediated association.

## **Discussion**

In the current study we used a stress process model to examine predictors of well-being among White and Black caregivers using hierarchical multiple regression analyses. Our results showed that Black and White caregivers differed not only on their levels of well-being, but also on a number of measures in the stress process model used in this study.

The results from the ANOVA analyses on the measures of appraisal and internal/external resources show that White caregivers were more likely to report experiencing emotional difficulty compared to Black caregivers, which is consistent with previous research that found higher stress appraisals in White caregivers compared to Black caregivers (Dilworth-Anderson et al., 2002; Haley et al., 2004). On measures of internal resources, Black caregivers

reported better caregiving mastery and caregiving benefits compared to White caregivers. The finding that Black caregivers report better internal resources than White caregivers is a unique aspect of the current study since previous research has not incorporated a diverse set of internal resource measures in analyses of racial differences in caregiving. Some previous studies found that Black caregivers reported more perceived benefits from caregiving (Roth, Dilworth-Anderson, et al., 2015; Skolarus et al., 2017) and higher mastery or self-efficacy than White caregivers (Apesoa-Varano et al., 2015; Dilworth-Anderson et al., 2002). There were also racial differences in measures of external resources with Black caregivers reporting more support, and they were also more likely to report having multiple caregivers compared to White caregivers. Other studies examining external resources among White and Black caregivers reported similar findings in regards to social support (Clay et al., 2008; Haley et al., 1996).

The results from the regression analyses were strongly supportive of the utility of the stress process model in explaining individual differences in caregiver well-being. As predicted, more benign appraisals, and higher levels of internal resources, both predicted better well-being on both indicators. However, levels of external resources were not significantly associated with either outcome in these regression analyses. External resources may not account for significant variation in outcomes of well-being because caregivers may be more reliant on internal mechanisms, such as appraisals and internal resources, than on external resources, such as support and availability of multiple caregivers. It is also possible that external resources, while valuable, may have beneficial effects mainly via improving other caregiving variables such as appraisals (Roth, Mittleman, Clay, Madan, & Haley, 2005). According to the stress process model, perceptions that one has greater resources should lead to reductions in stress appraisals, and thus these factors may be beneficial despite not functioning as mediators.

The hierarchical regression analyses were also useful in identifying potential mediators to explain the racial differences in well-being found in Badana, Study 1. In particular, for both well-being outcomes, the step introducing Internal Resources led to the racial difference

becoming non-significant. Accounting for Internal Resources may explain racial differences in caregiver well-being since race was no longer a significant predictor of either Positive Well-being or Depression and Anxiety when Internal Resources were added to the model.

On follow-up analyses examining mediation, there were no significant direct effects of race on Positive Well-being when considering either Appraisals or Internal Resources; yet, there was a significant direct effect of race on Depression and Anxiety when considering Appraisals. Black caregivers reported lower levels of Depression and Anxiety compared to White caregivers when considering Appraisals.

Our prediction that measures of appraisal and resources would mediate the association between race and outcomes of well-being was partially supported by the results of the mediation analyses. The Internal Resources composite variable was a significant mediator on the association between race and outcomes of Positive Well-being and Depression/Anxiety. Black caregivers reported better Internal Resources compared to White caregivers, which may explain why they reported better levels of Positive Well-being and lower levels of Depression and Anxiety in comparison to White caregivers. However, the Appraisals composite variable was not a significant mediator, and the indicators of external resources were not significant predictors of well-being. It has been postulated that since Black caregivers may possess more external resources, compared to White caregivers, they consequently may report better levels of well-being; yet, there is research that states that the amount of social support and social network size alone is not important, but that subjective perceptions of support are more closely related to better well-being (Brummett, Dilworth-Anderson, Siegler, & Williams, 2012; Clay et al., 2008). Our study found that although Black caregivers did report more external resources, those resources did not account for significant variation in well-being outcomes when incorporated in a stress process model. While Black caregivers may tend to report more external resources than White caregivers, that support may not explain racial differences in well-being.

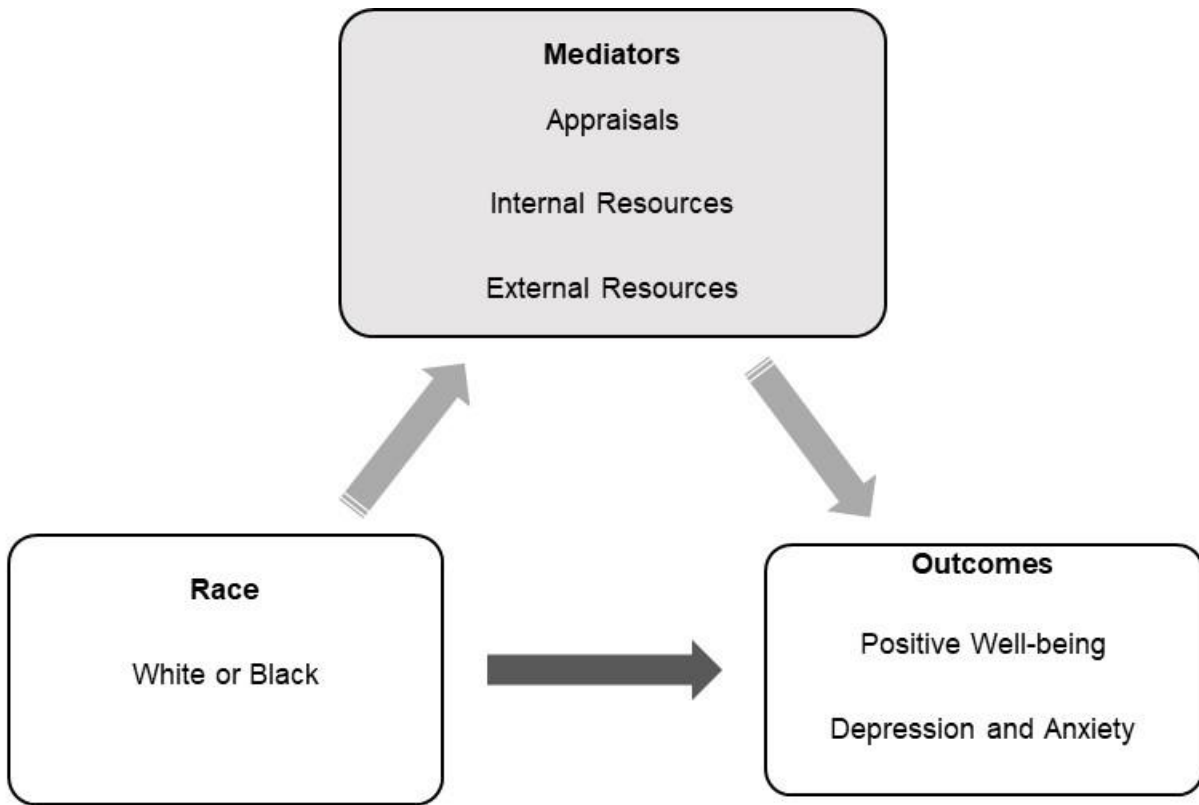


Previous research has not closely examined constructs of appraisal and internal resources separately while using stress process models to understand racial differences in caregiving. For example, a construct of internal resources was not included in the study by Haley and colleagues (1996). Separating key constructs of internal resources from measures of appraisal may allow researchers to better understand mechanisms to explain racial differences in caregiving among White and Black caregivers.

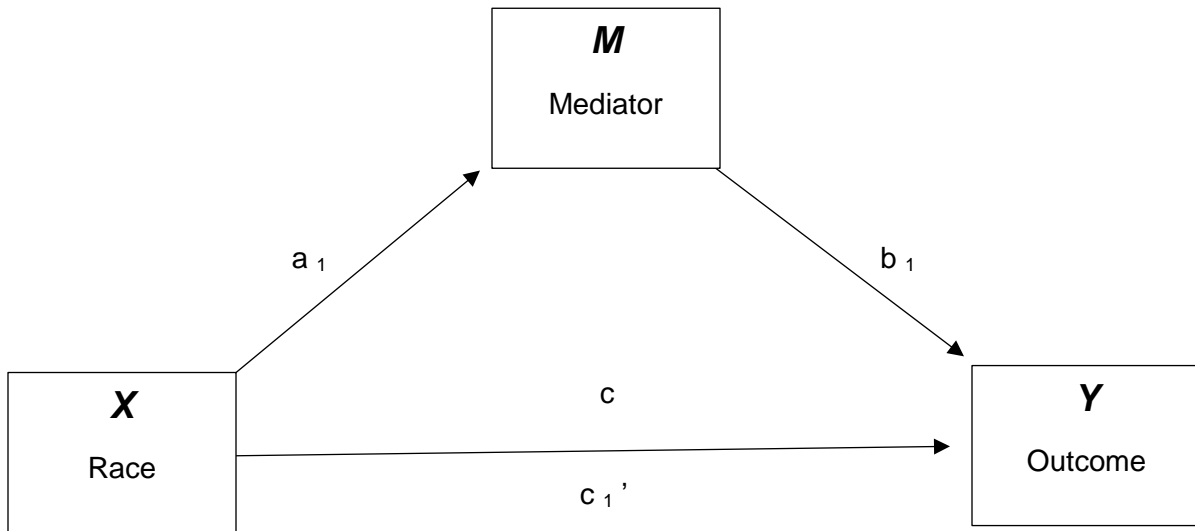
The current study has a few important limitations. These analyses used only cross-sectional data. Examining changes in stressors, appraisal, internal/external resources, and well-being over time may be beneficial to understand how White and Black caregivers may differ longitudinally instead of just at one time point. The study also is limited by the lack of measures with established psychometric validity, because this survey used brief indicators with few items. However, we attempted to resolve this issue by creating composite variables and variables with similar constructs to enhance our analyses.

Our study is unique in that it blends multiple components of a stress process model and that it contains a large, representative sample of White and Black caregivers compared to previous research. Black caregivers may be disadvantaged due to certain sociodemographic differences (e.g. lower socioeconomic status and lower likelihood of marriage), yet cultural propensity to provide care to family members or friends can be advantageous to their well-being and health (Dilworth-Anderson et al., 2005; Dilworth-Anderson et al., 2004).

Future research can build upon the current study by further investigating how other measures of internal resources may explain racial differences in caregiver well-being. Also, incorporating analyses, such as structural equation modelling, may allow researchers to examine the complex associations of race, stressors, appraisal, internal/external resources, and well-being among family caregivers.



**Figure 5.** Stress Process Mediation Conceptual Model



**Figure 6.** Stress Process Mediation Statistical Model

**Table 3.** Stress Process Descriptive Statistics by Caregiver Race

Variables	White Caregivers	Black Caregivers	<i>p</i>
	( <i>n</i> = 844)	( <i>n</i> = 389)	
	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )	
<b>Stressors</b>			
Duration of care (years)	7.46 (.32)	7.93 (.47)	.422
ADL/IADL assistance	4.26 (.09)	4.51 (.13)	.121
Hours of care (per day)	4.30 (.16)	5.27 (.24)	<b>.0013**</b>
Dementia care (yes) <i>n</i> (%)	160 (18.96)	84 (21.59)	.363
<b>Appraisals</b>			
Financial difficulty (yes) <i>n</i> (%)	182 (21.56)	115 (29.56)	.055
Emotional difficulty (yes) <i>n</i> (%)	433 (51.30)	163 (41.90)	<b>&lt;.0001**</b>
Physical difficulty (yes) <i>n</i> (%)	236 (27.96)	101 (25.96)	.070
Role overload	6.53 (.08)	6.32 (.12)	.149
<b>Internal Resources</b>			
Positive relationship	15.43 (.08)	15.63 (.11)	.156
Caregiving mastery	23.77 (.12)	24.59 (.18)	<b>.0002***</b>
Caregiving benefits	10.06 (.06)	10.78 (.09)	<b>&lt;.0001***</b>
<b>External Resources</b>			
Support	1.97 (.03)	2.18 (.05)	<b>.0005**</b>
Multiple caregivers (yes) <i>n</i> (%)	300 (35.55)	172 (44.22)	<b>.0005**</b>
<b>Well-being</b>			
Positive well-being	22.75 (.14)	23.59 (.21)	<b>.0009**</b>
Depression and anxiety	6.32 (.09)	5.89 (.13)	<b>.0077**</b>

*Note.* ADL/IADL = activities of daily living/instrumental activities of daily living. Results are covariate adjusted for sociodemographic characteristics. Bold numbers denote significant results. \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .001$ .

**Table 4.** Hierarchical Multiple Regression Analyses for Positive Well-being

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Sociodemographic</b>					
Race	<b>3.32**</b>	<b>3.90***</b>	<b>2.57**</b>	.55	.52
Sex	<b>-3.42**</b>	<b>-2.74**</b>	-1.16	-1.48	-1.49
Marital status	<b>-2.91**</b>	<b>-2.51**</b>	-1.77	.51	.55
Education	<b>-1.63***</b>	-1.58	-1.22	-.75	-.76
Age	<b>4.99***</b>	<b>4.33***</b>	<b>3.93***</b>	<b>3.72***</b>	<b>3.72***</b>
<b>Stressors</b>					
Duration of care		1.05	.98	1.66	1.66
ADL/IADL assistance		<b>-3.06**</b>	.90	-0.01	.00
Hours of care		<b>-4.02***</b>	<b>-2.82**</b>	-1.52	-1.54
Dementia care status		-1.36	-.51	-.42	-.42
<b>Appraisals</b>					
Financial difficulty			<b>-2.94**</b>	-.53	-.53
Emotional difficulty			<b>-7.25***</b>	<b>-4.54***</b>	<b>-4.54***</b>
Physical difficulty			<b>-4.33***</b>	-1.49	-1.47
Role overload			<b>-3.68***</b>	-1.21	-1.19
<b>Internal Resources</b>					
Positive relationship				<b>4.23***</b>	<b>4.21***</b>
Caregiving mastery				<b>23.58***</b>	<b>23.56***</b>
Caregiving benefits				1.69	1.68
<b>External Resources</b>					
Support					.07
Multiple caregivers					.26
<i>F</i>	<b>9.76***</b>	<b>10.38***</b>	<b>21.98***</b>	<b>66.45***</b>	<b>58.97***</b>
<i>R</i> <sup>2</sup>	.038	.071	.190	.466	.466
$\Delta F$	<b>9.76***</b>	<b>10.77***</b>	<b>44.74***</b>	<b>210.12***</b>	.041
$\Delta R^2$	.038	.033	.119	.277	.000

Note. ADL/IADL = activities of daily living/instrumental activities of daily living.  $\Delta R^2$  = change in  $R^2$  value from previous step. Bold numbers denote significant results. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 5.** Hierarchical Multiple Regression Analyses for Depression and Anxiety

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Sociodemographic</b>					
Race	<b>-2.67**</b>	<b>-3.26**</b>	<b>-2.07**</b>	-.86	-.80
Sex	<b>2.64**</b>	1.93	.25	-.01	-.01
Marital status	1.39	.91	.26	-1.86	-1.90
Education	-1.15	-1.15	-1.37	-1.96	-1.91
Age	-1.42	-.73	-.13	1.02	.97
<b>Stressors</b>					
Duration of care		-.21	-.24	-.56	-.56
ADL/IADL assistance		<b>4.70***</b>	.88	1.34	1.30
Hours of care		<b>3.23**</b>	1.86	.15	.23
Dementia care status		1.01	-.76	.24	.24
<b>Appraisals</b>					
Financial difficulty			<b>2.17**</b>	.22	.23
Emotional difficulty			<b>4.35***</b>	<b>2.44**</b>	<b>2.46*</b>
Physical difficulty			<b>4.30***</b>	1.70	1.65
Role overload			<b>6.20**</b>	<b>4.66***</b>	<b>4.63***</b>
<b>Internal Resources</b>					
Positive relationship				<b>-2.01*</b>	<b>-1.98*</b>
Caregiving mastery				<b>-20.58***</b>	<b>-20.57***</b>
Caregiving benefits				<b>2.97**</b>	<b>2.00**</b>
<b>External Resources</b>					
Support					-.05
Multiple caregivers					-.65
<i>F</i>	<b>3.59**</b>	<b>7.65***</b>	<b>18.31***</b>	<b>47.91***</b>	<b>42.56***</b>
<i>R</i> <sup>2</sup>	.014	.053	.163	.387	.387
$\Delta F$	<b>3.59**</b>	<b>12.56***</b>	<b>40.09***</b>	<b>147.57***</b>	.225
$\Delta R^2$	.014	.039	.110	.223	.000

Note. ADL/IADL = activities of daily living/instrumental activities of daily living.  $\Delta R^2$  = change in  $R^2$  value from previous step. Bold numbers denote significant results. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 6.** Mediation Results for Positive Well-being and Depression and Anxiety

	Mediator ( <i>M</i> )			Outcome ( <i>Y</i> )		
	Path	Coefficient ( <i>SE</i> )	95% CI	Path	Coefficient ( <i>SE</i> )	95% CI
<b>Positive Well-being (<i>Y</i>)</b>						
Race ( <i>X</i> )	<i>a</i> <sub>1</sub>	-.097 (.172)	-.435, .241	<i>c</i> <sub>1</sub> '	.408 (.231)	-.045, .860
Appraisals ( <i>M</i> )				<i>b</i> <sub>1</sub>	<b>-.585***</b> (.038)	-.660, -.510
Constant	<i>i</i> <sub><i>M</i></sub>	.125 (.240)	-.346, .597	<i>i</i> <sub><i>Y</i></sub>	<b>22.48***</b> (.322)	21.85, 23.11
Race ( <i>X</i> )	<i>a</i> <sub>1</sub>	<b>.599***</b> (.125)	.353, .845	<i>c</i> <sub>1</sub> '	-.169 (.216)	-.592, .255
Internal Resources ( <i>M</i> )				<i>b</i> <sub>1</sub>	<b>1.06***</b> (.049)	.962, 1.15
Constant	<i>i</i> <sub><i>M</i></sub>	<b>-.788***</b> (.175)	-1.13, -.44	<i>i</i> <sub><i>Y</i></sub>	<b>23.24***</b> (.301)	22.65, 23.83
<b>Depression and Anxiety (<i>Y</i>)</b>						
Race ( <i>X</i> )	<i>a</i> <sub>1</sub>	-.097 (.172)	-.435, .241	<i>c</i> <sub>1</sub> '	<b>-.288*</b> (.142)	-.567, -.009
Appraisals ( <i>M</i> )				<i>b</i> <sub>1</sub>	<b>.345***</b> (.025)	.299, .391
Constant	<i>i</i> <sub><i>M</i></sub>	.125 (.240)	-.345, .597	<i>i</i> <sub><i>Y</i></sub>	<b>6.56***</b> (.198)	6.17, 6.95
Race ( <i>X</i> )	<i>a</i> <sub>1</sub>	<b>.599***</b> (.125)	.353, .845	<i>c</i> <sub>1</sub> '	-.027 (.143)	-.307, .253
Internal Resources ( <i>M</i> )				<i>b</i> <sub>1</sub>	<b>-.492***</b> (.032)	-.555, -.429
Constant	<i>i</i> <sub><i>M</i></sub>	<b>-.788***</b> (.175)	-1.13, -.44	<i>i</i> <sub><i>Y</i></sub>	<b>6.22***</b> (.199)	5.83, 6.61

Note. CI = Confidence Interval. Bold numbers denote significant results. \**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

## CHAPTER FOUR:

### STUDY THREE

#### Introduction

While there is an extensive literature on family caregiving, relatively little research has focused on longitudinal changes in caregiver well-being and health over time. Previous research that has analyzed longitudinal changes in caregiver stress and coping has generally emphasized alternative hypotheses that caregivers experience either adaptation to caregiving stressors over time, e.g. due to experience with stress and enhanced coping, or declines in health and well-being outcomes due to the possible “wear and tear” of long-term exposure to caregiving stressors (Haley & Pardo, 1989; Townsend, Noelker, Deimling, & Bass, 1989). Another study by Goode, Haley, Roth, and Ford (1998) examined longitudinal changes in both physical and mental health among dementia caregivers using a stress process model to examine changes in caregiving stressors, appraisal, coping, support, and health. Results of the longitudinal study found that resource variable of support had a protective effect on health over time (Goode et al., 1998). The study also found that overall, there was no worsening of physical or mental health overtime among caregivers (Goode et al., 1998), suggesting adaptation to caregiving stressors over time. A longitudinal study by Roth et al. (2001) examined changes in well-being and health in a sample of White and Black dementia caregivers. Black caregivers reported less depression than White caregivers, which may show their resilience and adaptation to caregiving stressors (Roth et al., 2001). A study comparing stroke caregivers to non-caregivers found not only that levels of well-being and health were similar to that of non-caregivers three years after their care recipient had a stroke, but also that there were no racial



differences among caregivers over time (Haley, Roth, Hovater, & Clay, 2015). White caregivers may be more prone to the “wear and tear” of caregiving stressors because they had worse self-reports in the well-being measure of life satisfaction.

A limitation of previous longitudinal research is that most studies were limited to smaller convenience samples of caregivers who were often highly-strained (Roth, Fredman, et al., 2015), which may limit external validity of those studies. Also, inclusion of diverse measures of both positive and negative aspects of caregiving may allow researchers to understand how caregiving stressors are associated with well-being over time. The inclusion of positive aspects of caregiving can provide a more balanced view of the caregiving experience (Folkman, 1997) and may provide insight into potential racial differences in caregiving. Including measures of internal resources (e.g. perceived caregiving mastery or caregiving benefits), in addition to external resources (Vitaliano et al., 1991), may also allow researchers to analyze how different levels of support can impact caregiving over time.

The longitudinal design of population-based caregiving datasets, like the National Health and Aging Trends Study (NHATS) and the National Study of Caregiving (NSOC), allow researchers to study changes in caregiver outcomes across different time points using a nationally-representative sample of caregivers and their care recipients. These datasets can expand on the limitations of previous caregiving research by providing results with more external validity, oversampling of Black caregivers for analysis of racial minorities, and a diverse set of positive and negative measures of caregiving appraisal to allow researchers to examine differences in stress and coping.

Theoretical models can assist in longitudinal data analysis by offering a framework that researchers can utilize to observe changes over time (Collins, 2006). Stress and coping models are one of the more widely used theoretical models in caregiving and they allow for examination of individual differences in caregivers (Pinquart & Sörensen, 2005). Incorporation of a theoretical model, like a stress coping model, can help guide longitudinal analyses examining

racial differences between White and Black caregivers, as well as determining if there is either stability of outcomes over time through adaptation, or degradation through wear and tear of caregiving stressors. Longitudinal analyses can be utilized in caregiving research to provide meaningful information about changes in caregiver well-being and health.

In the third study we used a stress process model as a guiding theoretical framework to determine whether there are longitudinal changes in primary caregiver well-being and health when comparing indicators at baseline and longitudinal follow-up, and whether there are differences across race for White and Black caregivers in rates of change over time. We also determined whether any baseline and/or longitudinal differences or changes in caregiver well-being and health remain over time, between White and Black caregivers, after adjusting for sociodemographic covariates (caregiver sex., marital status, education, and age) and caregiving stressor covariates (caregiver Activities of daily living/ Instrumental activities of daily living (ADL/IADL) assistance, hours of care per day, duration of care, and dementia care status). Finally, we assessed whether caregiver internal and external resources change with time and whether this change differs by race.

## **Hypotheses**

We predicted that a.) Black caregivers would report better levels of well-being and worse levels of health at baseline compared to White caregivers; b.) We explored whether there were longitudinal changes in caregiving stressors, appraisals, internal and external resources, and well-being and health over time, to see whether these patterns were more consistent with wear and tear versus adaptation, and; c.) We explored whether racial differences remain or will attenuate over time after adjusting for demographic characteristics and caregiving stressors.

## **Method**

### **Population and Sample**

Participants in the current study included White and Black primary caregivers, of community dwelling Medicare beneficiary survey respondents aged 65 years and older, from

Rounds 1 and 5 of the National Health and Aging Trends (NHATS) dataset and in the supplemental Waves 1 and 2 of the National Study of Caregiving (NSOC) datasets. NHATS participants were interviewed at approximately one-year intervals from 2011 (Round 1) to 2015 (Round 5) with corresponding NSOC participants interviewed in 2011 (Wave 1) and 2015 (Wave 2). Combined, NSOC and NHATS datasets at NHATS Rounds 1 and 5 consisted of 2,100 caregivers and their care recipients. Of the total participants, 1,501 were caregivers at NSOC Wave 1, however they were no longer available for analysis for a variety of reasons at Wave 2 of NSOC. The remainder of the sample ( $n = 599$ ), those who were still caregiving from Wave 1 to Wave 2 of NSOC, was the main analytic group of this second study. Of the 599 still caregivers, 81 were excluded who did not identify as being Non-Hispanic White/Black, leaving 312 White caregivers and 206 Black caregivers. We further refined the sample to include 182 White primary caregivers and 110 Black primary caregivers. The University of South Florida Institutional Review Board certified this project as exempt from review (Pro00034601).

### **Demographics**

NHATS and NSOC participants self-reported their race/ethnicity (Black, non-Hispanic or White, non-Hispanic), age, sex (Male or Female), income, relationship to their care recipient (recoded as adult child, spouse/partner, or other relationship), education (recoded as less than high school, High School/Vocational School, or University), and marital status (recoded as married/living with partner or other). Income and occupation were not included as demographic measures due to missing cases of data.

### **Stress Process Model Measures**

A detailed description of the measures in the proposed stress process model are described below grouped by stressors, potential mediators (appraisals and resources), and outcomes (well-being and health).

### **Stressors.**

*Duration of care.* Participants reported how many years they provided care to their care recipient.

*Activities of daily living/ Instrumental activities of daily living (ADL/IADL) assistance.* Participants reported any assistance (Yes) with six ADLs (bathing, cleaning, and assistance toileting) and five IADLs (medication management, managing finances, and transportation) were summed to create a summary variable of ADL/IADL assistance. The new variable had a reliability score of  $\alpha = .64$  for Round 1 and  $\alpha = .57$  for Round 5.

*Hours of care per day.* Participants reported how many hours of care that they provided to a care recipient per day.

*Dementia care status.* Dementia care (Yes) was classified by either a) Participants reported if they were caring for an individual who was diagnosed with dementia b) An AD8 Dementia Screening Interview score that indicated that the care recipient had probable dementia or c) Cognitive tests that evaluate the care recipient's memory, orientation, and executive function (Kasper et al., 2013).

### **Appraisals.**

*Financial difficulty.* Participants reported if they experienced any Financial Difficulty on a scale from 1 (a little difficult) to 5 (very difficult). Inapplicable responses were coded as 0 (no difficulty).

*Emotional difficulty.* Participants reported if they experienced any Emotional Difficulty, on a scale from 1 (a little difficult) to 5 (very difficult). Inapplicable responses were coded as 0 (no difficulty).

*Physical Difficulty.* Participants reported if they experienced any Physical Difficulty on a scale from 1 (a little difficult) to 5 (very difficult). Inapplicable responses were coded as 0 (no difficulty).

Appraisal variables of financial, emotional, and physical difficulty were collapsed into dichotomous variables (No Difficulty/ Difficulty) due to high levels of skewness in each of the original variables.

*Role overload.* A Role Overload measure (Pearlin et al., 1990) was created from summing four survey items (Caregiver felt exhausted at night, Care was more than the caregiver could handle, Caregiver had no time for himself/herself, Care routine changed). Participants reported their score on a scale from 1 (very much) to 3 (not so much). All items were reverse coded, with higher scores indicating worse role overload. The role overload measure had an internal reliability score of  $\alpha = .74$  for Round 1 and  $\alpha = .77$  for Round 5.

### **Internal resources.**

*Positive relationship.* A measure of caregivers' perception of a Positive Relationship with their care recipient was created by summing four survey items (Caregiver enjoyed being with the care recipient, Care recipient appreciated the caregiver, Care recipient argues with the caregiver, Care recipient gets on the caregiver's nerves). Participants reported their score on a scale from 1 (a lot) to 5 (not at all). The items 'Caregiver enjoyed being with the care recipient' and 'Care recipient appreciated the caregiver' were reverse coded, with higher scores indicating better ratings of positive relationship. The positive relationship measure had an internal reliability score of  $\alpha = .61$  for Round 1 and  $\alpha = .65$  for Round 5.

*Caregiving mastery.* A measure of Caregiving Mastery was created from four survey items (Caregiver: Felt that life has meaning/purpose, Felt confident, Gave up improving their lives, Liked their living situation, Felt lonely, Adjusted to change easily, and Recovered quickly). Participants reported their score on a scale from 1 (agree strongly) to 4 (disagree strongly) as to how they agreed to each item. The items, 'Felt that life has meaning/purpose,' 'Felt confident,' 'Liked their living situation,' 'Adjusted to change easily,' and 'Recovered quickly' were reverse coded, with higher scores indicating better caregiving mastery. The caregiving mastery measure had an internal reliability score of  $\alpha = .59$  for Round 1 and  $\alpha = .68$  for Round 5.

*Caregiving benefits.* A measure of Caregiving Benefits was created from four survey items (Helping the care recipient: Made the caregiver more confident in his/her abilities, Allowed the caregiver to deal with difficult situations, Made the caregiver closer to him/her, Made the caregiver more satisfied in his/her care). Participants reported their score on a scale from 1 (very much) to 3 (not so much). All items were reverse coded, with higher scores indicating better ratings of caregiving benefits. The caregiving benefits measure had an internal reliability score of  $\alpha = .69$  for Round 1 and  $\alpha = .69$  for Round 5.

### **External resources.**

*Support.* Participants reported any Support (Yes) to four support variables (If the caregiver had: Friends/family to talk to, Friends/family to help with care acts, Friends/family to help with care recipient, Went to support group). Responses were summed to create a summary variable of support. Higher scores indicated more support use. The summary support measure had an internal reliability score of  $\alpha = .44$  for Round 1 and  $\alpha = .48$  for Round 5.

*Multiple caregivers.* The multiple caregivers variable is a dichotomous (Yes/No) variable that represents whether there were multiple caregivers or not.

### **Well-being and health.**

*Positive well-being.* A measure of Positive Well-being was created from six survey items (Caregiver: Felt Cheerful, Felt Calm/Peaceful, Felt Full of Life, Felt bored, Felt lonely, Felt upset). Participants reported their score on a scale from 1 (every day) to 5 (never). The items, 'Felt Cheerful,' 'Felt Calm/Peaceful,' and 'Felt Full of Life' were reverse coded. Higher scores indicated better ratings of positive well-being. The summary positive well-being measure had an internal reliability score of  $\alpha = .77$  for Round 1 and  $\alpha = .83$  for Round 5.

*Depression and anxiety.* A measure of Depression and Anxiety was created from four survey items (Caregiver Felt little interest, Felt down/depressed, Felt nervous/anxious, and Felt unable to stop worrying). Participants reported their score on a scale from 1 (Not at all) to 4 (nearly every day) as to how frequent they felt each item. Items were based off of similar

constructs from the Patient Health Questionnaire-2 (PHQ-2) and the Generalized Anxiety Disorder-2 (GAD-2) scales (Kasper et al., 2016). Higher scores indicated worse ratings of depression and anxiety. The summary depression and anxiety measure had an internal reliability score of  $\alpha = .71$  for Round 1 and  $\alpha = .74$  for Round 5.

*Health.* Participants self-reported their Health on a scale from 1 (excellent) to 5 (poor). Previous research has reported that self-rated health is a valid measurement of health (Mossey & Shapiro, 1982; Schnittker & Bacak, 2014). Lower scores indicated better health.

### **Data Analysis**

An initial attrition analysis compared baseline characteristics (Round 1) of those who were still caregivers at Round 5, with those who had been caregivers at Round 1 but did not complete Round 5 interviews. These analyses were conducted via two-sample independent *t*-tests on all continuous variables and Chi-square tests on all categorical variables.

We then conducted separate 3 x 2 x 2 (relationship type x race x time) factorial ANOVAs on the different measures of the stress process model: stressors, appraisals, resources, well-being, and health measures. Second, we conducted additional factorial ANOVAs, adjusting for the sociodemographic covariates of caregiver sex, marital status, education, and age. In addition to accounting for sociodemographic covariates, three separate models for well-being and health outcomes were also conducted to adjust for the same caregiving stressors of caregiver ADL/IADL assistance and hours of care. Including caregiving stressor covariates allowed us to determine if caregiving characteristics accounted for differences in well-being and health. Four repeated measures logistic regressions, adjusting for the aforementioned covariates, were then conducted to examine the impact of caregiver relationship type (adult child, spouse/partner, all other relationships), race (White or Black), and time (Round 1 or Round 5) on dichotomous measures of the appraisal (financial, emotional, and physical difficulty) and the external resource variable, multiple caregivers. Missing data was handled using the SAS multiple imputation module. Multiple imputation consisted of three steps: first

estimates of missing data will be generated, then 20 iterations of imputed data sets will be analyzed, and finally data will be pooled to obtain results (van Burren, 2007).

### **Attrition Analysis**

As shown in Table 7, there were a number of differences apparent at the baseline among caregivers who were available for these longitudinal analyses, versus those that were not. Those who were not available for the follow-up interview were more likely to have been dementia caregivers and less likely to have multiple caregivers at baseline. They were also more likely to report experiencing physical strain and reported lower caregiving benefits compared to those individuals who were still caregiving at the Round 5 follow-up interview. There were no significant differences in measures of caregiver age, sex, relationship type, marital status, education between those who were no longer caregivers at Round 5 versus those who were still caregiving from Round 1 to Round 5 (Table 8). There were significantly fewer White caregivers who were still caregiving at Round 5 versus those who were no longer caregiving.

To determine why the caregivers were absent at the second NSOC interview at NHATS Round 5, we examined attrition of the care recipients at each wave of NHATS, from Rounds 1 to 5. We first analyzed attrition due to death of the care recipient and then examined cases of missing data across each wave of the study to determine why they dropped out of the study. Figure 7 displays a flow chart that shows attrition at each NHATS round for Black and White care recipients. The majority of attrition across each wave was attributed to death of the care recipient, with 364 deaths overall for White caregivers and 131 deaths overall for Black caregivers, from NHATS Rounds 1 to 5. The remaining cases of attrition were participants who dropped out of the study at subsequent NHATS rounds, and therefore had missing data.

### **Still Caregiving Sample**

The analytic sample of still caregivers consisted of a total of 292 primary caregivers, caring for an NHATS individual in NHATS Rounds 1 and 5. Of the 292 total still caregivers, 182



were White caregivers and 110 were Black caregivers. There were significant racial differences on all measures of caregiver demographics at Round 1. Black caregivers were younger on average compared to White caregivers. Black caregivers also were more likely to be female and were less likely to have a post-secondary education compared to White caregivers (Table 9).

## Results

We conducted separate unadjusted and adjusted 3 x 2 x 2 (relationship type x race x time) factorial ANOVAs on the different measures of the stress process model: stressors, appraisals, resources, well-being, and health measures. We aimed to examine the impact of caregiver relationship type (adult child, spouse/partner, other relationship type), race (White or Black), and time (Round 1 or Round 5) on measures of stressors, appraisals, resources, well-being, and health. Second, we conducted additional factorial ANOVAs, adjusting for the sociodemographic covariates mentioned above. In addition to accounting for sociodemographic covariates, we conducted three separate models for well-being and health outcomes to adjust for caregiving stressor covariates. Including caregiving stressor covariates allowed us to determine if caregiving characteristics may account for differences in well-being and health. Repeated measures logistic regressions, both unadjusted and adjusted for the aforementioned covariates, were then conducted to examine the impact of caregiver relationship type (adult child, spouse/partner, other), race (White or Black), and time (Round 1 or Round 5) on dichotomous measures of the appraisal variables (financial, emotional, and physical difficulty).

### Stressors

We conducted unadjusted ANOVA analyses on all Caregiving Stressor measures controlling for sociodemographic covariates of caregiver sex, marital status, education, and age. Unadjusted results are displayed in Table 10.

**Duration of care.** Results showed significant main effects of relationship type ( $F(2, 286) = 3.42, p = .0340$ ) and time ( $F(1, 286) = 10.67, p = .0012$ ) on duration of care. Round 5 caregivers reported longer duration of care ( $M = 10.62$ ) compared to Round 1 caregivers ( $M =$

7.83). There was no significant main effect of race on duration of care, nor were there any significant two-way or three-way interactions. Post hoc analyses revealed that adult child caregivers reported less duration of care ( $M = 7.39$ ) compared to spousal/partner caregivers ( $M = 10.43$ ).

**ADL/IADL assistance.** Results showed significant main effects of relationship type ( $F(2, 286) = 6.56, p = .0016$ ), race ( $F(1, 286) = 6.51, p = .0112$ ), and time ( $F(1, 286) = 6.70, p = .0102$ ) on ADL/IADL Assistance. Black caregivers reported more ADL/IADL Assistance ( $M = 4.64$ ) compared to White caregivers ( $M = 3.81$ ). Round 5 caregivers reported more ADL/IADL Assistance ( $M = 4.45$ ) compared to Round 1 caregivers ( $M = 4.00$ ). There were no significant no significant two-way or three-way interactions. Post hoc analyses revealed that the Other Caregiver group reported less ADL/IADL Assistance ( $M = 3.36$ ) compared to adult child caregivers ( $M = 4.53$ ) and spousal/partner caregivers ( $M = 4.79$ ).

**Hours of care.** Results showed no significant main effects of relationship type, race, or time on Hours of care. There were no significant two-way or three-way interactions.

### **Appraisals**

We conducted adjusted ANOVA analyses for the Role Overload measure, and repeated measures logistic regression analyses for the categorical measures, controlling for sociodemographic covariates of caregiver sex, marital status, education, and age. Adjusted results are displayed in Table 10.

**Financial difficulty.** Adjusted analyses showed significant covariate associations for caregiver age. The association of relationship type and Financial Difficulty was significant ( $\chi^2(2) = 7.73, p = .0209$ ). Spousal/partner caregivers were 3.18 times more likely to report experiencing financial difficulty compared to the Other Caregiver groups. There was no significant association of time or race and Financial Difficulty, and there were no significant no significant two-way or three-way interactions.

**Emotional difficulty.** Adjusted analyses showed significant covariate associations for caregiver sex and education. The association of relationship type and Emotional Difficulty was significant ( $\chi^2(2) = 6.84, p = .0327$ ). Adult child caregivers were 1.15 times likely to report experiencing Emotional Difficulty compared to the Other Caregiver group. Spousal/partner caregivers were 3.31 times likely to report experiencing Emotional Difficulty compared to the Other Caregiver groups. There were no significant associations of race or time and financial difficulty. There were no significant no significant two-way or three-way interactions.

**Physical difficulty.** Adjusted analyses showed significant covariate associations for caregiver sex and marital status. The association of time on Physical Difficulty was significant ( $\chi^2(1) = 4.37, p = .0367$ ). Round 5 caregivers were 2.92 times more likely to report experiencing Physical Difficulty compared to all Round 1 caregivers. There was no significant association of race or relationship and financial difficulty. There were no significant no significant two-way or three-way interactions.

**Role overload.** Adjusted analyses showed significant covariate effects of caregiver sex. After covariate adjustment, there were no significant main effects of relationship type, race, or time on Role Overload. There were no significant two-way or three-way interactions.

### **Internal Resources**

We conducted adjusted ANOVA analyses on all Internal Resource measures controlling for sociodemographic covariates of caregiver sex, marital status, education, and age. Adjusted results are displayed in Table 10.

**Positive relationship.** Adjusted analyses showed significant covariate effects of caregiver sex and marital status. The main effect of relationship type ( $F(2, 282) = 4.51, p = .0118$ ) on positive relationship was significant. There were no significant main effects of race or time, no were there any significant two-way or three-way interactions. Post hoc analyses revealed that spousal/partner caregivers reported worse ratings of positive relationship ( $M =$

14.88) compared to both adult child caregivers ( $M = 15.76$ ) and the Other Caregiver group ( $M = 16.07$ ).

**Caregiving mastery.** Adjusted analyses showed significant covariate effects of caregiver sex and marital status. There were no significant main effects of race, relationship type or time on Caregiving Mastery, nor were there were no significant two-way or three-way interactions.

**Caregiving benefits.** Adjusted analyses showed no significant covariate effects. The main effect of race ( $F(1, 282) = 27.94, p = <.0001$ ) was significant. Black caregivers reported better Caregiving Benefits ( $M = 11.07$ ) compared to White caregivers ( $M = 9.99$ ). There were no significant main effects of relationship type or time on Caregiving Benefits, nor were there any significant two-way or three-way interactions.

### **External Resources**

We conducted adjusted ANOVA analyses for the Support measure, and repeated measures logistic regression analyses for the categorical measure of Multiple Caregivers, controlling for sociodemographic covariates of caregiver sex, marital status, education, and age. Adjusted results are displayed in Table 10.

**Support.** Adjusted analyses showed significant covariate effects of marital status. There were no significant main effects of race, relationship, or time on Support, nor were there any significant two-way or three-way interactions.

**Multiple caregivers.** Adjusted analyses showed significant covariate associations for caregiver age. There were no significant associations between relationship type, race, or time and having multiple caregivers.

### **Positive Well-being**

Results of the adjusted analyses, after accounting for sociodemographic covariates, showed significant covariate effects of caregiver sex and marital status. There were no

significant main effects of relationship, race, or time on Positive Well-being. There were also no significant two-way or three-way interactions.

Results of an additional adjusted analysis, adding caregiving stressors as covariates, showed significant covariate effects of caregiver sex and marital status. After covariate adjustment, there were still no significant main effects of relationship, race, or time on Positive Well-being. There were also no significant two-way or three-way interactions.

### **Depression and Anxiety**

Results of the adjusted analyses, after accounting for sociodemographic covariates, showed significant covariate effects of caregiver sex and marital status. After covariate adjustment, there were no significant main effects of relationship, race, or time on Depression and Anxiety. There were also no significant two-way or three-way interactions.

Results of the additional adjusted analyses, adding caregiving stressors as covariates, showed significant covariate effects of caregiver sex, marital status, and caregiver ADL/IADL assistance. After covariate adjustment, there were still no significant main effects of relationship, race, or time on Depression and Anxiety. There were also no significant two-way or three-way interactions.

### **Health**

Results of the adjusted analyses, after accounting for sociodemographic covariates, showed a significant covariate effect of education. After covariate adjustment, there were no significant main effects of relationship, race, or time on Health. There were also no significant two-way or three-way interactions.

Results of the additional adjusted analyses, adding caregiving stressors as covariates, showed significant covariate effects of education and caregiver ADL/IADL assistance. After covariate adjustment, there were still no significant main effects of relationship, race, or time on Health. There were also no significant two-way or three-way interactions.

## Discussion

In the current study, we examined if there were any longitudinal changes in measures of the stress process model (stressors, appraisals, resources, well-being and health) before and after covariate adjustment. We also determined the impact of caregiver relationship type (adult child, spouse/partner, other), race (White or Black), and time (Round 1 or Round 5) on measures of the proposed stress process model. We also examined cross-sectional differences in outcomes of well-being and health, before and after accounting for covariates, to determine if there were racial differences at baseline or at the follow-up interview.

Our prediction that Black caregivers would report better levels of well-being and worse levels of health at baseline compared to White caregivers was not supported by the study results. There were no racial differences in well-being or health.

Our prediction that Black caregivers would report more stressors, but more benign appraisals of stressors compared to White caregivers was partially supported by the results of the study. Black caregivers reported more ADL/IADL assistance on average compared to White caregivers. The results did not indicate that Black caregivers reported more benign appraisals of stressors compared to White caregivers. Our prediction that Black caregivers would report more external resource utilization compared to White caregivers was not supported by our results. However, we did find that there were racial differences for internal resources with Black caregivers reporting better Caregiving Benefits in comparison to White caregivers. Although there may be no racial differences in external resources, Black and White caregivers may differ in internal resources with Black caregivers reporting better internal resources even after accounting for other factors.

In summary, the caregivers in the current study were providing more caregiving over time, had greater perceived physical strain, but no changes in indicators of well-being over time. This pattern of facing higher levels of objective caregiving stressors over time, while not showing worsening appraisals of psychological stress, lower psychological well-being, or worse

health over time is consistent with the pattern that previous researchers have labeled “resilience” (Haley & Pardo, 1989; Townsend et al., 1989). There was some indication of wear and tear in terms of physical difficulty since reports of physical difficulty greatly increasing over time, while reports of financial and emotional difficulty remained relatively consistent.

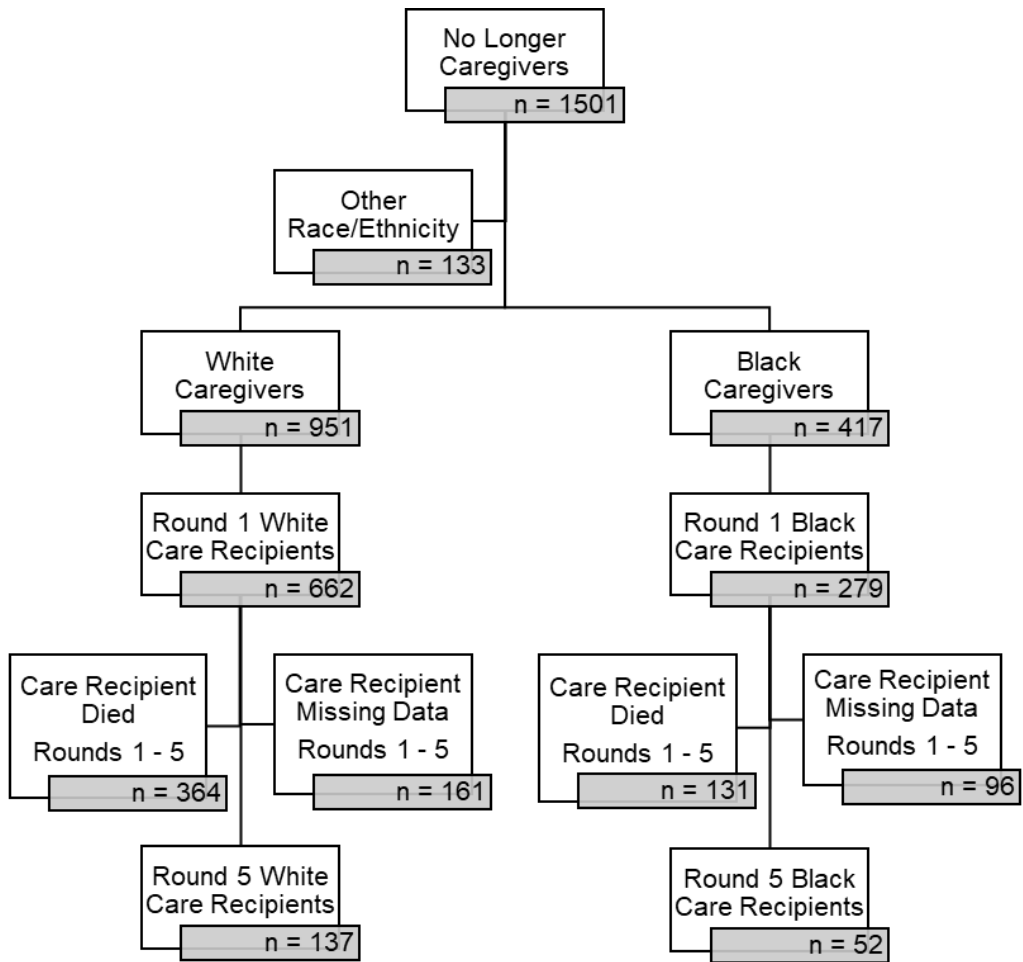
In our previous analyses, focused solely on the baseline data, we found much greater evidence for racial differences in appraisal, resources, and well-being, with advantages to Black caregivers. In these longitudinal analyses, there was considerable attrition, higher in White than in Black caregivers. In addition, there was higher attrition in dementia caregivers, and in caregivers who reported initial physical difficulties, and lack of multiple caregivers. Thus, it is likely that only the most resilient caregivers remained in the study over the years of longitudinal follow up. This differential attrition based on initial caregiving characteristics and race may have obscured racial differences in the longitudinal follow up.

Besides the substantial attrition in caregivers over time, there are some other important limitations that should be noted. Some of the measures used in the study are not psychometrically validated, which may limit results of the study. One measure in particular, self-rated health, was only a single item scale and did not account for the variation in diverse forms of health, such as physical or mental health. Also, our study only examined two time points from a prospective longitudinal sample of caregivers. Analyzing additional waves of caregivers, when the data is available, will allow researchers to examine trends in measures of stressors, appraisals, resources, well-being, and health over longer periods of time.

In general, our results are consistent with recent themes in the caregiving literature suggesting that many caregivers are highly resilient. Caregivers in the follow-up sample had been providing care on average for over nine years, were assisting with on average more than four ADLs or IADLs, and providing care for an average of over 30 hours per week. Further study of groups such as this who have the ability to sustain caregiving for long periods of time is warranted.

For those who are long-term caregivers, interventions targeting the reduction of physical difficulty may be of importance to alleviate caregiver strain that may result from the “wear and tear” of years of caregiving. Reducing caregiver strain may allow family caregivers to continue to provide quality care to their loved ones and keep them longer in the community.





**Figure 7.** Flow Chart of No Longer Caregivers by Race

**Table 7.** Comparison of No Longer Caregivers and Still Caregivers Demographics

Variables	No Longer Caregivers	Still Caregivers	<i>p</i>
	( <i>n</i> = 941)	( <i>n</i> = 292)	
	<i>n</i> (%)	<i>n</i> (%)	
<b>Caregiver Age <i>M</i> (<i>SD</i>)</b>	59.79 (13.78)	58.82 (14.13)	.2949
<b>Relationship Type</b>			.2906
Adult Child	465 (49.42)	156 (53.24)	
Spouse	256 (27.21)	80 (27.40)	
Other	220 (23.38)	56 (19.18)	
<b>Caregiver Sex</b>			.7244
Female	642 (68.23)	196 (67.12)	
Male	299 (31.77)	96 (32.88)	
<b>Education</b>			.9312
Less than High School	333 (35.39)	105 (35.96)	
High School/Vocational School	346 (36.77)	109 (37.33)	
University	262 (27.84)	78 (26.71)	
<b>Marital Status</b>			.2558
Married/Living with partner	370 (39.32)	104 (35.62)	
Other	188 (64.38)	188 (64.38)	
<b>Race</b>			<b>.0100**</b>
White	662 (70.35)	182 (62.33)	
Black	279 (29.65)	110 (37.67)	

Note. Bold numbers denote significant results. \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .001$

**Table 8.** Stress Process Descriptive Statistics for No Longer Caregivers and Still Caregivers

Variables	No Longer Caregivers	Still Caregivers	<i>p</i>
	( <i>n</i> = 941)	( <i>n</i> = 292)	
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	
<b>Stressors</b>			
Duration of care (years)	7.91 (9.36)	8.12 (9.24)	.7407
ADL/IADL assistance	4.39 (2.60)	4.17 (2.54)	.2004
Hours of care (per day)	4.66 (4.77)	4.44 (4.81)	.4919
Dementia care <i>n</i> (%)			
Yes	201 (21.36)	43 (14.73)	<b>.0129*</b>
<b>Appraisals</b>			
Financial difficulty (yes) <i>n</i> (%)	227 (24.12)	70 (23.58)	.9581
Emotional difficulty (yes) <i>n</i> (%)	465 (49.42)	131 (44.86)	.1738
Physical difficulty (yes) <i>n</i> (%)	281 (29.86)	56 (19.18)	<b>.0003***</b>
Role overload	6.52 (2.39)	6.30 (2.23)	.1632
<b>Internal Resources</b>			
Positive relationship	15.50 (2.26)	15.50 (2.05)	.9984
Caregiving mastery	24.00 (3.65)	24.13 (2.99)	.5802
Caregiving benefits	10.21 (1.86)	10.52 (1.71)	<b>.0127*</b>
<b>External Resources</b>			
Support	2.02 (1.02)	2.09 (.96)	.3002
Multiple caregivers (yes) <i>n</i> (%)	316 (33.58)	156 (53.42)	<b>&lt;.0001***</b>
<b>Well-being and Health</b>			
Positive well-being	22.97 (4.19)	23.14 (3.83)	.5468
Depression and anxiety	6.23 (2.61)	6.01 (2.17)	.1829
Health	2.62 (1.14)	2.47 (1.05)	.0683

*Note.* ADL/IADL = activities of daily living/instrumental activities of daily living. Bold numbers denote significant results. \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .001$ .

**Table 9.** Round 1 Still Caregivers Demographic Statistics by Race

Variables	White Caregivers	Black Caregivers	<i>p</i>
	( <i>n</i> = 182)	( <i>n</i> = 110)	
	<i>n</i> (%)	<i>n</i> (%)	
<b>Caregiver Age <i>M</i> (<i>SD</i>)</b>	61.10 (14.49)	55.05 (13.12)	<b>.0004</b> ***
<b>Relationship Type</b>			<b>&lt;.0001</b> ***
Adult Child	85 (46.70)	71 (64.55)	
Spouse	66 (36.26)	14 (12.73)	
Other	31 (17.03)	25 (22.73)	
<b>Caregiver Sex</b>			<b>.0358</b> *
Female	114 (62.64)	82 (74.55)	
Male	68 (37.36)	28 (25.45)	
<b>Education</b>			<b>.0012</b> **
Less than High School	13 (7.14)	22 (20.00)	
High School/Vocational School	87 (47.80)	55 (50.00)	
University	82 (45.05)	33 (30.00)	
<b>Marital Status</b>			<b>.0021</b> **
Married/Living with partner	77 (42.31)	27 (24.55)	
Other	105 (57.69)	83 (75.45)	

Note. Bold numbers denote significant results. \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .001$

**Table 10.** Stress Process Descriptive Statistics for Still Caregivers by Race and Time

Variables	Round 1		Round 5	
	White ( <i>n</i> = 182)	Black ( <i>n</i> = 110)	White ( <i>n</i> = 182)	Black ( <i>n</i> = 110)
	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )
<b>Stressors</b>				
Duration of care (years)	7.76 (10.12)	7.25 (7.43)	9.21 (11.67)	9.84 (10.32)
ADL/IADL assistance	3.84 (2.60)	4.35 (2.53)	4.19 (2.60)	5.01 (2.75)
Hours of care (per day)	4.18 (4.43)	5.35 (4.36)	4.53 (5.27)	5.29 (4.86)
Dementia care <i>n</i> (%)				
Yes	24 (13.19)	19 (17.27)	11 (6.04)	3 (2.73)
Previously Reported	-	-	41 (22.53)	36 (32.73)
<b>Appraisals</b>				
Financial difficulty (yes) <i>n</i> (%)	36 (19.78)	34 (30.91)	33 (18.13)	25 (22.73)
Emotional difficulty (yes) <i>n</i> (%)	87 (47.80)	44 (40.00)	88 (48.35)	46 (41.82)
Physical difficulty (yes) <i>n</i> (%)	35 (19.23)	21 (19.09)	47 (25.82)	32 (29.09)
Role overload	6.23 (.18)	6.04 (.25)	6.38 (.19)	6.68 (.27)
<b>Internal Resources</b>				
Positive relationship	15.36 (.17)	15.45 (.25)	15.67 (.17)	15.79 (.24)
Caregiving mastery	23.77 (.34)	24.12 (.24)	24.17 (.37)	24.19 (.24)
Caregiving benefits	10.02 (.14)	11.04 (.19)	9.96 (.14)	11.09 (.19)
<b>External Resources</b>				
Support	2.01 (.08)	2.27 (.11)	1.98 (.08)	2.18 (.12)
Multiple caregivers (yes) <i>n</i> (%)	86 (47.23)	70 (63.64)	86 (47.23)	70 (63.64)
<b>Well-being and Health</b>				
Positive well-being	23.08 (.30)	23.45 (.43)	22.91 (.33)	23.57 (.46)
Depression and anxiety	5.97 (.17)	5.85 (.25)	5.89 (.19)	5.63 (.27)
Health	2.48 (.07)	2.49 (.12)	2.50 (.09)	2.68 (.12)

*Note.* ADL/IADL = activities of daily living/instrumental activities of daily living. Results are covariate-adjusted. Bold numbers denote significant results. \* = *p* < .05, \*\* = *p* < .01, \*\*\* = *p* < .001.

## **CHAPTER FIVE:**

### **CONCLUSION**

In this dissertation project we aimed to examine racial differences in caregiving using a stress process model to analyze a population-based sample of White and Black primary caregivers of impaired older adults. Utilizing a stress process model as a guiding framework, we examined measures of stressors, appraisals, internal and external resources, and outcomes of well-being and health among White and Black caregivers.

Results of the studies in this dissertation showed how relationship type and race may be associated with caregiving stressors and outcomes of well-being and health. Black caregivers reported better well-being compared to White caregivers, after accounting for sociodemographic characteristics, despite reporting more caregiving stressors. The results also showed the utility of a stress process model in examining racial differences in caregiving by allowing us to examine how mediators of internal resources may explain differences in well-being outcomes among White and Black caregivers. Finally, the model was used to examine longitudinal changes in stress process measures from baseline to the follow-up interview. Caregivers reported more caregiving stressors and were more likely to report experiencing physical strain at the follow-up interview than at baseline. Also, Black caregivers tended to report more caregiving stressors but better measures of internal resources compared to White caregivers.

In general, the research was consistent with a pattern that has been suggested, with inconsistent findings, in previous research—that Black family caregivers appear less psychologically distressed than White caregivers, and generally have higher levels of perceived mastery about caregiving, perceive more benefits that have occurred in their lives because of

caregiving, and better perceptions of the quality of relationship they have with their impaired family members. The present study used a much larger, population-based sample than most previous research, and showed that these differences occurred even after rigorous control for potential confounding variables. The findings generally suggest that Black families have greater resilience to caregiving stress than White families, which may be due to such factors as differing cultural expectations about caregiving, and prior experience with adversity.

Future research should use theoretical models, like stress process models, to examine racial differences in caregiving among diverse samples of family caregivers. Identifying potential mechanisms for underlying racial differences in caregiving may allow for tailored interventions to lessen strain and enhance the well-being and health of family caregivers.

## REFERENCES

- Apesoa-Varano, E. C., Tang-Feldman, Y., Reinhard, S. C., Choula, R., & Young, H. M. (2015). Multi-cultural caregiving and caregiver interventions: A look back and a call for future action. *Generations*, 39(4), 39-48. Retrieved from [https://www.researchgate.net/publication/305157838\\_Multi-cultural\\_caregiving\\_and\\_caregiver\\_interventions\\_A\\_look\\_back\\_and\\_a\\_call\\_for\\_future\\_action](https://www.researchgate.net/publication/305157838_Multi-cultural_caregiving_and_caregiver_interventions_A_look_back_and_a_call_for_future_action)
- Badana, A. N. S., Marino, V. R., & Haley, W. E. (2017). Racial differences in caregiving: Variation by relationship type and dementia care status. *Journal of Aging and Health*. doi:10.1177/0898264317743611
- Brown, S. L., Brown, R. M., & Preston, S. D. (2012). The Human Caregiving System: A neuroscience Model of Compassionate Motivation and Behavior. In S. L. Brown, R. M. Brown, & L. A. Penner (Eds.), *Moving Beyond Self-Interest: Perspectives from Evolutionary Biology, Neuroscience, and the Social Sciences* (pp. 75-88). New York, New York: Oxford University Press.
- Brummett, B. H., Dilworth-Anderson, P., Siegler, I. C., & Williams, R. B. (2012). Associations of social support and 8-year follow-up depressive symptoms: Differences in African American and White caregivers. *Clinical Gerontologist*, 35(4), 289-302. doi:10.1080/07317115.2012.678569
- Capistrant, B. D. (2016). Caregiving for older adults and the caregivers' health: An epidemiologic review. *Current Epidemiology Reports*, 3(1), 72-78. doi:10.1007/s40471-016-0064-x



- Clay, O. J., Roth, D. L., Wadley, V. G., & Haley, W. E. (2008). Changes in social support and their impact on psychosocial outcome over a 5-year period of African American and White dementia caregivers. *International Journal of Geriatric Psychiatry, 23*(8), 857-862. doi:10.1002/gps.1996
- Collins, L. M. (2006). Analysis of longitudinal data: The integration of theoretical model, temporal design, and statistical model. *Annual Review of Psychology, 57*(1), 505-528. doi:10.1146/annurev.psych.57.102904.190146
- Cook, S. K., Snellings, L., & Cohen, S. A. (2018). Socioeconomic and demographic factors modify observed relationship between caregiving intensity and three dimensions of quality of life in informal adult children caregivers. *Health and Quality of Life Outcomes, 16*(169), 1-12. doi:10.1186/s12955-018-0996-6
- DeMatteis, J., Freedman, V. A., & Kasper, J. D. (2016). *National Health and Aging Trends Study Round 5 Sample Design and Selection. NHATS Technical Paper #16*. Retrieved from Baltimore, MA: [www.NHATS.org](http://www.NHATS.org)
- Dilworth-Anderson, P. (2011). Introduction to the science of recruitment and retention among ethnically diverse populations. *The Gerontologist, 51*(S1), S1-S4. doi:10.1093/geront/gnr043
- Dilworth-Anderson, P., Brummett, B. H., Goodwin, P. Y., Williams, I. C., Williams, R. B., & Siegler, I. C. (2005). Effect of race on cultural justification for caregiving. *Journals of Gerontology. Series B: Psychological Sciences and Social Sciences, 60B*(5), S257-262. doi:10.1093/geronb/60.5.S257
- Dilworth-Anderson, P., Goodwin, P. Y., & Williams, S. W. (2004). Can culture help explain the physical health effects of caregiving over time among African American caregivers? *Journal of Gerontology: Social Sciences, 59B*(3), S138-S145.

- Dilworth-Anderson, P., Williams, I. C., & Gibson, B. E. (2002). Issues of race, ethnicity, and culture in caregiving research: A 20-year review (1980-2000). *The Gerontologist*, 42(2), 237-272. doi:10.1093/geront/42.2.237
- Dilworth-Anderson, P., & Williams, S. W. (2004). Recruitment and retention strategies for longitudinal African American caregiving research: The Family Caregiving Project. *Journal of Aging and Health*, 16(5), 137S-156S. doi:10.1177/0898264304269725
- Folkman, S. (1997). Positive psychological states and coping with severe stress. *Social Science and Medicine*, 45(8), 1207-1221. doi:10.1016/s0277-9536(97)00040-3
- Fredman, L., Cauley, J. A., Hochberg, M., Ensrud, K. E., & Doros, G. (2010). Mortality associated with caregiving, general stress, and caregiving-related stress in elderly women: Results of Caregiver-Study of Osteoporotic Fractures. *Journal of the American Geriatrics Society*, 58(5), 937-943. doi:10.1111/j.1532-5415.2010.02808.x
- Fredman, L., Doros, G., Ensrud, K. E., Hochberg, M. C., & Cauley, J. A. (2009). Caregiving intensity and change in physical functioning over a 2-year period: results of the caregiver-study of osteoporotic fractures. *American Journal of Epidemiology*, 170(2), 203-210. doi:10.1093/aje/kwp102
- Fredman, L., Lyons, J. G., Cauley, J. A., Hochberg, M., & Applebaum, K. M. (2015). The relationship between caregiving and mortality after accounting for time-varying caregiver status and addressing the healthy caregiver hypothesis. *Journals of Gerontology. Series A: Biological Sciences and Medical Sciences*, 70(9), 1163-1168. doi:10.1093/gerona/glv009
- Freedman, V. A., & Spillman, B. C. (2016). Active life expectancy in older US population, 1982-2011: Differences between blacks and whites persisted. *Health Affairs*, 35(8), 1351-1358. doi:10.1377/hlthaff.2015.1247

- George, L. K., & Gwyther, L. P. (1986). Caregiver well-being: A multidimensional Examination of family caregivers of demented adults. *The Gerontologist*, 26(3), 253-259.  
doi:10.1093/geront/26.3.253
- Goode, K. T., Haley, W. E., Roth, D. L., & Ford, G. R. (1998). Predicting longitudinal changes in caregiver physical and mental health: A stress process model. *Health Psychology*, 17(2), 190-198. doi:10.1037/0278-6133.17.2.190
- Grad, J., & Sainsbury, P. (1963). Mental illness and the family. *Lancet*, 281(7280), 544-547.  
doi:10.1016/S0140-6736(63)91339-4
- Grad, J., & Sainsbury, P. (1968). The effects that patients have on their families in a community care and a control psychiatric service - A two year follow-up. *British Journal of Psychiatry*, 114(508), 265-278. doi:10.1192/bjp.114.508.265
- Haley, W. E., Gitlin, L. N., Wisniewski, S. R., Feeney Mahoney, D., Coon, D. W., Winter, L., . . . Ory, M. (2004). Well-being, appraisal, and coping in African-American and Caucasian dementia caregivers: Findings from the REACH study. *Aging & Mental Health*, 8(4), 316-329. doi:10.1080/13607860410001728998
- Haley, W. E., Levine, E. G., Brown, S. L., & Bartolucci, A. A. (1987). Stress, appraisal, coping, and social support as predictors of adaptational outcome among dementia caregivers. *Psychology and Aging*, 2(4), 323-330. doi:10.1037//0882-7974.2.4.323
- Haley, W. E., & Pardo, K. M. (1989). Relationship of severity of dementia to caregiving stressors. *Psychology and Aging*, 4(4), 389-392. doi:10.1037//0882-7974.4.4.389
- Haley, W. E., Roth, D. L., Coleton, M. I., Ford, G. R., West, C. A. C., Collins, 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. doi:10.1037/0022-006X.64.1.121

- Haley, W. E., Roth, D. L., Hovater, M., & Clay, O. J. (2015). Long-term impact of stroke on family caregiver well-being. *Neurology*, *84*, 1323-1329.  
doi:10.1212/WNL.0000000000001418
- Haley, W. E., West, C. A. C., Wadley, V. G., Ford, G. R., White, F. A., Barrett, J. J., . . . Roth, D. L. (1995). Psychological, social, and health impact of caregiving: A comparison of Black and White dementia family caregivers and noncaregivers. *Psychology and Aging*, *10*(4), 540-552. doi:10.1037/0882-7974.10.4.540
- Halpern, M. T., Fiero, M. H., & Bell, M. L. (2017). Impact of caregiver activities and social supports on multidimensional caregiver burden: Analyses from nationally-representative surveys of cancer patients and their caregivers. *Quality of Life Research*, *26*, 1587-1595.  
doi:10.1007/s11136-017-1505-9
- Hansen, T., Slagsvold, B., & Ingebretsen, R. (2013). The strains and gains of caregiving: An examination of the effects of providing personal care to a parent on a range of indicators of psychological well-being. *Social Indicators Research*, *114*(2), 323-343.  
doi:10.1007/s11205-012-0148-z
- Hayes, A. F. (2012). *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling*. Retrieved from <http://www.afhayes.com/public/process2012.pdf>
- Hayes, A. F. (2013). Model templates for PROCESS for SPSS and SAS. Retrieved from <http://www.afhayes.com/>
- Kasper, J. D., Freedman, V. A., & Spillman, B. C. (2013). *Classification of persons by dementia status in the National Health and Aging Trends Study. Technical Paper #5*. Retrieved from Baltimore, MD: [www.NHATS.org](http://www.NHATS.org)
- Kasper, J. D., Freedman, V. A., & Spillman, B. C. (2016). *National Study of Caregiving User Guide*. Retrieved from Baltimore, MA: [www.nhats.org](http://www.nhats.org)

- Knight, B. G., Longmire, C. V. F., Dave, J., Kim, J. H., & David, S. (2007). Mental health and physical health of family caregivers for persons with dementia: A comparison of African American and white caregivers. *Aging & Mental Health, 11*(5), 538-546.  
doi:10.1080/13607860601086561
- Knight, B. G., & Sayegh, P. (2010). Cultural values and caregiving: The updated sociocultural stress and coping model. *Journal of Gerontology: Psychological Sciences, 65B*(1), 5-13.  
doi:10.1093/geronb/gbp096
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. New York, NY: Springer.
- Montaquila, J., Freedman, V. A., Edwards, B., & Kasper, J. D. (2012). *National Health and Aging Trends Study Round 1 Sample Design and Selection. NHATS Technical Paper #1*. Retrieved from Baltimore, MA: [www.NHATS.org](http://www.NHATS.org)
- Moon, H., & Dilworth-Anderson, P. (2015). Baby boomer caregiver and dementia caregiving: Findings from the National Study of Caregiving. *Age and Ageing, 44*, 300-306.  
doi:10.1093/ageing/afu119
- Mossey, J. M., & Shapiro, E. (1982). Self-rated health: A predictor of mortality among the elderly. *American Journal of Public Health, 72*(8), 800-808. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1650365/>. doi:10.2105/ajph.72.8.800
- Pearlin, L. I., Mullan, J. T., Semple, S. J., & Skaff, M. M. (1990). Caregiving and the stress process: An overview of concepts and their measures. *The Gerontologist, 30*(5), 583-594. doi:10.1093/geront/30.5.583
- Pinquart, M., & Sörensen, S. (2003). Differences between caregivers and noncaregivers in psychological health and physical health: A meta-analysis. *Psychology and Aging, 18*(250-267). doi:10.1037/0882-7974.18.2.250
- Pinquart, M., & Sörensen, S. (2005). Ethnic differences in stressors, resources, and psychological outcomes of family caregiving: A meta-analysis. *The Gerontologist, 45*(1), 90-106. doi:10.1093/geront/45.1.90

- Pruchno, R. A., Brill, J. E., Shands, Y., Gordon, J. R., Genderson, M. W., Rose, M., & Cartwright, F. (2008). Convenience samples and caregiving research: How generalizable are the findings? *The Gerontologist*, *48*(6), 820-827.  
doi:10.1093/geront/48.6.820
- Roth, D. L., Brown, S. L., Rhodes, J. D., & Haley, W. E. (2018). Reduced mortality rates among caregivers: Does family caregiving provide a stress-buffering effect? *Psychology and Aging*, *33*(4), 619-629. doi:10.1037/pag0000224
- Roth, D. L., Dilworth-Anderson, P., Huang, J., Gross, A. L., & Gitlin, L. N. (2015). Positive aspects of family caregiving for dementia: Differential item functioning by race. *Journals of Gerontology. Series B: Psychological Sciences and Social Sciences*, *70*(6), 813-819.  
doi:10.1093/geronb/gbv034
- Roth, D. L., Fredman, L., & Haley, W. E. (2015). Informal caregiving and its impact on health: A reappraisal from population-based studies. *The Gerontologist*, *55*(2), 309-319.  
doi:10.1093/geront/gnu177
- Roth, D. L., Haley, W. E., Owen, J. E., Clay, O. J., & Goode, K. T. (2001). Latent growth models of the longitudinal effects of dementia caregiving: A comparison of African American and White family caregivers. *Psychology and Aging*, *16*(3), 427-436. doi:10.1037//0882-7974.16.3.427
- Roth, D. L., Mittleman, M. S., Clay, O. J., Madan, A., & Haley, W. E. (2005). Changes in social support as mediators of the impact of a psychosocial intervention for spouse caregivers of persons with Alzheimer's Disease. *Psychology and Aging*, *20*(4), 634-644.  
doi:10.1037/0882-7974.20.4.634
- Roth, D. L., Perkins, M., Wadley, V. G., Temple, E., & Haley, W. E. (2009). Family caregiving and emotional strain: Associations with psychological health in a national sample of community-dwelling middle-aged and older adults. *Quality of Life Research*, *18*(6), 679-688. doi:10.1007/s11136-009-9482-2

- SAS Institute. (2013). *The SURVEYSELECT procedure*. Retrieved from Cary, NC:  
<https://support.sas.com/documentation/onlinedoc/stat/131/surveyselect.pdf>
- Schnittker, J., & Bacak, V. (2014). The increasing predictive validity of self-rated health. *PLoS One*, 9(1), e84933. doi:10.1371/journal.pone.0084933
- Schulz, R., & Beach, S. R. (1999). Caregiving as a risk factor for mortality: The Caregiver Health Effects Study. *Journal of the American Medical Association*, 282(23), 2215-2219.  
doi:10.1001/jama.282.23.2215
- Schulz, R., & Eden, J. (2016). *Families caring for an aging America*. Retrieved from National Academies of Sciences, Engineering, and Medicine:  
<http://www.nationalacademies.org/hmd/Reports/2016/families-caring-for-an-aging-america.aspx>
- Skolarus, L. E., Freedman, V. A., Feng, C., & Burke, J. F. (2017). African American stroke survivors: More caregiving time, but less caregiving burden. *Circulation: Cardiovascular Quality and Outcomes*, 10(2), e003160. doi:10.1161/CIRCOUTCOMES.116.003160
- Talley, R. C., & Crews, D. C. (2007). Framing the public health of caregiving. *American Journal of Public Health*, 97, 224-228. doi:10.2105/AJPH.2004.059337
- Townsend, A. L., Noelker, L., Deimling, G., & Bass, D. (1989). Longitudinal impact of interhousehold caregiving on adult children's mental health. *Psychology and Aging*, 4(4), 393-401. doi:10.1037/0882-7974.4.4.393
- van Buren, S. (2007). Multiple imputation of discrete and continuous data by fully conditional specification. *Statistical Methods in Medical Research*, 16(3), 219-242.  
doi:10.1177/0962280206074463
- Vitaliano, P. P., Russo, J., Young, H. M., Teri, L., & Maiuro, R. D. (1991). Predictors of burden in spouse caregivers of individuals with Alzheimer's disease. *Psychology and Aging*, 6(3), 392-402. doi:10.1037/0882-7974.6.3.392

- Wolff, J. L., Mulcahy, J., Huang, J., Roth, D. L., Covinsky, K., & Kasper, J. D. (2017). Family caregivers of older adults, 1999-2015 trends in characteristics, circumstances, and role-related appraisal. *The Gerontologist*, *58*(6), 1021-1032. doi:10.1093/geront/gnx093
- Wolff, J. L., Spillman, B. C., Freedman, V. A., & Kasper, J. D. (2016). A national profile of family and unpaid caregivers who assist older adults with health care activities. *JAMA Internal Medicine*, *176*(3), 372-379. doi:10.1001/jamainternmed.2015.7664
- Zarit, S. H., Reever, K. E., & Bach-Peterson, J. (1980). Relatives of the impaired elderly: correlates of feelings of burden. *The Gerontologist*, *20*(6), 649-655. doi:10.1093/geront/20.6.649



**APPENDIX A:**  
**INSTITUTIONAL REVIEW BOARD LETTER**



RESEARCH INTEGRITY AND COMPLIANCE  
Institutional Review Boards, FWA No. 00001669  
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799  
(813) 974-5638 • FAX (813) 974-7091

10/24/2018

**RE: Not Human Subjects Research Determination**

**IRB#: Pro00034601**

**Title: Using a Stress Process Model to Examine Longitudinal Racial Differences in Well-being and health: Results from a Population Based Study of Caregiving**

Dear Dr. Badana:

The Institutional Review Board (IRB) has reviewed your application. The activities presented in the application involve methods of program evaluation, quality improvement, and/or needs analysis. While potentially informative to others outside of the university community, study results would not appear to contribute to generalizable knowledge. As such, the activities do not meet the definition of human subject research under USF IRB policy, and USF IRB approval and oversight are therefore not required.

While not requiring USF IRB approval and oversight, your study activities should be conducted in a manner that is consistent with the ethical principles of your profession. If the scope of your project changes in the future, please contact the IRB for further guidance.

If you will be obtaining consent to conduct your study activities, please remove any

references to "research" and do not include the assigned Protocol Number or USF IRB contact information.

If your study activities involve collection or use of health information, please note that there may be requirements under the HIPAA Privacy Rule that apply. For further information, please contact a HIPAA Program administrator at (813) 974-5638.

Sincerely,   
Kristen Salomon, Ph.D., Chairperson  
USF Institutional Review Board

**APPENDIX B:**  
**STRESS PROCESS MODEL GUIDE**

**I. STRESSORS**

- A. **Duration of Care** (Years)
- B. **ADL/IADL Assistance** (Summary variable, Yes)
- C. **Hours of Care** (per day)
- D. **Dementia Care Status** (Yes)

**II. POTENTIAL MEDIATORS**

**Appraisals:**

- A. **Financial Difficulty** [Recoded 0 (no difficulty) and 1 (difficulty)]
- B. **Emotional Difficulty** [Recoded 0 (no difficulty) and 1 (difficulty)]
- C. **Physical Difficulty** [Recoded 0 (no difficulty) and 1 (difficulty)]
- D. **Role Overload** [Scaled from 1 (very much) to 3 (not so much)]
  - 1. You felt exhausted at night
  - 2. Care more than you can handle
  - 3. You have no time for yourself
  - 4. Care routine changes

**Internal Resources:**

- E. **Positive Relationship** [Scaled from 1 (a lot) to 5 (not at all)]
  - 1. Enjoy being with care recipient
  - 2. Care recipient appreciates you
  - 3. Care recipient argues with you
  - 4. Care recipient gets on your nerves
- F. **Caregiving Mastery** [Scaled from 1 (agree strongly) to 4 (disagree strongly)]
  - 1. Felt that life has meaning/purpose
  - 2. Felt confident
  - 3. Gave up improving life
  - 4. Liked living situation
  - 5. Felt lonely
  - 6. Adjusted to change easily
  - 7. Recovered quickly

- G. **Caregiving Benefits** [*Scaled from 1 (very much) to 3 (not so much)*]
1. Helping care recipient makes you more confident in your abilities
  2. Helping care recipient makes you deal with difficult situations
  3. Helping care recipient makes you closer to him/her
  4. Helping care recipient makes you more satisfied in his/her care

**External Resources:**

- H. **Support** [*Summary variable, Yes*]
1. Friends/family to talk to
  2. Friends/family help with Acts
  3. Friends/family help with care recipient
  4. Went to support group
- I. **Multiple Caregivers** [*Yes/No*]

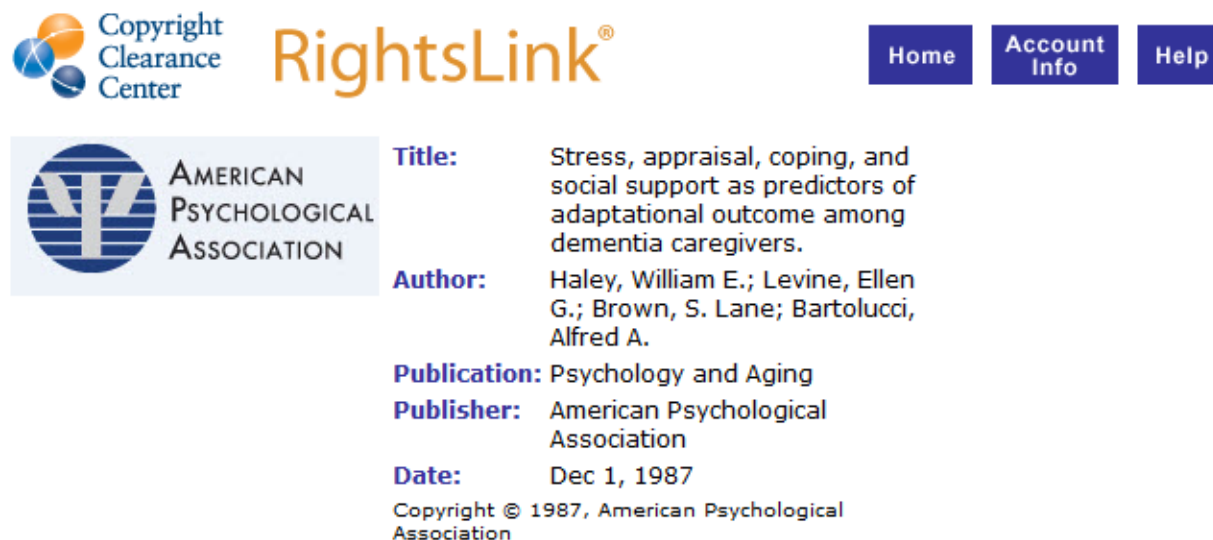
**III. WELL-BEING AND HEALTH**

- A. **Positive Well-being** [*Scaled 1 (every day) to 5 (never)*]
1. Felt Cheerful
  2. Felt Calm/Peaceful
  3. Felt Full of Life
  4. Felt bored
  5. Felt lonely
  6. Felt upset
- B. **Depression and Anxiety** [*Scaled 1 (Not at all) to 4 (nearly every day)*]
1. Felt little interest
  2. Felt down/depressed
  3. Felt nervous/anxious
  4. Felt unable to stop worrying
- C. **Health** [*Scaled from 1 (excellent) to 5 (poor)*]

## APPENDIX C:

### COPYRIGHT PERMISSIONS

Figure 2: Stress and Coping model by Haley and colleagues (1987)



The screenshot shows the Copyright Clearance Center RightsLink interface. At the top left is the Copyright Clearance Center logo. To its right is the RightsLink logo. On the top right are three navigation buttons: Home, Account Info, and Help. Below the logo is the American Psychological Association logo. To the right of the logo, the following metadata is displayed:

**Title:** Stress, appraisal, coping, and social support as predictors of adaptational outcome among dementia caregivers.

**Author:** Haley, William E.; Levine, Ellen G.; Brown, S. Lane; Bartolucci, Alfred A.

**Publication:** Psychology and Aging

**Publisher:** American Psychological Association

**Date:** Dec 1, 1987

Copyright © 1987, American Psychological Association

#### Grant Reuse

APA hereby grants permission at no charge for the following material to be reused according to your request, subject to a required credit line. Author permission is not required in this instance.

- Single text excerpts of less than 400 words (or a series of text excerpts that total less than 800 words) from APA books and journals.
- 1-3 Chart/Graph/Tables or Figures from 1 article or chapter.
- Note that scales, measures, instruments, questionnaires, photographs, or creative images are NOT included in this gratis reuse.
- Also, the abstract of a journal article may not be placed in a database for subsequent redistribution without contacting APA for permission.

BACK

CLOSE WINDOW

Copyright © 2019 [Copyright Clearance Center, Inc.](#) All Rights Reserved. [Privacy statement.](#) [Terms and Conditions.](#)

Comments? We would like to hear from you. E-mail us at [customercare@copyright.com](mailto:customercare@copyright.com)

Figure 3: Revised Folkman (1997) Stress Appraisal Model

**ELSEVIER LICENSE  
TERMS AND CONDITIONS**

May 10, 2019

---

---

This Agreement between University of South Florida -- Adrian Badana ("You") and Elsevier ("Elsevier") consists of your license details and the terms and conditions provided by Elsevier and Copyright Clearance Center.

License Number	4585401307211
License date	May 10, 2019
Licensed Content Publisher	Elsevier
Licensed Content Publication	Social Science & Medicine
Licensed Content Title	Positive psychological states and coping with severe stress
Licensed Content Author	Susan Folkman
Licensed Content Date	Oct 1, 1997
Licensed Content Volume	45
Licensed Content Issue	8
Licensed Content Pages	15
Start Page	1207
End Page	1221
Type of Use	reuse in a thesis/dissertation
Intended publisher of new work	other
Portion	figures/tables/illustrations
Number of figures/tables/illustrations	1
Format	both print and electronic
Are you the author of this Elsevier article?	No
Will you be translating?	No
Order reference number	5
Original figure numbers	"Positive psychological states and coping with severe stress" by S. Folkman, 1997, Social Science and Medicine, 54, p. 1217. Copyright 1997 by Elsevier Science Ltd.
Title of your thesis/dissertation	Racial differences in Caregiving
Publisher of new work	University of South Florida
Expected completion date	Jun 2019
Estimated size (number of pages)	1
Requestor Location	University of South Florida 4202 E. Fowler Ave., MHC 1300

Publisher Tax ID 98-0397604  
Total 0.00 USD  
Terms and Conditions

## INTRODUCTION

1. The publisher for this copyrighted material is Elsevier. By clicking "accept" in connection with completing this licensing transaction, you agree that the following terms and conditions apply to this transaction (along with the Billing and Payment terms and conditions established by Copyright Clearance Center, Inc. ("CCC"), at the time that you opened your Rightslink account and that are available at any time at <http://myaccount.copyright.com>).

## GENERAL TERMS

2. Elsevier hereby grants you permission to reproduce the aforementioned material subject to the terms and conditions indicated.

3. Acknowledgement: If any part of the material to be used (for example, figures) has appeared in our publication with credit or acknowledgement to another source, permission must also be sought from that source. If such permission is not obtained then that material may not be included in your publication/copies. Suitable acknowledgement to the source must be made, either as a footnote or in a reference list at the end of your publication, as follows:

"Reprinted from Publication title, Vol /edition number, Author(s), Title of article / title of chapter, Pages No., Copyright (Year), with permission from Elsevier [OR APPLICABLE SOCIETY COPYRIGHT OWNER]." Also Lancet special credit - "Reprinted from The Lancet, Vol. number, Author(s), Title of article, Pages No., Copyright (Year), with permission from Elsevier."

4. Reproduction of this material is confined to the purpose and/or media for which permission is hereby given.

5. Altering/Modifying Material: Not Permitted. However figures and illustrations may be altered/adapted minimally to serve your work. Any other abbreviations, additions, deletions and/or any other alterations shall be made only with prior written authorization of Elsevier Ltd. (Please contact Elsevier at [permissions@elsevier.com](mailto:permissions@elsevier.com)). No modifications can be made to any Lancet figures/tables and they must be reproduced in full.

6. If the permission fee for the requested use of our material is waived in this instance, please be advised that your future requests for Elsevier materials may attract a fee.

7. Reservation of Rights: Publisher reserves all rights not specifically granted in the combination of (i) the license details provided by you and accepted in the course of this

licensing transaction, (ii) these terms and conditions and (iii) CCC's Billing and Payment terms and conditions.

8. License Contingent Upon Payment: While you may exercise the rights licensed immediately upon issuance of the license at the end of the licensing process for the transaction, provided that you have disclosed complete and accurate details of your proposed use, no license is finally effective unless and until full payment is received from you (either by publisher or by CCC) as provided in CCC's Billing and Payment terms and conditions. If full payment is not received on a timely basis, then any license preliminarily granted shall be deemed automatically revoked and shall be void as if never granted. Further, in the event that you breach any of these terms and conditions or any of CCC's Billing and Payment terms and conditions, the license is automatically revoked and shall be void as if never granted. Use of materials as described in a revoked license, as well as any use of the materials beyond the scope of an unrevoked license, may constitute copyright infringement and publisher reserves the right to take any and all action to protect its copyright in the materials.

9. Warranties: Publisher makes no representations or warranties with respect to the licensed material.

10. Indemnity: You hereby indemnify and agree to hold harmless publisher and CCC, and their respective officers, directors, employees and agents, from and against any and all claims arising out of your use of the licensed material other than as specifically authorized pursuant to this license.

11. No Transfer of License: This license is personal to you and may not be sublicensed, assigned, or transferred by you to any other person without publisher's written permission.

12. No Amendment Except in Writing: This license may not be amended except in a writing signed by both parties (or, in the case of publisher, by CCC on publisher's behalf).

13. Objection to Contrary Terms: Publisher hereby objects to any terms contained in any purchase order, acknowledgment, check endorsement or other writing prepared by you, which terms are inconsistent with these terms and conditions or CCC's Billing and Payment terms and conditions. These terms and conditions, together with CCC's Billing and Payment terms and conditions (which are incorporated herein), comprise the entire agreement between you and publisher (and CCC) concerning this licensing transaction. In the event of any conflict between your obligations established by these terms and conditions and those established by CCC's Billing and Payment terms and conditions, these terms and conditions shall control.

14. Revocation: Elsevier or Copyright Clearance Center may deny the permissions described in this License at their sole discretion, for any reason or no reason, with a full refund payable to you. Notice of such denial will be made using the contact information provided by you. Failure to receive such notice will not alter or invalidate the denial. In no event will Elsevier or Copyright Clearance Center be responsible or liable for any costs, expenses or damage incurred by you as a result of a denial of your permission request, other than a refund of the amount(s) paid by you to Elsevier and/or Copyright Clearance Center for denied permissions.



## LIMITED LICENSE

The following terms and conditions apply only to specific license types:

15. **Translation:** This permission is granted for non-exclusive world **English** rights only unless your license was granted for translation rights. If you licensed translation rights you may only translate this content into the languages you requested. A professional translator must perform all translations and reproduce the content word for word preserving the integrity of the article.

16. **Posting licensed content on any Website:** The following terms and conditions apply as follows: Licensing material from an Elsevier journal: All content posted to the web site must maintain the copyright information line on the bottom of each image; A hyper-text must be included to the Homepage of the journal from which you are licensing at <http://www.sciencedirect.com/science/journal/xxxxx> or the Elsevier homepage for books at <http://www.elsevier.com>; Central Storage: This license does not include permission for a scanned version of the material to be stored in a central repository such as that provided by Heron/XanEdu.

Licensing material from an Elsevier book: A hyper-text link must be included to the Elsevier homepage at <http://www.elsevier.com> . All content posted to the web site must maintain the copyright information line on the bottom of each image.

**Posting licensed content on Electronic reserve:** In addition to the above the following clauses are applicable: The web site must be password-protected and made available only to bona fide students registered on a relevant course. This permission is granted for 1 year only. You may obtain a new license for future website posting.

17. **For journal authors:** the following clauses are applicable in addition to the above:

### **Preprints:**

A preprint is an author's own write-up of research results and analysis, it has not been peer-reviewed, nor has it had any other value added to it by a publisher (such as formatting, copyright, technical enhancement etc.).

Authors can share their preprints anywhere at any time. Preprints should not be added to or enhanced in any way in order to appear more like, or to substitute for, the final versions of articles however authors can update their preprints on arXiv or RePEc with their Accepted Author Manuscript (see below).

If accepted for publication, we encourage authors to link from the preprint to their formal publication via its DOI. Millions of researchers have access to the formal publications on ScienceDirect, and so links will help users to find, access, cite and use the best available version. Please note that Cell Press, The Lancet and some society-owned have different preprint policies. Information on these policies is available on the journal homepage.

**Accepted Author Manuscripts:** An accepted author manuscript is the manuscript of an article that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and editor-author communications.

Authors can share their accepted author manuscript:

- immediately
  - via their non-commercial person homepage or blog
  - by updating a preprint in arXiv or RePEc with the accepted manuscript
  - via their research institute or institutional repository for internal institutional uses or as part of an invitation-only research collaboration work-group
  - directly by providing copies to their students or to research collaborators for their personal use
  - for private scholarly sharing as part of an invitation-only work group on commercial sites with which Elsevier has an agreement
- After the embargo period
  - via non-commercial hosting platforms such as their institutional repository
  - via commercial sites with which Elsevier has an agreement

In all cases accepted manuscripts should:

- link to the formal publication via its DOI
- bear a CC-BY-NC-ND license - this is easy to do
- if aggregated with other manuscripts, for example in a repository or other site, be shared in alignment with our hosting policy not be added to or enhanced in any way to appear more like, or to substitute for, the published journal article.

**Published journal article (JPA):** A published journal article (PJA) is the definitive final record of published research that appears or will appear in the journal and embodies all value-adding publishing activities including peer review co-ordination, copy-editing, formatting, (if relevant) pagination and online enrichment.

Policies for sharing publishing journal articles differ for subscription and gold open access articles:

**Subscription Articles:** If you are an author, please share a link to your article rather than the full-text. Millions of researchers have access to the formal publications on ScienceDirect, and so links will help your users to find, access, cite, and use the best available version.

Theses and dissertations which contain embedded PJAs as part of the formal submission can be posted publicly by the awarding institution with DOI links back to the formal publications on ScienceDirect.

If you are affiliated with a library that subscribes to ScienceDirect you have additional private sharing rights for others' research accessed under that agreement. This includes use for classroom teaching and internal training at the institution (including use in course packs and courseware programs), and inclusion of the article for grant funding purposes.

**Gold Open Access Articles:** May be shared according to the author-selected end-user license and should contain a [CrossMark logo](#), the end user license, and a DOI link to the formal publication on ScienceDirect.

Please refer to Elsevier's [posting policy](#) for further information.

18. **For book authors** the following clauses are applicable in addition to the above: Authors are permitted to place a brief summary of their work online only. You are not allowed to download and post the published electronic version of your chapter, nor may you scan the printed edition to create an electronic version. **Posting to a repository:** Authors are permitted to post a summary of their chapter only in their institution's repository.

19. **Thesis/Dissertation:** If your license is for use in a thesis/dissertation your thesis may be submitted to your institution in either print or electronic form. Should your thesis be published commercially, please reapply for permission. These requirements include permission for the Library and Archives of Canada to supply single copies, on demand, of the complete thesis and include permission for Proquest/UMI to supply single copies, on demand, of the complete thesis. Should your thesis be published commercially, please reapply for permission. Theses and dissertations which contain embedded PJAs as part of the formal submission can be posted publicly by the awarding institution with DOI links back to the formal publications on ScienceDirect.

### **Elsevier Open Access Terms and Conditions**

You can publish open access with Elsevier in hundreds of open access journals or in nearly 2000 established subscription journals that support open access publishing. Permitted third party re-use of these open access articles is defined by the author's choice of Creative Commons user license. See our [open access license policy](#) for more information.

#### **Terms & Conditions applicable to all Open Access articles published with Elsevier:**

Any reuse of the article must not represent the author as endorsing the adaptation of the article nor should the article be modified in such a way as to damage the author's honour or reputation. If any changes have been made, such changes must be clearly indicated.

The author(s) must be appropriately credited and we ask that you include the end user license and a DOI link to the formal publication on ScienceDirect.

If any part of the material to be used (for example, figures) has appeared in our publication with credit or acknowledgement to another source it is the responsibility of the user to ensure their reuse complies with the terms and conditions determined by the rights holder.

#### **Additional Terms & Conditions applicable to each Creative Commons user license:**

**CC BY:** The CC-BY license allows users to copy, to create extracts, abstracts and new works from the Article, to alter and revise the Article and to make commercial use of the Article (including reuse and/or resale of the Article by commercial entities), provided the user gives

appropriate credit (with a link to the formal publication through the relevant DOI), provides a link to the license, indicates if changes were made and the licensor is not represented as endorsing the use made of the work. The full details of the license are available at <http://creativecommons.org/licenses/by/4.0>.

**CC BY NC SA:** The CC BY-NC-SA license allows users to copy, to create extracts, abstracts and new works from the Article, to alter and revise the Article, provided this is not done for commercial purposes, and that the user gives appropriate credit (with a link to the formal publication through the relevant DOI), provides a link to the license, indicates if changes were made and the licensor is not represented as endorsing the use made of the work. Further, any new works must be made available on the same conditions. The full details of the license are available at <http://creativecommons.org/licenses/by-nc-sa/4.0>.

**CC BY NC ND:** The CC BY-NC-ND license allows users to copy and distribute the Article, provided this is not done for commercial purposes and further does not permit distribution of the Article if it is changed or edited in any way, and provided the user gives appropriate credit (with a link to the formal publication through the relevant DOI), provides a link to the license, and that the licensor is not represented as endorsing the use made of the work. The full details of the license are available at <http://creativecommons.org/licenses/by-nc-nd/4.0>. Any commercial reuse of Open Access articles published with a CC BY NC SA or CC BY NC ND license requires permission from Elsevier and will be subject to a fee.

Commercial reuse includes:

- Associating advertising with the full text of the Article
- Charging fees for document delivery or access
- Article aggregation
- Systematic distribution via e-mail lists or share buttons

Posting or linking by commercial companies for use by customers of those companies.

## 20. Other Conditions:

v1.9

Questions? [customercare@copyright.com](mailto:customercare@copyright.com) or +1-855-239-3415 (toll free in the US) or +1-978-646-2777.

Figure 1: Pearlman and colleagues' (1990) Stress Process Model

**OXFORD UNIVERSITY PRESS LICENSE  
TERMS AND CONDITIONS**

May 10, 2019

---

---

This Agreement between University of South Florida -- Adrian Badana ("You") and Oxford University Press ("Oxford University Press") consists of your license details and the terms and conditions provided by Oxford University Press and Copyright Clearance Center.

License Number 4585391234742

License date May 10, 2019

Licensed content publisher Oxford University Press

Licensed content publication Gerontologist, The

Licensed content title Caregiving and the Stress Process: An Overview of Concepts and Their Measures<sup>1</sup>

Licensed content author Pearlman, Leonard I.; Mullan, Joseph T.

Licensed content date Oct 1, 1990

Type of Use Thesis/Dissertation

Institution name

Title of your work Racial differences in Caregiving

Publisher of your work University of South Florida

Expected publication date Jun 2019

Permissions cost 0.00 USD

Value added tax 0.00 USD

Total 0.00 USD

Title Racial differences in Caregiving

Institution name University of South Florida

Expected presentation date Jun 2019

Order reference number 1

Portions “Caregiving and the stress process: An overview of concepts and their measures” by L. I. Pearlin, J. T. Mullan, S. J. Semple, and M. M. Skaff, 1990, *The Gerontologist*, 30, p. 586. Copyright 1990 by The Gerontological Society of America.  
University of South Florida  
4202 E. Fowler Ave., MHC 1300

Requestor  
Location

Publisher Tax ID GB125506730

Total 0.00 USD

Terms and Conditions

### **STANDARD TERMS AND CONDITIONS FOR REPRODUCTION OF MATERIAL FROM AN OXFORD UNIVERSITY PRESS JOURNAL**

1. Use of the material is restricted to the type of use specified in your order details.
2. This permission covers the use of the material in the English language in the following territory: world. If you have requested additional permission to translate this material, the terms and conditions of this reuse will be set out in clause 12.
3. This permission is limited to the particular use authorized in (1) above and does not allow you to sanction its use elsewhere in any other format other than specified above, nor does it apply to quotations, images, artistic works etc that have been reproduced from other sources which may be part of the material to be used.
4. No alteration, omission or addition is made to the material without our written consent. Permission must be re-cleared with Oxford University Press if/when you decide to reprint.
5. The following credit line appears wherever the material is used: author, title, journal, year, volume, issue number, pagination, by permission of Oxford University Press or the sponsoring society if the journal is a society journal. Where a journal is being published on behalf of a learned society, the details of that society must be included in the credit line.
6. For the reproduction of a full article from an Oxford University Press journal for whatever purpose, the corresponding author of the material concerned should be informed of the proposed use. Contact details for the corresponding authors of all Oxford University Press journal contact can be found alongside either the abstract or full text of the article concerned, accessible from [www.oxfordjournals.org](http://www.oxfordjournals.org) Should there be a problem clearing these rights, please contact [journals.permissions@oup.com](mailto:journals.permissions@oup.com)
7. If the credit line or acknowledgement in our publication indicates that any of the figures, images or photos was reproduced, drawn or modified from an earlier source it will be necessary for you to clear this permission with the original publisher as well. If this

permission has not been obtained, please note that this material cannot be included in your publication/photocopies.

8. While you may exercise the rights licensed immediately upon issuance of the license at the end of the licensing process for the transaction, provided that you have disclosed complete and accurate details of your proposed use, no license is finally effective unless and until full payment is received from you (either by Oxford University Press or by Copyright Clearance Center (CCC)) as provided in CCC's Billing and Payment terms and conditions. If full payment is not received on a timely basis, then any license preliminarily granted shall be deemed automatically revoked and shall be void as if never granted. Further, in the event that you breach any of these terms and conditions or any of CCC's Billing and Payment terms and conditions, the license is automatically revoked and shall be void as if never granted. Use of materials as described in a revoked license, as well as any use of the materials beyond the scope of an unrevoked license, may constitute copyright infringement and Oxford University Press reserves the right to take any and all action to protect its copyright in the materials.

9. This license is personal to you and may not be sublicensed, assigned or transferred by you to any other person without Oxford University Press's written permission.

10. Oxford University Press reserves all rights not specifically granted in the combination of (i) the license details provided by you and accepted in the course of this licensing transaction, (ii) these terms and conditions and (iii) CCC's Billing and Payment terms and conditions.

11. You hereby indemnify and agree to hold harmless Oxford University Press and CCC, and their respective officers, directors, employees and agents, from and against any and all claims arising out of your use of the licensed material other than as specifically authorized pursuant to this license.

12. Other Terms and Conditions:

v1.4

Questions? [customer care@copyright.com](mailto:customer care@copyright.com) or +1-855-239-3415 (toll free in the US) or +1-978-646-2777.

AMERICAN  
PSYCHOLOGICAL  
ASSOCIATION

**Title:** Predictors of burden in spouse caregivers of individuals with Alzheimer's disease.

**Author:** Vitaliano, Peter P.; Russo, Joan; Young, Heather M.; Teri, Linda; Maiuro, Roland D.

**Publication:** Psychology and Aging

**Publisher:** American Psychological Association

**Date:** Sep 1, 1991

Copyright © 1991, American Psychological Association

### Grant Reuse

APA hereby grants permission at no charge for the following material to be reused according to your request, subject to a required credit line. Author permission is not required in this instance.

- Single text excerpts of less than 400 words (or a series of text excerpts that total less than 800 words) from APA books and journals.
- 1-3 Chart/Graph/Tables or Figures from 1 article or chapter.
- Note that scales, measures, instruments, questionnaires, photographs, or creative images are NOT included in this gratis reuse.
- Also, the abstract of a journal article may not be placed in a database for subsequent redistribution without contacting APA for permission.

BACK

CLOSE WINDOW



**APPENDIX D:  
ADDITIONAL TABLES**

Study 1: Significant Results for 3 x 2 Factorial ANOVA and Logistic Regression Analyses

	Main Effects		Interaction	Covariates						
	Relationship	Race	Relationship x Race	Sex	Marital status	Education	Age	ADL/IADL assistance	Hours of care	Dementia care status
<b>Stressors</b>										
Duration of care	*									
ADL/IADL assistance	*	*								
Hours of care		*								
Dementia care status										
<b>Appraisals</b>										
Financial difficulty	*	*	G		*		*			
Emotional difficulty	*	G	*	*	*	*				
Physical difficulty	L			*			*			
Role overload	*		G	*						
<b>Internal Resources</b>										
Positive relationship	*			*		*				
Caregiving mastery		G			*			*		
Caregiving benefits	G	*	L	*		*				
<b>External Resources</b>										
Support	L	G			*	*	*			
Multiple caregivers	*				*		*			
<b>Outcomes</b>										
Positive well-being	L	G		*	*		*	*	*	
Depression and anxiety		*		L		L		*	*	
Health	L	L				*	*	*	*	

Note. \* = significant throughout. Yellow denotes a loss (L) in significance after covariate adjustment. Green denotes a gain (G) in significance after covariate adjustment. Stressors were not covariate adjusted.

Study 3: Significant Results for 3 x 2 and 2 x 2 Factorial ANOVAs

	Main Effects			Interactions			Covariates					
	Relationship	Race	Time	Race x Time	Relationship x Race	Relationship x Time	Sex	Marital status	Education	Age	ADL/IADL assistance	Hours of care
<b>Stressors</b>												
Duration of care	*		*									
ADL/IADL assistance	*	*	*									
Hours of care												
<b>Appraisals</b>												
Financial difficulty	*	L								*		
Emotional difficulty	*						*		*			
Physical difficulty	L		*				*	*				
Role overload			*				*					
<b>Internal Resources</b>												
Positive relationship	*		*				*	*				
Caregiving mastery		L					*	*				
Caregiving benefits		*										
<b>External Resources</b>												
Support	L							*				
<b>Outcomes</b>												
Positive well-being							*	*				
Depression and anxiety							*	*			*	
Health									*		*	

Note. \* = significant throughout. Yellow denotes a loss (L) in significance after covariate adjustment. Green denotes a gain (G) in significance after covariate adjustment. Stressors were not covariate adjusted.