

**Racial Disparities in Memory Failure Attribution to AD and its Effect on Hypothetical
Help-Seeking Behaviors**

by

Marisa S. Mills

**A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science
(Psychology)
in the University of Michigan–Dearborn
2019**

Master's Thesis Committee:

**Associate Professor Brenda Whitehead, Chair
Professor Nancy Wrobel, Co-chair**

Table of Contents

Acknowledgements	iii
List of Tables	iv
List of Figures	v
List of Appendices	vi
Abstract	vii
Chapter 1 Introduction	1
Racial Disparities in Alzheimer’s disease.....	2
The Importance of Timely Help-Seeking.....	3
The Influence of Memory Failure Attribution on Help-Seeking Behavior.....	4
Influence of Experience with AD on Memory Failure Attribution and Help-Seeking.....	7
Purpose and Direction of Current Study.....	8
Hypotheses.....	10
Chapter 2 Methods	12
Participants.....	12
Measures.....	13
Demographic Questionnaire.....	13
Memory Failure Scale (MFS).....	13
Intention to Seek Help.....	13
Help-Seeking Threshold.....	14

Memory Failure Attribution.....	14
Alzheimer’s disease Concern Questionnaire.....	15
Familial/Personal AD Experience Questionnaire.....	15
Procedure.....	15
Statistical Analysis.....	17
Data Collection/Storage.....	17
Chapter 3 Results.....	18
Descriptive Statistics.....	18
Bivariate Correlations.....	18
Simple Mediation Analysis.....	20
Moderated Mediation Analysis.....	22
Independent Sample T-Test.....	23
Post-Hoc Gender Analysis.....	23
Chapter 4 Discussion.....	26
Hypothesis 1.....	27
Hypothesis 2.....	29
Hypothesis 3.....	30
Hypothesis 4.....	31
Post-Hoc.....	31
Strengths and Limitations of the Present Study.....	32
Implications.....	33
References.....	35

Acknowledgements

I would like to acknowledge and thank everyone that has supported me throughout this process and throughout the entirety of my educational journey. Thank you Dr. Brenda Whitehead and Dr. Nancy Wrobel for believing in the importance of this project's topic enough to help guide, assist, and offer me invaluable advice. Thank you both for your expertise, kindness, patience, time, and commitment to what was at once just an idea; I am tremendously appreciative and grateful that I have had the opportunity to soak in as much knowledge as I have from you both. I would also like to thank all of the faculty that I have been able to learn from throughout this Master's program, as I have learned lessons from each and every one of you that I will hold with me forever. Thank you to my cohort that have encouraged me every step of the way, and have made this Master's experience unforgettable. Lastly, I would like to thank my parents, siblings, family, and friends that have always pushed me to follow my aspirations, inquire about the unknown, explore the hard questions, and to never give up. You all have been very supportive, and it is not unnoticed.

List of Tables

Table 1: Descriptive Statistics.....39

Table 2: Bivariate Correlations Between Study Variables.....40

Table 3: Results of t-tests of AD Concern Questionnaire by Ethnicity.....41

Table 4: Results of t-tests and Descriptive Statistics of Outcome Variables by Gender.....42

List of Figures

Figure 1: Mediation Model of Ethnicity and Memory Failure Attribution to Help-Seeking Threshold.....	43
Figure 2: Moderated Mediation Model of Familial/Personal AD Experience Influence on Memory Failure Attribution.....	43
Figure 3: Interaction between Ethnicity and Familial/Personal AD Experience on Memory Failure Attribution.....	44
Figure 4: Mediation Model of Gender and Memory Failure Attribution to Help-Seeking Threshold.....	44

List of Appendices

Appendix A: Demographic Questionnaire.....	45
Appendix B: Memory Failure Scale (MFS).....	46
Appendix C: Intention to Seek Help.....	47
Appendix D: Help-Seeking Threshold.....	48
Appendix E: Memory Failure Attribution.....	49
Appendix F: Alzheimer’s disease Concern Questionnaire.....	50
Appendix G: Familial/Personal AD Experience Questionnaire.....	51
Appendix H: Informed Consent.....	52
Appendix I: Resource List.....	54

Abstract

As the number of Americans living beyond the age of 85 increases, we can expect to see an increase in the health issues that directly affect this population, such as dementia. Alzheimer's disease (AD) is the most common cause of dementia, and it is a top ten leading cause of death within the U.S. Since there is no cure for AD, early detection is essential in enhancing treatment effectiveness before symptoms become too severe. African Americans are twice as likely as non-Hispanic whites to develop AD; however, research has shown that compared to non-Hispanic whites, African Americans tend to seek out AD evaluations later and present with more debilitating symptoms. Prior research revealed that African Americans, more so than non-Hispanic whites, tend to attribute memory failures—a hallmark sign of AD—to “normal aging” which reduces their help-seeking behaviors. This research aimed to identify the differences between African American and non-Hispanic white everyday memory failure appraisals, and how this appraisal influences their intended help-seeking behaviors. In this present study, the primary predicting variables were AD concern, memory failure frequency, and help-seeking intentions. Furthermore, the influence of having family members or close friends with the disease was examined, in order to better understand what drives the racial discrepancy seen among help-seeking behaviors. It was hypothesized that memory failure attribution would mediate the expected relationship between ethnicity and help-seeking behaviors. Additionally, it was hypothesized that familial/personal AD experience would moderate this relationship.

Utilizing an online survey, data was collected from 501 African American and non-Hispanic whites. Results indicated that non-Hispanic whites were significantly more concerned about AD than African Americans. Furthermore, ethnicity and familial/personal AD experience together significantly predicted greater memory failure attributions to AD. However, the hypothesized mediation effect was not supported. African Americans often go understudied in empirical research, as a result this study contributes to filling that void. Healthcare providers can use this information to increase awareness in the Black community of the early signs of AD, specifically memory failure, and the importance of timelier help-seeking behaviors, as a means of maximizing treatment effectiveness, and their quality of life.

Chapter 1

Introduction

This study was conducted to investigate the demographic differences in the association among memory failure in the context of Alzheimer's risk and hypothetical help-seeking behaviors. Specifically, this study examined the ways varying predictors, ethnicity and family/personal history of Alzheimer's disease (AD), were linked to attributing everyday memory failures to AD. Since an association has previously been identified between more generally perceiving AD as a threat and help-seeking behaviors (Ostergren, Heeringa, Leon, Connell, & Roberts, 2017), this study aimed to provide insight into what factors, with regard to memory failure—the hallmark sign of AD—could influence middle-aged and older adults' hypothetical help-seeking behaviors.

The United States is experiencing substantial growth in its aging population, indicated by the steady increase of Americans living beyond the age of 85 (Santos et al., 2017). According to the U.S. Census Bureau, by 2035 it is expected that the number of 65-and-older adults will surpass the number of children for the first time in history (Vespa, Armstrong, & Medina, 2018, March). With this increase in the elderly population stems an increase in health deficiencies that directly affect the elderly, such as dementia. Alzheimer's disease (AD) is the most common cause of dementia, and it is the sixth leading cause of death within the United States (Santos et al., 2017; Alzheimer's Association, 2018). Specifically, AD currently impacts more than five million Americans and this number is expected to nearly triple by 2050 (Alzheimer's Association, 2019). Not only is this a deadly disease, it is also an expensive one, with chronic

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

AD medical care costing the nation almost three-hundred billion dollars (Alzheimer's Association, 2019).

One of the first hallmark signs of Alzheimer's is memory failure, and as the disease progresses, memory issues become more prominent and disabling (Cutler & Sramek, 1996). These memory issues can range from having a hard time recalling recent situations, to having difficulty finishing everyday tasks that were at one time easy to complete (Cutler & Sramek, 1996). Memory failures, in particular, are shown to be a regularly reported symptom to cause people to worry, even when other AD symptoms are present (Feldman, Wilcock, Thuné-Boyle, & Iliffe, 2016). Yet, memory lapses are not always an indication of AD, as some memory failures are a consequence of normal aging, stress, and other lifestyle factors (Vondras, Powless, Olson, Wheeler, & Snudden, 2005). Therefore, it is unclear which particular circumstances lead individuals to attribute everyday memory failures to AD specifically, as opposed to these other perceived causes. Furthermore, it is uncertain how this memory failure appraisal influences the timeliness of a person's future AD help-seeking behaviors. Presently, there is not a cure for Alzheimer's disease. Early detection is crucial in enhancing treatment effectiveness before symptoms become too debilitating and severe, making prompt help-seeking key.

Racial Disparities in Alzheimer's disease

As the elderly demographic continues to increase, the population of non-Hispanic whites is estimated to shrink by nearly 20 million over the next four decades, while ethnic minority numbers are expected to steadily grow (Vespa, Armstrong, & Medina, 2018, March). Though there are currently more non-Hispanic whites living with AD than there are African Americans with AD, on a per capita basis, African Americans are more likely than non-Hispanic whites to have Alzheimer's disease (Alzheimer's Association, 2018). It is projected that there will be a steady increase in the total number of newly diagnosed cases of AD, with African Americans

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

representing a larger proportion of diagnoses than in the past (Hughes, Tyler, Danner, & Carter, 2009). Many studies have found that African Americans are approximately twice as likely as non-Hispanic whites to have the disease (Barnes & Bennett, 2014; Logue, 2011). Despite African Americans suffering from high rates of stroke and vascular dementia, Freels, Nyehuis, and Gorelick (2002) reported that older African Americans have higher mortality rates from Alzheimer's disease than the former conditions, indicating just how fatal the disease truly is. Additionally, compared to non-Hispanic whites, African Americans are more likely to present with AD at an earlier age; yet, African Americans are persistently diagnosed in the later stages of the disease (Griffith, & Lopez, 2009, April 01; Alzheimer's Association, 2015). When African Americans finally receive an AD diagnosis, their symptoms are more severe—including greater cognitive impairments and a greater need for assistance (Barnes & Bennett, 2014; Clark et al., 2005, Miles, Froehlich, Bogardus, & Inouye, 2001). Since African Americans are disproportionately affected by AD, it is essential that African Americans recognize AD symptoms promptly, so that a timely medical and/or psychological evaluation can be requested.

The Importance of Timely Help-Seeking

Timely AD detection is important as treatments have been found to be most effective in slowing the rate of cognitive decline in the earlier stages of the disease (Alzheimer's Association, 2015). In particular, researchers have found that cholinesterase inhibitors (ChEIs), drugs that aim to slow down the progression of AD symptomatology, are more effective in relieving symptoms the earlier they are started (Winblad et al., 2006). Raskind, Peskind, Wessel, and Yuan (2000) revealed that postponing pharmacological treatment for up to half of a year for individuals with mild-to-moderate AD could result in a permanent loss of cognitive abilities. Beyond treatment, early detection is beneficial in enhancing an individual's overall quality of life

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

and increasing an individual's level of autonomous decision-making (Alzheimer's Association, 2015; Griffith, & Lopez, 2009). At the worst, receiving a delayed AD diagnosis can reduce pharmacotherapy responsiveness and increase the likelihood of an individual missing AD treatment entirely (Griffith, & Lopez, 2009). It has been reported that compared to non-Hispanic whites, African Americans were more likely to seek medical attention in the later stages (Barnes & Bennett, 2014). Clark et al. (2005) even noted a delay among older African Americans of up to seven years between noticing initial AD symptoms and seeking a medical evaluation. A qualitative study carried out with UK Black African and Caribbean participants indicated that recognizing the "right time" to seek help was a barrier for timely AD evaluations as well, however, participants indicated that the frequency and severity of forgetfulness influenced their help-seeking behaviors (Berwald, Roche, Adelman, Mukadam, & Livingston, 2016).

Even when African Americans endorse timely help-seeking behaviors, many tend to seek help from informal sources initially, as opposed to formal sources, such as healthcare providers. Connell et al. (2007) found that African Americans were more likely to report that they were better equipped to help assist a family member with AD, compared to White participants, suggesting that African American families were willing to solely take over the caregiver responsibility. This notion was further supported by Dungee-Anderson and Beckett (1992) who found that African Americans are more likely to seek help from their family units and rely on spirituality to cope with symptomatology, as compared to Caucasians. As a result, it appears that African Americans use more informal networks of support to cope with AD. According to the Alzheimer's Association (2015), the majority of African Americans never seek out medical and/or psychological services for AD in their lifetime.

The Influence of Memory Failure Attribution on Help-Seeking Behavior

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

A recent study found that memory loss was the symptom that triggered help-seeking for more than 80% of people recently diagnosed with dementia (Shigematsu, 2011). Congruently, many researchers have decided to focus on understanding help-seeking behaviors in the distinctive case of Alzheimer's and dementia treatment. To begin, it has been suggested that those who perceive a greater threat of AD more readily request AD evaluations and treatment, compared to those who do not make this same causal attribution (Ostergren et al., 2017). Roberts et al. (2003) found that compared to Caucasians, African Americans were less likely to perceive the threat of Alzheimer's disease; in particular, African Americans were less concerned about the disease's advancement and possible deteriorating effects. Additionally, African Americans were more likely to attribute their forgetfulness to "normal aging", and, in turn, they were less likely to endorse the utilization of geriatric services in the future, as compared to Caucasians (Roberts et al., 2003). There are many studies that propose that African Americans are less aware of the facts surrounding AD, and in turn, perceive AD symptomatology as a normality (Roberts et al., 2003; Hodgson & Cutler, 2004; Connell, Roberts, & McLaughlin, 2007; Blay, Furtado, & Peluso, 2008). Even more, some African Americans refer to the disease as "old timer's disease" (Mahoney, Cloutterbuck, Neary, & Zhan, 2005; Cloutterbuck & Mahoney, 2003). As a result, it could be suggested that bringing more awareness to AD symptom presentation would encourage more timely help-seeking behaviors among African Americans.

Similar to Roberts et al. (2003), other researchers have confirmed a link between help-seeking behaviors and the self-assessment of memory (Hodgson & Cutler, 2004; Hurt, Burns, Brown, & Barrowclough, 2011). Hodgson and Cutler (2004) found that those who endorsed more frequent memory failure experiences, as indicated by a memory experiences inventory, were more likely to have sought out advice and resources concerning their memory failure

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

apprehensions. In addition, Hodgson and Cutler (2003) found a negative correlation between a person's memory self-assessment and "AD symptom-seeking", suggesting that individuals who perceived their memory to be poorer were more likely to look for signs of AD. Likewise, in Hurt et al. (2011), those that perceived their memory concerns to be more severe, in terms of symptom frequency and consequences, sought out the most professional help. Furthermore, the individuals who sought out help attributed their forgetfulness to "medical" and "biological" causes, whereas the non-help-seeking individuals attributed their forgetfulness to "psychosocial" influences (Hurt et al., 2011), implying that memory failure appraisal may play a role in help-seeking behaviors.

The aforementioned findings further extend to the causal attributions individuals make concerning the symptoms that others present with—either in real-life or in vignettes. Hamilton-West, Milne, Chenery, and Tilbrook (2010) showed that when individuals either perceived that the symptoms in a vignette were depicting dementia or were severe, they had a higher intention of seeking help; yet, when the individuals attributed the symptoms to stress and/or psychological causes, they were less likely to endorse help-seeking behaviors—even though these symptoms actually depicted dementia as well. In Clark et al. (2005), family caregivers of African American patients with probable AD were most likely to recommend that their patient seek help when "forgetfulness" was a symptom that the patient experienced. However, more than half of the caregivers in this study went on to report that they delayed having the patient consult a professional when the forgetfulness was attributed to "normal aging", or when the symptom's level of severity was ambiguous (Clark et al., 2005). When the caregivers in Clark et al. (2005) attributed memory failures to dementia, or evaluated these memory failures to be severe, this encouraged their help-seeking behaviors; however, when AD symptoms were not perceived as

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

severe or characteristic of an actual pathological condition, patients and caregivers were less likely to seek help. This illustrates that a distinction exists between symptom recognition and symptom attribution. Overall, Clark et al. (2005) findings support the idea that an association may exist between help-seeking behaviors and attributing memory failures to dementia.

Influence of Experience with AD on Memory Failure Attribution and Help-Seeking

Prior research has suggested that family history is a risk factor for Alzheimer's disease, as family members of people with an AD diagnosis tend to be more susceptible to certain AD biomarkers, and have more noticeable adverse changes in their brain morphology, processing speed, executive functioning, and memory domains (Donix et al., 2012). Many studies have reported that African Americans have a greater familial risk of AD, than non-Hispanic whites—a risk nearing 50% (Alzheimer's Association, 2015; Cutler & Sramek, 1996). Furthermore, compared to non-Hispanic whites, African Americans are more likely to have families with multiple members experiencing AD (Logue, 2011). First-degree relatives of African Americans have even been shown to have a higher overall risk of dementia compared to first-degree relatives of Caucasians (Green et al., 2002). Specifically, Green and colleagues (2002) showed that this risk is roughly 1.6 times greater for African American relatives. Additionally, it had been demonstrated that children of parents with probable AD were more concerned about developing AD, and more likely to attribute their forgetfulness to AD symptomatology subsequently (Hodgson & Cutler, 2003). Researchers have also found that the individuals with biological AD exposure were more likely to perceive the threat of AD than those with non-genetic personal AD exposure (e.g., spouse or friend with AD) (Suhr & Kinkela, 2007). Particularly, Cutler (2015) found that individuals worried more about AD when immediate relatives suffered from the disease. Hodgson and Cutler (2004) results went a step further,

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

indicating that the individuals with greater AD concern, and/or the individuals that were the children of a parent with AD were more likely to seek out help, thus suggesting that AD experience is possibly associated with help-seeking behaviors as well. Hodgson and Cutler (2004) suggest that this association could be credited to the children having more knowledge about where to actually seek help, or having more comfort with discussing the topic overall.

Previous research has also demonstrated that personal non-genetic experience with Alzheimer's is associated with increased concern over the disease (e.g., Cutler, 2015). For example, Suhr and Kinkela (2007) looked specifically at what factors influenced adults to perceive the threat of AD and they discovered that adults with personal AD experience, genetic or not, were more likely to perceive the threat of AD. The researchers proposed that exposure to AD, in any capacity, could influence individuals to concentrate on their own daily memory failures more (Suhr & Kinkela, 2007). More so, Suhr and Kinkela (2007) provided insight on the effects that the perception of AD threat could have on individuals. The authors found a significantly positive association between cognitive impairments and worry surrounding AD. This suggests that the perception of AD threat is not merely an appraisal, but instead it is actually associated with AD symptomatology for some individuals. Similarly, Ostergren et al. (2017) found that individuals with biological AD exposure were more likely to have increased memory complaints and were more likely to recognize AD as a threat. This shows that both exposure to AD and perception of AD threat could be indicative of true pathological symptomatology. As a result, further understanding at what point individuals are concerned with the disease could be crucial for encouraging early AD detection.

Purpose and Direction of Current Study

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

There is no cure or means of prevention for Alzheimer's disease, but early detection can permit symptom-mitigating treatment; therefore, it is imperative for researchers to identify factors that are associated with enhancing timely help-seeking behaviors from formal networks, such as psychological and/or medical professionals. By increasing help-seeking behaviors, it is expected that there will be an increase in early AD detection and treatment efficiency. Exploring the effects that ethnicity and memory failure attribution has on help-seeking behaviors provides useful information on ways to increase timely AD evaluations and AD awareness, specifically among African Americans whom are more likely to delay or avoid seeking out AD evaluations. This study specifically examines whether memory failure attributions to AD mediate the relationship between ethnicity and help-seeking threshold. In other words, this research explores the differences between African Americans and non-Hispanic whites in their evaluations of daily memory failures, and whether or not these evaluations directly facilitate their urgency in seeking out professional help. If it is discovered that African Americans have a higher threshold for help-seeking than non-Hispanic whites, specifically in the presence of attributing memory failures to other causes aside from AD/dementia, interventions can be designed to increase awareness to African Americans of the importance of early AD detection and the disease's symptomatology. In turn, this could encourage African Americans to seek help in a timelier manner.

Furthermore, this study explores whether or not familial/personal exposure to AD moderates the expected mediating influence of memory failure attribution on the relationship between ethnicity and help-seeking behaviors. In particular, if it is discovered that greater exposure to AD leads African Americans to attribute memory failures to AD, thereby positively influencing help-seeking behaviors, then healthcare professionals can target those individuals lacking AD exposure and bring greater awareness of the severity and symptomatology of AD to

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

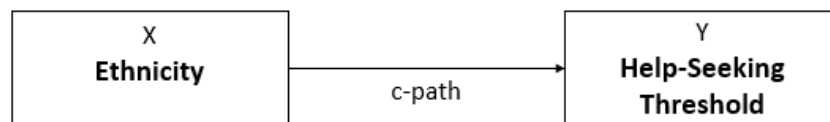
that population. These results will indirectly provide insight on whether or not awareness and knowledge about the disease overall is the issue at the forefront influencing African American help-seeking behaviors. Lastly, since it has been demonstrated that AD concern is positively associated with help-seeking behaviors, AD concern will be used to explore whether or not this current study maintains consistency with these past findings.

African Americans often go understudied in empirical research, and this study aims to address this concern and fill this gap within the literature. Since African Americans are disproportionately affected by AD, this is a crucial area of research, as the number of minorities and the aging population continues to grow. Overall, this is the first study, as far as I am aware, that looks at these factors as they relate to the AD racial discrepancy that is present. Furthermore, this is also one of the first studies that examines the differences in help-seeking thresholds, instead of merely examining help-seeking intentions. The hypotheses, in turn, will be based on connections seen within the AD literature.

Hypotheses

Hypothesis 1 (X → Y):

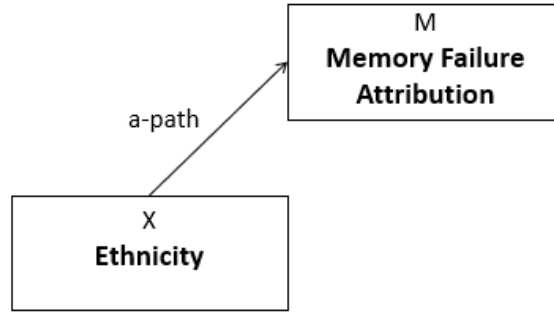
African Americans will have a higher threshold for help-seeking than non-Hispanic Whites.



Hypothesis 2 (X → M):

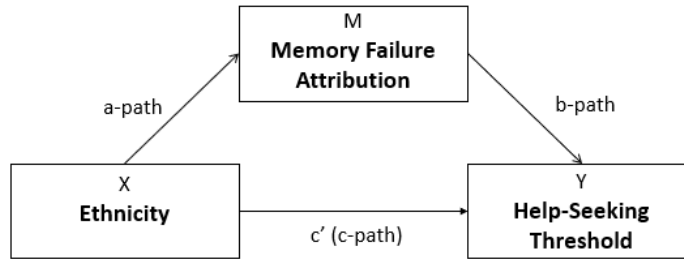
African Americans will be less likely than non-Hispanic Whites to attribute memory failures to AD.

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS



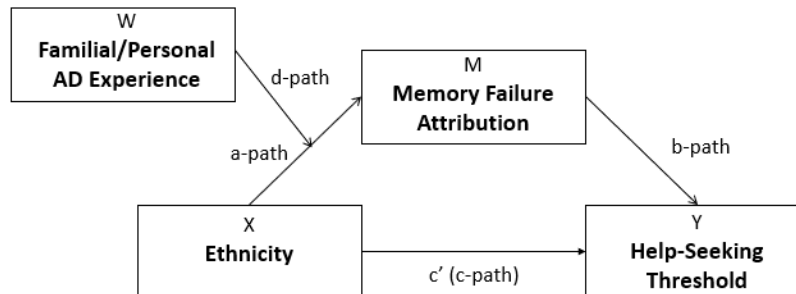
Hypothesis 3 ($X \rightarrow M \rightarrow Y$):

The impact of ethnicity on help-seeking behaviors will be mediated by memory failure attribution to Alzheimer's disease.



Hypothesis 4 ($X \rightarrow W * M \rightarrow Y$):

Family history of Alzheimer's disease and personal experience with AD will moderate the mediating effect of memory failure attribution on the association between ethnicity and help-seeking behaviors.



Chapter 2

Methods

Participants

Data collection in this study was conducted completely online. Participants were recruited through the TurkPrime Prime Panels website. TurkPrime Prime Panels does not collect any personal identifiable information from participants. Inclusion/exclusion criteria required that participants be between the ages of 40 and 65, currently reside in the United States, identify as either African American/Black or non-Hispanic white/Caucasian, and able to read and understand English. Surveys were downloaded from Qualtrics. By participating in the present study, participants received a compensation of \$1.75 for approximately 15 minutes of their time.

Of the 501 participants, 49.9% ($n=250$) of participants identified as non-Hispanic whites/Caucasian, and 50.1% ($n=251$) of participants identified as African American/Black. In regard to gender, 49.7% ($n=249$) of participants were male and 50.3% ($n=252$) of participants were female. Participants ranged from 40-65 years of age ($M=52.25$, $SD=7.65$). A total of 52.3% ($n=262$) of participants reported no familial/personal experience with AD, while 47.7% ($n=239$) of participants endorsed at least having one familial/personal source of exposure to AD. Of the African American and non-Hispanic white participants that specified having biologic family members with AD, the majority ($n=86$) indicated having more second-degree relatives with AD than first-degree relatives ($n=43$).

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

Measures

Demographics Questionnaire. (Appendix A) A demographic section of the questionnaire was completed by all participants and included questions to assess relevant background information, such as the participant's age, gender, and ethnicity/race.

Memory Failures Scale (MFS). (Appendix B) The Memory Failures Scale (MFS) (Cheyne, Carriere, & Smilek, 2006), is a 12-item scale rated on a 5-point Likert scale ranging from 1-*Never* to 5-*Very Often*. Sample items include: "I forget people's names, even though I rehearsed them" and "I forget important dates like birthdays and anniversaries". Participant responses were summed for all 12 items. Total scores for this scale range from 12 to 60. Higher scores indicate greater proneness to everyday memory failures. The memory failures assessed are not explained merely by attentional errors. This was used to provide data on the experiences the participants have with their own memory on the daily basis. This self-assessment will be used to examine how these personal memory failures influences the participant's perceptions on help-seeking behavior and other variables. Cronbach's alpha for the current sample was .89.

Intention to Seek Help. (Appendix C) Each participant indicated on a 6-point Likert rating scale the likelihood that they would seek help from a psychological/medical professional for 12 listed everyday memory failure scenarios. The 12 scenarios were derived from Cheyne, Carriere, and Smilek (2006) MFS. Intentions for each item are rated from 1-*Very Unlikely* to 6-*Very Likely*. Participant responses were summed for all 12 items. Total scores for this scale range from 12 to 72. Higher scores were indicative of a greater likelihood to seek help for the particular memory failures. Cronbach's alpha for the current sample was .95.

Help-Seeking Threshold. (Appendix D) Each participant indicated at what point they would seek help from a psychological/ medical professional for the 12 listed memory failure

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

scenarios provided in Cheyne, Carriere, and Smilek (2006) MFS. Ratings included: 1=*Just Once*; 2=*Once a month*; 3=*Once a week*; 4=*Several times a week*; 5=*Once a day*; 6=*Several times a day*; 7=*I would never seek out an evaluation no matter how many times it happened*. These ratings were modified from Erber, Szuchman, and Rothberg (1990). Participant responses were summed for all 12 items. Total scores for this scale ranged from 12 to 84. Higher ratings suggest a lower critical perceived need for a professional evaluation. The outcome variable in this study has been based on this particular measure. Cronbach's alpha for the current sample was .95.

Memory Failure Attribution. (Appendix E) Each participant rated 8 possible reasons for each memory failure listed. The 12 memory failure items were based on the 12 items from the Cheyne, Carriere, and Smilek (2006) MFS. Sample items include: "Forgetting people's names, even though you rehearsed them" and "Forgetting important dates like birthdays and anniversaries". Participants indicated whether each of these memory failures should be attributed to: normal aging, poor ability, lack of effort, task difficulty, bad luck, distractions, Alzheimer's disease/dementia, or emotional distress. Four of the eight possible interpretations of memory failure attributions were derived from previous work (Erber, Szuchman, and Rothberg, 1990) and these included: poor ability, lack of effort, task difficulty, and bad luck. The mediation variable has been based on this measure, with 1 coded as "*Alzheimer's disease/dementia*" and 0 coded as "*all other attributions*" for analytic purposes. After recoding, participant responses were summed for all 12 items. As a result, total scores for this scale ranged from 0 to 12. Higher scores indicate greater AD/dementia attribution.

Alzheimer's disease Concern Questionnaire. (Appendix F) This questionnaire was specifically created for this study in order to measure the participant's personal concern with Alzheimer's disease, outside of memory failures. This is a 5-item self-rated scale on a 5-point

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

Likert scale ranging from 1-*Strongly Disagree* to 5-*Strongly Agree*. Participant responses were summed for all 5 items. Total scores for this scale ranged from 5 to 25. Higher scores are indicative of greater AD concern. Sample items include: “I am concerned about the idea of getting Alzheimer’s disease”, “I think I have a high risk of getting Alzheimer’s disease”, and “I think I have a high risk of getting Alzheimer’s disease”. Two items in this scale were reverse-coded, including item three that states, “I do not really think about Alzheimer’s disease” and item four that states, “The idea of getting Alzheimer’s disease does not bother me”. This questionnaire was used to maintain consistency with the findings in past studies that indicated that AD concern positively influenced help-seeking behavior. Cronbach’s alpha for the current sample was .81.

Familial/Personal AD Experience Questionnaire. (Appendix G) This questionnaire created for this study included questions to assess participant’s known family history of Alzheimer’s disease, and personal experience with Alzheimer’s disease. Participants were also asked to specify the nature of their relationship to that particular person(s) (i.e., first degree relative, second degree relative, other). The moderator variable has been based on this measure. For analytic purposes, the explicit number of family members with AD was added to 1 if the participant also indicated having personal exposure with AD. Totals for this measured ranged from 0 to 11, with higher scores indicating greater familial/personal AD exposure.

Procedure

The study was reviewed and approved by the Institutional Review Board (IRB) at the University of Michigan-Dearborn, prior to data collection. As aforementioned, participation in this study was based completely online. Individuals eligible for the study were provided with an

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

access link to the Qualtrics survey from TurkPrime Prime Panels. Once on the Qualtrics link, the participants were initially directed to an informed consent form. This consent form delineated the purpose of this study, the study's benefits/risks, eligibility requirements, voluntary nature of the study, compensation, confidentiality, estimated time of survey completion, and contact information for questions/concerns. Following the reading of the consent section, the participant had to either select "I consent" or "I do not consent". The participants, who responded "I do not consent", were thanked for their interest in the study and were redirected back to TurkPrime Prime Panels. The participants, who responded "I consent", were allowed to move forward on the survey. The first section of the survey consisted of demographic questions. The participants then completed measures that assessed their memory failure frequency, their assumptions surrounding particular memory failures, their help-seeking intentions and help-seeking thresholds surrounding these memory failures, and their personal concern with AD. The participants were then provided with a resource list that they were able to save and print out, to mitigate the potential risk of any discomfort that may have resulted from answering questions. The participants were also provided with the contact information of a Licensed Clinical Psychologist to aid with any questions or concerns that may have surfaced. Upon successful completion of the survey, participants were thanked for their participation and redirected back to the TurkPrime Prime Panels website. As previously mentioned, research participants were compensated \$1.75 for approximately 15 minutes of their time. This pricing was established in advance by TurkPrime Prime Panels for this specified amount of time.

Statistical Analysis

All analyses were conducted using IBM SPSS Statistics 25. Descriptive Statistics were used to summarize participant demographics. A bivariate Pearson correlation was used in order

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

to identify significant correlations between ethnicity and help-seeking behaviors, ethnicity and memory failure attributions to AD, and memory failure attributions to AD and help-seeking behaviors. PROCESS macro Version 3 (model 4 and model 7) developed by Hayes (2013) was used to determine simple mediation and moderation. The percentile Bootstrap estimation approach, with 5,000 samples, was used to test indirect effects.

Data Collection/Storage

The electronic data participants provide will be stored using password protected websites and laptops at the University of Michigan-Dearborn. The researchers will retain the digital form of the data indefinitely. The data will be made available to other researchers for other studies following the completion of this research study, but the data made public will not contain information that could identify any participants.

Chapter 3

Results

Descriptive Statistics

After removing three cases due to substantial missing data, a total sample size of 501 remained. For participants that had missing scale values, a median score was calculated using the participant's scale items scores that were available. Median substitution was used, as opposed to mean substitution, to maintain the ordinal nature of the data. Basic descriptive statistics were run for all of the variables used for analysis. Table 1 provides the means, standard deviations, skewness, kurtosis, and minimum/maximum values for each study variable. Additionally, the internal reliability of the scale (as reflected in Cronbach alpha values) are provided. After examining skewness and kurtosis, the descriptive statistics in Table 1 indicated a positively-skewed statistic for the memory failure attribution variable above two. As a result, a natural logarithm (ln) transformation was applied to this variable to account for this skewness, and statistical tests for the hypothesis analyzed the transformed data. There were no other significant issues found within the distribution of data. The majority of participants ($n=494$) reported at least experiencing one of the twelve daily memory failures specified in Cheyne, Carriere, and Smilek (2006) Memory Failure scale.

Bivariate Correlations

Bivariate Pearson correlations are presented in Table 2 and were examined for all predictor and demographic variables used in this study. As expected, ethnicity and Alzheimer's

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

disease concern were significantly correlated ($r = -.10, n=501, p=.028$) suggesting that African Americans are significantly less concerned with Alzheimer's disease than non-Hispanic whites. These results are specifically outlined in Table 3. Contrary to the initial prediction, ethnicity was not significantly correlated with any of the other study variables, including help-seeking threshold and memory failures attribution.

This study's primary outcome variable, total help-seeking threshold, was significantly associated with gender ($r = .09, n=501, p=.036$) and memory failure frequency ($r = .11, n=501, p=.012$), indicating that females and individuals with greater memory failures are more inclined to perceive the need for a professional AD evaluation only when memory failures are more severe. Help-seeking threshold was negatively correlated with help-seeking intention ($r = -.37, n=501, p<.01$), memory failure attribution to AD ($r = -.14, n=501, p=.002$), and familial/personal AD experience ($r = -.09, n=501, p=.036$). This finding suggests that those with more AD exposure are more likely to seek help for daily memory failures earlier on. Additionally, those that attributed their memory failures to AD specifically, as opposed to normal aging and external factors, are more likely to seek help for daily memory failures earlier on. Lastly, those with a greater intent to seek help had a lower help-seeking threshold, suggesting that they are more likely to seek help for daily memory failures earlier on.

This study's proposed moderator variable, familial/personal AD experience, was negatively correlated with age ($r = -.10, n=501, p=.029$), suggesting that the older participants had fewer familial/personal AD exposures. Furthermore, there were positive associations between familial/personal AD experience and memory failure frequency ($r = .13, n=501, p=.003$), memory failure attribution to AD ($r = .18, n=501, p<.01$), and help-seeking intention ($r = .12, n=501, p=.009$). Corresponding with the literature, this suggests that those with more

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

familial/personal AD exposures are likely to report having more frequent daily memory failures. More so, those with more familial/personal AD experiences are more likely to attribute their memory failures to AD specifically. Finally, those with more familial/personal AD experiences are more likely to seek out an AD evaluation. As predicted, there was also a significant positive relationship between familial/personal AD experience and AD concern ($r = .34, n = 501, p < .01$), indicating that individuals exposed to more AD, also experienced greater AD concern.

Attributing memory failures to AD, the hypothesized mediator variable, was significantly associated with gender ($r = -.11, n = 501, p = .012$), memory failure frequency ($r = -.11, n = 501, p = .014$), intent to seek help ($r = .23, n = 501, p < .01$), and AD concern ($r = .21, n = 501, p < .01$). This indicated that females and individuals with more frequent memory failures were less likely to attribute their memory failures to AD, whereas individuals that more readily attributed their memory failures to AD endorsed greater concern surrounding AD and greater intent to seek help. In line with previous research, greater AD concern was also associated with more frequent memory failures ($r = .19, n = 501, p < .01$), and greater intent to seek help ($r = .21, n = 501, p < .01$). Intention to seek help was significantly correlated with age ($r = -.09, n = 501, p = .041$) and gender ($r = -.09, n = 501, p = .041$), suggesting that there is a lesser likelihood for females and older individuals to seek help. Finally, a significant amount of individuals with more frequent memory failures reported a greater likelihood of seeking help ($r = .13, n = 501, p = .004$).

Simple Mediation Analysis

The hypothesis stated that attributing memory failure to Alzheimer's disease would mediate the relationship between ethnicity and help-seeking behaviors. Hayes' Model 4 within the PROCESS macro was used to test hypotheses one through three with ethnicity as the primary predictor (X), memory failure attribution (ln transformed) as the mediator (M) and help-seeking

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

threshold as the outcome variable (Y). The results consist of the total effect of ethnicity on help-seeking threshold (c-path), the effect of ethnicity on memory failure attributions (a-path), the effect of memory failure attributions on help-seeking threshold (b-path) and the association between ethnicity and help-seeking threshold, controlling for memory failure attribution (c'-path).

Results are presented in Figure 1. According to this regression analysis, the total effect of ethnicity on help-seeking threshold moderately trended toward statistical significance $F(1,499)=3.55, p=.060, R^2=.01$ (c-path). The relationship between ethnicity (X) and memory failure attribution (M) was non-significant ($\beta=.0003, t(499)=.01, p=.991$) (a-path). The analysis confirmed that ethnicity (X) and memory failure attribution (M) together predict help-seeking threshold (Y) $F(2,498)=6.63, p<.01, R^2=.03$. The analysis also confirmed that memory failure attribution to AD (M) was a significant predictor of help-seeking threshold (Y) ($\beta=-8.36, t(498)=-3.11, p<.01$) (b-path). The direct effect of ethnicity (X) on help-seeking threshold (Y), when controlling for memory failure attribution, also verged on statistical significance ($\beta=-3.06, t(498)=-1.90, p=.058$) (c'-path). Lastly, the indirect effect was tested using the percentile bootstrap approach with 5,000 samples. There was a non-significant indirect effect of ethnicity on help-seeking threshold through memory failure attribution ($\beta=-0.00, SE=0.24, 95\% \text{BCa CI} [-.46,.51]$). Overall, these results suggest that memory failure attribution does not mediate the relationship between ethnicity and help-seeking behaviors, failing to support the mediational hypothesis. The results did not support the hypotheses that there would be a significant difference in daily memory failure attribution and help-seeking threshold among African Americans and non-Hispanic whites; however, due to the moderate trend toward statistical

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

significance, there are still possible implications that should be considered when exploring these variables in future research.

Moderated Mediation Analyses

To test first stage moderated mediation for proposed hypothesis 4, stating that familial/personal AD experience would moderate the relationship between ethnicity and help-seeking behaviors, Model 7 in the PROCESS macro of Hayes (2013) was used to observe the association between ethnicity and memory failure attribution (a-path) and the interaction effect of ethnicity and familial/personal AD experience on memory failure attribution (d-path). Again, ethnicity was entered as the primary predictor (X), memory failure attribution (ln transformed) as the mediator (M) and help-seeking threshold as the outcome variable (Y). Familial/personal experience with AD was entered as the proposed Moderator (W) between ethnicity and memory failure attribution. Results are presented in Figure 2. The results indicate that the relationship between ethnicity (X) and memory failure attribution (M) is not significant ($\beta = -.04$, $t(497) = -1.22$, $p = .225$) (a-path). The results further indicate that there is not a significant effect between familial/personal AD experience and memory failure attribution ($\beta = .02$, $t(497) = 1.2$, $p = .233$). As the confidence intervals surrounding the indirect effect of memory failure attribution did span zero at the three provided levels, this indicates that there is not a significant moderated mediation. However, the interaction effect of ethnicity and familial/personal AD experience on memory failure attribution is significant ($\beta = .05$, $t(497) = 2.36$, $p = .019$). In particular, with less familial/personal AD exposure, African Americans were less likely to attribute their memory failures to AD than non-Hispanic whites; yet, when African Americans had more AD exposure, they were more likely to attribute their memory failures to AD than non-Hispanic whites. This is depicted in Figure 3. Overall, there is not a significant increase in help-seeking threshold when

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

an increase in familial/personal AD experience ensues, suggesting that there is not a moderated mediated effect. However, ethnicity and AD exposure together do interact to influence memory failure attributions to AD.

Independent Samples T-Test

In order to examine differences in Alzheimer's disease concern between African American and non-Hispanic whites an independent samples *t*-test was conducted. Given a violation of Levene's test for homogeneity of variances, $F(1,499)=7.52, p<.01$, a *t*-test not assuming homogeneous variances was calculated. The results of this test indicated that there was a significant difference in AD concern between the two groups, $t(490.301)=2.2, p=.028$. These results suggest that non-Hispanic whites ($M=15.81, SD=4.44$) are more concerned with AD than African Americans ($M=14.87, SD=5.10$). These results are presented in Table 4.

Post-Hoc Gender Analysis

Based on the aforementioned bivariate correlation results that implied that gender is significantly associated with many of the outcome variables in this study, it appeared necessary to further investigate this variable post-hoc to better understand the nuances of the original hypothesized relationship. Specifically, it was hypothesized that attributing memory failure to Alzheimer's disease would mediate the relationship between the demographic characteristic, ethnicity, and help-seeking behaviors. However, the demographic characteristic, gender, may be important as well in gaining further insight into this relationship between memory failure attribution and help-seeking behaviors.

To begin, independent samples *t*-tests were conducted to compare the different outcome variables with females and males. The results are presented in Table 4. There are statistically significant differences at the .05 level of significance between male and female adults in help-

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

seeking intentions, help-seeking thresholds, and memory failure attributions. Results indicated that males had a greater intent to seek help, lower help-seeking threshold, and were more likely to attribute daily memory failures to AD/dementia compared to women. No statistical differences existed between males and females in terms of memory failure frequency, AD concern, and reported familial/personal AD experience.

Next, Hayes' Model 4 was used within the PROCESS macro, to observe the association between gender and help-seeking threshold (c-path), the effect of gender on memory failure attributions (a-path), the effect of memory failure attributions on help-seeking threshold (b-path) and the direct effect of gender on help-seeking threshold, when controlling for memory failure attribution (c'-path). This analysis was identical to the aforementioned simple mediation conducted, aside from the replacement of the demographic variable, ethnicity, with the demographic variable, gender. These results are depicted in Figure 4.

According to this regression analysis, it was found that gender exerts a total effect on help-seeking threshold $F(1,499)=4.40, p=.037, R^2=.01$ (c-path), suggesting that males had a lower help-seeking threshold than females. Furthermore, gender (X) significantly predicts memory failure attribution (M) ($\beta = -.07, t(499) = -2.52, p=.012$) (a-path), suggesting that males were more likely to attribute their memory failures to AD/dementia than females. The analysis confirmed that gender (X) and memory failure attribution (M) together predict help-seeking threshold (Y) $F(2,498)=6.40, p<.01, R^2=.03$. The analysis also confirmed a significant relationship between memory failure attribution (M) and help-seeking threshold (Y) ($\beta=-7.82, t(498)=-2.89, p <.01$) (b-path). However, gender was no longer a significant predictor of help-seeking threshold, when controlling for the mediator ($\beta = 2.89, t(498)=1.78, p=.076$) (c'-path). Lastly, the indirect effect was tested using the percentile bootstrap approach with 5,000 samples.

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

There was a significant indirect effect of gender on help-seeking threshold through memory failure attribution ($\beta=0.525$, $SE= 0.29$, 95% BCa CI [0.075,1.20]). Overall, these results suggest that memory failure attribution to AD fully mediates the relationship between gender and help-seeking behaviors. Future research should be done to re-examine this relationship, and ascertain what factors, in addition to memory failure attribution, facilitate this relationship observed between gender and help-seeking behaviors.

Chapter 4

Discussion

This study sought to explore the influences that ethnicity, memory failure attribution, and familial/personal AD experience had on hypothetical help-seeking behaviors, in order to provide useful information on ways to increase timely AD evaluations among a growing vulnerable population. There is growing awareness that African Americans are disproportionately affected by Alzheimer's disease, compared to non-Hispanic whites, yet, few preliminary studies have assessed predictors of help-seeking behaviors on a large African American sample.

Consistent with prior research, this study found that African Americans were less likely to be concerned with AD, as compared to non-Hispanic whites. In Roberts et al. (2003), African Americans were less concerned with the development of AD and the disease's consequences, as they more likely attributed symptoms to normal aging. Even when socioeconomic status (SES) was controlled for, Caucasians still were more worried about AD than African Americans (Roberts et al., 2003). Given that this current study did not find a significant difference between the two group's memory failure appraisal, it is conceivable that African Americans' lack of awareness of AD symptomatology, as reported in other studies, is associated with the lower levels of concern that were observed here. Unfortunately, further descriptive statistics, such as education status and AD knowledge, were not measured or controlled for in this study, so a definitive conclusion cannot be made. However, prior research has suggested that there is an association between level of concern surrounding AD and general AD knowledge. Looking at

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

these two groups in particular, previous research reported that Caucasians were more knowledgeable and aware of facts surrounding AD and more worried about the disease, as compared to African Americans (Roberts et al., 2003). Since perception of AD threat has been shown to predict help-seeking behaviors in prior studies (e.g., Shinan-Altman & Werner, 2017), it would make sense that African Americans are less likely to perceive the threat of AD, as they have been shown to seek out help in a more untimely manner (Clark et al., 2005). The results from this study are divergent from Connell et al. (2007) findings that proposed that there was no significant difference in level of concern for AD between African Americans and Caucasians.

Hypothesis 1

It was hypothesized that ethnicity would significantly predict help-seeking threshold. In particular, it was expected that African Americans would have a higher threshold for help-seeking than non-Hispanic whites, indicated by a significant total effect. The results of this study revealed a moderate trend toward significance, suggesting the possible relevance of the relationship between ethnicity and help-seeking threshold. Considering that African Americans have been more likely to perceive AD symptomatology as a normal part of aging (Roberts et al., 2003; Hodgson & Cutler, 2004; Connell et al., 2007; Mahoney et al., 2005; Kane, 2000), it was expected that African Americans would perhaps have a lower critical perceived need to seek help. In addition, compared to non-Hispanic whites, African Americans have been shown to more frequently seek out professional help in an untimely manner (Barnes & Bennett, 2014), further implying that perhaps African Americans have a lower critical perceived need to seek help.

However, some researchers have acquired similar findings to this current study. For example, Feldman and colleagues (2016) found that the ethnicity of the demented person did not

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

affect the timeliness of their help-seeking behaviors. Even further, they discovered that the ethnicity of the caregiver did not play a significant role in explaining immediate help-seeking behaviors (Feldman et al., 2016). It is plausible that the differences observed between African Americans and non-Hispanic whites, in terms of timely help-seeking behaviors, is less about an individual's help-seeking threshold and more about the quality of help obtained. It has been reported that minorities face many barriers when seeking help from formal sources, in particular, minorities are often underdiagnosed with AD, due to cultural biases within the healthcare system. Clutterbuck and Mahoney (2003) found that the caregivers of African Americans with dementia believed that their interactions with healthcare providers were generally negative, as providers often "dismissed" their concerns, and "devalued" their observations. Likewise, Hughes et al. (2009) reported that family caregivers of African American patients were frustrated with care provided by primary care physicians, as their family members were initially misdiagnosed, with an emphasis on more "chronic disorders". Since this study particularly inquired about seeking help from formal sources, such as a medical and/or psychological professionals, it is possible that African Americans actually do seek help early on when AD symptomatology is recognized. However, the dismissal of their concerns by healthcare providers could delay an otherwise timely AD diagnosis, making it appear as if there is a true difference in help-seeking threshold between the two groups, when there is not. Due to the barriers that minorities face in the health care system, it is not unreasonable to assume that even with the best of intentions to receive healthcare, it might not be a reality, possibly because they have had previous poor experience with the healthcare system.

Lastly, it should not be overlooked that a discrepancy may exist between answering questions on help-seeking behavior intentions, and actual help-seeking behaviors. To my

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

knowledge, there are no studies that report whether or not a person's help-seeking behavior intentions translate into true help-seeking behaviors in reference to similar problems.

Despite all of the aforementioned propositions, since the effect of ethnicity on help-seeking threshold was borderline significant, further research should be conducted to either support this notable trend toward significance, or more definitively support that there is not a direct relationship between these two variables. In this present study, only 2.59% of help-seeking threshold was accounted for, therefore, it is plausible that this model is underpowered and ethnicity does truly predict help-seeking threshold.

Hypothesis 2

Next, it was hypothesized that ethnicity would significantly predict memory failure attribution. In particular, it was expected that African Americans would be less likely to attribute their memory failures to AD, compared to non-Hispanic whites, indicated by a significant correlation. Again, the results of this study did not support the original prediction, as the relationship between ethnicity and memory failure attribution was non-significant. Prior research proposed that African Americans were more likely to attribute AD symptomatology to normal aging and psychosocial factors, as compared to non-Hispanic whites (Roberts et al., 2003; Hodgson & Cutler, 2004), leading to the insinuation that African Americans would be more likely to attribute memory failures to external sources and normal aging in this study. However, Roberts and colleagues (2003) reported that African Americans and Caucasians did not significantly differ in their beliefs concerning AD risks, treatments, and symptoms, therefore, it is probable that these two groups do not differ in memory failure appraisal as well.

The contradiction observed may also be due to the memory failure attribution measure itself. Participants were asked to indicate the most likely cause of 12 daily memory failures from

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

8 possible causes. However, the statistical analysis only looked at whether or not an individual attributed the memory failure to AD/dementia. This, in turn, could have minimized the true differences between both groups. Another plausible explanation as to why a significant difference was not obtained could be attributed to this study's sample. Specifically, this study used older adults recruited through an internet medium. As we know, the internet is a frequent source used to find health related information, and many people consult the web with their concerns. For example, Hodgson and Cutler (2004) found that roughly 25% of their respondents sought out AD information from the internet. As a result, the participants acquired for this study through TurkPrime Prime Panels, may be more aware of AD facts, through their own use of the internet, thus shrinking the knowledge gap that normally influences symptom appraisal. Consequently, this current sample could be non-representative of the general older adult population. It should be noted however that these explanations are greatly speculative.

Hypothesis 3

It was predicted that a relationship between ethnicity and help-seeking behaviors would be mediated by memory failure attribution to Alzheimer's disease; this was not supported. Since ethnicity was not originally a predictor of help-seeking threshold, memory failure attribution did not have a relationship to mediate. However, in agreement with initial predictions, this present study confirmed that memory failure attribution to AD is a significant predictor of hypothetical help-seeking behaviors. Hurt et al. (2011) results are in agreement with this finding, as individuals were more likely to seek out help after attributing their forgetfulness to "medical" and "biological" causes, as opposed to "psychosocial" causes. Likewise, Feldman et al. (2016) found that memory failure attribution was a mediator of help-seeking behaviors for caregivers, as they were "six times more likely" to seek help instantly when they attributed symptoms to

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

dementia, instead of aging. As a result, memory failure attribution should still be considered an important variable in predicting timely help-seeking behaviors.

Hypothesis 4

The hypothesis that family history of Alzheimer's disease and personal experience with AD would moderate the mediating effect of memory failure attribution on the association between ethnicity and help-seeking behaviors was partially supported. In particular, ethnicity and familial/personal AD experience together significantly predicted memory failure attribution to AD. This result suggests that when African Americans endorsed more familial/personal AD experience, they were generally more likely to attribute memory failures to AD than non-Hispanic whites, however, without this exposure they were less likely to attribute memory failures to AD compared to non-Hispanic whites. This suggests that AD exposure is more influential for African Americans than for non-Hispanic whites. This finding is consistent with prior research that suggested that having familial/personal AD exposure could sensitize an individual to their own AD symptomatology, in turn, leading to greater AD attribution for memory failures (Hodgson & Cutler, 2003). Furthermore, this finding supports the original suggestion that providing greater awareness of AD symptomatology to those African Americans without familial/personal AD exposure could be beneficial in increasing timelier help-seeking behaviors for this group. However, contrary to what was expected, there was not a mediating effect of memory failure attribution on the relationship between ethnicity and help-seeking behaviors. Together, these results suggest that ethnicity alone is most likely not predicting the associations seen among help-seeking behaviors and memory failure appraisal.

Post-Hoc

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

Surprisingly, the demographic characteristic, gender, was highly correlated with the outcome and predictor variables in this study. Results indicated that males had a greater intent to seek help, lower help-seeking threshold, and were more likely to attribute daily memory failures to AD/dementia compared to women. Prior research inconsistently supported these findings. In particular, Hodgson and Cutler (2003) reported that women were more likely to seek out help for AD concern than men, however, women most frequently sought help from informal sources, such as family networks. Women have been reportedly more likely to use a multitude of sources to gather information than men (Hodgson & Cutler, 2003). Furthermore, multiple studies suggested that women endorsed greater levels of worry surrounding AD compared to men (e.g., Werner, Goldberg, Mandel, & Korczyn, 2013; Cutler, 2015). However, in terms of the U.S. population, Cutler (2015) denied finding an association between worry and gender; this finding is consistent with the current study.

The Post-Hoc results also revealed that memory failure attribution to AD fully mediated the relationship between gender and help-seeking behaviors. This suggests that memory failure attribution to AD accounts for the relationship between gender and help-seeking threshold. Prior research has suggested that women partake in more coping strategies than men, when appraising a stressor as more severe (Tamres, Janicki, & Helgeson, 2002). As a result, it is possible that the differences seen in help-seeking behaviors between men and women rely heavily on their varying coping strategies, in addition to their stressor appraisals. Future research should identify other variables that mediate this relationship between gender and help-seeking threshold, in order, to encourage women to seek out an AD evaluation in a more timely manner.

Strengths and Limitations of the Present Study

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

There are several limitations to the present study that must be acknowledged. To begin, conducting research online comes with many risks, such as participants not answering truthfully about their identities, or participants responding to questions in a randomized manner. Precautions were taken to minimize these risks, however, no precaution is guaranteed. In addition, this study did not take into account various demographic characteristics (e.g., socioeconomic status, marriage, level of education) that could have played a role in enhancing the outcomes that were acquired. Lastly, given the recruitment strategy used, it is not clear whether or not this sample is representative of the population, as these individuals were recruited through an internet medium, therefore, this may limit the generalizability of these results. However, this limitation offers an opportunity for future research on a sample that is not based solely online.

Despite the aforementioned limitations, TurkPrime Prime Panels offered a large participant pool that allowed for recruitment more globally. The participants recruited for this study were screened for necessary criteria by TurkPrime Prime Panels prior to recruitment. Recruiting participants in a face-to-face manner would have resulted in slower recruitment time, fewer participants, and less U.S. representation. Furthermore, TurkPrime Prime Panels indicated that participants were less likely to have participated in other psychological studies, in turn, reducing the chance of familiarity and repetitive participation. Furthermore, this study examined help-seeking threshold, a variable often overlooked in research that focuses on help-seeking behaviors. Most importantly, this study is one of few studies to examine timely help-seeking behaviors among a sizeable number of African Americans.

Implications

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

Alzheimer's disease currently affects approximately 5 million people, and more than 20% of those cases are African Americans (Alzheimer's Association, 2019). Compared to non-Hispanic whites, African Americans are disproportionately affected by AD, and have worse health outcomes, as they are often diagnosed later in the disease's course. This study specifically examined this racial disparity in timely help-seeking behaviors, by focusing on the influences of memory failure attributions and AD exposure. Having a better understanding of the interplay among these variables is useful in identifying intervention targets that promote AD awareness and timelier help-seeking.

The findings for this study can be applied to the clinical setting, as medical and psychological professionals should promote AD awareness to all patients, especially African Americans whom are less concerned about the disease. This research should also encourage the development of outreach initiatives in the Black community on AD symptoms, the difference between "normal aging" and pathology, available treatment interventions, and the importance of early AD detection from formal sources. Since a significant interaction between ethnicity and exposure to AD influenced memory failure attribution, these initiatives should specifically inform those without AD exposure of the signs of AD. African Americans are understudied in research, as a result, providing accurate information in community forums and internet mediums, where most people tend to seek out advice, is crucial for undertaking this racial disparity in help-seeking behaviors. Ultimately, this is an area of study that researchers should continue to focus on in order to help reduce this burden imposed on a population that too often go unnoticed.

References

- Alzheimer's Association. (2015). African-Americans and Alzheimer's: The Silent Epidemic. Retrieved from http://www.alz.org/national/documents/report_africanamericanssilenteidemic.pdf
- Alzheimer's Association. (2018). 2018 Alzheimers disease facts and figures. *Alzheimers & Dementia*, 14(3), 367-429. doi:10.1016/j.jalz.2018.02.001
- Alzheimer's Association. (2019). 2019 Alzheimers disease facts and figures. *Alzheimers & Dementia*, 15(3), 321-387. doi:10.1016/j.jalz.2019.01.010
- Barnes, L. L., & Bennett, D. A. (2014). Alzheimer's Disease In African Americans: Risk Factors And Challenges For The Future. *Health Affairs*, 33(4), 580-586. doi:10.1377/hlthaff.2013.1353
- Berwald, S., Roche, M., Adelman, S., Mukadam, N., & Livingston, G. (2016). Black African and Caribbean British Communities' Perceptions of Memory Problems: "We Don't Do Dementia.". *Plos One*, 11(4). doi:10.1371/journal.pone.0151878
- Blay, S. L., Furtado, A., & Peluso, É T. (2008). Knowledge and beliefs about help-seeking behavior and helpfulness of interventions for Alzheimers disease. *Aging & Mental Health*, 12(5), 577-586. doi:10.1080/13607860802343050
- Cheyne, J. A., Carriere, J. S. A., & Smilek, D. (2006). Absent-mindedness: Lapses of conscious awareness and everyday cognitive failures. *Consciousness and Cognition*, 15, 578–592.
- Clark, P. C., Kutner, N. G., Goldstein, F. C., Peterson-Hazen, S., Garner, V., Zhang, R., & Bowles, T. (2005). Impediments to Timely Diagnosis of Alzheimers Disease in African Americans. *Journal of the American Geriatrics Society*, 53(11), 2012-2017. doi:10.1111/j.1532-5415.2005.53569.x
- Cloutterbuck, J., & Mahoney, D. F. (2003). African American Dementia Caregivers. *Dementia*, 2(2), 221-243. doi:10.1177/1471301203002002006
- Connell, C. M., Roberts, J. S., & Mclaughlin, S. J. (2007). Public Opinion About Alzheimer Disease Among Blacks, Hispanics, and Whites. *Alzheimer Disease & Associated Disorders*, 21(3), 232-240. doi:10.1097/wad.0b013e3181461740
- Cutler, S. J. (2015). Worries About Getting Alzheimer's. *American Journal of Alzheimers Disease & Other Dementiasr*, 30(6), 591-598. doi:10.1177/1533317514568889

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

- Cutler, N. R., & Sramek, J. J. (1996). *Understanding Alzheimers disease*. University Press of Mississippi: Jackson, Miss.
- Donix, M., Ercoli, L. M., Siddarth, P., Brown, J. A., Martin-Harris, L., Burggren, A. C., . . . Bookheimer, S. Y. (2012). Influence of Alzheimer Disease Family History and Genetic Risk on Cognitive Performance in Healthy Middle-Aged and Older People. *The American Journal of Geriatric Psychiatry*, 20(7), 565-573. doi:10.1097/jgp.0b013e3182107e6a
- Dungee-Anderson, D., & Beckett, J. O. (1992). Alzheimers disease in African American and white families: A clinical analysis. *Smith College Studies in Social Work*, 62(2), 155-168. doi:10.1080/00377319209516705
- Erber, J. T., Szuchman, L. T., & Rothberg, S. T. (1990). Everyday memory failure: Age differences in appraisal and attribution. *Psychology and Aging*, 5(2), 236-241. doi:10.1037/0882-7974.5.2.236
- Feldman, L., Wilcock, J., Thuné-Boyle, I., & Iliffe, S. (2016). Explaining the effects of symptom attribution by carers on help-seeking for individuals living with dementia. *Dementia*, 16(3), 375-387. doi:10.1177/1471301215593185
- Freels, S., Nyenhuis, D. L., & Gorelick, P. B. (2002). Predictors of survival in African American patients with AD, VaD, or stroke without dementia. *Neurology*, 59(8), 1146-1153. doi:10.1212/wnl.59.8.1146
- Green, R. C. (2002). Risk of Dementia Among White and African American Relatives of Patients With Alzheimer Disease. *Jama*, 287(3), 329. doi:10.1001/jama.287.3.329
- Griffith, A., P., & Lopez, L., O. (2009, April 01). Disparities in the Diagnosis and Treatment of Alzheimer's Disease in African American and Hispanic Patients: A Call to Action. Retrieved from <https://www.questia.com/library/journal/1P3-1862957491/disparities-in-the-diagnosis-and-treatment-of-alzheimer-s>
- Hamilton-West, K. E., Milne, A. J., Chenery, A., & Tilbrook, C. (2010). Help-seeking in relation to signs of dementia: A pilot study to evaluate the utility of the common-sense model of illness representations. *Psychology, Health & Medicine*, 15(5), 540-549. doi:10.1080/13548506.2010.487109
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press
- Hodgson, L. G., & Cutler, S. J. (2003). Looking for Signs of Alzheimers Disease. *The International Journal of Aging and Human Development*, 56(4), 323-343. doi:10.2190/e6j1-pux7-j43c-090b

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

- Hodgson, L. G., & Cutler, S. J. (2004). Help Seeking for Personal Concerns About Developing Alzheimer's Disease. *Journal of Applied Gerontology*, 23(4), 385-410. doi:10.1177/0733464804270587
- Hughes, T., Tyler, K., Danner, D., & Carter, A. (2009). African American caregivers. *Dementia*, 8(1), 95-116. doi:10.1177/1471301208099048
- Hurt, C. S., Burns, A., Brown, R. G., & Barrowclough, C. (2011). Why dont older adults with subjective memory complaints seek help? *International Journal of Geriatric Psychiatry*. doi:10.1002/gps.2731
- Kane, M. N. (2000). Ethnoculturally-sensitive practice and Alzheimers disease. *American Journal of Alzheimers Disease*, 15(2), 80-86. doi:10.1177/153331750001500205
- Logue, M. W. (2011). A Comprehensive Genetic Association Study of Alzheimer Disease in African Americans. *Archives of Neurology*, 68(12), 1569. doi:10.1001/archneurol.2011.646
- Mahoney, D. F., Cloutterbuck, J., Neary, S., & Zhan, L. (2005). African American, Chinese, and Latino Family Caregivers Impressions of the Onset and Diagnosis of Dementia: Cross-Cultural Similarities and Differences. *The Gerontologist*, 45(6), 783-792. doi:10.1093/geront/45.6.783
- Miles, T. P., Froehlich, T. E., Bogardus, S. T., & Inouye, S. K. (2001). Dementia and Race: Are There Differences Between African Americans and Caucasians? *Journal of the American Geriatrics Society*, 49(4), 477-484. doi:10.1046/j.1532-5415.2001.49096.x
- Ostergren, J. E., Heeringa, S. G., Leon, C. F., Connell, C. M., & Roberts, J. S. (2017). The Influence of Psychosocial and Cognitive Factors on Perceived Threat of Alzheimer's Disease. *American Journal of Alzheimers Disease & Other Dementias*, 32(5), 289-299. doi:10.1177/1533317517714552
- Raskind, M. A., Peskind, E. R., Wessel, T., & Yuan, W. (2000). Galantamine in AD: A 6-month randomized, placebo-controlled trial with a 6-month extension. *Neurology*, 54(12), 2261-2268. doi:10.1212/wnl.54.12.2261
- Roberts, J. S., Connell, C. M., Cisewski, D., Hipps, Y. G., Demissie, S., & Green, R. C. (2003). Differences Between African Americans and Whites in Their Perceptions of Alzheimer Disease. *Alzheimer Disease & Associated Disorders*, 17(1), 19-26. doi:10.1097/00002093-200301000-00003
- Santos, C. Y., Snyder, P. J., Wu, W., Zhang, M., Echeverria, A., & Alber, J. (2017). Pathophysiologic relationship between Alzheimers disease, cerebrovascular disease, and cardiovascular risk: A review and synthesis. *Alzheimers & Dementia: Diagnosis, Assessment & Disease Monitoring*, 7, 69-87. doi:10.1016/j.dadm.2017.01.005

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

- Shigematsu, K. (2011). Motivation of dementia patients in seeking initial medical consultation observed by outpatient clinic (initial consultation tends to be late). *Alzheimers & Dementia*, 7(4). doi:10.1016/j.jalz.2011.05.1268
- Shinan-Altman, S., & Werner, P. (2017). Is there an association between help-seeking for early detection of Alzheimers disease and illness representations of this disease among the lay public? *International Journal of Geriatric Psychiatry*, 32(12). doi:10.1002/gps.4661
- Suhr, J. A., & Kinkela, J. H. (2007). Perceived Threat of Alzheimer Disease (AD). *Alzheimer Disease & Associated Disorders*, 21(3), 225-231. doi:10.1097/wad.0b013e31813e6683
- Tamres, L. K., Janicki, D., & Helgeson, V. S. (2002). Sex Differences in Coping Behavior: A Meta-Analytic Review and an Examination of Relative Coping. *Personality and Social Psychology Review*, 6(1), 2-30. doi:10.1207/s15327957pspr0601_1
- Vespa, J., Armstrong, D. M., & Medina, L. (2018, March). Demographic Turning Points for the United States ... Retrieved from https://www.census.gov/content/dam/Census/library/publications/2018/demo/P25_1144.pdf
- Vondras, D. D., Powless, M. R., Olson, A. K., Wheeler, D., & Snudden, A. L. (2005). Differential effects of everyday stress on the episodic memory test performances of young, mid-life, and older adults. *Aging & Mental Health*, 9(1), 60-70. doi:10.1080/13607860412331323782
- Werner, P., Goldberg, S., Mandel, S., & Korczyn, A. D. (2013). Gender differences in lay persons' beliefs and knowledge about Alzheimers disease (AD): A national representative study of Israeli adults. *Archives of Gerontology and Geriatrics*, 56(2), 400-404. doi:10.1016/j.archger.2012.11.001
- Winblad, B., Wimo, A., Engedal, K., Soininen, H., Verhey, F., Waldemar, G., . . . Schindler, R. (2006). 3-Year Study of Donepezil Therapy in Alzheimer's Disease: Effects of Early and Continuous Therapy. *Dementia and Geriatric Cognitive Disorders*, 21(5-6), 353-363. doi:10.1159/000091790

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

Table

Table 1
Descriptive Statistics (N=501)

	Mean (SD)	Minimum	Maximum	Skew	Kurtosis	Cronbach's α
Age	52.25 (7.65)	40	65	-.08	-1.25	-
AD Experience	.80 (1.19)	0	11	2.79	13.70	-
Scaled Variables						
^a Memory Failure Attribution	1.18 (2.25)	0	12	2.95	10.11	-
Memory Failure Frequency	26.98 (7.89)	12	60	.64	.96	.89
Help-Seeking Intent	29.84 (13.60)	12	72	.68	.25	.95
Help-Seeking Threshold	64.40 (18.25)	12	84	-1.05	.58	.95
AD Concern	15.34 (4.80)	5	25	-.15	-.54	.81

Note. ^aMemory Failure Attribution: 0=all other attributions, 1=AD/dementia (information prior to log transformation)

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

Table 2
Bivariate Correlations Between Study Variables (N = 501)

Variables	1	2	3	4	5	6	7	8	9
1. Age	-								
2. Gender ^a	.08	-							
3. Ethnicity ^b	.15**	.01	-						
4. Memory Failure Frequency ^c	-.05	.02	-.05	-					
5. Help-Seeking Intent ^d	-.09*	-.09*	.06	.13**	-				
6. Help-Seeking Threshold ^e	.05	.09*	-.08	.11*	-.37**	-			
7. AD Concern ^f	.03	.01	-.10*	.19**	.21**	-.06	-		
8. Memory Failure Attribution ^g	-.06	-.11*	.00	-.11*	.23**	-.14**	.21**	-	
9. AD Experience	-.10*	.01	-.03	.13**	.12**	-.09*	.34**	.18**	-

Note. ^aGender: 0 = male, 1 = female. ^bEthnicity: 0 = non-Hispanic white, 1 = African American. ^cMemory Failure Frequency: (1=Never – 5=Very Often). ^dHelp-Seeking Intent: (1=Very Unlikely – 6=Very Likely). ^eHelp-Seeking Threshold: (1=Just Once – 7=I would never seek out an evaluation, no matter how many times it happened). ^fAD Concern: (1=Strongly Disagree – 5=Strongly Agree). ^gMemory Failure Attribution: 0=all other attributions, 1=AD/dementia. * $p < .05$. ** $p < .01$.

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

Table 3
Results of t-tests of AD Concern Questionnaire by Ethnicity (N=501)

Statement	Group				p-value
	African American		Non-Hispanic white		
	M	SD	M	SD	
I am concerned about the idea of getting Alzheimer's disease.	3.24	1.40	3.44	1.17	0.075
I often think about whether or not I will get Alzheimer's disease.	2.84	1.40	2.96	1.20	0.276
I do not really think about Alzheimer's disease.	2.83	1.41	2.94	1.29	0.340
The idea of getting Alzheimer's disease does not bother me.	3.64	1.30	3.81	1.13	0.110
I think I have a high risk of getting Alzheimer's disease.	2.33	1.25	2.65	1.08	0.002*

Note: *p<.01

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

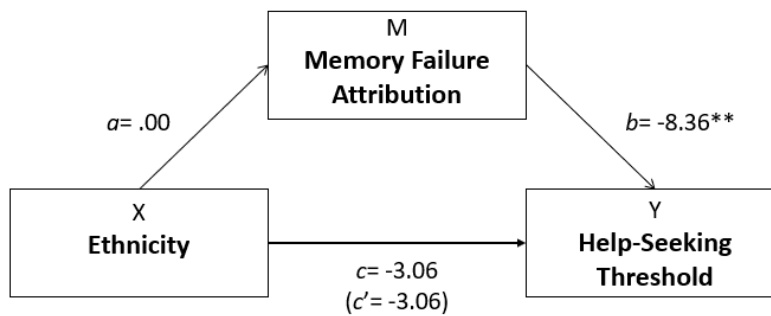
Table 4
Results of t-tests and Descriptive Statistics of Outcome Variables by Gender (N=501)

Outcome	Group						95% CI for Mean Difference		
	Male			Female			t	df	
	M	SD	n	M	SD	n			
Memory Failure Frequency	26.82	8.25	249	27.15	7.52	252	-1.71, 1.06	-.47	499
Help-Seeking Intent	31.09	14.37	249	28.58	12.54	252	.14, 4.88	2.09*	488.41
Help-Seeking Threshold	62.87	18.35	249	66.15	17.55	252	-6.44, -.13	-2.058*	499
AD Concern	15.31	4.69	249	15.37	4.92	252	-.90, .79	-.13	499
Memory Failure Attribution ^a	.24	.32	249	.17	.28	252	.01, .12	2.52*	487.34
AD Experience	.78	1.16	249	.81	1.22	252	-.24, .18	-.248	499

Note. Memory Failure Attribution^a: (ln transformation). *p<.05.

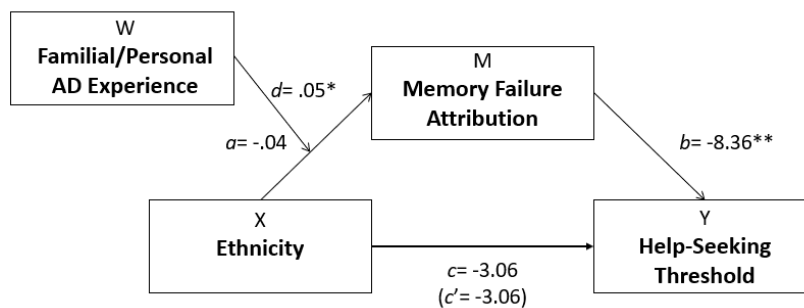
Figures

Figure 1
Mediation Model of Ethnicity and Memory Failure Attribution to Help-Seeking Threshold



Note: Figure 1 models the direct effect of ethnicity and help-seeking threshold through the predicted mediator, memory failure attribution.
 $**p < .01$

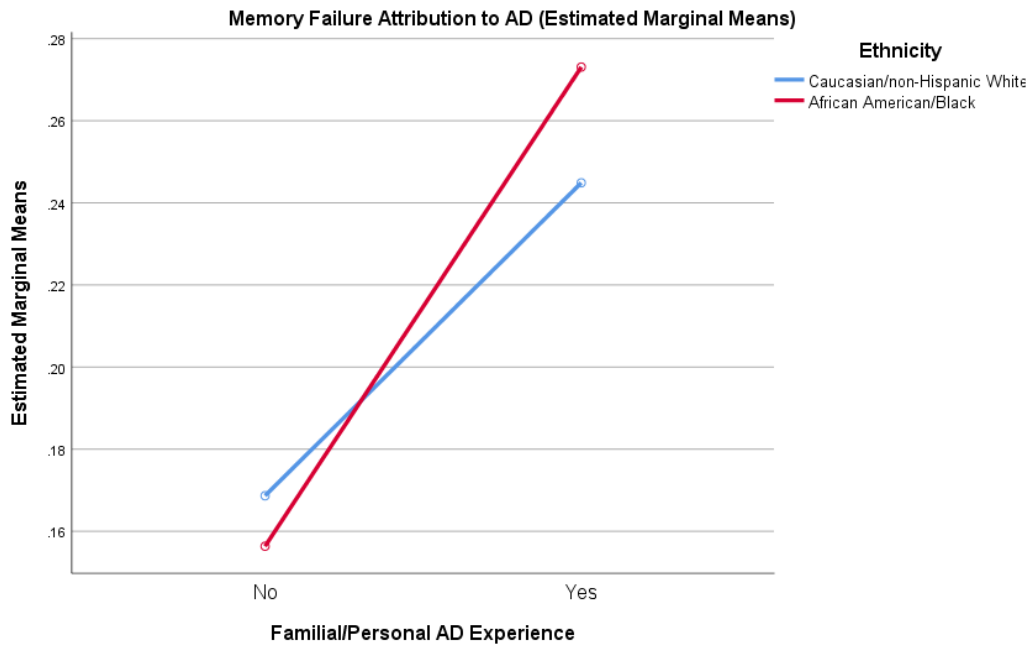
Figure 2
Moderated Mediation Model of Familial/Personal AD Experience Influence on Memory Failure Attribution



Note: Figure 2 models the influence that familial/personal AD experience has on moderating the expected mediating relationship.
 $*p < .05$. $**p < .01$

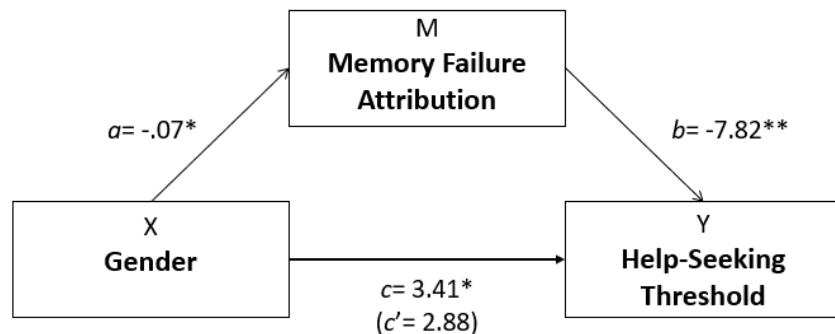
RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

Figure 3
Interaction between Ethnicity and Familial/Personal AD Experience on Memory Failure Attribution



Note: Figure 3 models the interaction between ethnicity and familial/personal AD Experience. The actual analysis of the interaction between ethnicity and familial/personal AD experience on memory failure attribution was based on the continuous variable, familial/personal AD experience. This dichotomous version of the variable is used here to aid in the interpretation of the effect this AD exposure has on memory failure attribution.

Figure 4
Mediation Model of Gender and Memory Failure Attribution to Help-Seeking Threshold



Note: Figure 4 models the direct effect of gender and help-seeking threshold through the mediator, memory failure attribution.

* $p < .05$. ** $p < .01$

Appendix A: Demographics Questionnaire

Please answer each question as accurately as possible.

What is your age?

What is your sex?

- Male
- Female

Please specify your ethnic background (Note: If neither applies, then you are ineligible to participate in this study)

- Caucasian/non-Hispanic white
- Black/African American

Appendix B: Memory Failure Scale (MFS)

The following statements are about things you may have experienced related to your memory.

We want to know how frequently these sorts of things have happened to you. Please select the choice that most closely applies to you.

Response Options:

- 1-Never
- 2-Rarely
- 3-Sometimes
- 4-Often
- 5-Very Often

1. I leave important letters/emails unanswered for days.
2. I forget appointments.
3. I forget people's names immediately after they have introduced themselves.
4. I forget people's names, even though I rehearsed them.
5. I find I cannot quite remember something though it is on the tip of my tongue.
6. I forget what I went to the supermarket to buy.
7. I forget important dates like birthdays and anniversaries.
8. I double-book myself when scheduling appointments.
9. I forget passwords.
10. I remember facts but not where I learned them.
11. Even though I put things in a special place I still forget where they are.
12. When I go to introduce my friends I forget their names.

Appendix C: Intention to Seek Help

The following statements are about things you may have experienced related to your memory.
We want to know the likelihood of you seeking help for these memory failures.

If you found yourself in the following situations, what is the likelihood that you would seek out medical/psychological help?

Response Options:

- 1-Very Unlikely
- 2-Unlikely
- 3-Somewhat Unlikely
- 4-Somewhat Likely
- 5-Likely
- 6-Very Likely

1. Leaving important letters/emails unanswered for days.
2. Forgetting appointments.
3. Forgetting people's names immediately after they have introduced themselves.
4. Forgetting people's names, even though you rehearsed them.
5. Not being able to remember something though it is on the tip of your tongue.
6. Forgetting what you went to the supermarket to buy.
7. Forgetting important dates like birthdays and anniversaries.
8. Double-booking yourself when scheduling appointments.
9. Forgetting passwords.
10. Remembering facts but not where you learned them.
11. Forgetting where things are, even though you put them in a special place.
12. Forgetting friend's names when you go to introduce them.

Appendix D: Help-Seeking Threshold

The following statements are about things you may have experienced related to your memory.

We want to know how frequently these sorts of things would have to happen to you before seeking a psychological/medical evaluation.

How frequently would the situations below have to occur before you sought out medical/psychological help?

Response Options:

- 1-Just Once
- 2-Once a month
- 3-Once a week
- 4-Several times a week
- 5-Once a day
- 6-Several times a day
- 7-I would never seek out an evaluation, no matter how many times it happened

- 1. Leaving important letters/emails unanswered for days.
- 2. Forgetting appointments.
- 3. Forgetting people's names immediately after they have introduced themselves.
- 4. Forgetting people's names, even though you rehearsed them.
- 5. Not being able to remember something though it is on the tip of your tongue.
- 6. Forgetting what you went to the supermarket to buy.
- 7. Forgetting important dates like birthdays and anniversaries.
- 8. Double-booking yourself when scheduling appointments.
- 9. Forgetting passwords.
- 10. Remembering facts but not where you learned them.
- 11. Forgetting where things are, even though you put them in a special place.
- 12. Forgetting friend's names when you go to introduce them.

Appendix E: Memory Failure Attribution

The following statements are about things you may have experienced related to your memory. We want to know what you think is the most likely cause of these memory failures.

What do you think is the most likely cause of the following memory failures?

Response Options:

- 1-Alzheimer's disease/Dementia
- 2-Normal Aging
- 3-Poor Ability
- 4-Lack of effort
- 5-Task Difficulty
- 6-Bad Luck
- 7-Distractions
- 8-Emotional Distress

- 1. Leaving important letters/emails unanswered for days.
- 2. Forgetting appointments.
- 3. Forgetting people's names immediately after they have introduced themselves.
- 4. Forgetting people's names, even though you rehearsed them.
- 5. Not being able to remember something though it is on the tip of your tongue.
- 6. Forgetting what you went to the supermarket to buy.
- 7. Forgetting important dates like birthdays and anniversaries.
- 8. Double-booking yourself when scheduling appointments.
- 9. Forgetting passwords.
- 10. Remembering facts but not where you learned them.
- 11. Forgetting where things are, even though you put them in a special place.
- 12. Forgetting friend's names when you go to introduce them.

Appendix F: Alzheimer's disease Concern Questionnaire

This section asks about your personal concern with Alzheimer's disease, outside of memory failures.

Please indicate how strongly you agree or disagree with each of the statements.

Response Options:

- 1-Strongly Disagree
- 2-Somewhat Disagree
- 3-Neutral
- 4-Somewhat Agree
- 5-Strongly Agree

1. I am concerned about the idea of getting Alzheimer's disease.
2. I often think about whether or not I will get Alzheimer's disease.
3. I do not really think about Alzheimer's disease.
4. The idea of getting Alzheimer's disease does not bother me.
5. I think I have a high risk of getting Alzheimer's disease.

Appendix G: Familial/Personal AD Experience Questionnaire

To your knowledge, has someone in your family (i.e., grandparents, parents, aunts/uncles, siblings, etc.) been diagnosed with Alzheimer's disease?

- Yes
- No

If yes, please specify the nature of this relationship (check all that apply):

- First degree relative(s) (i.e., parents, full siblings, children)
- Second degree relative(s) (i.e., grandparents, grandchildren,uncles/aunts, nephews/nieces, half-siblings)
- Other: _____

Displayed if 'First Degree relative(s)' checked:

How many first degree relatives have had Alzheimer's disease?

Displayed if 'Second Degree relative(s)' checked:

How many second degree relatives have had Alzheimer's disease?

Displayed if 'Other' checked:

How many other relatives have had Alzheimer's disease?

Have you had any other personal experience(s) with Alzheimer's disease (i.e. spouse, friend, distant relative)?

- Yes
- No

Appendix H: Informed Consent

Welcome to the research study!

Purpose of the study: We are interested in understanding what people think about their experiences with memory in various context. You will be presented with information relevant to this topic and asked to answer some questions about it.

Description of Subject Involvement: The study should take you around 10-15 minutes to complete. Your participation in this research is completely voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice. If you would like to contact the Principal Investigator (PI) of the study to discuss this research, please e-mail Marisa Mills at msmills@umich.edu.

Eligibility Requirements:

- African American/Black or Caucasian/non-Hispanic white
- Between the ages of 40-65 years old
- Read and understand English
- Reside within the United States

Benefits: Although you may not directly benefit from being in this study, others may benefit because this research will help the researchers to learn more about how various individual factors interact to influence attitudes that can be used to develop future awareness and educational programs.

Risks and Discomforts: The risks of participating in this study are minimal. However, you may feel some discomfort answering questions about your background, memory experiences and attitudes. A resource page will be made available to all participants at the conclusion of the study (or by contacting the PI Marisa Mills at msmills@umich.edu or Nancy Wrobel, Ph.D., a Fully Licensed Psychologist, at nwrobel@umich.edu or 313-593-5088 if you choose not to complete the study).

Compensation: Upon satisfactory completion of the study, you will receive compensation in the amount that you have agreed to with the platform through which you entered this survey.

Confidentiality: Please find a quiet and private location to complete the survey. To keep your information safe, the researchers will not ask you to identify yourself on the survey. Furthermore, TurkPrime adds a unique participant ID to your data file, so that your identity is anonymous.

RACIAL DISPARITIES IN AD HELP-SEEKING BEHAVIORS

Voluntary nature of the study: Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. If you decide to withdraw early the data that you generate will be destroyed.

Contact Information: If you have questions about this research, you may contact Marisa Mills at msmills@umich.edu or Brenda Whitehead, Ph.D. at bwht@umich.edu.

By clicking the button below, you acknowledge that your participation in the study is voluntary, you meet all of the eligibility requirements above, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

- I consent
- I do not consent

Appendix I: Resource List

Resource List

If for any reason this study happens to cause you any discomfort or distress due to the subject matter involved (e.g. answering questions about your background, memory experiences and attitude). Please do not hesitate to use any and all of the resources provided below. Additionally, if you are facing an immediate crisis call 9-1-1.

- a. Nancy Wrobel, Ph.D, Fully Licensed Psychologist
Email: nwrobel@umich.edu
Phone number: 313-593-5088
- b. 1-800-272-3900
This is the general 24/7 Alzheimer's Association hotline number
- c. <https://www.alz.org/>
This is the Alzheimer's Association national website that provides information on Alzheimer's disease and dementia symptoms, support groups in your specific area, stages of the disease, and general facts and figures
- d. <https://www.apa.org/topics/alzheimers/index>
This website provides information on finding Psychologists in your area, and general news and research on Alzheimer's disease

Press the arrow at the bottom of this section to complete this study!