

AGE AND GENDER DIFFERENCES IN ATTITUDES AND KNOWLEDGE ABOUT  
ALZHEIMER'S DISEASE

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Age and Gender Differences in Attitudes and Knowledge

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about Alzheimer's Disease

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**MASTER OF SCIENCE**

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## **ABSTRACT**

The purpose of this study was to examine possible age and gender discrepancies in knowledge and attitudes towards individuals with Alzheimer's disease (AD). Data were taken from a Midwestern survey study of community-dwelling adults aged 18-88 ( $N=211$ ). Participants were divided into two age groups: younger adults (ages 18-49), and older adults, encompassing the Baby Boom generation (ages 49+). The findings indicated that, relative to older adults, younger adults were: less likely to know someone with AD; less likely to make lifestyle changes to reduce their AD risk; and less factually knowledgeable about AD. However, younger adults reported more positive attitudes about AD. When demographic variables, knowing someone with AD, and knowledge of AD were examined simultaneously as predictors of attitudes, the following were significant: age, knowledge, and knowing someone with AD. Gender had no significant relationships with any of the outcome variables examined. Interpretations of these findings were discussed.

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## INTRODUCTION

The number of adults age 65 and above (i.e., older adults) in the United States is rapidly increasing. As of 2013, older adults made up 13.7% of the U.S. population, and this percentage is expected to reach 20% by the year 2050 (Administration on Aging, 2014). Given these trends, there is an increasing need for the general population to hold accurate and positive attitudes toward older adults (Gellis, Sherman, & Lawrence, 2003), especially those with health impairments like dementia.

Dementia is one of the major challenges affecting our aging society, Alzheimer's disease (AD) being the most common form. AD is an irreversible neurodegenerative disease that causes progressive impairment in all cognitive domains, beginning with memory and executive functioning (Werner & Lowenstein, 2001). Advanced symptoms of the disease include depression, disorientation, personality changes, inability to distinguish objects, and difficulties speaking, swallowing, and walking (Alzheimer's Association, 2014). Age is the biggest risk factor for AD; an estimated 5.2 million Americans have AD, and 5 million of these individuals are older adults. The Alzheimer's Association (2014) further shows that after age 65, the odds of developing AD doubles every five years and reaches about 50% after age 85. This population is expected to reach 13.8 million by the year 2050 (Alzheimer's Association, 2014). Research has revealed many facts about the biological process of AD, but the specific cause remains unclear. Although there is no cure, lifestyle factors such as cognitively stimulating activities, diet, and exercise can lower the risk of developing AD (Alzheimer's Association, 2014). Moreover, medical treatments can delay the onset and progression of symptoms.

The well-being of individuals with AD may be affected by societal knowledge and attitudes regarding the disease (Allen, Cherry, & Palmore, 2009). Due to the progressive nature



of AD, most individuals with AD eventually need long-term care. Although 26.8% of older adults who need long-term care reside in skilled nursing homes, most caregiving takes place in home or community-based settings (35.3%) and residential care communities (37.9%; Center for Disease Control, 2014). Because most people with AD live in the community, researchers as well as dementia care professionals have emphasized the importance of educating caregivers and community members about dementia (Jones, Moyle, & Stockwell-Smith, 2013). Education of caregivers, for example, is associated with reduced caregiver burden and more positive attitudes (Germack, 2013; Herron & Priest, 2013; Schindler, Engel, & Rupprecht, 2012). However, in a recent poll of American older adults by the MetLife Foundation (2011), 62% of the sample reported “not knowing much” about AD. In order to address this need for education, it is necessary to assess the general public’s current knowledge and attitudes about AD.

A major challenge to educational efforts is that society has biases toward both mental illness and aging, and AD in particular may carry a negative stigma (O’Connor & McFadden, 2012). The MetLife Foundation (2011) found that 31% of older adults reported fearing AD more than other terminal diseases, such as cancer or stroke. A common stereotype about older adults is that they are or will become “senile” (Kane, 2006), and the diagnostic label of AD alone may elicit pity (O’Connor & McFadden, 2012). However, findings regarding American adults’ attitudes toward AD are mixed (Blay & Peluso, 2010).

There is a need for further research on knowledge and attitudes about AD that 1) involves community-based samples of adults of all ages, and 2) examines age and gender differences. The majority of previous research has been conducted with either college students or professional caregivers from hospitals, nursing homes, or assisted living facilities (Jones et al., 2013; Lann-Wolcott & Williams, 2011; Schindler et al., 2012). Moreover, few studies have

explored age and gender differences in knowledge about AD or attitudes toward AD. Therefore, the current study adds to the literature by examining age and gender disparities with regard to knowledge and attitudes about AD in a community-based sample. The following chapters include a review of relevant literature, description of the methodology, presentation of the results, and discussion of the implications.

## REVIEW OF LITERATURE

Attitudes, or responses to a person, object, or event, are multidimensional and include emotional, cognitive, and behavioral components. These components lie on a continuum from positive to negative (Breckler, 1984). When a group of people have a negative attitude toward someone else, this often leads to maltreatment, increased social distance, and excluding that individual from social relationships (Lauber, Nordt, Falcato, & Rossler, 2004; Morano & DeForge, 2004; Webb, Jacobs-Lawson, & Waddell, 2009). Social distance is defined as the perceived level or desired degree of separation between two different groups. One such group might be people with cognitive impairment, and another might be healthy people without cognitive impairment (Link, Cullen, Frank, & Wozniak, 1987). Whenever social distance between these two groups increases, the willingness of the healthy group to interact with the cognitively impaired group decreases, negatively affecting quality of life for the latter (Angermeyer, Buyantugs, Kenzine, & Matschinger, 2004; Webb et al., 2009).

Lann-Wolcott, Medvene, & Williams (2011) emphasized that humans, regardless of cognitive status, are social beings. Although many cognitively impaired individuals are cognizant of the social distance that exists because they are perceived as incompetent (Webb et al., 2009), they still long for connections with others. They also wish to be treated as persons with basic human rights, which is the definition of personhood (McCormack, 2004). For people with AD, these basic desires are known to persist until very late in the disease process. Their quality of life from diagnosis to death is greatly impacted by the way they are regarded and treated by others (Webb et al., 2009).

This literature review explores the attitudes that American adults have toward people with AD. It begins by examining ageism in general, and how ageism relates to attitudes toward

AD. Such research is highly relevant, since age is the biggest risk factor for AD. Next, attitudes toward AD are discussed in terms of potential age and gender differences. Then, education and knowledge about AD is explored in relation to attitudes, including the influence of having contact with people with AD. Two relevant theoretical frameworks, terror management theory and contact theory, are discussed in the ageism and knowledge subsections, respectively. Last, the current study is introduced.

## **Ageism and Alzheimer's Disease**

### **Characteristics of Ageism**

Aging is inevitable, even though people tend to resist it. Out of such reluctance, consciously and unconsciously, many individuals exhibit ageism toward older adults. As described by Butler (1969), ageism is defined as systematic stereotyping, prejudice, and discrimination based on a person's perceived chronological age. Ageism against older people is different from other types of prejudice such as sexism or racism, because everyone who lives long enough will experience aging. Ageism has repercussions for the well-being of older adults by potentially subverting the reputation and treatment of older people in society (Allen et al., 2009), despite the fact that many people value long life. An example occurs when "people are more likely to attribute memory failures of older adults to intellectual incompetence and memory failures of younger adults to lack of attention or effort" (Bodner, 2009, p. 120). Moreover, older adults are less likely to secure interviews for employment (McMullin & Marshall, 2001) and are among the highest-risk populations to experience abuse or neglect by their caregivers (O'Keeffe et al., 2007).

Numerous societal and psychological factors may contribute to ageism. First, as a consequence of industrialization, urbanization, and out-migration of younger adults, older adults

in the U.S tend to be stripped of their dignity through marginalization, reduced responsibilities, and reduced power (Nelson, 2005). Thus, older adults may be regarded as second-class citizens with little or nothing to offer society (Nelson, 2005). Young adults today have looser ties to their grandparents than they have had in the past (Bodner, 2009). Second, even though longevity is cherished, the common practice of age segregation in society fuels ageist attitudes. Age segregation is among the most problematic societal aspects of ageism (Cuddy, Norton, & Fiske, 2005). Yet another factor that promotes ageism is the youth-oriented focus of the media. Children as young 4 years old have been found to be ageist (T. B. Anderson, 1999). This is largely due to the fact that images of older adults in books and media are often represented in unfavorable, unkempt, and even pitiable ways; successively, many young adults grow up forming negative stereotypes of older adults (Sorgman & Sorenson, 2001). While there are many dimensions of aging, young adults focus mostly on the physical attributes of an individual to describe someone as being old (Cottle & Glover, 2007).

Finally, anxiety about death may subconsciously fuel ageism. According to Terror Management Theory (TMT), the awareness of one's inevitable death elicits subconscious anxiety. This anxiety is a driving force behind the pursuit of self-esteem, ethnocentrism, and adherence to culture and religion (Becker, 1973; Burke, Martens, & Faucher, 2010). Since older adults are associated with death and physical decline, ageism may be a defense mechanism against confronting those issues (Martens, Goldenberg, & Greenberg, 2005). There is some empirical support for this idea. For example, Martens and colleagues (2004) found that young adults who rated their personalities as being similar to the "average older person" responded significantly more negatively to older people when primed to think about death. Older adults

with progressive health conditions like AD may serve as potent reminders of death, thereby triggering more ageism than healthy older adults (O'Connor & McFadden, 2012).

Stereotypes are a prominent manifestation of ageism. Cuddy and Fiske (2002) defined stereotypes as “cognitive structures that store our beliefs and expectations about the characteristics of members of social groups” (p. 4). Stereotypes are known to fall along two content dimensions, warmth and competence. People regarded as warm are regarded as gentle, sweet, and non-threatening, while people regarded as competent are regarded as competitive, capable, and high-status (Cuddy et al., 2005). In the U.S., older adults tend to be perceived as warm and incompetent, or “doddering yet dear” (Fiske, Cuddy, Glick, & Xu, 2002). Such stereotyping appears to be more prominent for older adults with health conditions, especially AD, relative to healthy older adults (O'Connor & McFadden, 2012).

### **Attitudes toward Alzheimer's Disease**

As stated above, people may experience more thoughts about death and indicators of ageism in response to older individuals who are not perceived as healthy (Gekoski & Knox, 1990). There is a particularly strong stigma associated with AD, which has been described as a “living death” (Werner & Heinik, 2008). Surveys in both the U.S. and U.K. have found that older adults fear developing AD more than cancer, heart disease, or stroke (Alzheimer's Society, 2007; MetLife Foundation, 2011). Negative aging stereotypes include forgetfulness and senility (Cuddy et al., 2005). Professionals as well as lay community members have expressed negative perceptions of people with AD, although prosocial emotions like sympathy have been reported as well (Blay & Peluso, 2010; Devlin, MacAskill, & Stead, 2007; O'Connor & McFadden, 2010). In one experiment, college students rated a hypothetical older target person with AD as less competent than healthy older targets, and felt more pity for the target with AD than a target with

arthritis. No information about the targets' functioning was provided aside from the diagnosis (O'Connor & McFadden, 2012).

Competence does decline as the disease progresses, but varies greatly between individuals, situations, and time points (Werner & Heinik, 2008). People in the mild stages may show little impairment in their everyday functioning, and certain abilities remain intact into the later stages, including creativity, recognition of emotions, and social skills (Alzheimer's Association, 2014). However, the label of AD alone may elicit stigma, even in the absence of information about symptoms (O'Connor & McFadden, 2010). This stigma can create a stressful environment and become self-fulfilling.

Studies on caregiving have shown that discrimination against AD doesn't emerge from outsiders alone, but from family members as well (Green, Hayes, Dickinson, Whittaker, & Gilheany, 2003). Negative attitudes, especially among family caregivers, are directly associated with resistance to care, which is associated with caregiver burden (Lann-Wolcott & Williams, 2011; Miyamoto, Tachimori, & Ito, 2010). Resistance to care is a leading reason for nursing home placement (Lann-Wolcott & Williams, 2011; Rodney, 2000).

Especially for those with AD, a problem that arises from ageism is infantilization. Infantilization involves being overly polite, speaking loudly and slowly in simple tense and baby talk; "a simplified speech register...with high pitch and exaggerated intonation" based on the idea that the person cannot hear or understand (Nelson, 2005, p. 209). Many people with AD resent baby talk and consider it disrespectful, condescending, and humiliating. While individuals who exhibit this attitude may have a good intention, infantilization does not respect personhood. It can also become self-fulfilling, which further bolsters the preservation of ageist stereotypes and prejudice (Grant, 1996; Nelson, 2005). Lann-Wolcott, Medvene, & Williams (2011)

stressed the need for person-centered communication, which increases the likelihood of pleasing the person's (with AD) desire for personhood.

Few comprehensive studies on attitudes toward AD have been conducted with representative community-based samples. Most research has focused on either college students or professional caregivers (Jones et al., 2013; Lann-Wolcott & Williams, 2011; Schindler et al., 2012). In addition, little is known about age and gender disparities in attitudes toward AD, although the literature on ageism suggests that such differences may exist.

### **Age and Gender Differences in Ageism**

#### **Age Differences**

Young adults in the U.S. consider “old age” to begin at an earlier chronological time point than do their older counterparts (McConatha, Hayta, Rieser-Danner, & Polat, 2004). Several studies have found that younger adults exhibit more negative attitudes about aging than either middle-aged or older adults (Allan & Johnson, 2009; Cuddy et al., 2005; O'Hanlon & Brookover, 2002; Rupp, Vondanovich, & Crede, 2005). Young adults may seek greater social distance from their elders due to age segregation and denial of death (Bodner, 2009). However, findings have been inconsistent. Funderburk et al. (2006) found that young adults (college students) held neutral attitudes towards older adults, while Damron-Rodriguez and colleagues (2004) found that young adults held neutral-to-positive attitudes. A study of 955 adults from Israel found that middle-aged participants (aged 40-67) were significantly more ageist than either young adults (aged 18-39) or older adults (Bodner, Bergman, & Cohen-Fridel, 2012). Such patterns do not mean that older adults lack ageist attitudes. Through assimilation and internalization of ageist stereotypes, many older adults question their own competencies, judgments, and behaviors (Bennett & Gaines, 2010).



In general, age groups appear to differ in terms of ageist attitudes, although findings have been mixed regarding the direction of these differences. Little is known about age disparities in terms of attitudes toward dementia. College students reported generally positive attitudes about AD in one study, but they were not compared to adults of other ages within the community (O'Connor & McFadden, 2010). It is possible that older adults would have more negative attitudes than younger age groups, since the threat of AD is more personally relevant to them (MetLife Foundation, 2011). For example, despite experience caring for individuals with dementia, Baby Boomers have shown reluctance to get screened for AD (Boustani et al., 2011). More research on age differences on attitudes toward AD is needed, and the aims of the current study will help address this gap in the literature.

### **Gender Differences**

Across all age groups in Bodner et al. (2012), men reported more ageist attitudes than women, a pattern also seen in other studies (Allan & Johnson, 2009; Allen et al., 2009; Kalavar, 2001; Kite, Stockdale, Bernard, & Johnson, 2002; Rupp et al., 2005). In a study of middle-aged and young adult subjects, male participants were more fearful of older adults than female participants, but female participants were more concerned about the physical appearance changes that comes with aging (McConatha et al., 2004). Moreover, the average age the males considered to be “old” was age 52.95, while the average age the females considered “old” was age 61.70 (McConatha et al., 2004). Older women are also more likely to experience negative age stereotypes than older men (McConatha, Schnell, Volkwein, Riley, & Leach, 2003). Due to this double standard, older women’s self-esteem may suffer, because they tend to internalize the social and cultural norms about their physical self (Huebner & Fredrickson, 1999; McConatha et al., 2003; Yoon-Soo, Boer-Kimball, & Alora-Palli, 2009). Almost nothing is known about

gender disparities in terms of attitudes about AD. Men might have more negative attitudes than women, mirroring the patterns seen in ageism, or gender may not be relevant in the face of AD (O'Connor & McFadden, 2012). Further research is needed to explore such possibilities, such as the current study.

### **Knowledge and Familiarity with Alzheimer's disease**

#### **Knowledge and Education**

The focus will now turn to the potential impacts of knowledge about AD and familiarity with the condition; such factors have a strong influence on attitudes (Breckler, 1984). The educational attainment of a non-stigmatized, healthy group may reinforce a positive attitude toward a stigmatized group. For example, a study of older adults with various mental illnesses showed that educational attainment reduced social distance between healthy older adults and those with anxiety and depression (Webb et al., 2009). Education also improved understanding from the healthy group and reduced discrimination. However, education had no impact on attitudes toward schizophrenia, because people tended to focus on the uncontrollable and dangerous behaviors exhibited by people with the disorder. AD symptoms may also include difficult behaviors, so it could be the case that greater education about AD would not be associated with positive attitudes.

Although it is believed that education and familiarity with older adults can help abate ageism, research has shown inconsistent findings. When educated in gerontological courses, young adults' knowledge and positive attitudes towards the elderly has increased (Narayan, 2008; O'Hanlon & Brookover, 2002). On the contrary, Cottle and Glover (2007) found no relationship between knowledge and attitude display towards older adults. Similarly, Allan and Johnson (2009) also found no direct relationship between knowledge and the expression of age

discrimination; however, young adults who had factual knowledge about the aging process were less anxious around older adults. Likewise, exposure to older adults may be associated with more positive attitudes toward them (Curl, Simons, & Larkin, 2005), and some studies have found this to be the case for AD as well (O'Connor & McFadden, 2010).

Given the fact that most individuals with AD are cared for in the community, education of caregivers and community members could go a long way toward reducing stigma (Jones et al., 2013). Caregivers who have taken part in educational programs report more positive attitudes and reduced caregiver burden (Germack, 2013; Herron & Priest, 2013; Schindler et al., 2012). However, the available evidence suggests that most American adults lack basic knowledge about AD, although a majority of studies have asked blanket questions rather than assessing specific factual knowledge (MetLife Foundation, 2011).

Being knowledgeable about AD is advantageous, but there are incidences where it can have a negative impact (Werner, 2001). One study found that informal caregivers with more knowledge of AD (especially the biomedical knowledge) had lower levels of depression, but higher levels of anxiety regarding AD (Proctor, Martin, & Hewison, 2002). Perhaps being knowledgeable about the etiology of the disease heightens the caregiver's expectation of loss and other challenges that comes with having the disease (Proctor et al., 2002). Given this possibility, the current study seeks to clarify the association between knowledge about AD and attitudes toward AD.

### **Familiarity and Contact**

Exposure to individuals with AD increases people's knowledge about the disease process, and has been found to affect attitudes, often for the better (Yamashita, Kinney, & Lokon, 2011). A theoretical framework, contact theory, may help explain the mechanisms behind this. Contact

theory proposes that under certain conditions, when people of different groups (such as age, race, health status, religion) contact and interact with each other, stereotypes and prejudice lessens and positive attitudes increase between the two groups (Pettigrew & Tropp, 2005).

Contact theory is based on the writings of Thomas Pettigrew (1998), who argues that contact creates the exposure necessary for familiarity between the two groups, and also creates the opportunity to dispel negative stereotypes assimilated earlier in life (Lundquist & Ready, 2008; Pettigrew & Tropp, 2005). Studies have supported this hypothesis, showing that the attitudes of young persons who have close contact with individuals with AD differ from those who have not had contact with individuals with AD. Lundquist and Ready (2008) found that young adults were less reluctant to make personal sacrifices for older adults with AD than their counterparts without such contact. In addition, young adults who have frequent intergenerational contact showed more positive attitudes, less anxiety, and more willingness to be involved in being in contact with older adults in the future (Hutchison, Fox, Laas, Matharu, & Urzi, 2010).

College students who participated in a service learning program with older adults expressed more understanding of the aging process and showed a more compassionate attitude after the completion of the intergenerational service learning program (Blieszner & Artale, 2001; Whitbourne, Collins, & Skultety, 2001). Furthermore, medical students who hold negative attitudes toward older adults have been shown to have more positive attitudes after spending time with older adults or learning about aging (Paris et al., 1997). Lastly, after an aging simulation task, students expressed more compassionate attitudes towards the elderly (Schuldberg, 2005).

Studies suggest that there may be age and gender differences in terms of exposure to individuals with AD, although the patterns are not straightforward. The likelihood of knowing someone with AD increases with age (Alzheimer's Association, 2014). Although middle-aged

and older adults who come into contact older adults with AD—as in the case of caregiving—often do it out of filial responsibility, older adults are known to initially react kindly to an individual with mental health issues, but may later withdraw to prevent over-dependence or violence of the individual (Morano & DeForge, 2004).

Although young adults in previous studies have been less likely to know someone with AD relative to older adults, they are increasingly likely to experience a grandparent having AD (Prince et al., 2013). Celdran and colleagues (2012) conducted a study on how grandparents' health impacts their grandchildren's lives. Their results showed that grandchildren felt more responsible and mature than their peers when helping care for a grandparent with dementia, especially when their parents were open and encouraging about the disease. Overall, young adults realized the need to support individuals with AD when they had intimate contact with such individuals (Lundquist & Ready, 2008)

Middle-aged daughters and daughter in-laws often are the caregivers to elders with AD because traditionally and stereotypically, females have been assigned communal qualities revolving around nurturing, being sympathetic, intuitive and as kin keepers (Moody & Sasser, 2012). Females may therefore have more exposure to AD (and therefore knowledge) than males. However, unlike middle-aged caregivers, national surveys have found that young adult caregivers were mostly males (Center for Disease Control, 2014; Levine et al., 2005). This not only contradicts the gender stereotype but also opens the possibility that future middle-aged men will perform personal-care tasks when encouraged by family members (Piercy & Chapman, 2001).

## Current Study

Taken together, the studies reviewed above suggest that older adults with AD may experience greater ageism and stigma than older adults in general. However, greater knowledge about AD and contact with people who have AD may be associated with more positive attitudes. Studies have suggested that ageism is greater among younger adults and men. However, it is not clear whether such age and gender disparities apply to attitudes about AD, factual knowledge of AD, or contact with people who have AD, particularly within a community-based sample. Additionally, it is not known whether the relationship between knowledge and attitudes varies by age and gender. The current study examined the following research questions. Specific hypotheses are proposed wherever previous literature supports them:

1. Are there age group or gender differences in terms of having family or friends with AD, being concerned about one day providing care for someone with AD, or making lifestyle changes to reduce one's risk of AD? It is hypothesized that older adults and women will provide more affirmative responses to these items than younger adults or men.
2. Does factual knowledge about AD differ by age group and gender, and do these two variables moderate each other? It is hypothesized that older adults and women will have more knowledge about AD than younger adults or men.
3. Do attitudes about AD differ by age group and gender, and do these two variables moderate each other? It is hypothesized that younger adults and men will have less positive attitudes than older adults and women.
4. To what extent does factual knowledge about AD, having contact with

someone with AD, and level of education predict more positive attitudes toward people with AD? It is hypothesized that each of these variables will independently predict positive attitudes above and beyond age or gender.

5. Does the relationship between knowledge about AD and attitudes toward AD vary by age or gender? Not enough information is known to provide a specific hypothesis to this question.

## **METHODS**

### **Participants**

The current study utilized secondary data taken from a larger survey study that examined the impact of a community intervention on adults' attitudes, knowledge, and concerns about dementia. A total of 211 individuals from the Midwestern metro area participated and were included in the current analyses. Participants included college undergraduates and adults of all ages from the wider community. The subjects ranged in age from 18-88 years and were 98% Caucasian. Of the sample, 32% ( $n = 67$ ) were males and 68% ( $n = 144$ ) were females. Educational attainment of the participants ranged from less than a high school diploma to a graduate degree. See Table 1 for descriptive characteristics of the sample.



Table 1

*Descriptive Characteristics of the Sample*

Variables	M	SD	%	Range
Age	37.86	21.46		18-88
Sex (% male)			31.8%	
Education				
% high school graduate			97.2%	
% some college			87.7%	
% college graduate			37.5%	
% graduate or professional			12.4%	
Total Knowledge Score	10.39	1.71		5-14
Total Attitude Score	97.86	13.73		61-140

**Measures****Knowing Someone, Lifestyle, and Concern**

Participants answered two yes/no questions that reflected knowing someone with AD and lifestyle changes: “Do you have any family or friends with AD or dementia” and “Have you made changes in your lifestyle or diet to reduce your risk of AD or dementia?” These variables were coded as 0 = no and 1 = yes. Participants also responded to the question, “How concerned are you about someday caring for someone with AD or dementia?” This question about concern had the response options of “not at all”, “somewhat concerned”, and “very concerned.”

### **Knowledge of Alzheimer's Disease**

Knowledge about AD was measured by a 14-item true/false questionnaire developed and validated by Connell and colleagues (Connell, Roberts, & McLaughlin, 2007; Connell, Roberts, McLaughlin, & Akinleye, 2009). This questionnaire assesses the respondent's factual knowledge about AD; see Appendix A for questionnaire items. Total scores were calculated by summing the number of correct answers, and this composite was used in the present analyses.

### **Attitudes toward Alzheimer's Disease**

Attitudes toward AD were measured via the 20-item Dementia Attitudes Scale (DAS; O'Connor & McFadden, 2010). The DAS measures the strength of thoughts and feelings respondents have toward individuals with AD and other dementias. This scale has been used in different settings, including clinical ones (George, Stuckley, & Whitehead, 2014; Scerri & Scerri, 2013). See Appendix B for the full questionnaire. Respondents rated each item on a Likert scale ranging from 1=strongly disagree to 7=strongly agree. Ratings for all the items were summed into a composite, which was used in the current analyses.

### **Procedure**

Participants were recruited from two upper Midwestern communities. Recruitment was conducted through newspaper advertisements, flyers posted on bulletin boards in local colleges and businesses, and a mass mailing of 200 names randomly selected from a county-wide mailing list. The mailing list targeted people aged 55 and above, and the response rate was 30%. Participants could choose between completing the battery of surveys online through Survey Monkey or filling out paper copies. The study was classified as exempt by the Institutional Review Board, so signed informed consent was not obtained. Instead, the required consent

information was presented on either the computer screen or a paper cover sheet. Participants were entered into a drawing to win \$20 or \$50 gift cards as compensation.

### **Statistical Analyses**

Participants were split into two age groups for the primary analyses: younger adults (ages 18-48;  $n = 136$ ), and older adults (age 49 and up;  $n = 75$ ). This dichotomy was used because it differentiated Baby Boomers from the younger generations, which may be an important distinction when it comes to attitudes about AD (Bodner et al., 2012; Boustani et al., 2011). A similar dichotomous variable for age group was used in Anderson et al. (2011). Additionally, middle-aged individuals (traditionally ages 40-64) comprised just 23% of the sample, so they were not analyzed as a separate group.

Chi-square analyses were used to address the first research question. Age group and gender were included in crosstabs with the yes/no questions about family/friends with AD, concerns about developing AD, and lifestyle changes to reduce the risk of AD. The second and third research questions were examined via separate 2 by 2 analysis of variance (ANOVA) models. Knowledge about AD and attitudes toward AD were the dependent variables, and the independent variables were age group and gender. Finally, hierarchical multiple regression was used to address the fourth and fifth questions. Attitudes toward AD were the outcome, and groups of predictors were entered sequentially in two steps. Step 1 included gender, age as a continuous variable, knowledge about AD, knowing someone with AD, and educational level (coded from 0 = less than high school to 5 = graduate or professional degree). Gender\*knowledge and age\*knowledge interactions were added in Step 2. Age and knowledge were mean-centered before the interaction terms were created. All statistical tests were evaluated at an alpha level of 0.05, two-tailed.

## RESULTS

### Comparison of Online Versus Paper

Preliminary analyses were conducted to examine whether there were any age or gender differences between participants who completed the survey online ( $n = 47$ ) versus those who completed paper surveys ( $n = 164$ ). An ANOVA showed no significant differences between the age compositions of both groups,  $F(1, 210) = 0.22, p = 0.64$ . Of the online participants, 68.9% were female, compared to 65.9% of the paper participants. A chi-square test of this difference was not significant,  $\chi^2(1) = 0.70, p = 0.72$ .

### Research Question 1

#### Knowing Someone

In the overall sample, 40.0% of individuals reported knowing a family member or friend with dementia. The proportion differed between older and younger adults, with 49.3% of older adults answering affirmatively, compared to 34.6% of younger adults. This difference was statistically significant,  $\chi^2(1) = 4.40, p = 0.04$ , partially supporting the first hypothesis. On the other hand, no significant gender difference was found,  $\chi^2(1) = 1.23, p = 0.27$ . However, it is important to note that a greater percentage of females (42.4%) responded affirmatively than men (34.3%).

#### Lifestyle

Just 15.2% of the sample reported making lifestyle and dietary changes to avoid the risk of dementia, and there was a significant difference between age groups,  $\chi^2(1) = 5.09, p = 0.02$ . Older adults (29.3%) were more likely to respond affirmatively than younger adults (11.0%). There were no significant gender differences,  $\chi^2(1) = 0.12, p = 0.73$ . These results supported the first hypothesis for age group but not gender.

## Concern

With regard to future concerns about caring for someone with AD or dementia, 28% of the sample was “not at all” concerned, 58.8% was “somewhat” concerned, and 13.3% was “very” concerned. There were no significant age group [ $\chi^2(2) = 2.96, p = 0.23$ ] and no significant gender [ $\chi^2(2) = 0.97, p = 0.62$ ] differences in how concerned individuals were.

## Research Question 2

The second research question addressed whether factual knowledge about AD differed by age or gender. An ANOVA showed a significant main effect for age group,  $F(1, 207) = 5.84, p = 0.02$ , partial  $\eta^2 = 0.03$ . Younger adults were less knowledgeable about AD than older adults, providing partial support for the second hypothesis. However, there were no significant gender differences [ $F(1, 207) = 2.22, p = 0.14$ , partial  $\eta^2 = 0.01$ ] and no significant interaction between age and gender [ $F(1, 207) = 2.52, p = 0.11$ , partial  $\eta^2 = 0.01$ ]. See Table 2 (the interaction is not shown in the table because it was not significant). Levene’s test was not significant,  $p = 0.21$ , indicating the homogeneity of variance assumption for ANOVA was satisfied.

Table 2

*Mean Levels of Knowledge about Alzheimer's Disease by Age Group and Gender*

Variable	Mean	SD
Age Group*		
Younger Adults	10.20	1.84
Older Adults	10.64	1.40
Gender		
Male	10.07	1.73
Female	10.49	1.68

\*Mean difference  $p < 0.05$ .

### Research Question 3

The third research question addressed whether attitudes about AD differed by age or gender. An ANOVA showed that the main effect for age group was significant,  $F(1, 207) = 7.22, p < 0.01$ , partial  $\eta^2 = 0.03$ . Surprisingly, the direction of this mean difference ran contrary to the third hypothesis. Older adults were expected to report more positive attitudes than younger adults, but the opposite was the case. The main effect for gender was not significant [ $F(1, 207) = 0.31, p = 0.58$ , partial  $\eta^2 < 0.01$ ], and neither was the interaction between age and gender [ $F(1, 207) = 2.96, p = 0.09$ , partial  $\eta^2 = 0.01$ ]. See Table 3 (the interaction is not shown in the table because it was not significant). Levene's test was not significant,  $p = 0.27$ , indicating satisfaction of the homogeneity of variance assumption.

Table 3

*Mean Levels of Attitudes toward Alzheimer's Disease by Age Group and Gender*

Variable	Mean	SD
Age Group*		
Younger Adults	100.25	13.62
Older Adults	93.52	12.90
Gender		
Male	96.08	10.93
Female	98.69	14.81

\*Mean difference  $p < 0.05$ .

#### Research Question 4

The fourth research question addressed the extent to which knowing someone with AD, factual knowledge of AD, and level of education would predict attitudes toward AD above and beyond age or gender. The overall regression model was significant at Step 1,  $R^2 = 0.10$ ,  $F(5, 205) = 4.60$ ,  $p < 0.001$ . Regression coefficients for the predictors in Step 1 are shown in Table 4. Age had a significant negative association with attitudes, while gender was not significant. The fourth hypothesis was partially supported in that having a family member or friend with AD, and greater knowledge of AD, significantly predicted more positive attitudes. Educational level was not significant, however. Tolerance levels for all predictors were well above 0.10, indicating that multicollinearity was not an issue (Table 4).

### Research Question 5

The fifth research question addressed whether age or gender would moderate the association between knowledge of AD and attitudes toward AD. When age\*knowledge and gender\*knowledge interactions were added in Step 2 of the regression model, there was no improvement in model fit,  $\Delta R^2 < 0.01, p = 0.95$ . The interaction terms were not significant (Table 4). The relationship between knowledge about AD and attitudes towards AD does not appear to vary by age or gender.

Table 4

*Hierarchical Regression Analysis of Predictors of Attitudes toward Alzheimer's Disease*

Variable	<i>B</i>	<i>SE (B)</i>	<i>B</i>	<i>p</i>	Tolerance
Step 1					
Level of Education	1.44	1.00	0.10	0.15	0.99
Knowledge of AD	1.26	0.54	0.16	0.02*	0.96
Knowing Person with AD	4.09	1.88	0.15	0.03*	0.96
Age	-0.15	0.04	-0.23	0.01*	0.97
Gender	1.59	1.98	0.05	0.42	0.97
Step 2					
Age*Knowledge	-0.01	0.03	-0.02	0.78	0.94
Gender*Knowledge	-0.19	1.15	-0.02	0.87	0.32

\* $p < 0.05$ .

*Note.* AD = Alzheimer's disease. Age was a continuous variable. Educational level was from 0 = less than high school to 5 = graduate or professional degree. Knowing a person with AD was coded as no = 0 and yes = 1. Age and knowledge were mean-centered.



## DISCUSSION

The current study was one of the first to examine knowledge and attitudes about Alzheimer's disease in a community-based sample of adults, with a focus on age and gender disparities. The research questions were informative, because negative attitudes often lead to maltreatment, increased social distance and ultimately exclusion from social relationships. Data were obtained from 211 individuals from the Fargo-Moorhead community. In general, no significant gender differences were found for any of the variables examined. The men and women in this sample appeared to have similar exposure to AD, knowledge about AD, and attitudes toward AD. The average attitude leaned toward the positive end of the scale, providing a more optimistic view than previous research has afforded (O'Connor & McFadden, 2012; Werner & Heinik, 2008). Hypotheses regarding age differences were supported in part.

As expected, older adults were more likely than younger adults to report having a family member or friend with AD. This finding reflects the fact that most people with AD are over age 65 (Alzheimer's Association, 2014). However, only a minority of the overall sample (40%) responded affirmatively to this question, suggesting that many adults lack direct experience with AD, which could contribute to stigma (Blay & Peluso, 2010; O'Connor & McFadden, 2012). Additionally, more participants might have reported knowing someone with AD if the question had been worded broadly, rather than being specific to family and friends.

Nearly 60% of the sample was at least "somewhat" concerned about someday caring for someone with AD, while another 13% were "very" concerned. There were no age differences in these proportions, which may indicate that younger adults are at least willing to entertain the possibility, if only in a hypothetical sense. Despite their concerns, only 15% of the sample reported making lifestyle or dietary changes to reduce their risk of AD. Older adults were more

likely to report doing so than younger adults, which supports previous research on terror management theory. In a controlled condition, when reminded about death, research has shown that adults over age 60 express greater intention to engage in healthy behaviors than adults aged 18-30 (Bevan, Maxfield, & Bultmann, 2014). The result obtained for this present study takes a further step by showing that in regards to AD, older adults are more likely to make positive changes that impact their health. However, such participants were still in the minority. Given that age is the biggest risk factor for AD, this may reflect a certain level of denial (Alzheimer's Association, 2014; MetLife Foundation, 2011).

As hypothesized, older adults had a higher average score on the knowledge about AD questionnaire compared to younger adults. This finding may reflect older adults' greater familiarity with AD from being exposed to others with the condition. Previous studies have suggested that ageism contributes to younger people not learning as much about age-related conditions, which may then lead to further social distance (Bodner, 2009; Cottle & Glover, 2007; Damron-Rodriguez, Funderburk, Lee, & Solomon, 2004; Nelson, 2005; Sorgman & Sorenson, 2001).

With regard to attitudes about AD, younger adults were expected to have less positive attitudes than older adults, in keeping with previous work on ageism (Allan & Johnson, 2009; Cuddy et al., 2005; Rupp et al., 2005). However, the opposite was the case--younger adults held more positive attitudes than the older generation. Older participants' attitudes did lean toward the positive, on average (their mean attitude score was 93.52 out of a possible 140). Younger participants just had an even higher average score ( $M = 100.25$ ).

In a few prior studies, college students did report prosocial emotions toward people with AD, such as sympathy (O'Connor & McFadden, 2010). One study found that a majority of

young adults would consider caring for an elderly relative to avoid nursing home placement (Dellman-Jenkins & Pinkard, 2000). Young adult caregivers have addressed older care recipients' emotional needs by uplifting their spirits, calming their fears, tolerating and exhibiting patience for those with AD, ceasing from doing or uttering things that do not preserve their self-worth, and reminiscing on good memories (Piercy & Chapman, 2001). It may be that these prosocial desires, and the "warm" stereotype content dimension, predominated among the younger participants in the current study. This could indicate that they had a more person-centered view of individuals with AD, but may also reflect unrealistic idealism and pity (O'Connor & McFadden, 2012).

As for the older group, their greater knowledge and exposure to AD may simply have given them a more realistic attitude. Evidence suggests that greater education and exposure to a stigmatized group improves other people's attitudes (Webb et al., 2009; Yamashita et al., 2011), but this effect may be tempered by difficult behaviors exhibited by the group (Webb et al., 2009). Older participants may have seen the problem behaviors that occur in AD, perhaps even as primary caregivers (Family Caregiver Alliance, 2014). Younger generations on the other hand are more likely to be peripherally involved (Levine et al., 2005; Sutor & Pillemer, 1993), and therefore only superficially knowledgeable. A significant negative association between age and attitudes about AD was still apparent in the regression analyses, which controlled for other factors and included age as a continuous variable.

The regression analyses also showed that knowing someone with AD and factual knowledge about AD significantly predicted positive attitudes, above and beyond age and gender. Educational level was not a significant predictor. Moreover, the correlation between education and knowledge was found to be just  $-0.03$  ( $p = 0.66$ ). While these non-significant

associations may be partially due to the limited range of the education variable, it suggests that understanding and feelings about AD are independent of the level of education a person possesses. Facts about AD (and aging in general) need to be acquired outside the school system, which underscores the importance of assessing people's knowledge about AD and offering customized community education programs (Jones et al., 2013). The positive association between factual knowledge and attitudes did not vary by age or gender, suggesting that educational programs could equally benefit different age and gender groups.

For every outcome variable examined, there were no significant gender differences, even though women outnumber men especially at old age, and also face more chronic illnesses than men (Laidlaw & Pachana, 2009). Many studies have suggested that males tend to be more ageist than females, and females tend to have more exposure to individuals with AD (Allan & Johnson, 2009; Allen et al., 2009; Bodner et al., 2012). However, little was previously known about gender differences in knowledge and attitudes towards people with AD. It may be that men and women have similar views regarding AD, regardless of their attitudes toward older adults in general. Further research should explore this possibility.

While the current study was informative, there were limitations. First, this research was a cross-sectional survey of adults in a narrow geographical region. Therefore, it is necessary to examine these trends in other areas in North America and other nations where AD is common. Attitudes and knowledge of people towards individuals with AD may be influenced by geographical location, as the population of older adults varies by state. Hence, adults residing in a state with a greater number of older adults may be more knowledgeable and have more positive attitudes towards individuals with AD or vice versa, depending on culture and outreach programs available. Second, the sample contained few middle-aged adults relative to adults in other age

ranges, which could limit generalizability. Additionally, 98% of the participants were Caucasians, so future work should include a more ethnically diverse sample. Third, the sample may have a selection bias, because individuals who were not interested in the study probably did not choose to participate; this also limits generalizability. Finally, the question about knowing a friend or family member with AD could have been worded more broadly, to capture whether participants knew or had known anyone with AD in another capacity.

Despite these limitations, the current study has some potentially important implications and future directions. For example, the findings suggested that many adults lack direct experience with AD, as only a minority (40%) of the sample had a friend or family member with AD. To address this, special community functions could be developed in which individuals with AD, especially in the early-mid stages, would be actively involved, along with members of the community. This could increase contact, dispel stereotypes, gradually eliminate social distance, and enhance personhood. Additionally, the overall average attitude in the sample was positive, suggesting that adults in all age groups would be receptive toward learning more about AD. The findings also showed that a majority of the sample was concerned about developing AD, but only 15% reported making lifestyle changes to reduce their risk. This implies that unlike other age-related diseases—cardiovascular disease for instance—many people may not be aware of risk factors for AD. Therefore, as developmental programs are being developed to promote positive attitudes, there should also be more publicity about diet and lifestyle factors that reduce the risk of developing AD. Lastly, future studies could investigate how flexible people are at changing negative attitudes towards individuals with AD in community-based settings.

In conclusion, the present study added to the literature by examining age and gender disparities in knowledge of AD and attitudes about AD in a community based sample. Given

population aging and the rise in AD cases, it is crucial to understand the attitudes caregivers and community members have toward such individuals, in order to promote personhood (Nelson, 2005). The findings of this study could inform the development of educational and outreach programs in which more positive attitudes can be promoted. Ultimately, changes in attitudes could improve the well-being of people with AD and prepare community members for caregiving or social service jobs.

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## APPENDIX A: KNOWLEDGE OF ALZHEIMER'S DISEASE QUESTIONNAIRE

1. The primary symptom of Alzheimer's disease is memory loss. True/False
2. Most people with Alzheimer's disease live in nursing homes. True/False
3. The first signs of Alzheimer's disease usually occur before age 60. True/False
4. Men are more likely to develop Alzheimer's disease than women. True/False
5. Scientists have discovered a gene that causes most types of Alzheimer's disease. True/False
6. Drugs are available to treat the symptoms of Alzheimer's disease. True/False
7. Drugs are available to prevent Alzheimer's disease. True/False
8. Alzheimer's disease is just one of many types of dementia. True/False
9. There is no known cure for Alzheimer's disease. True/False
10. Alzheimer's disease can be diagnosed by a blood test. True/False
11. The number of people with Alzheimer's disease is now higher than ever. True/False
12. Significant loss of memory and mental ability, commonly known as senility, is a normal part of aging. True/False
13. People with Alzheimer's disease usually die within a year or 2 after developing the disease. True/False
14. Alzheimer's disease is the most common type of chronic cognitive impairment among the aged. True/False

## APPENDIX B: DEMENTIA ATTITUDES SCALE

All items are rated on the following scale: 1 = strongly disagree 2 = disagree  
3 = slightly disagree 4 = neutral 5 = slightly agree 6 = agree 7 = strongly agree

1. It is rewarding to work with people who have dementia.
2. I am afraid of people with dementia.
3. People with dementia can be creative.
4. I feel confident around people with dementia.
5. I am comfortable touching people with dementia.
6. I feel uncomfortable being around people with dementia.
7. Every person with dementia has different needs.
8. I am not very familiar with dementia.
9. I would avoid an agitated person with dementia.
10. People with dementia like having familiar things nearby.
11. It is important to know the past history of people with dementia.
12. It is possible to enjoy interacting with people with dementia.
13. I feel relaxed around people with dementia.
14. People with dementia can enjoy life.
15. People with dementia can feel when others are kind to them.
16. I feel frustrated because I do not know how to help people with dementia.
17. I cannot imagine taking care of someone with dementia.
18. I admire the coping skills of people with dementia.
19. We can do a lot now to improve the lives of people with dementia.
20. Difficult behaviors may be a form of communication for people with dementia.