

ARTICLE

# Age differences in attitudes about older adults with dementia

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## Abstract

Dementia, a term that describes a variety of brain conditions marked by gradual, persistent and progressive cognitive decline, affects a significant proportion of older adults. Older adults with dementia are sometimes perceived less favourably than those without dementia. Furthermore, compared to persons without dementia, those with dementia are often perceived by others as having reduced personhood. This study was aimed at investigating whether differences in attitudes towards dementia and personhood perceptions vary as a function of age group, care-giver status, attitudes towards ageing, dementia knowledge, gender and education. In total 196 younger, middle-aged and older adults were recruited. Findings revealed that being a care-giver as well as having less ageist attitudes were predictive of being more comfortable around persons with dementia, having more knowledge about dementia and ascribing greater personhood to people with dementia. Those with more dementia knowledge (prior to the study) were less comfortable around people with dementia. Finally, when controlling this prior dementia knowledge, older adults were more comfortable around people with dementia compared to younger and middle-aged adults. Gender and education were not associated with any of the variables under study. Findings contribute to a better understanding of the role of age- and care-giver-related factors in the determination of attitudes towards dementia.

**Keywords:** ageing; dementia; attitudes; personhood; care-givers

## Introduction

On a global scale, the proportion of older adults in the population is growing at an unprecedented rate. Importantly, with our population's increasing age comes an increase in the prevalence of dementia (Prince *et al.*, 2013, 2016; Duong *et al.*, 2017; World Health Organization, 2017; Wu *et al.*, 2017). As dementia affects an increasing number of people, associated direct and indirect costs are also increasing (Wimo *et al.*, 2010, 2017; Wong *et al.*, 2016; Cloutier *et al.*, 2017).

Dementia literacy, defined as beliefs and knowledge about dementia that promote recognition, management or prevention of the condition (Low and Anstey,

2009), is, therefore, of importance to our society (Annear *et al.*, 2015). Care-givers of individuals with dementia as well as laypersons tend to have insufficient knowledge about dementia (Low and Anstey, 2009; McParland *et al.*, 2012; Cahill *et al.*, 2015; Glynn *et al.*, 2017; Cations *et al.*, 2018). For example, laypersons often believe the myth that dementia is a normal part of ageing (Cahill *et al.*, 2015; Cations *et al.*, 2018).

Of note, demographic characteristics may also be related to one's general dementia knowledge. Dementia knowledge, for instance, is greater among younger adults and those with relatively higher levels of education (Sahin *et al.*, 2006; Li *et al.*, 2011). While general dementia knowledge does not differ by gender, women tend to have greater awareness of specific dementia symptoms compared to men (Sahin *et al.*, 2006).

Given that dementia primarily affects older adults, it is important to consider negative attitudes and stereotypes towards ageing. According to the Social Identity Theory (Tajfel and Turner, 1979), people seek to define the group to which they belong in positive terms and the opposing group, to which they do not belong, in negative terms. When applied to ageing, we can see how younger adults may project negative attitudes on to older adults to promote a more positive image of their own group of younger adults (Harwood, 2007). Terror Management Theory (Greenberg *et al.*, 1986) offers another explanation for negative attitudes towards ageing. According to this theory, we avoid situations that remind us that death is inescapable. In terms of ageing, this theory suggests that younger adults avoid situations involving older adults, including older adults with dementia (O'Connor and McFadden, 2012), as a way of preserving the belief that death is only a distant possibility. It has been suggested that, by psychologically distancing themselves from older adults, younger adults may be able to have more positive attitudes about ageing (Calasanti, 2005).

Attitudes towards ageing can be influenced by a myriad of factors. For example, increased knowledge about ageing leads to reduced anxiety about ageing and, subsequently, to fewer negative attitudes towards older adults (Allan and Johnson, 2008). Similarly, increased contact with older adults reduces these negative attitudes (Schuldberg, 2005). However, the type of contact is of relevance: persons residing with older adults have more anxiety about ageing compared to persons who have regular contact with older persons in their work environment (Allan and Johnson, 2008). Age also plays a role in attitudes towards ageing. That is, negative attitudes towards ageing are prevalent in younger and middle-aged adults but not in older adults (Kite *et al.*, 2005).

Attitudes towards ageing also tend to influence attitudes about dementia because people believe that dementia is a normal part of ageing (Corner and Bond, 2004). Thus, people with negative attitudes about ageing may also have more negative dementia attitudes. Moving beyond attitudes towards ageing, dementia generally has been associated with negative attitudes (Jolley and Benbow, 2000; Sahin *et al.*, 2006).

These negative attitudes can be related to demographic characteristics. That is, attitudes towards dementia may vary by age and level of educational attainment (Heese, 2015). For example, younger adults have more positive attitudes towards dementia than older adults (Cheston *et al.*, 2016). On the other hand, middle-aged

adults are more likely to be ashamed of having family members with dementia than are younger and older adults (Zhang *et al.*, 2017). Contact with persons with dementia increases positive attitudes towards dementia (Cheston *et al.*, 2018). Finally, people with more dementia knowledge tend to have more positive attitudes towards dementia (Song, 2002; Lee, 2012).

Personhood, a construct that is closely related to attitudes towards ageing and dementia, has been conceptualised as ‘a standing or status that is bestowed upon one human being, by others, in the context of relationship and social being ... impl[y]ing, recognition, respect, and trust’ (Kitwood, 1997: 8). If an individual is unable to communicate information verbally about his or her life because of dementia, it may become more challenging to ascribe personhood to that individual. In fact, persons with dementia tend to be ascribed less personhood than those without dementia (Miron *et al.*, 2017). As well, dementia care decisions can be influenced by personhood perceptions (Malloy and Hadjistavropoulos, 2004; Hunter *et al.*, 2013).

Our primary goal was to assess systematically whether attitudes towards ageing and a person’s age influenced attitudes and perceptions regarding dementia. We also examined the influence of care-giver status, dementia knowledge, gender and education on attitudes towards dementia and personhood perceptions.

## Methodology

### Participants

Eligible participants included those who were between 18 and 35 years (*i.e.* younger adults), between 40 and 60 years (*i.e.* middle-aged adults) and over 65 years (*i.e.* older adults), including informal care-givers of at least one older adult with dementia. In order to maximise sample representativeness by not relying on a local sample, participants were recruited through the online Qualtrics panels system (<https://www.qualtrics.com/>). This widely adopted method of recruitment is increasingly used by many North American research universities (*e.g.* Tomfohrde and Reinke, 2016; Ammaturo *et al.*, 2017; Torres *et al.*, 2017). The Qualtrics panels system maintains a database of several million North American residents and use of this system maximises sample representativeness by including a variety of participants from across North America who match the target demographic. Sampling strategies used by Qualtrics panels also minimise biases inherent in recruiting samples from the local community. In other words, Qualtrics panels have access to a more diverse demographic than can be found locally. Before they participate in a study through Qualtrics panels, potential participants complete detailed questionnaires about their demographics such as age, gender and level of education. This information is checked for accuracy by Qualtrics panels before potential participants are approved for the study. Checks for data accuracy are also incorporated throughout the survey. Incentive programmes are provided by Qualtrics panels to reward participants and promote engagement in research studies.

Qualtrics used a data-sampling method involving demographic screening questions (to assess eligibility for participation in this study based on age, gender and care-giving status) and our desired sample size. Compensation for participation in this study was provided via Qualtrics panels. Prior to participating in this

study, participants provided informed consent. All information obtained as part of the study was kept confidential. Approval for this study was granted by our institutional ethics review board.

## **Measures**

### *Demographics Information Sheet*

The Demographic Information Sheet included questions about age, gender, level of education and contact with persons with dementia.

### *Dementia Knowledge Questionnaire*

The Dementia Knowledge Questionnaire (DKQ; Graham *et al.*, 1997) is a measure used to assess knowledge about dementia. We used a modified version of the DKQ that consisted of seven questions with the highest possible total score being 16. Knowledge in the areas of basic knowledge, epidemiology, symptoms and causes of dementia is assessed throughout the questionnaire. The DKQ has good predictive validity when comparing care-givers with varying degrees of contact with services for older adults with dementia (Graham *et al.*, 1997). That is, care-givers in contact with an Alzheimer's support group were the most knowledgeable and care-givers with no contact with mental health services for older adults were the least knowledgeable.

### *Dementia Attitudes Scale*

The Dementia Attitudes Scale (DAS; O'Connor and McFadden, 2010) is a measure of attitudes towards dementia. It consists of 20 items with a two-factor structure. Items in Factor 1 (*i.e.* social comfort) address the affective and behavioural domains of dementia while items in Factor 2 (*i.e.* dementia knowledge) address the cognitive domain. Higher scores on this scale are indicative of more positive attitudes. The measure was validated among college students and certified nursing assistant students. Cronbach's alpha values for the DAS were between 0.83 and 0.85. Significant correlations were reported between the DAS and other relevant measures (*e.g.* Attitudes Toward Old People Scale – Kogan, 1961; Scale of Ageism – Fraboni *et al.*, 1990), providing supportive evidence of convergent validity for the DAS. Further evidence of construct validity is supported by the finding that more frequent contact with persons with dementia was positively correlated with more positive attitudes on the DAS (Jackson *et al.*, 2008). In our study, both the social comfort and dementia knowledge sub-scales of the DAS had good internal reliability with Cronbach's alpha values of 0.811 and 0.817, respectively.

### *Ambivalent Ageism Scale*

The Ambivalent Ageism Scale (AAS; Cary *et al.*, 2017) is a 13-item measure of attitudes towards older adults. The measure includes two sub-scales: benevolent items represent patronising behaviours and paternalistic attitudes, and hostile items represent hostile behaviours and attitudes towards older adults. The AAS is a psychometrically sound instrument with good test-retest reliability ( $\alpha = 0.80$ ) and excellent internal consistency ( $\alpha = 0.91$ ). The AAS was shown to be highly

correlated with the Fraboni Scale of Ageism (FSA; Fraboni *et al.*, 1990). High hostile ageist beliefs are linked to a perception of older adults as cold and incompetent, regardless of benevolent beliefs (Cary *et al.*, 2017). In contrast, low hostile ageist beliefs and high benevolent ageist beliefs are accompanied by a perception of older adults as warm and incompetent (Cary *et al.*, 2017). This finding is of relevance because it reveals that the two sub-scales predict warmth and competence in different ways. In our study, the benevolent and hostile sub-scales of the AAS had good internal reliability with Cronbach's alpha values of 0.899 and 0.879, respectively.

### *Personhood in Dementia Questionnaire*

The Personhood in Dementia Questionnaire (PDQ; Hunter *et al.*, 2013) is a 20-item measure of health-care professionals' person-centred attitudes towards those with dementia. The PDQ is comprised of ten themes centring on personhood (e.g. emotional capacity, cognitive capacity, personality, psychological continuity; Hunter *et al.*, 2013). For the purposes of this study, since informal care-givers and laypersons were asked to complete this questionnaire rather than only health-care professionals, the term 'residents' was replaced with 'individuals' in the PDQ. The PDQ has been found to have a Cronbach's alpha value of 0.79 (Hunter *et al.*, 2013). The Pearson product-moment correlation between the PDQ and a modified version of the personhood sub-scale of the Person-directed Care measure showed moderate convergent validity (Hunter *et al.*, 2013). The PDQ has been shown to predict clinical care intentions (Hunter *et al.*, 2013), long-term care staff resilience (Williams *et al.*, 2015) and long-term care staff burnout (Hunter *et al.*, 2016). In our study, the PDQ had good internal reliability with a Cronbach's alpha value of 0.857.

### *Procedure*

Prior to beginning the study, participants completed a demographic information sheet which included questions about age, gender, level of education and contact with persons with dementia. First, participants completed the DKQ to capture their existing dementia knowledge (*i.e.* DKQ1). Second, information about dementia (*see* Table 1) was presented to participants in audio and written form. This was done in order to ensure that participants had a reasonable understanding of dementia prior to filling out the various questionnaires. Third, participants completed the DKQ a second time (*i.e.* DKQ2) to examine if their dementia knowledge increased as a result of being presented with the information about dementia. Finally, participants completed the AAS, DAS and PDQ to assess attitudes towards ageing, attitudes towards dementia and personhood perceptions, respectively.

### *Statistical analyses*

All dependent variables were screened for accuracy of data entry and missing values through the examination of descriptive statistics. Values for each variable were within range. Means and standard deviations (SD) for each variable were plausible. Missing values were not identified. The variables were then examined for univariate

**Table 1.** Dementia information

- Dementia is a neurological condition that affects the brain.
- There are several types of dementia, but Alzheimer's disease is the most common.
- Dementia is a group of conditions that involve a deterioration of the ability to speak, think and reason.
- Dementias cause a gradual deterioration of cognitive abilities and in moderate to severe stages, people with dementia may require 24-hour care.
- Over 5 per cent of people over the age of 65 have Alzheimer's disease or another dementia.
- Dementia can affect ability to think, reasoning, memory, speech, continence, vision and life expectancy.
- There is no known cure for the vast majority of dementias.
- Several factors can cause dementia, *e.g.* diet, infection, hereditary factors, stroke and alcohol. Contrary to popular belief, dementia is not caused by old age *per se*.

outliers. As recommended by Tabachnick and Fidell (2013), cases in which standardised *z*-scores exceeded 3.29 were considered as potential univariate outliers. Univariate outliers were not identified.

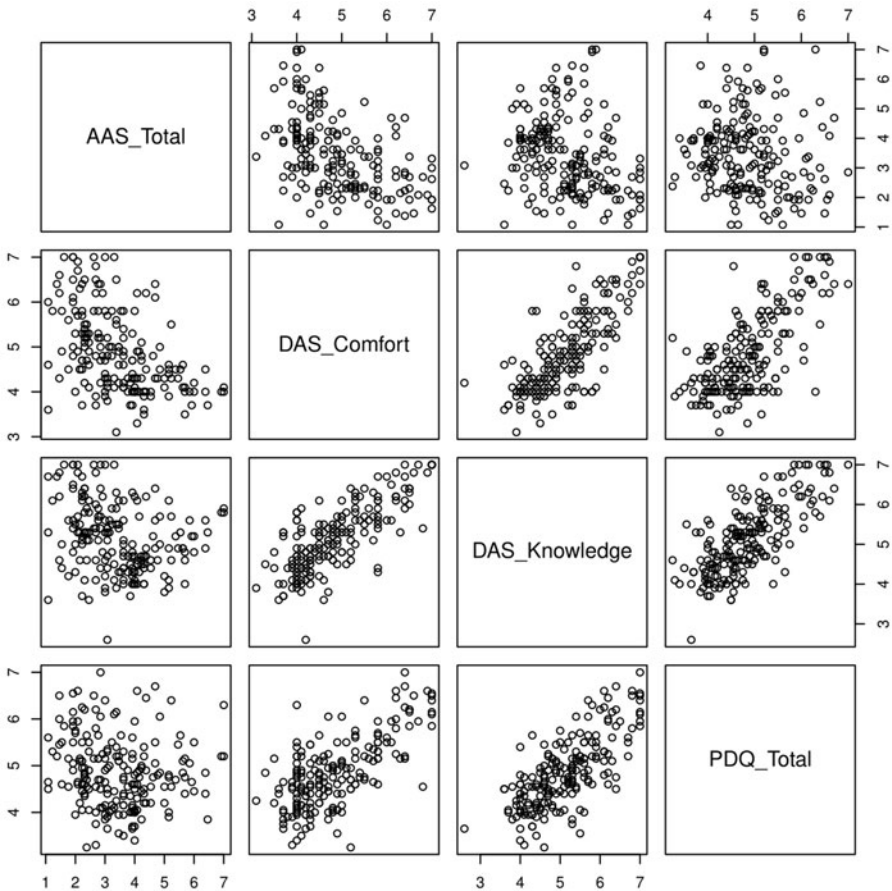
Finally, an examination of histograms, skewness and kurtosis statistics, and probability plots for comfort around people with dementia, knowledge about dementia and personhood perceptions was carried out. Residual plots for each of the dependent variables suggested an adequate normality assumption for the regression model. Pairs plots suggested negative associations between attitudes towards ageing and each of the dependent variables (*see* Figure 1). Boxplots provided a comparison of the distributions of the dependent variables by care-giver status, age groups, gender and education (*see* Figure 2).

As a manipulation check, differences in dementia knowledge prior to (mean = 7.5459, SD = 2.92521) and following (mean = 13.3367, SD = 3.72777) the presentation of dementia information was examined. This was done to ensure that our educational intervention was successful in increasing dementia knowledge. A paired-samples *t*-test was conducted. As expected, a significant main effect of dementia knowledge before and after the presentation of dementia-related information was found,  $t(195) = -23.542$ ,  $p < 0.001$ .

For the primary analysis, a series of multiple regression models were conducted to examine if attitudes towards ageing, age groups, care-giver status, dementia knowledge, gender and education predicted attitudes towards dementia and personhood perceptions. Interactions between age group and dementia knowledge were also investigated. A separate multiple regression model was carried out for each dependent variable (*i.e.* DAS – Comfort, DAS – Knowledge, PDQ). For each multiple regression model, the full model as well as each independent variable's unique contribution to the dependent variable after all other independent variables have been controlled for was examined.

## Results

The final sample included 196 participants. The sample's demographic characteristics are summarised in Table 2. Relevant means and standard deviations across



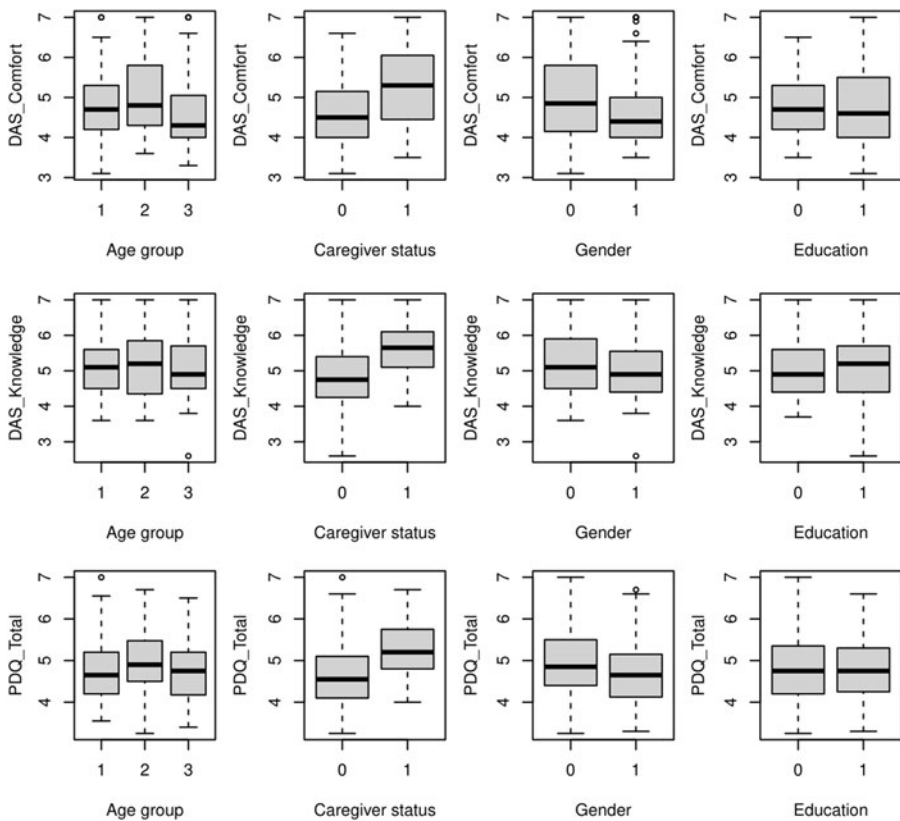
**Figure 1.** Pairs plots showing correlations between attitudes towards ageing, attitudes towards dementia and personhood perceptions.

Notes: AAS: Ambivalent Ageism Scale. DAS: Dementia Attitudes Scale. PDQ: Personhood in Dementia Questionnaire.

age groups and care-giver status are presented in Table 3. For each of the three response variables (*i.e.* comfort around people with dementia, knowledge about dementia, personhood perceptions), a multiple regression model was fitted. The independent variables included attitudes towards ageing, age groups, care-giver status, dementia knowledge prior to and following the presentation of dementia information, gender, education, and the interaction between age groups and dementia knowledge prior to the presentation of dementia information. Prior to these analyses, attitudes towards ageing and dementia knowledge were centred to be more representative of scores across age groups.

Tables 4–6 show the regression models that were fitted. Each of the three response variables were significantly predicted by the full model,  $p < 0.001$ . Thus, an examination of each independent variable's unique contribution to the full model was carried out for each response variable. Age groups, gender and





**Figure 2.** Boxplots comparing the distributions of each dependent variable by age groups, care-giver status, gender and education.

Notes: DAS: Dementia Attitudes Scale. PDQ: Personhood in Dementia Questionnaire.

education were not associated with any of the response variables. Significant associations for each of the response variables are discussed in the paragraphs below.

As shown in Table 4, attitudes towards ageing ( $p < 0.001$ ), care-giver status ( $p < 0.001$ ), dementia knowledge prior to the presentation of dementia information ( $p < 0.05$ ), and the interaction between age groups and dementia knowledge prior to the presentation of dementia information ( $p < 0.05$ ) made independent and unique contributions to the full model predicting DAS – Comfort scores. That is, more negative attitudes towards ageing were a significant predictor of less comfort around people with dementia. Care-givers (compared to non-care-givers) were more comfortable around people with dementia. Those who had greater knowledge about dementia prior to the presentation of dementia information were less comfortable around people with dementia. However, upon examination of the interaction of dementia knowledge and age group, it was revealed that older adults who had greater knowledge about dementia prior to the presentation of dementia information were more comfortable around those with dementia compared to their older adult counterparts who had less prior dementia knowledge.



**Table 2.** Frequencies for demographic characteristics of the sample

	N (%)
Age groups:	
Younger adults (18–35 years)	71 (36.2)
Middle-aged adults (40–60 years)	60 (30.6)
Older adults (over 65 years)	65 (33.2)
Care-giver status:	
Care-givers	56 (28.6)
Non-care-givers	140 (71.4)
Gender:	
Males	84 (42.9)
Females	112 (57.1)
Education:	
Without post-secondary education	58 (29.6)
With post-secondary education	138 (70.4)

**Table 3.** Relevant means and standard deviations (SD) for the sample

	DAS – Comfort	DAS – Knowledge	PDQ
	<i>Mean values (SD)</i>		
Age groups:			
Younger adults	4.71 (0.95)	5.08 (0.92)	4.84 (0.76)
Middle-aged adults	5.05 (0.90)	5.18 (0.90)	4.94 (0.80)
Older adults	4.83 (0.85)	5.11 (0.85)	4.78 (0.75)
Care-giver status:			
Care-givers	5.28 (1.03)	5.66 (0.78)	5.32 (0.69)
Non-care-givers	4.68 (0.80)	4.90 (0.84)	4.66 (0.72)

Notes: DAS: Dementia Attitudes Scale. PDQ: Personhood in Dementia Questionnaire.

As shown in Table 5, attitudes towards ageing ( $p < 0.001$ ) and care-giver status ( $p < 0.001$ ) made independent and unique contributions to the full model predicting DAS – Knowledge scores. More negative attitudes towards ageing was a significant predictor of less knowledge about dementia. Care-givers had more knowledge about dementia compared to non-care-givers.

As shown in Table 6, attitudes towards ageing ( $p < 0.05$ ) and care-giver status ( $p < 0.001$ ) made independent and unique contributions to the prediction of PDQ scores. More negative attitudes towards ageing was a significant predictor of ascribing less personhood to persons with dementia. Compared to non-care-givers, care-givers ascribed more personhood to persons with dementia.

**Table 4.** Results for the linear regression model for comfort around people with dementia (Dementia Attitudes Scale – comfort)

	$\beta$	SE	$p$
Intercept	4.63	0.14	0.00
AAS	-0.39	0.05	0.00
Age groups (middle-aged adults)	0.23	0.14	0.09
Age groups (younger adults)	0.25	0.14	0.08
Care-giver status (care-givers)	0.75	0.12	0.00
DKQ1	-0.09	0.04	0.04
DKQ2	0.00	0.02	0.98
Gender (males)	-0.20	0.11	0.07
Education (more than high school)	-0.04	0.12	0.75
Age groups (middle-aged adults): DKQ1	0.10	0.05	0.05
Age groups (younger adults): DKQ1	0.14	0.05	0.01
Full model	$F(10, 185) = 13.42, R^2 = 0.4204$		0.00

Notes: AAS: Ambivalent Ageism Scale. DKQ1: first administration of the Dementia Knowledge Questionnaire. DKQ2: second administration of the Dementia Knowledge Questionnaire. SE: standard error.

## Discussion

This study involved a systematic evaluation of differences in attitudes towards dementia and personhood perceptions as a function of age, attitudes towards ageing and care-giver status. The influence of dementia knowledge, gender and education was also examined. Age-related differences in attitudes towards dementia and related personhood perceptions have not been investigated previously in a systematic fashion. Thus, evaluation of age-related differences in perceiving people with dementia makes a novel contribution to the literature.

### **Impact of age- and care-giver-related variables on attitudes towards and perceptions of dementia**

While the Social Identity Theory (Tajfel and Turner, 1979) suggests that younger adults would likely have more negative attitudes towards older people (and, consequently, towards dementia) when compared to middle-aged and older adults, the Terror Management Theory (Greenberg *et al.*, 1986) suggests that younger adults would likely have more positive attitudes because they are able to psychologically distance themselves from older adults (Calastanti, 2005). Contrary to our expectation, findings from this study did not provide support for either of these theories

**Table 5.** Results for the linear regression model for knowledge about dementia (Dementia Attitudes Scale – knowledge)

	$\beta$	SE	$p$
Intercept	4.86	0.15	0.00
AAS	-0.22	0.05	0.00
Age groups (middle-aged adults)	0.06	0.15	0.67
Age groups (younger adults)	0.20	0.15	0.19
Care-giver status (care-givers)	0.83	0.13	0.00
DKQ1	-0.05	0.05	0.32
DKQ2	0.00	0.02	0.90
Gender (males)	-0.13	0.12	0.28
Education (more than high school)	0.02	0.13	0.90
Age groups (middle-aged adults): DKQ1	0.07	0.06	0.21
Age groups (younger adults): DKQ1	0.09	0.05	0.10
Full model	$F(10, 185) = 7.215, R^2 = 0.2806$		0.00

Notes: AAS: Ambivalent Ageism Scale. DKQ1: first administration of the Dementia Knowledge Questionnaire. DKQ2: second administration of the Dementia Knowledge Questionnaire. SE: standard error.

within the context of attitudes towards older people with dementia. That is, being a younger adult was not significantly associated with being more comfortable around persons with dementia, having more knowledge about dementia or ascribing higher personhood to those with dementia.

It is possible that age itself was not as salient a factor in predicting attitudes towards dementia and personhood perceptions as attitudes towards ageing. That is, our study demonstrated that more negative attitudes towards ageing was predictive of less comfort around people with dementia, less knowledge about dementia and lower ascribed personhood to those with dementia. Thus, regardless of age, attitudes towards ageing appear to play a central role in attitudes and perceptions regarding dementia. As well, those with more dementia knowledge prior to the presentation of dementia information were likely to be more comfortable around people with dementia. When controlling for this prior dementia knowledge, older adults appeared to be significantly more likely to be comfortable around persons with dementia than their younger or middle-aged counterparts.

In addition to age-related factors, we studied the role of care-giver status in attitudes towards dementia and personhood perceptions. In our study, being a care-giver was predictive of being more comfortable around people with dementia and having more knowledge about dementia. This is consistent with previous research reporting more positive attitudes towards dementia being associated with more dementia contact (e.g. Moyle *et al.*, 2011; Cheston *et al.*, 2018). Seeing

**Table 6.** Results for the linear regression model for personhood perceptions (Personhood in Dementia Questionnaire)

	$\beta$	SE	p
Intercept	4.68	0.14	0.00
AAS	-0.10	0.05	0.04
Age groups (middle-aged adults)	0.15	0.13	0.25
Age groups (younger adults)	0.18	0.14	0.18
Care-giver status (care-givers)	0.70	0.12	0.00
DKQ1	-0.01	0.04	0.78
DKQ2	0.01	0.02	0.73
Gender (males)	-0.19	0.11	0.08
Education (more than high school)	-0.08	0.11	0.48
Age groups (middle-aged adults): DKQ1	0.03	0.05	0.54
Age groups (younger adults): DKQ1	0.03	0.05	0.51
Full model	$F(10, 185) = 5.177, R^2 = 0.2186$		0.00

Notes: AAS: Ambivalent Ageism Scale. DKQ1: first administration of the Dementia Knowledge Questionnaire. DKQ2: second administration of the Dementia Knowledge Questionnaire. SE: standard error.

as care-givers spend more time with older adults with dementia, it was also expected that care-givers would ascribe higher levels of personhood to those with dementia compared to non-care-givers (Wimo *et al.*, 2002). Our findings were consistent with this hypothesis. That is, care-giver status was predictive of personhood perceptions, with care-givers ascribing higher levels of personhood to those with dementia compared to non-care-givers. This finding may be explained by the increased contact that care-givers have with persons with dementia compared to dementia-related contact of non-care-givers. Care-givers in this study had at least one family member with dementia and were in contact with this family member at least once per month. This interaction creates opportunities for care-givers to provide person-centred care, which has been shown to effectively increase the likelihood of ascribing personhood in those with dementia (Moyle *et al.*, 2011).

### **Directions for future research**

Several limitations should be considered when interpreting findings from this study. Online recruitment may lead to limited generalisability of the findings. For example, persons without internet access would have been excluded from the study. In future studies, participants could also be recruited within the local community to include those without internet access. Moreover, the findings from our study are correlational in nature. Thus, further experimental investigations in this area would provide a

clearer and more comprehensive understanding of differences in attitudes towards dementia and personhood perceptions. A longitudinal study could be carried out to assess the effects of attitudes towards ageing, age and care-giver status over a longer period of time. Given that attitudes towards ageing and care-giver status were consistently predictive of attitudes towards dementia and personhood perceptions, future investigations could examine whether the presentation of information that tackles ageist beliefs and/or increased opportunities to care for older adults with dementia improves attitudes towards and perceptions of those who have dementia. Finally, the measurement of attitudes through the use of self-report scales does not necessarily translate into actual behaviours. It would be valuable for experimental studies to investigate the role of attitudes towards ageing, age and care-giver status in behaviours that persons engage in when interacting with older persons with dementia.

## Conclusion

Results from this study elucidated the role of age- and care-giver-related factors in attitudes towards dementia and personhood perceptions. This study demonstrated that more positive attitudes towards ageing and being a care-giver was predictive of being more comfortable around people with dementia, having more knowledge about dementia and ascribing higher personhood to those with dementia. Compared to younger adults, older adults were also found to be more comfortable around people with dementia. Furthermore, older adults with more dementia knowledge prior to the presentation of dementia information were more comfortable around those with dementia. Our findings allow for the identification of populations that are less comfortable being with people who have dementia, have less knowledge about dementia and who ascribe reduced personhood to them. As age did not play a role in attitudes towards dementia and personhood perceptions, attitudes towards ageing may be a better target for interventions. Our findings also indicate that increasing public awareness and knowledge about dementia should lead to improved attitudes towards dementia. Ultimately, a better understanding of the role of age- and care-giver-related factors in attitudes towards dementia and personhood perceptions could lead to interventions that could reduce the marginalisation of individuals with dementia living in our communities.

**Author contributions.** TH prepared the grant application that funded the study, played a major role in its conceptualisation, and guided and supervised every aspect of this investigation, including a major contribution to the write-up and interpretation of the results. CN assisted with the development of the data collection protocol, data collection, data analysis/interpretation, write-up and literature review. NLG played a major role in data analysis, interpretation and write-up. YCM played a major role in the data analysis and assisted with the write-up of the results. All authors discussed the results as well as read, edited and approved the final manuscript.

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**Conflict of interest.** The authors declare no conflicts of interest.

**Ethical standards.** Approval for this study was granted by the University of Regina's Ethics Review Board.

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