The Gerontologist, 2023, **XX**, 1–9
https://doi.org/10.1093/geront/gnad136
Advance access publication 17 October 2023
Measurement Article

Development and Validation of a Revised Ambivalent Ageism Scale for Use in the Health Care Sector: The AAS_{hc}

Sylvie D'hondt, MPH,[1,*] Isabelle Aujoulat, PhD,[1] and Jean-Marie Degryse, MD, PhD[1,2]

[1]Institute of Health and Society, UCLouvain, Brussels, Belgium.
[2]Department of Public Health and Primary Care, KULeuven, Leuven, Flemish Brabant, Belgium.
*Address correspondence to: Sylvie D'hondt, MPH. E-mail: sylvie.dhondt@uclouvain.be

Decision Editor: Joseph E. Gaugler, PhD, FGSA

Abstract

Background and Objectives: The aim of this study was to adapt and validate the Ambivalent Ageism Scale (AAS) among paramedical students for use in the health care sector.

Research Design and Methods: A cross-sectional study was conducted among the following paramedical students: physiotherapy, occupational therapy, and nursing students. A total of 6 items were added based on the literature and the scale was evaluated by students and professors with experience working with older adults. The following psychometric properties were evaluated: internal consistency, concurrent validity, structural validity (exploratory factor analysis), and reliability.

Results: A total of 265 students participated: 19.2% physiotherapy students, 27.5% occupational therapy students, 50.6% nursing students, and 2.6% other paramedical students. The concurrent validity study showed a significant correlation between AAS_{hc} (Ambivalent Ageism Scale in the health care sector) and UCLA-GAS-F (French version of the University of California, Los Angeles Geriatric Attitudes Scale) with r (265) = 0.491 ($p < .001$). The factor analyses produced an 18-item ($\alpha = 0.866$) scale composed of 5 factors: Infantilization (5 items, $\alpha = 0.766$), Control (2 items, $\alpha = 0.789$), Overaccommodation (2 items, $\alpha = 0.829$), Unwanted help (2 items, $\alpha = 0.656$), and Hostile Ageism (7 items, $\alpha = 0.717$). Finally, the generalizability analysis revealed a G-coefficient of 0.86, a Phi-coefficient of 0.83, and a standard error of measurement of 2.31%.

Discussion and Implications: The AAS_{hc} appears to be a valid and reliable scale to measure ageism among paramedical students. This scale can be a useful tool to reduce ageism toward older adults in the health care sector.

Keywords: Attitudes and perception toward aging, Measurement, Psychometrics, Scale development.

Background and Objectives

The proportion of older adults continues to grow. In 2019, 19% of Belgians were aged 65 years and older; following the Organization for Economic Co-operation and Development projection, this age category will reach 25.3% in 2050 (Organization for Economic Co-operation and Development, 2023). Despite this population aging, age segregation is still present and the perception toward older adults appears to be increasingly negative (Levy, 2017; Ng et al., 2015). Currently, aging is mainly reduced to a stereotypical view of a pathological process that must be cured, which involves declines and losses leading inevitably to death and that must be absolutely feared and avoided (Rattan, 2014). However, the aging process is not only a process of decline and loss but also one that includes growth and development. This predominant biomedical perception generates negative attitudes toward older adults, leading to ageism (Inker, 2018). Ageism refers to all forms of age-based beliefs (stereotypes), emotions (prejudice), and behaviors (discrimination) directed toward older adults or oneself (World Health Organization, 2021). As part of society, health care students are not immune to these ageist stereotypes, which may negatively affect their attitudes toward older adults when working with them as future health care workers. Several causes have been identified, such as limited aging education and the medicalization of the aging process due to a focus on curing diseases and deficits during education (Happell, 2002; Nash et al., 2014). This stereotypical perception can cause students to develop a pessimistic perception of aging and generate ageist attitudes (Abreu & Caldevilla, 2015; Maximiano-Barreto et al., 2019) and may explain their lack of interest in working with older adults (Happell, 2002; Jackson et al., 2017; Kalu et al., 2018; Rathnayake et al., 2016) as well as their increasingly negative attitudes toward older adults over the course of their academic studies (De Biasio et al., 2016; Kishimoto et al., 2005).

Because these students are future health care workers, it is important to change their perceptions and help them develop positive attitudes toward older adults. This is particularly important because the professional experience that follows is likely to confirm (and even reinforce) these stereotypes (Nash et al., 2014). Indeed, Crutzen et al. (2022) showed that "professionals constitute a particular risk group" in terms of developing a more negative perception of older adults because they work daily with the frailest and sickest older population and the quality of these daily contacts may not be optimal

Received: January 26 2023; Editorial Decision Date: June 17 2023.

(Crutzen et al., 2022, p. 3). The risk of these stereotypes is the "stereotype threat" (Steele et al., 2002): When an individual must perform a task in a specific domain that is negatively related to stereotypes, the person worries about confirming these stereotypes. This may lead to impaired performance and may contribute to the disengagement of older adults from certain activities of their everyday life, thus increasing their dependence. Frequent exposure to people who experience difficult aging may, therefore, induce a process of reinforcement and legitimization of these ageist stereotypes and attitudes toward older adults (Crutzen et al., 2022). Consequently, this ageist view can lead to fear and anxiety about growing old or to a sense of pity toward older adults. The first theory, the Terror Management Theory, explains that daily contact with the frailest and most dependent older adults can lead to an increase in aging and death anxiety (Koder & Helmes, 2008; Koukouli et al., 2014), which is related to an increase in negative attitudes toward older adults, leading to a more hostile form of ageism (Allan & Johnson, 2008; Boswell, 2012; Brunton & Scott, 2015; Inker, 2018; Liu et al., 2015). The second theory, the Stereotype Content Model, explains that the outgroup perceives older adults as incompetent but warm, leading to patronizing feelings and attitudes associated with benevolent ageism (Fiske et al., 2002).

Measurement of Ageism

Several studies have already been conducted to assess ageism among health care students. However, mixed results were found: Although some studies reported relatively positive or neutral attitudes toward older adults (Akyil et al., 2020; Fitzgerald et al., 2003; Hughes et al., 2008; Liu et al., 2012), negative attitudes have also been revealed (Abreu & Caldevilla, 2015; Bleijenberg, 2012; Frost et al., 2016; Ruiz et al., 2015). These inconsistent findings could be explained by the differences in research designs or study limitations (Wilson et al., 2017). But, the main reason is the complex nature of ageist attitudes toward older adults in the health care sector (Inker, 2018; Rush et al., 2017; São José et al., 2019). Ageism is a multidimensional construct combining multiple aspects: positive/negative, implicit/explicit and self-/other-directed aspects (Iversen et al., 2009).

The Ambivalent Ageism Scale (AAS) developed and validated by Cary et al. (2017) among a young and middle-aged population is composed of 13 items subdivided into two factors: benevolent ageism (AB, nine items) and hostile ageism (AH, four items). Benevolent ageism is a more implicit form of ageism that leads to paternalism (Cary et al., 2017). In the health care sector, paternalistic care is described as a dominant attitude of the caregiver that restricts individual freedom and autonomy but has beneficial or protective intentions (Fernández-Ballesteros et al., 2019). Hostile ageism is a more explicit form of ageism that leads to more negative attitudes toward older adults. A French version (D'hondt & Degryse, 2022) was validated in a sample of public health students, mainly including health care professionals engaging in studies (n = 111). The study revealed a pertinent and sensitive scale to assess ageism in this population with good internal consistency and concurrent validity. However, the French version did not present the two dimensions of the original scale. The factor analysis showed a multidimensional structure composed of three factors among the study population: Infantilization, Control, and Overaccommodation. These new findings suggest that ageism among health care students and professionals is a complex construct that needs to be further investigated. Furthermore, the study showed that implicit ageism seems to be prevalent in the health care sector (D'hondt & Degryse, 2022). But, as mentioned by Ayalon et al. (2019) in their systematic review, the available ageism scales concentrate mainly on explicit forms of ageism. As the AAS is the first scale to include both implicit and explicit forms of ageism, this scale seems to be more relevant to measure ageism in the health care sector. However, it was not developed for this specific population.

The aim of this study was to further validate the French version of the ASS and to adapt it to the health care sector amongst a sample of paramedical students.

Research Design and Methods

Procedure

A cross-sectional survey was conducted among first to last-year paramedical students at a graduate school in Belgium (N = 780). The following students were included: physiotherapy, occupational therapy, and nursing students. This study was part of a larger survey consisting of several scales that lasted approximately 25 minutes. All students received an email invitation asking them to volunteer through the school secretary. Participants could respond to either a paper version or an electronic version. The electronic version of the survey was sent to all students through their student electronic mail address and was also posted on social networks. The paper version was given by a researcher at the end of classes and during the lunch break. The data were strictly confidential and anonymous. All participants provided their written consent and allowed the use of their data for scientific purposes only before participating in the survey. We collected the data between March and June 2022. Sample size calculation revealed that with a 95% confidence interval and a margin of error of 5%, 258 was an appropriate sample size. The Hospitalo-Facultaire ethics committee of Saint Luc provided approval (2022/21MAR/130).

Measures

Ambivalent Ageism Scale in the health care sector (AAS_{hc})

We started with the French version of the AAS (D'hondt & Degryse, 2022), which is a scale that measures benevolent and hostile ageism. Benevolent ageism was measured with nine items (e.g., even if they do not ask for help, older people should always be offered help), and hostile ageism was measured with four items (e.g., old people are too easily offended). Participants responded on a 6-point Likert scale (1 = "*Strongly disagree*" to 6 = "*Strongly agree*"). To adapt the scale to the health care context, six additional items were created and tested during this study. These items were constructed based on a literature review and inspired by an existing scale (Paternalist/Autonomist Care Assessment, Fernández-Ballesteros et al., 2019) as well as the "Content Stereotype Model" developed by Fiske et al. (2002). Two professors in geriatric nursing who had professional experience working with older adults assessed the relevance and comprehensiveness of the new scale. The comprehension and acceptability of the items were evaluated by six paramedical students of the study population.

French version of the University of California, Los Angeles Geriatric Attitudes Scale (UCLA-GAS-F)

The Geriatric Attitudes Scale (GAS) is a 14-item questionnaire on attitudes toward older adults and their care (Opsommer et al., 2021). Four factors are presented: social values, medical care, compassion, and resource distribution. As this scale was developed for health care professionals, a "non-applicable" option was added to adapt it to students and their level of experience. An adapted percentage was calculated that took into account non-applicable responses. In this study, the GAS was used as a second measure of ageism among paramedical students to assess the concurrent validity of the AAS_{hc}. The English version of the scale has frequently been used to assess ageism among health care students (Caliskan et al., 2018; De Biasio et al., 2016; Kishimoto et al., 2005; Woolsey, 2007) and has been validated across this population (α = 0.60–0.79) (Lee et al., 2005; Lucchetti et al., 2018; Opsommer et al., 2021; Reuben et al., 1998; Sahin et al., 2012). The French version of UCLA-GAS was validated across a sample of physiotherapist students (n = 119) and showed moderate internal consistency (α = 0.49–0.57), good test-retest reliability, and good discriminant validity (Opsommer et al., 2021). In this study, the Cronbach's alpha was 0.661.

Sociodemographic variables

In addition to completing the survey, the students were asked to respond to background questions about the type of experience with older adults and their level of familiarity with ageism. Other variables, such as academic year, study direction, age, and gender, were also included.

Data Analysis

The data were analyzed using The Statistical Package for the Social Sciences (SPSS; IBM Corp), version 27.0. For all further analyses, the total scores of the following scales were transformed into percent scores.

Item analysis

A classic item analysis was performed using the characteristics of the distributions of the score of the items as well as the total score of the scale. This first step provided information on the response pattern of the participants, the acceptability, and the sensibility of the scale.

Structural validity

A minimum sample size was calculated using a sample-to-variable ratio set at 10-to-1 (Watkins, 2018). First, AAS_{hc} was tested for the presence of multivariate outliers using the Mahalanobis distance at $p < .001$. If outliers were identified, they were not included in subsequent analyses (Bandalos & Finney, 2018; Watkins, 2018). An exploratory factor analysis using direct oblimin rotation and principal axis factoring extraction was performed. Common factor analysis was selected over principal component analysis because the intent was to identify a latent factor structure. Due to the nature of the constructs, it was assumed that factors would be correlated. Therefore, oblimin rotation was employed (Watkins, 2018). To test the appropriateness of the data, Kaiser–Meyer–Olkin (KMO) statistic and Bartlett's sphericity tests were calculated first. The KMO statistic was required to be above a minimum of 0.50 (Watkins, 2018). To estimate the number of factors to be retained, the visual scree test was used. The formula of Norman and Streiner (2014) was used to evaluate the statistical significance of pattern coefficients at the 1% level: $\frac{5.152}{\sqrt{N-2}}$ (Watkins, 2018).

Concurrent validity

To explore concurrent validity, the Pearson correlation was used. For concurrent validity, UCLA-GAS-F was used, as it is a well-known scale to evaluate ageism among health care professionals. The following hypothesis was formulated: the French version of the AAS includes both hostile and benevolent items; as most of the GAS items are related to hostile ageism, it is expected that the AAS will correlate with the GAS. However, as hypothesized by Cary et al. (2017), the factor of hostile ageism should correlate more strongly with the GAS than the benevolent subscale, represented by the factor of Infantilization. In addition to the observed correlation coefficients, the coefficients after correction for attenuation were also presented using the formula developed by Fan (2003), $r_{x'y'} = \frac{r_{xy}}{\sqrt{r_{xx}r_{yy}}}$, where $r_{x'y'}$ is the correlation between the two instruments corrected for attenuation; r_{xy} is the observed correlation; and r_{xx} and r_{yy} are the reliability indices of the AAS_{hc} and the UCLA-GAS-F (Fan, 2003).

Reliability

The internal consistency was evaluated using Cronbach's alpha coefficient. A generalizability study was conducted using the GENOVA program. First, a G-study was organized based on a person × items design (p × I) to calculate the weight of different variance components. To further explore the contribution of items in dimensions identified by the factor analysis, we used the urGenova program for imbalanced data sets (as the number of items per dimension varied). An (I:d) × p design was used to explore the role of different identified factors (subscales) in the variance of the total scores (d stands for dimensions, I for items, and p for persons). Subsequently, a decision study (D-study) was organized to explore the impact of the number of items on two kinds of reliability indices: the G-coefficient and the Phi-coefficient (Shavelson et al., 1989).

Results

Scale Development

The pretest among six paramedical students from the study population and the two experts indicated that the six additional items (see Table 2) were comprehensive, acceptable, and relevant to measure ageism among future health care professionals. One student mentioned doubt about the following item: "*Complaints made by older patients should systematically be interpreted in relation to the advanced age of the patient*." Based on the other results, the item was kept for further analysis. The AAS_{hc} was composed of 19 items. For each item, participants responded on a 6-point Likert scale, with a higher score representing a higher level of ageism (score range of 19 to 114).

Participants

Of the 780 students, 265 students (84.5% female participants) participated: 19.2% physiotherapy students, 27.5% occupational therapy students, 50.6% nursing students, and 2.6% other paramedical students (dietetic and speech therapy students). The age range was 18–45 years with a mean of 21.86 (SD = 3.419). See Table 1 for further information.

Table 1. Characteristics of the Sample (*n* = 265)

Characteristics	Sample *n* (%)
Sex	
Male	41 (15.5)
Female	224 (84.5)
Age	
Mean (*SD*)	21.86 (3.419)
Range	18–45 y
Academic year	
1st year	88 (33.2)
2nd year	56 (21.1)
3rd year	65 (24.5)
4th year	36 (13.6)
Specialization year	20 (7.5)
Academic orientation	
Nursing	134 (50.6)
Physiotherapy	51 (19.2)
Occupational therapy	73 (27.5)
Dietetic	3 (1.1)
Speech therapy	4 (1.5)
Experience with older people	
Caring for your older relatives	200 (75.5)
Volunteering	51 (19.2)
Working in a hospital	101 (38.1)
Working in a long-term care institution	58 (21.9)
Internship	246 (92.8)
Working at home	48 (18.1)
Visiting your grandparents	208 (78.5)
Working in a day center	21 (7.9)
No experience	0 (0)
Familiarity to the concept of ageism (n = 262)[a]	
Not at all, I've never heard of it	79 (30.2)
Yes, I have heard of it but I don't know what it means	25 (9.5)
Yes, I am vaguely familiar with the concept	69 (26.3)
Yes, I am familiar with the concept	38 (14.5)
Yes, I am familiar with the concept and try to pay attention to it	51 (19.5)
If yes, in which context?	
During classes	160 (60.4)
During internship	56 (21.1)
On social network	19 (7.2)
On television	29 (10.9)
During a conversation with relatives	18 (6.8)
During a seminar	18 (6.8)
Don't know	1 (0.4)

Note:
[a]The following question was asked: Have you heard about the concept of ageism?

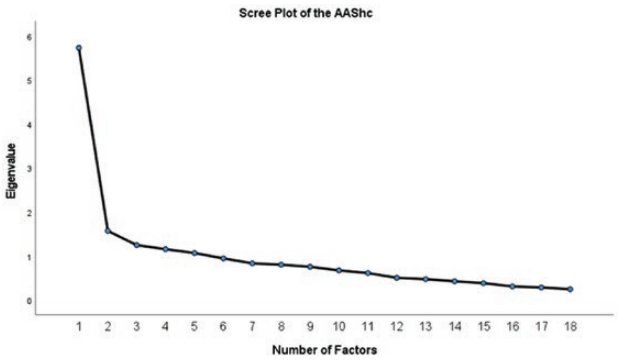

Figure 1. Exploratory factor analysis: scree plot of the AAS_{hc} (*N* = 265). AAS_{hc} = The Ambivalent Ageism Scale in the health care sector.

Scale Properties

Structural validity

No multivariate outliers were identified; The final sample is 265, indicating a very satisfactory sample-to-variable ratio (14:1) to proceed with factor analysis. The result of Bartlett's test of sphericity was $\chi^2(153) = 1{,}567.593$, $p < .001$, and the KMO statistic was 0.843, showing good appropriateness of the data for conducting factor analysis. Based on the results of the scree, a 5-factor model was suggested (See Figure 1). However, according to the original scale, a two-factor model was suggested. The two models were then examined. The five-factor model explained 59.76% of the total variance, while the two-factor model explained only 40.61%. Five items saliently loaded more on the first factor, called Infantilization (e.g., it is helpful to repeat things to old people because they rarely understand the first time). Two items loaded more on the second factor, called Control (e.g., even if they want to, old people should not be allowed to work because they are fragile and may get sick). Two items loaded more on the third factor, called Overaccommodation (e.g., people should shield older adults from sad news because they are easily moved to tears). Seven items saliently loaded more on the fourth factor, called Hostile ageism (e.g., old people are a drain on the health care system and the economy). Finally, the last two items loaded more on the fifth factor, called Unwanted help (e.g., even if they do not ask for help, older people should always be offered help). The last item ("*Complaints made by older patients should systematically be interpreted in relation to the advanced age of the patient.*") was deleted because it did not load saliently on any factors. See Table 2 for more information.

Concurrent validity

The observed correlation coefficients and the coefficients after correction for attenuation are shown in Table 3. The results confirmed the expected hypothesis, showing good concurrent validity. The AAS_{hc} was correlated with UCLA-GAS-F, $r\ (265) = 0.491$, $p < .01$. The Hostile ageism factor of AAS_{hc} and UCLA-GAS-F were correlated at $r\ (265) = 0.540$, $p \leq .01$, while the Infantilization factor and UCLA-GAS-F were less correlated at $r\ (265) = 0.386$, $p \leq .01$.

Internal consistency

The Cronbach's alpha of the scale was $\alpha = 0.866$. The subscales showed satisfactory results: Infantilization (five items, $\alpha = 0.766$), Control (two items, $\alpha = 0.789$), Overaccommodation

Table 2. Exploratory Factor Analysis: Factor Loadings, Variance Explained, (*n* = 265)

Items	Factors				
	1	2	3	4	5
1. It is good to speak slowly to old people because it may take them a while to understand things that are said to them	**0.741**	−0.277	−0.313	−0.269	0.264
2. It is helpful to repeat things to old people because they rarely understand the first time	**0.740**	−0.352	−0.387	−0.390	0.123
3. It is good to contact the family of older patients first when announcing important information[a]	**0.640**	−0.283	−0.402	−0.404	0.221
4. To avoid accidents, older patients should be supervised constantly[a]	**0.520**	−0.239	−0.331	−0.339	0.389
5. The health problems of older patients are often too complex to be explained to them in detail[a]	**0.481**	−0.234	−0.153	−0.364	0.292
6. Even if they want to, old people shouldn't be allowed to work because they are fragile and may get sick	0.446	**−0.815**	−0.392	−0.214	0.169
7. Even if they want to, old people shouldn't be allowed to work because they have already paid their debt to society	0.317	**−0.797**	−0.324	−0.249	0.120
8. Older people need to be protected from the harsh realities of society	0.397	−0.365	**−0.942**	−0.246	0.184
9. People should shield older adults from sad news because they are easily moved to tears	0.441	−0.337	**−0.733**	−0.340	0.250
10. Old people are too easily offended	0.503	−0.202	−0.355	**−0.771**	0.122
11. Old people exaggerate the problems they have at work	0.383	−0.240	−0.304	**−0.758**	0.259
12. It is good to tell old people that they are too old to do certain things; otherwise, they might get their feelings hurt when they eventually fail	0.355	−0.275	−0.207	**−0.525**	−0.020
13. Most old people interpret innocent remarks or acts as being ageist	0.357	−0.237	−0.355	**−0.433**	0.125
14. The patient's advanced age is a legitimate exclusion criterion for access to health care[a]	0.266	−0.282	−0.181	**−0.403**	0.300
15. Regardless of the preference of older patients, caregivers should have the final say in decisions about their health[a]	0.261	−0.257	−0.222	**−0.385**	0.211
16. Old people are a drain on the health care system and the economy	0.165	0.118	0.032	**−0.361**	0.270
17. Even if they do not ask for help, old people should be helped with their groceries	0.442	−0.338	−0.456	−0.279	**0.549**
18. Even if they do not ask for help, older people should always be offered help	0.420	−0.264	−0.356	−0.222	**0.541**
19. Complaints made by older patients should systematically be interpreted in relation to the advancing age of the patient[b]					
% Variance explained	59.76%				
n	265				

Notes: Extraction method: principal axis factoring; Rotation method: oblimin; Factor 1: Infantilisation, Factor 2: Control, Factor 3: Overaccommodation, Factor 4: Hostile ageism, Factor 5: Unwanted help.
Bold indicates items with the highest factor loadings.
[a]New items.
[b]Item deleted.

Table 3. Concurrent Validity: Observed Correlation Coefficients and Coefficient After Correction for Attenuation

	AAS_{hc}	GAS-F
Ambivalent Ageism Scale in the health care sector	1	0.491**
Geriatrics attitude scale	0.649[a]	1

Notes: AAS_{hc} = The Ambivalent Ageism Scale in the health care sector; GAS-F = French version of the Geriatric Attitudes Scale.
[a]Coefficient after correction for attenuation.
**Significant *p* value at a 0.01 level.

(two items, α = 0.829), Hostile ageism (seven items, α = 0.717) and Unwanted help (two items, α = 0.656). The internal consistency analysis supported our choice to delete Item 19 as Cronbach's alpha did not change.

Generalizability analysis

A p × I design was used to perform the G-analysis with p = number of persons (*n* = 265) and I = number of items (*n* = 18). In Tables 4–6, the variance components are given for each of the variance sources estimated by this design. The "p" component shows the variance attributable to persons. Compared with the common findings in other tests or scales, this effect was rather high (approximately 21%). The "I" component represents the variance between items and the way they discriminate subjects and represented 18% of the variance. The "pI" component reflects the inconsistency with which the items rank-order subjects along the AAS_{hc} scale, in addition to all other sources of "error" variance (for instance, the fact that participants participated on different occasions). Furthermore, an in-depth analysis (See Table 5) of the different sources of variance revealed that less than 3% of the observed variation in the total score can be explained by the

Table 4. Generalizability Study (p × I Design): Estimated Variance Components of the AAS_{hc} (n = 265)

Source	Estimated variance component	Standard error	Percentage of total variance
p	149.24	14.95	21.6%
I	123.83	40.68	17.9%
pI	416.28	8.75	60.3%

Notes: AAS_{hc} = The Ambivalent Ageism Scale in the health care sector; I = items; p = persons.

Table 5. Generalizability Study ([I:d] × p Design): Estimated Variance Components of the AAS_{hc} (n = 265)

Source	Degrees of freedom	Variance component	Variance component (%)
p	264	129.58	8.64
d	4	43.22	2.88
I:d	13	90.21	6.01
Pd	1,056	888.02	59.24
pI:d	3,432	347.82	23.20

Notes: AAS_{hc} = The Ambivalent Ageism Scale in the health care sector; d = dimensions; I = items; p = persons.

different dimensions identified by the factor analysis. The "pd" variance component (60%) reflects the inconsistency with which the dimensions rank order subjects. The I:d component reflects the homogeneity of the item scores within the dimensions and was low, as expected (6%). Finally, the decision study revealed a G-coefficient of 0.86 and a Phi-coefficient of 0.83 (See Table 6).

Discussion and Implications

The aim of this study was to further validate the French version of the AAS and to adapt it to the health care sector amongst a sample of paramedical students.

Following the adaptation of the scale to the health care sector, the AAS_{hc} (see Supplementary Table 1) was composed of 18 items divided into 5 factors: Infantilization (5 items, α = 0.766), Control (2 items, α = 0.789), Overaccommodation (2 items, α = 0.829), Hostile ageism (7 items, α = 0.717) and Unwanted help (2 items, α = 0.656). The results showed good internal consistency and good concurrent validity of the AAS_{hc}. The generalizability analysis found a G-coefficient of 0.86, a Phi-coefficient of 0.83, and a standard error of measurement of 2.31%. This means that an individual total score on the AAS_{hc} (expressed as a percentage score) should be interpreted with a 95% confidence interval of ±1.96 × 2.31% or ± 4.5%. Furthermore, an in-depth analysis of the different sources of variance revealed that the dimensions identified by the factor analysis accounted for less than 3% of the total score variance. Therefore, we believe that the latent construct measured by the AAS_{hc} is undoubtedly multidimensional, but further research is needed. The factors identified cannot be used as a basis to interpret individual scores based on the subscales.

Table 6. Decision Study: Reliability Indices of the AAS_{hc} in Function of the Number of Items in the Scale

Number of items	G-coefficient	Phi-coefficient	Standard error of measurement (%)
14	0.83	0.79	2.97
15	0.84	0.80	2.77
16	0.85	0.81	2.60
17	0.85	0.82	2.44
18	*0.86*	*0.83*	*2.31*
19	0.87	0.84	2.19
20	0.87	0.84	2.08
21	0.88	0.85	1.98
22	0.88	0.85	1.84

Note: AAS_{hc} = The Ambivalent Ageism Scale in the health care sector. Italics indicates actual number of items of the AAShc (18 items).

As explained, in this study, the results of the factor analysis revealed a 5-factor model composed of Infantilization (five items), Control (two items), Overaccommodation (two items), Hostile ageism (seven items), and Unwanted help (two items). Compared with the original scale of AAS and the bidimensional structure found in a young and middle-aged population (Cary et al., 2017), the results suggest that ageism in the health care sector is a complex and multidimensional construct. The first validation and adaptation of the French version of the AAS performed among public health students already suggested this hypothesis. Indeed, the factor analysis highlighted a three-factor model with the initial 13 items (D'hondt & Degryse, 2022). These three factors of Infantilization, Control, and Overaccommodation were found in the five-factor model. Two additional factors were found, Hostile ageism and Unwanted help, confirming the presence of both implicit (benevolent) and explicit (hostile) ageism in the health care sector.

As Ayalon et al. (2019) highlighted in their systematic review, all available ageism scales failed to cover all dimensions of ageism, as the main scales concentrate on explicit forms of ageism. This review also revealed a common need for psychometric assessments of existing scales as many have less than three independent studies as evidence base. Furthermore, this evidence is often of low quality and/or limited to a few psychometric properties. Finally, studies often found inconsistent results (Ayalon et al., 2019). As mentioned in the World Health Organization report, the need for an ageism scale that measures the complexity of ageism is fundamental to addressing ageism (World Health Organization, 2021). Our study can contribute to addressing this gap.

As highlighted in several studies, implicit ageism seems to be prevalent in the health care sector (Fernández-Ballesteros et al., 2019; Lagacé et al., 2011, 2012; Tuckett, 2006; K. N. Williams et al., 2009; K. Williams et al., 2017). However, no available validated and used ageism scale in the health care sector considers this implicit form of ageism. This benevolent and blatant ageism can take different forms, such as unwanted help, infantilization, overaccommodation, elder speak (also called baby talk), paternalistic care, and controlling behaviors and decisions (doing what is best for them without asking). Although the primary intentions of health care professionals are mostly beneficent and

protective toward older patients, paternalism can lead to a limitation of autonomy and freedom, resulting in a relationship of authority and dependence between the caregiver (the one who knows) and the "patient" (Tuckett, 2006). The AAS_{hc}, which includes both implicit and explicit forms of ageism, seems relevant for measuring ageism in this specific population.

In conclusion, the main benefits of the AAS_{hc} are the consideration of a more implicit form of ageism, its adaptation to the health care sector, and the satisfactory results that emerged from our in-depth psychometric and clinimetric analysis.

However, as with any self-report design, these findings are limited. Social desirability bias could be present. However, the implicit form of this scale limits this bias. Moreover, although the sample size is representative of the study population, all the selected students were from the same graduate school. Further studies are needed to continue to evaluate the psychometric properties of this scale in different populations, cultures, and health care sectors. Although this study revealed satisfactory results for the evaluated psychometric properties, others need to be studied.

The development of a scale adapted to the health care sector is an important step toward understanding the unique contribution of these ageist attitudes on the health care relationship and the care provided to older adults. This scale is also a useful tool for researchers developing and implementing interventions to reduce ageism toward older adults in the health care sector.

Supplementary Material

Supplementary data are available at *The Gerontologist* online.

Funding

This work was supported by an unconditional grant from the Fondation Louvain. The Fondation Louvain is the support unit of the Université Catholique de Louvain in charge of developing education and research projects of the university by collecting gifts from corporate, foundations, and alumni.

Conflict of Interest

None.

Data Availability

The data supporting the findings of this study are available upon reasonable request by contacting the corresponding author because the researchers have not completed the expected analyses for future publications. The French version of the AAS_{hc} is available in the Supplementary material section (see Table 1). The conducted research was not preregistered.

Acknowledgments

We would like to thank P. de la Court and P. Badin for their collaboration during the validation process of the items and all the students who participated voluntarily.

Authors Contribution

All authors contributed to the formulation of the research questions, design, and protocol of the study. S. D'hondt carried out the data collection and analyses with close advice and support of J.-M. Degryse. All authors assisted in writing and revising the article.

References

Abreu, M., & Caldevilla, N. (2015). Attitudes toward aging in Portuguese nursing students. *Procedia - Social and Behavioral Sciences*, 171, 961–967. https://doi.org/10.1016/j.sbspro.2015.01.215

Akyil, R. C., Kahraman, A., Taskiran, N., Akyil, M. S., Oncu, S., & Turk, G. (2020). Healthcare students' levels of compassion and attitudes towards older people: A cross-sectional descriptive study. *International Journal of Caring Sciences*, 13(3), 2201–2208. http://www.internationaljournalofcaringsciences.org/docs/74_tsakiran_original_13_3.pdf

Allan, L. J., & Johnson, J. A. (2008). Undergraduate attitudes toward the elderly: The role of knowledge, contact and aging anxiety. *Educational Gerontology*, 35(1), 1–14. https://doi.org/10.1080/03601270802299780

Ayalon, L., Dolberg, P., Mikulionienė, S., Perek-Białas, J., Rapolienė, G., Stypinska, J., Willińska, M., & de la Fuente-Núñez, V. (2019). A systematic review of existing ageism scales. *Ageing Research Reviews*, 54, 100919. https://doi.org/10.1016/j.arr.2019.100919

Bandalos, D. L., & Finney, S. J. (2018). Factor analysis: Exploratory and confirmatory. In G. R. Hancock, L. M. Stapleton, & R. O. Mueller (Eds.), *The reviewer's guide to quantitative methods in the social sciences* (2nd ed., pp. 98–122). Routledge. https://doi.org/10.4324/9781315755649-8

Bleijenberg, N. (2012). Dutch nursing students' knowledge and attitudes towards older people—A longitudinal cohort study. *Journal of Nursing Education and Practice*, 2(2), 1–8. https://doi.org/10.5430/jnep.v2n2p1

Boswell, S. S. (2012). Predicting trainee ageism using knowledge, anxiety, compassion, and contact with older adults. *Educational Gerontology*, 38(11), 733–741. https://doi.org/10.1080/03601277.2012.695997

Brunton, R. J., & Scott, G. (2015). Do we fear ageing? A multidimensional approach to ageing anxiety. *Educational Gerontology*, 41(11), 786–799. https://doi.org/10.1080/03601277.2015.1050870

Caliskan, T., Kendir, C., Tekin, N., & Kartal, M. (2018). Attitudes toward the elderly among young family physicians in Turkey. *Journal of Family Medicine and Primary Care*, 7(5), 998–1001. https://doi.org/10.4103/jfmpc.jfmpc_277_17

Cary, L. A., Chasteen, A. L., & Remedios, J. (2017). The ambivalent ageism scale: Developing and validating a scale to measure benevolent and hostile ageism. *Gerontologist*, 57(2), e27–e36. https://doi.org/10.1093/geront/gnw118

Crutzen, C., Missotten, P., Adam, S., & Schroyen, S. (2022). Does caring lead to stigmatisation? The perception of older people among healthcare professionals and the general population: A cross-sectional study. *International Journal of Older People Nursing*, 17(5), e12457. https://doi.org/10.1111/opn.12457

D'hondt, S., & Degryse, J. -M. (2022). Développement d'une version française adaptée de l'Ambivalent Ageism Scale: Une mesure de l'âgisme. *Canadian Journal on Aging/La Revue canadienne du vieillissement*, 42(1), 56–68. https://doi.org/10.1017/s0714980822000290

De Biasio, J. C., Parkas, V., & Soriano, R. P. (2016). Longitudinal assessment of medical student attitudes toward older people. *Medical Teacher*, 38(8), 823–828. https://doi.org/10.3109/0142159X.2015.1112891

Fan, X. (2003). Two approaches for correcting correlation attenuation caused by measurement error: Implications for research practice.

Educational and Psychological Measurement, 63(6), 915–930. https://doi.org/10.1177/0013164403251319

Fernández-Ballesteros, R., Sánchez-Izquierdo, M., Olmos, R., Huici, C., Caprara, M. G., Santacreu, M., Ribera Casado, J. M., & Cruz-Jentoft, A. (2019). Development and validation of a paternalism and autonomist care assessment. *Journal of Advanced Nursing*, 75(11), 3166–3178. https://doi.org/10.1111/jan.14154

Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, 82(6), 878–902. https://doi.org/10.1037/0022-3514.82.6.878

Fitzgerald, J. T., Wray, L. A., Halter, J. B., Williams, B. C., & Supiano, M. A. (2003). Relating medical students' knowledge, attitudes, and experience to an interest in geriatric medicine. *Gerontologist*, 43(6), 849–855. https://doi.org/10.1093/geront/43.6.849

Frost, J., Ranse, K., & Grealish, L. (2016). Assessing ageist behaviours in undergraduate nursing students using the Relating to Older People Evaluation (ROPE) survey: Assessing ageism in undergraduate nurses. *Australasian Journal on Ageing*, 35(1), 58–61. https://doi.org/10.1111/ajag.12260

Happell, B. (2002). The role of nursing education in the perpetuation of inequality. *Nurse Education Today*, 22(8), 632–640. https://doi.org/10.1016/s0260-6917(02)00104-1

Hughes, N. J., Soiza, R. L., Chua, M., Hoyle, G. E., MacDonald, A., Primrose, W. R., & Gwyn Seymour, D. (2008). Medical student attitudes toward older people and willingness to consider a career in geriatric medicine. *Journal of the American Geriatrics Society*, 56(2), 334–338. https://doi.org/10.1111/j.1532-5415.2007.01552.x

Inker, J. (2018). *Ageism among healthcare professionals: The influence of personal aging anxiety, job role, and work setting on attitudes toward older patients*. Virginia Commonwealth University. https://doi.org/10.25772/F1VX-WY69

Iversen, T. N., Larsen, L., & Solem, P. E. (2009). A conceptual analysis of Ageism. *Nordic Psychology*, 61(3), 4–22. https://doi.org/10.1027/1901-2276.61.3.4

Jackson, J., Clark, A., Pearse, L., Miller, E. A., Stanfield, H., & Cunningham, C. J. L. (2017). Explaining student interest and confidence in providing care for older adults: The role of demographics and life experiences. *Journal of Gerontological Nursing*, 43(3), 13–18. https://doi.org/10.3928/00989134-20160901-04

Kalu, M. E., Abaraogu, U. O., & Norman, K. E. (2018). Do physiotherapy students demonstrate ageist attitude? A scoping review of literature. *Physical & Occupational Therapy in Geriatrics*, 36(1), 72–89. https://doi.org/10.1080/02703181.2018.1440040

Kishimoto, M., Nagoshi, M., Williams, S., Masaki, K. H., & Blanchette, P. L. (2005). Knowledge and attitudes about geriatrics of medical students, internal medicine residents, and geriatric medicine fellows. *Journal of the American Geriatrics Society*, 53(1), 99–102. https://doi.org/10.1111/j.1532-5415.2005.53018.x

Koder, D. A., & Helmes, E. (2008). Predictors of interest in working with older adults: A survey of postgraduate trainee psychologists. *Gerontology & Geriatrics Education*, 29(2), 158–171. https://doi.org/10.1080/02701960802223233

Koukouli, S., Pattakou-Parasyri, V., & Kalaitzaki, A. E. (2014). Self-reported aging anxiety in Greek students, health care professionals, and community residents: A comparative study. *Gerontologist*, 54(2), 201–210. https://doi.org/10.1093/geront/gnt036

Lagacé, M., Medouar, F., Loock, J., & Davignon, A. (2011). À mots couverts: Le regard des aînés et des soignants sur la communication quotidienne et ses manifestations d'âgisme implicite. *Canadian Journal on Aging/La Revue canadienne du vieillissement*, 30(2), 185–196. https://doi.org/10.1017/s0714980811000092

Lagacé, M., Tanguay, A., Lavallée, M. -L., Laplante, J., & Robichaud, S. (2012). The silent impact of ageist communication in long term care facilities: Elders' perspectives on quality of life and coping strategies. *Journal of Aging Studies*, 26(3), 335–342. https://doi.org/10.1016/j.jaging.2012.03.002

Lee, M., Reuben, D. B., & Ferrell, B. A. (2005). Multidimensional attitudes of medical residents and geriatrics fellows toward older people. *Journal of the American Geriatrics Society*, 53(3), 489–494. https://doi.org/10.1111/j.1532-5415.2005.53170.x

Levy, B. R. (2017). Age-stereotype paradox: Opportunity for social change. *Gerontologist*, 57(Suppl_2), S118–S126. https://doi.org/10.1093/geront/gnx059

Liu, Y., While, A. E., Norman, I. J., & Ye, W. (2012). Health professionals' attitudes toward older people and older patients: A systematic review. *Journal of Interprofessional Care*, 26(5), 397–409. https://doi.org/10.3109/13561820.2012.702146

Liu, Y. -E., Norman, I. J., & While, A. E. (2015). Nurses' attitudes towards older people and working with older patients: An explanatory model. *Journal of Nursing Management*, 23(8), 965–973. https://doi.org/10.1111/jonm.12242

Lucchetti, A. L. G., da S Ezequiel, O., Moreira-Almeida, A., & Lucchetti, G. (2018). Measuring medical students' attitudes and knowledge about geriatrics and gerontology in Brazilian medical students: A comparison of instruments. *Australasian Journal on Ageing*, 37(2), E74–E77. https://doi.org/10.1111/ajag.12532

Maximiano-Barreto, M. A., Luchesi, B. M., & Chagas, M. H. N. (2019). Implicit attitudes toward the elderly among health professionals and undergraduate students in the health field: A systematic review. *Trends in Psychiatry and Psychotherapy*, 41(4), 415–421. https://doi.org/10.1590/2237-6089-2018-0108

Nash, P., Stuart-Hamilton, I., & Mayer, P. (2014). The continuation of prejudice: Addressing negative attitudes in nurse training and continuing professional education. *Educational Gerontology*, 40(1), 53–60. https://doi.org/10.1080/03601277.2013.768084

Ng, R., Allore, H. G., Trentalange, M., Monin, J. K., & Levy, B. R. (2015). Increasing negativity of age stereotypes across 200 years: Evidence from a database of 400 million words. *PLoS One*, 10(2), e0117086. https://doi.org/10.1371/journal.pone.0117086

Opsommer, E., Chevalley, O., Pegito, I., & Demeulenaere, P. (2021). Transcultural adaptation and validation of a French version of the University of California, Los Angeles geriatrics attitudes scale (UCLA-GAS-F). *Archives of Physiotherapy*, 11(1), 21. https://doi.org/10.1186/s40945-021-00114-1

Organization for Economic Co-operation and Development. (2023). Population projections: Percentage of people aged 65 and over in Belgium. *OECD.Stat*. http://www.oecd.org/els/emp/MD_POPPROJ.xlsx

Rathnayake, S., Athukorala, Y., & Siop, S. (2016). Attitudes toward and willingness to work with older people among undergraduate nursing students in a public university in Sri Lanka: A cross sectional study. *Nurse Education Today*, 36, 439–444. https://doi.org/10.1016/j.nedt.2015.10.007

Rattan, S. (2014). Aging is not a disease: Implications for intervention. *Aging and Disease*, 5(3), 196–202. https://doi.org/10.14336/ad.2014.0500196

Reuben, D. B., Lee, M., Davis, J. W., Eslami, M. S., Osterweil, D. G., Melchiore, S., & Weintraub, N. T. (1998). Development and validation of a geriatrics attitudes scale for primary care residents. *Journal of the American Geriatrics Society*, 46(11), 1425–1430. https://doi.org/10.1111/j.1532-5415.1998.tb06012.x

Ruiz, J. G., Andrade, A. D., Anam, R., Taldone, S., Karanam, C., Hogue, C., & Mintzer, M. J. (2015). Group-based differences in anti-aging bias among medical students. *Gerontology & Geriatrics Education*, 36(1), 58–78. https://doi.org/10.1080/02701960.2014.966904

Rush, K. L., Hickey, S., Epp, S., & Janke, R. (2017). Nurses' attitudes towards older people care: An integrative review. *Journal of Clinical Nursing*, 26(23–24), 4105–4116. https://doi.org/10.1111/jocn.13939

Sahin, S., Mandiracioglu, A., Tekin, N., Senuzun, F., & Akcicek, F. (2012). Attitudes toward the elderly among the health care providers: Reliability and validity of Turkish version of the UCLA Geriatrics Attitudes (UCLA-GA) scale. *Archives of Gerontology and Geriatrics*, 55(1), 205–209. https://doi.org/10.1016/j.archger.2011.08.015

São José, J. M. S., Amado, C. A. F., Ilinca, S., Buttigieg, S. C., & Larsson, A. T. (2019). Ageism in health care: A systematic review of operational definitions and inductive conceptualizations. *Gerontologist*, 59(2), e98–e108. https://doi.org/10.1093/geront/gnx020

Shavelson, R. J., Webb, N. M., & Rowley, G. L. (1989). Generalizability theory. *American Psychologist*, 44(6), 922–932. https://doi.org/10.1037/0003-066x.44.6.922

Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. *Advances in Experimental Social Psychology*, 34, 379–440. Academic Press. https://doi.org/10.1016/S0065-2601(02)80009-0

Tuckett, A. G. (2006). On paternalism, autonomy and best interests: Telling the (competent) aged-care resident what they want to know. *International Journal of Nursing Practice*, 12(3), 166–173. https://doi.org/10.1111/j.1440-172X.2006.00565.x

Watkins, M. W. (2018). Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology*, 44(3), 219–246. https://doi.org/10.1177/0095798418771807

Williams, K., Shaw, C., Lee, A., Kim, S., Dinneen, E., Turk, M., Jao, Y. -L., & Liu, W. (2017). Voicing ageism in nursing home dementia care. *Journal of Gerontological Nursing*, 43(9), 16–20. https://doi.org/10.3928/00989134-20170523-02

Williams, K. N., Herman, R., Gajewski, B., & Wilson, K. (2009). Elderspeak communication: Impact on dementia care. *American Journal of Alzheimer's disease and Other Dementias*, 24, 11–20. https://doi.org/10.1177/1533317508318472

Wilson, D. M., Nam, M. A., Murphy, J., Victorino, J. P., Gondim, E. C., & Low, G. (2017). A critical review of published research literature reviews on nursing and healthcare ageism. *Journal of Clinical Nursing*, 26(23–24), 3881–3892. https://doi.org/10.1111/jocn.13803

Woolsey, L. J. (2007). Physician assistant attitude and expressed intent to work with geriatric patients. *Gerontology & Geriatrics Education*, 28(1), 61–78. https://doi.org/10.1300/J021v28n01_05

World Health Organization. (2021). *Global report on ageism*. World Health Organization. https://www.who.int/publications/i/item/9789240016866