Educational Gerontology

Validation of the Attitude-Older Adult and Aging-Visual Analogue Scales (At-O-A)

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The purpose of this study was to psychometrically test a tool developed by the authors to assess college students' attitudes toward older adults and the aging process. The Older Adult and Aging-Visual Analog Scales, or At-O-A, consists of two visual analog scales, one that measures attitudes toward older adults and the other that measures attitudes toward the aging process. The content validity of the tool was first assessed, and revisions were made based on experts' feedback. Then a convenience sample of undergraduate students from the University of Southern Indiana and York College of Pennsylvania was recruited to further test the reliability and validity of the At-O-A (n = 198). The revised Fraboni Scale of Ageism (Rupp, Vodanovich, & Credé, 2005) and the Anxiety About Aging Scale (Lasher & Faulkender, 1993) were used to assess concurrent validity of the At-O-A. Results of Pearson's Correlation tests indicate medium-to-strong relationships with the Fraboni Scale of Ageism and the Anxiety About Aging Scale, establishing this scale's concurrent validity. Test-retest reliability of both visual analog scales in the At-O-A was >.75, which indicates good reliability. Based on these findings, the At-O-A can be considered an efficient, easily administered, and psychometrically sound tool that may be useful for measuring generalized attitudes toward older adults and aging.

Gerontology educators frequently address the concepts of attitudes toward older adults and aging in their courses. This is an effort to encourage interest in careers in aging and to aid students in developing culturally competent attitudes toward older adults and aging. As population aging

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occurs (United States Census Bureau, 2012), college students are increasingly exposed to the older population in both professional and personal situations, yet society tends to view older adults in a negative light as compared to the general population of adults (Kite, Stockdale, Whitley, & Johnson, 2005), and there is a general fear about growing older (Cummings, Kropf, & DeWeaver, 2000). Having positive attitudes toward older adults and aging and/or engaging in rewarding experiences with older adults increases the likelihood that one will choose a career in aging (Hughes et al., 2008; Robert & Mosher-Ashley, 2000). Those who are more knowledge-able about aging tend to have less ageist attitudes and are less anxious about aging themselves (Allan & Johnson, 2008). Educators have identified a variety of classroom activities (Knapp & Stubblefield, 2000; Ligon, Ehlman, Moriello, & Welleford, 2009) and approaches (Hantman, Oz, Gutman, & Criden, 2013) that may promote development of more positive attitudes.

As institutions of higher learning become increasingly focused on outcomes assessment (Weinstein, 2006), it is important for gerontology educators to have access to pragmatic evalua-tive tools with statistically sound psychometric properties that can measure potential changes in attitudes toward older adults and aging. Several validated tools exist that are designed to measure attitudes toward older adults, attitudes toward aging, and anxiety about aging, but none have been developed specifically for use in the classroom and tested for psychometric properties. A primary difference in measuring attitudinal shifts in the classroom as opposed to a research setting is the availability of time for data collection.

LITERATURE REVIEW

Tuckman and Lorge (1953) were some of the first to examine attitudes toward older adults using a questionnaire to measure participants' misconceptions and stereotypes about older adults. The Tuckman-Lorge questionnaire asks participants to respond ''yes'' or ''no'' to a series of 137 statements regarding physical change, personality characteristics, and adjustment including personality disintegration, conservatism, and resistance to change; family relationships; activities; and interests. The dichotomous scoring of the statements forces participants to choose one extreme or the other. This scale was commonly used in the past, but has not been used in the recent literature. The length of this scale may deter its use.

Kogan's Attitudes Toward Old People Scale (1961) was one of the first tools used to measure attitudes toward older adults using a multidimensional scale. It consists of 17 pairs of statements concerning older adults. Each pair is phrased in both a positive and negative manner. Participants are asked to express the extent of agreement with each statement using a six-point Likert scale. The Attitudes Toward Old People Scale measures attitudes toward older adults on four dimensions: authoritarianism and anomie, physical disability, mental illness, and person-ality. Kogan's Scale continues to be used in the literature (Leung et al., 2012; Ryan, Melby, & Mitchell, 2007; Lee, 2009; Kaf, Barboa, Fisher, & Shavely, 2011), but it has been criticized for its length, dated wording, and the unequal psychometric properties of the positive and negative scales (Iwasaki & Jones, 2008).

The Aging Semantic Differential was designed in 1969 by Rosencrantz and McNevin. This scale consists of 32 pairs of polar adjectives accompanied by a 7-point Likert scale. Participants are instructed to choose between the two adjectives which best describe a 35-year-old and 70-year-old person. In 2003, Polizzi revised the Aging Sematic Differential by updating the

adjective pairs. The revised 24-item tool has a four-factor structure which measures attitude on four dimensions: attitude, intelligence/importance, health/confidence, and physical appearance. In reviewing the literature, this tool appears to be the most frequent tool used to evaluate participants' attitudes toward older adults (Harris & Dollinger, 2001; Chase, 2011; Gluth, Ebner, & Schmiedek, 2010; Stewart, Eleazer, Boland, & Wieland, 2007) but has been criticized for some shortcomings with its validity (Gonzales, Tan, & Morrow-Howell, 2010).

The Aging Opinion Survey (Kafer, Rakowski, Lachman, & Hickey, 1980) is a 30-item scale which evaluates attitudes toward older adults and aging using a 5-point Likert scale. This tool measures attitudes toward aging on three subscales: stereotypic age decrement, personal anxiety toward aging, and the social value of elders. The Aging Opinion Survey has been used in the literature to evaluate attitudes toward aging with a variety of populations including university students and caregivers (Katz, 1990; Rakowski, Barber, & Seelbach, 1983; Cummings et al., 2000; Courts, Barba, & Tesh, 2001). In general, there has been limited use of this survey.

Fraboni, Saltstone, and Hughes (1990) suggested that previous constructs of attitudes toward aging and older adults only measured cognitive factors, and not affective factors. In 1990 Fraboni et al. developed the Fraboni Scale of Ageism (FSA), which uses a 4 point Likert scale to measure the extent of agreement with 29 statements (1 = strongly disagree to 4 = strongly agree). The results of the scores can range from 29-116 with higher scores signifying a higher degree of ageism. This tool uses a three factor structure measuring antilocution, discrimination, and avoidance. Rupp et al. (2005) revised the FSA and changed factor labels to stereotypes, separation, and affective attitudes, providing a more accurate reflection of the composition of the scale. This tool has frequently been used in the literature to evaluate college students' attitudes toward older adults (Allan & Johnson, 2008; Jackson, Cherry, Smitherman, & Hawley, 2008; Lin, Bryant, & Boldero, 2011; Rupp, Vodanovich, & Credé, 2006).

The Anxiety about Aging Scale (AAS; Lasher & Faulkender, 1993) was developed to examine how aging anxiety influences one's attitudes and interactions with older adults. The original scale was comprised of 84 items for which participants were asked to rate the extent to which they agree with each statement on a 7-point Likert scale. The revised scale includes 20 items and uses a 5-point Likert scale. This tool provides a multidimensional measurement of aging anxiety on a four factor structure which includes fear of old people, psychological concerns, physical appearance, and fear of loss. In the literature this scale has frequently been used to evaluate college students' anxiety about aging (Allan & Johnson, 2008), individual differences in personality traits, and anxiety about aging (Harris & Dollinger, 2003), as well as anxiety about aging following participation in programs on older adults and the aging (Harris & Dollinger, 2001; Henry, Douglass, & Kostiwa, 2007).

While there are many tools available to evaluate attitudes toward older adults, attitudes toward the aging process, and anxiety about aging, resources required to complete these tools may create barriers. Most instruments consist of 20–30 items and require at least 10–20 minutes to complete. Because time and resources are of the essence in a college classroom, it is important to find a tool that is quick and simple to use. With this in mind, the researchers in this study developed two visual analog scales (VASs) for use in the college classroom: one evaluating attitudes toward older adults (Attitudes Toward Older Adults-VAS or At-Older Adults-VAS) and the other evaluating attitudes toward the aging process (Attitudes Toward Aging VAS or At-Aging-VAS). A VAS is a measurement instrument that measures a construct believed to range across a continuum of values that are difficult to measure objectively. VASs have been

used successfully in the past to measure a wide variety of constructs such as pain (Bijur, 2001, Gallagher, 2002) and fatigue severity (Lee, Hicks, & Nino-Murcia, 1991). The purpose of this study was to psychometrically test two VASs to assess college students' attitudes toward older adults and the aging process.

METHODS

Originally, the authors (Ligon et al., 2009) developed two Visual Analog Scales to measure potential changes in attitudes toward older adults and attitudes toward the aging process following completion of an oral history project. Each VAS was a horizontal line, 100 mm in length, which was anchored by percentages (0%−100%) at each end. The instructions for the first VAS read, ''Place a vertical mark through the line to rate your attitude toward older adults.'' The instructions for the second VAS, ''Place a vertical mark through the line to rate your attitude toward your own aging process.'' The VAS scores were determined by measuring in millimeters from the left hand end of the line to the point the student marked. Researchers interpreted marks closer to 100 to reflect more positive attitudes while marks closer to 0 were interpreted to reflect more negative attitudes. Analysis of the VASs revealed positive shifts in attitudes, yet questions remained about the validity and reliability of VASs as a measurement tool. In the present study, researchers refined the original VASs and then tested the psychometric properties of the refined tool.

Assessing Content Validity

First, based on feedback from journal reviewers, authors refined the anchors for these initial VASs changing the anchors from *0%–100%* to *not positive at all* on the left end of the scale and *extremely positive* on the right end of the scale. Operational definitions of attitudes toward older adults and attitudes toward aging were added. All other aspects of the scales remained the same. See Figure 1 for the operational definitions and revised VASs.

All survey questions refer to the Visual Analogue Scales (VAS) 1 and 2 shown below.

Operational definition of attitudes toward older adults: a positive or negative evaluation of people over the age of 65

Operational definition of attitudes toward your own aging process: a positive or negative evaluation of the process of growing older

Visual Analogue Scales (not drawn to scale)

Question 1

Place a vertical mark through the line to rate your attitude toward older adults

Not positive at all -- Extremely positive

VAS 2

Place a vertical mark through the line to rate your attitude toward your own aging process.

Not positive at all -- Extremely positive

FIGURE 1 At-O-A version sent to content experts for feedback.

With these revisions in place, the scales and operational definitions shown in Figure 1 were submitted to a panel of six content experts for further input along with a series of questions designed to elicit their feedback on the content of the scales. Five of the content experts had specialties related to gerontology while the sixth expert was a sociologist who had expertise in survey research. The panelists were instructed to review the scales based on a prepared list of questions about clarity, understanding, sensitivity of the questions, the anchors and whether the scales measured the appropriate constructs. They were also offered the opportunity to provide suggestions on improving each scale in general. Changes to the scales were made if two of the six content experts had the same concern or if one expert had a compelling concern. Two of the six experts had concerns regarding the anchors, and as a result, the anchors of the scale were changed to *negative* and *positive*. One expert pointed out that the nature of the VAS is to measure a continuum, but our operational definitions did not reflect this continuum. Therefore, the operational definitions were reworded to indicate a range. See Table 1 for the results of content validity testing and Figure 2 for the revision to the anchors and operational definitions based on content-expert feedback.

Following revision to the anchors and operational definitions, the scales as shown in Figure 2 were submitted to a group of 30 undergraduate gerontology students to ensure the instructions were clear to the people who represent those who will actually use the scales. Each student was instructed to give feedback about the understanding and sensitivity of the questions. No additional changes were made based on student feedback. Therefore, Figure 2 displays the final version of the two VASs and operational definitions used in the current study. Researchers titled their tool (including both Visual Analog Scales) the Attitude-Older Adult and Aging-Visual Analog Scales, or the At-O-A.

Psychometric Testing

A convenience sample of undergraduate students from the University of Southern Indiana and York College of Pennsylvania were recruited to further test the reliability and validity of the At-O-A. At both the University of Southern Indiana and York College of Pennsylvania, the majority of undergraduate students are Caucasian (USI $= 89\%$; YCP $= 87\%$) and female (USI $= 61\%$; YCP $= 56\%$). Students 18 years of age and older who were enrolled in either Introduction to Sociology classes at York College or a Health Care Ethics class at the University of Southern Indiana were eligible for inclusion. Students currently or previously enrolled in gerontology courses were excluded. Approval for research with human subjects was given by Institutional Review Boards of the University of Southern Indiana, York College of Pennsylvania and The Sage Colleges.

Procedures

The participants were asked to participate in two sessions held during class time at the same time of day, one week apart. During the first session, participants filled out a demographic survey, the At-O-A, the 20-item AAS (Lasher & Faulkender, 1993), and the revised FSA (Rupp et al., 2005). Prior to filling out the surveys, a script was read to the students, and the students gave their consent to participate in this project by completing the surveys. One week later, the

TABLE 1
Results of Content Validity Testing

Question	Results	Comments
Please read the operational definition of ''attitudes toward older adults.'' Does the VAS shown in Figure 1 measure this construct?	5 out of 6 answered yes	I am also curious why your operational definitions do not represent more of a continuum (positive to negative) since VAS suggests a continuum but ''positive or negative'' suggests nominal The question is so broad, that it is hard to say what you are measuring
Please read the operational definition of ''attitudes toward your own aging process.'' Does the VAS shown in Figure 2 measure this construct?	5 out of 6 answered yes	I am also curious why your operational definitions do not represent more of a continuum (positive to negative) since VAS suggests a continuum but ''positive or negative'' suggests nominal If you are trying to measure whether students are afraid of growing old, or whether they think of growing old as something negative, then the question doesn't capture this.
Are the anchors appropriate (not positive at all and extremely positive). If not, please state why and make another suggestion.	4 out of 6 answered yes	I am curious why you chose Not positive at all vs. Extremely negative as your anchors since Not positive at all could be considered neutral vs. negative. I think it would make sense to use another term for the not positive at all end. It seems to be more positively worded as currently written. I would suggest, since you are asking about attitudes and research tells us that subjects are reluctant to disclose negative attitudes, that you consider different language for the first anchor
Are any of the questions ''sensitive'' or ''embarrassing''?	6 out of 6 answered no	In actuality, someone might be embarrassed to disclose that they had negative (or Not positive at all) attitudes. You may end up with an abundance of neutral answers.
Is the wording in each question clear?	6 out of 6 answered yes	
Did you have difficulty understanding either of the questions? If so, please state why and suggest how the item can be revised.	6 out of 6 answered no	

students completed the At-O-A only. This time interval was chosen under the assumption that attitudes would not change within this period of time, and the students would forget what they marked during the first session.

The FSA was chosen as the gold standard to evaluate concurrent validity of the At-Older Adults-VAS. Test retest reliability of the three factors of the scale are $r = .72$ for the stereotype factor, .66 for the separation factor, and .70 for the affective factor (Naftz & Wurtle, 2010). The FSA has been noted to have adequate levels of internal consistency (Cronbach alpha $= .86$) and sufficient levels of construct validity (Fraboni et al., 1990). Rupp et al. (2005) provided evidence of a three-factor structure and adequate construct validity.

In the following questions, attitudes toward older adults and attitudes toward your own aging process are defined in the following ways:

Definition of attitudes toward older adults: An evaluation, ranging from negative to positive, of people over the age of 65

Definition of attitudes toward your own aging process: An evaluation, ranging from negative to positive, of the process of growing older

Please follow instructions in order to answer Questions 1 and 2.

Question 1

Place a vertical mark through the line to rate your attitude toward older adults.

Negative   Positive
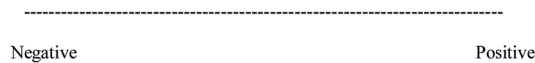
Question 2

Place a vertical mark through the line to rate your attitude toward your own aging process.

Negative   Positive
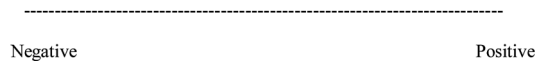
FIGURE 2 At-O-A final version.

The AAS was chosen as the gold standard to evaluate concurrent validity of the At-Aging-VAS. Lasher and Faulkender (1993) provide evidence for construct validity of the AAS by demonstrating that the scores were negatively correlated with the amount of contact, self-efficacy, and knowledge of aging and positively correlated with the quality of contact with elders. The 20-item scale has been found to demonstrate high internal consistency (Cronbach alpha = .82) (Lasher & Faulkender, 1993).

Data Analysis

In order to psychometrically test the At-O-A to assess peoples' attitudes toward older adults and the aging process, researchers sought to evaluate test-retest reliability and concurrent validity of the tool. Test-retest reliability was analyzed by calculating intraclass correlation coefficient (ICC) values for each scale using survey scores from the first session and comparing them to the scores from the second session. ICC values above 0.70 were considered satisfactory (Polit & Beck, 2004) while those above 0.75 were considered good reliability (Portney & Watkins, 2009). To establish concurrent validity, Pearson's correlation tests were calculated to determine the relationship between the results on the At Older Adults-VAS with the FSA and the At Aging-VAS with the AAS. In interpreting strength of relationship, an r-value of $>.5$ was considered strong while values ranging from 0.3–0.5 were considered moderate (Burns & Grove, 2006).

TABLE 2
Baseline Information ($n = 198$)

Variables	M *or* %	SD *or* n	Range
Institution			
York College of Pennsylvania (%)	66.77	132	
University of Southern Indiana (%)	33.33	66	
Race			
White, non-Hispanic (%)	90.40	179	
African American (%)	3.00	6	
American or Alaskan Indian (%)	0.50	1	
Asian (%)	2.00	4	
Other (%)	4.00	8	
Gender			
Female (%)	59.10	117	
Male (%)	33.80	67	
Missing data (%)	7.10	14	
Age (*M*)	19.60	±3.01	18–42
AT Older Adults-VAS (*M*)	75.26	±17.55	12–100
AT Aging-VAS (*M*)	60.67	±21.07	0–100
Fraboni (*M*)	45.65	±7.92	25–69
AAS (*M*)	68.95	±9.27	39–100

RESULTS

Surveys were distributed to 298 students in total at time one; of those, 198 surveys were completed at both time one and time two in full and could be matched. Of the 198 surveys analyzed, 66.7% were from York College of Pennsylvania students ($n = 132$) while 33.3% were from the University of Southern Indiana students ($n = 66$). Surveys were not included for analysis if the time one survey could not be matched with the time two survey and/or if surveys were left blank in part or in full with one exception: 14 students (7%) left ''gender'' blank on their surveys but otherwise completed other items, and these surveys were not excluded. The response rate for completing surveys at both time one and time two was 66%. Most participants were non-Hispanic White (90%), females (59%), and the majority was from York College of Pennsylvania (67%). The average age of participants was 19.60 ± 3.0 years. See Table 2 for baseline information.

When data were evaluated for test-retest reliability, the ICC value for the AT Older Adults-VAS Scale was 0.87, 95% *CI* [.821, .898]. For the At-Aging-VAS Scale, the ICC value was 0.84, 95% *CI* [.780, .874] (see Table 3). The Pearson Correlation for the At-Older Adults-VAS

TABLE 3
Test-Retest Reliabilities

Scale	Intraclass correlation coefficient (average measures)	95% confidence interval	df
VAS Attitudes toward Older Adults	.865	.821, .898	197
VAS Attitudes toward Aging	.834	.780, .874	197

TABLE 4
Concurrent Validity of VAS Scales with Fraboni and AAS

Scale	Pearson correlation sig. (2-tailed)	N
VAS Attitudes toward Older Adults		
Time One with Fraboni	−.499**	19
Time Two with Fraboni	−.637**	8
VAS Attitudes toward Aging		
Time One with AAS	.384**	19
Time Two with AAS	.430**	8

**Correlation is significant at the 0.01 level (2-tailed).

session one and the Fraboni Scale of Ageism was −.50 at time one and −.64 at time two. The Pearson Correlation for the At-Aging-VAS for session one was .38 and .43 for session two. All correlations were significant at the .01 level (two-tailed). Refer to Table 4.

DISCUSSION

Test retest reliability of the At-Older Adults-VAS and the At-Aging-VAS were both $>.75$, which indicates good reliability. The Pearson Correlation for the At-Older Adults-VAS at time one and time two indicated medium and strong relationships, respectively, establishing the scale's concurrent validity. The Pearson Correlation for the At-Aging-VAS Scale at time one and time two both indicated medium strength relationships, establishing this scale's concurrent validity. The reliability and validity of the At-O-A has promising implications for the measurement of attitudes toward older adults and the aging process in the classroom.

In comparing the test-retest reliability of the At-Older Adults-VAS with other scales that measure attitudes toward older adults, our results match favorably with them. The only measures that have been evaluated for test-retest reliability are The Aging Semantic Differential ($r = .81$–.84; Polizzi, 2003) and The FSA ($r = .66$–.72; Naftz & Wurtle, 2010). ICC values for the current study were 0.87, indicating that our results were slightly more favorable. Because our scale was correlated with a gold standard measure, the FSA, we conclude that the At-O-A is a valid way to measure attitudes toward older adults.

It is not possible to compare the test-retest reliability of the At-Aging-VAS with other scales that measure attitudes toward the aging process because no literature was found about the test-retest reliability of the AAS. Although the concurrent validity of this scale is not as strong as the At-Older Adults-VAS, validity is still within an acceptable range; therefore, our scale can still be considered a valid way to measure attitudes toward the aging process.

A noteworthy advantage of the At-O-A over the others is that it takes less than five minutes to administer and collect, whereas the others can take anywhere from 10–30 minutes. The At-O-A provides a quick and practical measurement in settings with time constraints. The efficiency and simplicity of this pragmatic measurement tool may prove beneficial for exploring general attitudes toward older adults and the aging process in the classroom setting and beyond. The practicality of the At-O-A may be extended to professional settings in which employers have similar goals in mind and face similar time constraints. The At-O-A is easily administered in

such settings, and, thus, it provides educators and employers with opportunities to quickly and easily evaluate attitudinal shifts that may occur in response to gerontological programs, activities, and trainings.

There are several limitations to the current research and to use of the At-O-A. A limitation of the current research is that the FSA and AAS were chosen as gold standards, yet neither of these scales has been extensively tested. Construct and predictive validity of the two VASs was not tested. Furthermore, findings are generalizable primarily to non-Hispanic, White, traditional college-age students. Finally, there are limits to use of the At-O-A. While the VAS scales have demonstrated adequate reliability and validity, it should be noted that attitudes toward aging and attitudes toward older adults are multidimensional constructs. The original Fraboni tool (Fraboni, et al., 1990) identified three factors: antilocution, discrimination, and avoidance. Rupp et al. (2005) revised the FSA and revised the factor labels to include stereotypes, separation, and affective attitudes. The AAS (Lasher & Faulkender, 1993) provides a multidimensional measurement of aging anxiety on a four-factor structure including fear of old people, psychological concerns, physical appearance, and fear of loss. The At-O-A is an extremely generalized measure and is limited in the detail of information collected; therefore, in a research setting, as opposed to the classroom or workplace, researchers are encouraged to use instruments that reflect the multidimensionality of these constructs.

In conclusion, the present study establishes that the At-O-A has acceptable levels of reliability and validity when measuring generalized attitudes toward older adults and aging anxiety. The study was carried out in two different geographic locations and it was found to be easily administered in both locations. The simplicity of the instrument lends itself to use in a variety of locations, languages, and settings. The At-O-A instrument is designed to be a quick and easily administered tool that may be useful for educators and employers as they seek to measure attitudes toward older adults and aging.

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