Development and Validation of a Short-Form Adaptation of the Age-Related Vision Loss Scale: The AVL12

Amy Horowitz, Joann P. Reinhardt, and Tenko Raykov

Abstract: This article describes the development and evaluation of a short form of the 24-item Adaptation to Age-Related Vision Loss (AVL) scale. The evaluation provided evidence of the reliability and validity of the short form (the AVL12), for significant interindividual differences at the baseline and for individual-level change in AVL scores over time. Thus, the AVL12 maintains strong psychometric properties and is a shorter, more efficient measure for assessing adaptation to age-related vision loss in both research and clinical settings.

The Adaptation to Age-Related Vision Loss (AVL) scale (Horowitz & Reinhardt, 1998) was developed to provide a psychosocial measure of adjustment specifically for older adults who are adapting to late-life vision loss. The major impetus for developing the AVL was the absence of instruments in the field that specifically focused on older adults with visual impairments (both those who are blind and those with low vision) and on their psychosocial, rather than functional, adaptation to vision loss. Horowitz and Reinhardt (1998) argued that it was not that older adults adapted differently to visual impairment than did younger people, but that the indicators of adaptation would be different in later life. For example, references to braille, school, and work in the few scales that focused on psychological issues related to vision loss would not be appropriate for older adults who lost vision later in life.

Furthermore, in lieu of a specific measure of adaptation to late-life vision loss, most researchers relied on global measures of well-being, such as measures of life satisfaction, morale, and depression. Global measures of well-being, however, focus on the older person's current emotional state and on the congruence between desired and achieved lifetime goals. Adaptation to a specific late-life stressor, such as visual impairment, is not synonymous with adaptation to aging, but may be a contributor to overall subjective

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well-being in later life. Thus, both global and domain-specific measures are relevant to understanding the quality of life of older adults with visual impairments. In a review of the literature, common themes were identified that contributed to the definition of adaptation to age-related vision loss, namely, themes of acceptance, a realistic approach to both limitations and remaining capabilities, and a balance between independence and the appropriate use of assistance (Horowitz & Reinhardt, 1998).

The original AVL scale had 24 items and a dichotomous response set (agree or disagree). A factor analysis of the original 24-item scale indicated that while the different aspects of adaptation just noted are reflected in the items, the scale was more consistent with, and best used as, a unidimensional measure. Furthermore, analyses gave support for the reliability and validity of the scale. The internal consistency of the scale was high (alpha = .84), and convergent validity was indicated by significant correlations with commonly used scales of life satisfaction (correlations ranged from .49 to .63) and depression (correlations ranged from −.55 to −.74) and a single-item self-rating of adaptation (correlations ranged from .37 to .45; see Horowitz & Reinhardt, 1998).

Given the increasing number of older adults with age-related vision loss (Campbell, Crews, Moriarty, Zack, & Blackman, 1999; Horowitz, Brennan, & Reinhardt, 2005), as well as the increasing need to document the effectiveness and outcomes of vision rehabilitation services (Agency for Healthcare Research and Quality, 2002), it is not surprising that research on the psychosocial consequences of age-related vision loss and psychosocial outcomes of vision rehabilitation services for older adults has been increasing in recent years. However, the research tools that are available focus primarily on assessing vision-related function. These tools include questionnaires that were available at the time that the AVL scale was developed, such as the Visual Function Self-report (Steinberg et al., 1994), the Activities of Daily Vision Scale (Mangione et al., 1992); and the Visual Activities Questionnaire (Sloane, Ball, Owsley, Bruni, & Roenker, 1992), as well as scales that have appeared in the literature since then, such as the Melbourne Low Vision ADL Index (Haymes, Johnston, & Heyes, 2001), the National Eye Institute Visual Function Questionnaire (NEI-VFQ; Mangione et al., 2001), and the Veterans Affairs Low-Vision Visual Function Questionnaire (Stelmack et al., 2004; Szlyk et al., 2004). However, as Stelmack et al. (2004) noted, these questionnaires were developed for various applications, many to evaluate medical treatments, and are not routinely used to assess the impact of vision rehabilitation services. Furthermore, although visual function measures are useful tools for measuring functional status, which is the major focus of vision rehabilitation, these instruments do not purposively or adequately address the psychosocial issues that inevitably accompany an age-related vision loss and that must be confronted and resolved as part of the process of adaptation. Yet, the psychosocial aspects of low vision care are becoming increasingly recognized as an important part of the rehabilitation process (Agency for Healthcare Research and Quality, 2002). Thus, given the continued need for a measure such as the AVL scale, and the desire to maximize the sensitivity of the AVL to capture change, we developed a shorter version of the AVL that is more efficient to use and maintains the psychometric strengths of the longer scale.

Methods

Identification of proposed items for the short AVL

The original 24-item AVL scale was incorporated into the study, Social Support and Adaptation to Chronic Vision Loss, with a sample of 570 adults who were applicants for vision rehabilitation services, including low vision, orientation and mobility, rehabilitation training, and counseling (Reinhardt, 2001). The type and amount of actual services the participants received depended on their individual preferences and needs. The data from the study were used to guide the modifications made to the original 24-item AVL scale. The participants ranged in age from 63 to 99 years, with a mean of 80 years ($SD = 7$). Of the 570 participants, 64% reported macular degeneration, about one-fourth reported glaucoma, and just over one-third reported cataracts (some respondents reported more than one visual condition). The participants varied in the severity of their visual impairment. On a scale of functional vision loss (Horowitz, Teresi, & Cassels, 1991) with a possible range of 0 to 15 (a high score indicating more severe vision loss), the mean was 11 ($SD = 3$), with 78% scoring at or above the cut score of 9, indicating a significant level of impairment.

Several procedures were followed to identify items that could be deleted from the original scale. First, distributions for each of the AVL 24 items were examined. Ten items were identified that had more skewed distributions, a relatively high proportion of missing data, relatively low item-total correlations, or poor feedback from the interviewers (the items were difficult to administer in terms of time and understanding). These items were dropped from the scale. See Table 1 for a list of the items in the original 24-item version, the reasons for dropping particular items, and the resulting 14-item version with the scoring for each item described.

Second, some of the wording of the items in the original scale was modified to have all items consistently reflect self-references, that is, to require that answers from the participant were about the participant, rather than about visually impaired people in general. For example, the item that was originally worded as "Visually impaired people might as well accept the fact that visual impairment makes them pretty helpless" was reworded as "I might as well accept the fact that visual impairment makes me pretty helpless." Last, response categories were changed from a dichotomous agree-or-disagree format to a 4-point Likert-type scale (strongly agree, agree, disagree, and strongly disagree) to maximize sensitivity. The resulting scale contained 14 items (see Table 1), 10 of which were negatively worded (for instance, "I feel that losing one's sight means losing one's self") and 4 of which were positively worded (for example, "There are worse things that can happen to me than losing vision"). The shortened AVL scale was tested in an independent longitudinal study, entitled Depression, Disability, and Rehabilitation (Horowitz, Reinhardt, & Kennedy, 2005), which had a baseline sample of 584 older adults who were applicants for vision rehabilitation.

Table 1
Items on the AVL24 and the AVL14.

AVL24	AVL14
1. Because of my vision loss, I feel like I can never really do things for myself.	1. Because of my vision loss, I feel like I can never really do things for myself.
2. Most services available to visually impaired persons are useless in really helping them with their problems.	[Missing data]
3. I can still do many of the things I love; it just takes me longer because of my visual impairment.	[Low item-total correlation]
4. Visual impairment is the cause of all my problems.	2. Visual impairment is the cause of all my problems.
5. Some people in the family act as though the visually impaired person is a burden to them.	[Skew]
6. A visually impaired person can never really be happy.	3. Because of my visual impairment, I can never really be happy.
7. Because of my trouble seeing, I am afraid that people will take advantage of me.	4. Because of my trouble seeing, I am afraid that people will take advantage of me.
8. By learning new ways of doing things (that compensate for vision loss), a visually impaired person has a chance to be more independent.	5. As a person with vision loss, I can become more independent by learning new ways of doing things.
9. Visually impaired persons cannot afford to talk back or argue with family and friends.	[Skew]
10. People should not expect too much from visually impaired persons.	6. People should not expect too much from me because of my visual impairment.
11. People who experience vision loss late in life will never be able to learn how to get around without bumping into things.	[Interviewer feedback]
12. It is too hard for older people to learn new ways of doing things (that compensate for vision loss) if they become visually impaired.	[Interviewer feedback]
13. Visually impaired people may as well accept the fact that visual impairment makes people pretty helpless.	7. I may as well accept the fact that visual impairment makes me pretty helpless.
14. It is degrading for visually impaired persons to depend so much on family and friends.	[Interviewer feedback]
15. Although the circumstances of my life have been changed, I am still the same person I was before my visual impairment.	8. Although the circumstances of my life have been changed, I am still the same person I was before my visual impairment.
16. Sighted people generally dislike being with visually impaired people (because of their vision problems).	[Missing data]
17. Sighted people expect visually impaired persons to do things that are impossible.	[Interviewer feedback]
18. Visually impaired people have to depend on sighted people to do most of the things they did for themselves.	9. I have to depend on sighted people to do most of the things I did for myself.
19. Losing one's sight means losing one's self.	10. I feel that losing one's sight means losing one's self.
20. People with vision problems are uncomfortable making new friends because they cannot always see people's faces clearly.	11. I am uncomfortable making new friends because I cannot always see people's faces clearly.

(cont.)

Table 1
(cont.)

AVL24	AVL14
21. I feel comfortable asking my family and friends for help with things I can no longer do because of my vision loss.	12. I feel comfortable asking my family and friends for help with things I can no longer do because of my vision loss.
22. When a person becomes visually impaired, sighted friends don't understand him or her as they did before.	[Interviewer feedback]
24. It is better for persons with vision problems to let other people do things for them.	13. Because of my vision loss, it is better to let other people do things for me.
24. There are worse things that can happen to a person than losing vision.	14. There are worse things that can happen to me than losing vision.

Note: AVL24 scoring: 1 = agree and 0 = disagree; items 3, 8, 15, 21, and 24 are reverse coded (positively worded); range = 0–24; a higher score indicates better adaptation. AVL14 scoring: 3 = strongly agree, 2 = agree, 1 = strongly disagree, and 0 = disagree; items 5, 8, 12, and 14 are reverse coded (positively coded); range = 0–42; a higher score indicates better adaptation.

Psychometric analyses of the modified AVL

The AVL14 items were integrated into an in-depth interview eliciting data on sociodemographic characteristics, visual status, general health, functional ability, personal resources, social support, and psychological well-being. The participants ranged in age from 65 to 100 years, with a mean of 80 years ($SD = 8$). Two-thirds reported macular degeneration, one-fourth reported glaucoma, one-third reported cataract, and 15% reported diabetic retinopathy (some respondents reported more than one visual condition). There was a full range of visual acuity, with 40% having visual acuities that were better than 20/70, 39% having visual acuities of 20/70 to 20/190, and 21% having visual acuities of 20/200 or worse (Horowitz, Reinhardt, & Kennedy, 2005). Data from the baseline ($n = 584$), six-month ($n = 455$), and one-year ($n = 418$) follow-ups were used in these psychometric analyses. Both this and the previously mentioned study followed the tenets of the World Medical Association Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Subjects and were approved by the Human Subjects Review Committee (institutional review board) of Lighthouse International.

In addition to the AVL scale, two measures of mental health were used in the analyses: the widely used measure of depressive symptomatology, the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), a 20-item scale, each item rated on a 4-point Likert scale, coefficient alpha = .87, range = 0–60, and a vision-specific mental health measure (a 4-item scale, coefficient alpha = .67, range = 4–20), taken from the NEI-VFQ 25 (Mangione et al., 2001). On the latter scale, each of 4 items was rated on a Likert scale ranging from 1 (definitely true) to 5 (definitely false) regarding how true the statement was for the participants regarding their vision loss: frustrated a lot, have less control over what to do, worry about embarrassing self, and worry about eyesight.

The structure underlying the responses on the AVL scale was evaluated using several techniques that are available through covariance structural modeling and latent variable modeling (Muthen, 2002; Raykov & Marcoulides, 2006). First, a confirmatory factor analysis was conducted using weighted least-squares estimation, which accounted for the discrete nature of the scale items. The reliability of the scale was also examined by computing an alpha coefficient. Then, the validity of the AVL scale was evaluated. For criterion validity, the associations of the scores on the AVL scale with both the CES-D and the NEI-VFQ vision-specific mental health measures were tested at a latent variable level. For construct validity, a model was fit with two factors, the first loading on the AVL items, and the second loading on the depression and NEI-VFQ mental health scales. Finally, the AVL scores were examined for their sensitivity to change over time, using a multiple-indicator longitudinal model. To maximize the use of all available data, full information maximum likelihood (FIML) techniques were used in the analyses with multiple time points.

To accomplish our modeling purposes and respond to our research questions, we used confirmatory factor analysis with categorical indicators (Muthen & Muthen, 2006) for the scale-development work and the validity-related analyses. To examine the degree to which scores on the AVL were related to the mental health construct, we used a confirmatory factor analysis model and focused on the correlations of the pertinent latent variables, which followed the procedure for addressing construct validity as outlined in Bollen (1989). The statistical technique on which these analyses are based is an underlying latent variable approach, which was developed to analyze categorical-dependent variables (the AVL items in this case). These analyses were conducted with the widely used Mplus software (Muthen, 2002; Muthen & Muthen, 2006; Raykov & Marcoulides, 2006).

Results

First, we performed a confirmatory factor analysis to determine whether the relationships among the responses from the AVL14 scale could be accounted for by one underlying factor. Because the data for the AVL items are categorical ordinal data, with four categories for each item, the assumption of continuous observed variables could not be made. Therefore, an underlying latent variable approach was implemented using latent variable modeling. In this approach, it is assumed that there is a normally distributed latent variable that underlies participants' responses to each item. To test this assumption, we first computed a polychoric correlation matrix (PCM), which is the correlation matrix for the underlying 14 continuous latent normal variables (rather than for the 14 observed discrete variables). This assumption was tested for pairs of items, and the results showed that the assumption was plausible for the 14 items.

The single-factor confirmatory model, in which the 14 discrete items were considered indicators of a single latent variable (using the weighted least-squares estimation method; Muthen & Muthen, 2006), was found to fit acceptably well (chi-square = 217.68, $p < .001$, $df = 77$, RMSEA = .06, CFI = 0.93; SRMR = 0.11). However, two items (5: "As a per-

Table 2
Confirmatory factor analyses.

AVL14		AVL12	
Item number	Unstandardized common factor loadings (λ)	Item number	Unstandardized common factor loadings (λ)
AVL1	0.84	AVL1	1.00
AVL2	0.84	AVL2	0.98
AVL3	0.86	AVL3	1.04
AVL4	0.70	AVL4	0.84
AVL5	−0.09		
AVL6	0.76	AVL5	0.91
AVL7	0.89	AVL6	1.06
AVL8	0.43	AVL7	0.50
AVL9	0.79	AVL8	0.95
AVL10	0.80	AVL9	0.93
AVL11	0.78	AVL10	0.91
AVL12	0.03		
AVL13	0.71	AVL11	0.87
AVL14	0.25	AVL12	0.32

son with vision loss, I can become more independent by learning new ways of doing things" and 12: "I feel comfortable asking my family and friends for help with things I can no longer do because of my vision loss") did not load significantly on the underlying latent variable, adaptation to vision loss. Thus, these two items were removed, and the confirmatory factor analysis was repeated on the 12 AVL items (referred to hereafter as the AVL12 scale). This single-factor confirmatory model also showed an acceptable fit (chi-square = 176.22, $p < .001$, $df = 54$, RMSEA = .062, CFI = 0.94; SRMR = 0.11), with each of the 12 indicators loading significantly on a common latent variable. These results support the unidimensionality of the AVL12 scale. See Table 2 for factor loadings for the AVL14 and the AVL12 items. An alpha coefficient was also computed for the items on the AVL12 scale and found to be .85.

For descriptive purposes, we examined the distribution of scale scores. The observed scores matched the potential range of 0–36, with a mean of 23.9 ($SD = 8.4$). As depicted in Figure 1, while there was a tendency to score at the higher end (better adjusted) of the scale, the skewness statistic remained less than 1, with a score of −.55, and the full range of scores were adequately represented.

Next, to address the criterion validity of the AVL12 scale, these scores were correlated with two mental health measures that were included in the study: the CES-D, which is widely used to measure depressive symptomatology in gerontological research (Shaver & Brennan, 1991), and the mental health subscale of the NEI-VFQ, which is widely used in vision research (Mangione et al., 2001). Both constructs could be expected to be related to adaptation to vision loss, in that higher levels of adaptation should be associated with lower depressive symptomatology and better vision-specific mental

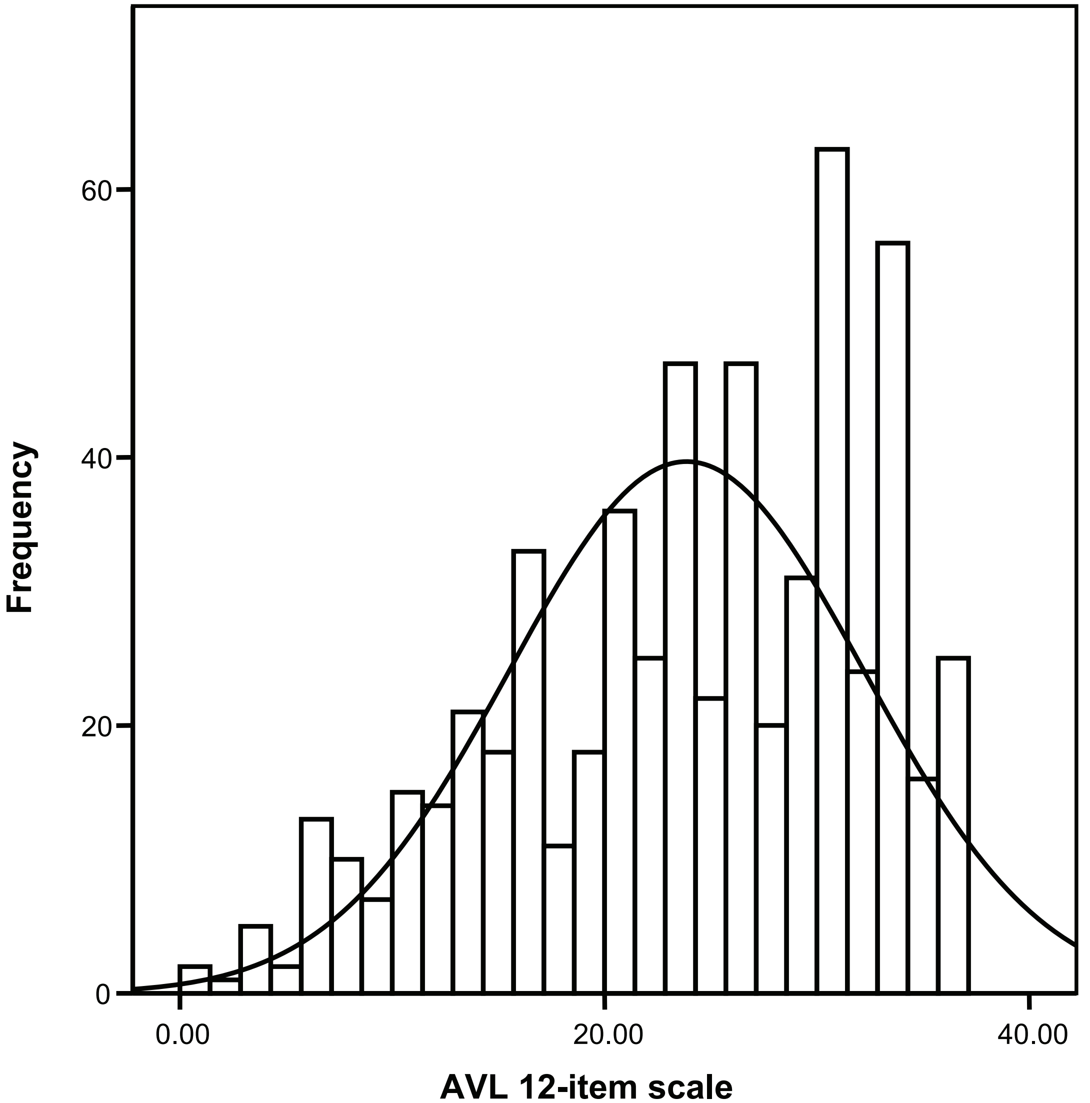

Figure 1. Distribution of the scores on the AVL12 scale.

health. The results demonstrated an association of $r = -.46$ ($p < .001$) with depressive symptoms and $r = -.59$ ($p < .001$) with the vision-specific mental health scale (a lower score indicates more positive vision-specific mental health), each indicating shared variance, but not tautological relationships. The findings also showed a correlation of $r = .41$ ($p < .001$) between the measure of depressive symptoms and vision-specific mental health.

To address construct validity, we fit a covariance structure model with two factors (see Bollen, 1989). A two-factor model was used to compare the vision-specific measure of adjustment, adaptation to vision loss (the AVL12 items), with mental health (assessed with two indicators). Specifically, the CES-D and

Table 3
Covariance structure model.

Factors	Estimates	*SE*	Est./*SE*
AVL common factor			
AVL1	0.76	0.02	31.23
AVL2	0.73	0.02	27.03
AVL3	0.79	0.02	33.32
AVL4	0.62	0.03	18.34
AVL5	0.67	0.03	23.34
AVL6	0.87	0.02	48.53
AVL7	0.37	0.05	8.00
AVL8	0.67	0.03	23.32
AVL9	0.71	0.03	25.33
AVL10	0.73	0.03	25.60
AVL11	0.59	0.03	17.50
AVL12	0.22	0.05	4.44
Mental health factor			
CES-D	5.59	0.45	12.36
NEI	2.90	0.20	14.37
AVL–mental health factor correlation	−0.87	0.03	−26.02

NEI-VFQ scale scores were considered in this model as indicators of a second latent factor, in addition to the one with the AVL item indicators. This factor represents the common source of interrelation between the overall scores on the CES-D and on the NEI-VFQ. Thus, the first factor loaded on the 12 AVL items (accounting for their discrete nature; Muthen & Muthen, 2006), and the second factor loaded on the depression and NEI-VFQ mental health scale scores (see Table 3). The fit of the model was good (chi-square = 212.440, $p < .001$, $df = 50$, RMSEA = .075, CFI = 0.93, weighted RMR = 1.06).

Furthermore, the correlation between the two factors was negative, significant, and strong ($r = -.87$, $p < .001$), which reflects a marked linear pattern of relationship between adaptation to vision loss and the common latent source of variability in the CES-D and NEI scores. In the context of the previously reported evidence for criterion validity, this strong latent correlation attests to the construct validity of the AVL12 scale (Bollen, 1989) and indicates that participants who were high in adaptation to vision loss reported fewer depressive symptoms and had more positive vision-specific mental health, as demonstrated by lower scores on the latter measure. A scatter plot of the observed scores on the CES-D and the NEI-VFQ mental health scale is presented in Figure 2.

Finally, we conducted an analysis to tease apart average change from individual change by examining the latent AVL12 construct across measurements at three points in time. The model treated all AVL items as categorical variables, since each item had only four different values that could be selected by each participant (Muthen & Muthen, 2006). In addition, the model postulated identical factor loadings for each of the 12 items across the three assessment occasions, as well as identical thresholds for each item across the three points in time. Thus, the model embodied the measurement invariance requirement, which is essential in longitudinal research that claims (as did this study) that the same latent construct has been measured at each point in time (Raykov, 2004). Furthermore, for each assessment point, there was a latent construct, called adaptation to vision loss, indicated by the 12 items. Across the three points in time, a level-and-shape model was postulated (as a second-order factor analysis model) for these three latent constructs. This model was viewed as a restricted, longitudinal second-order

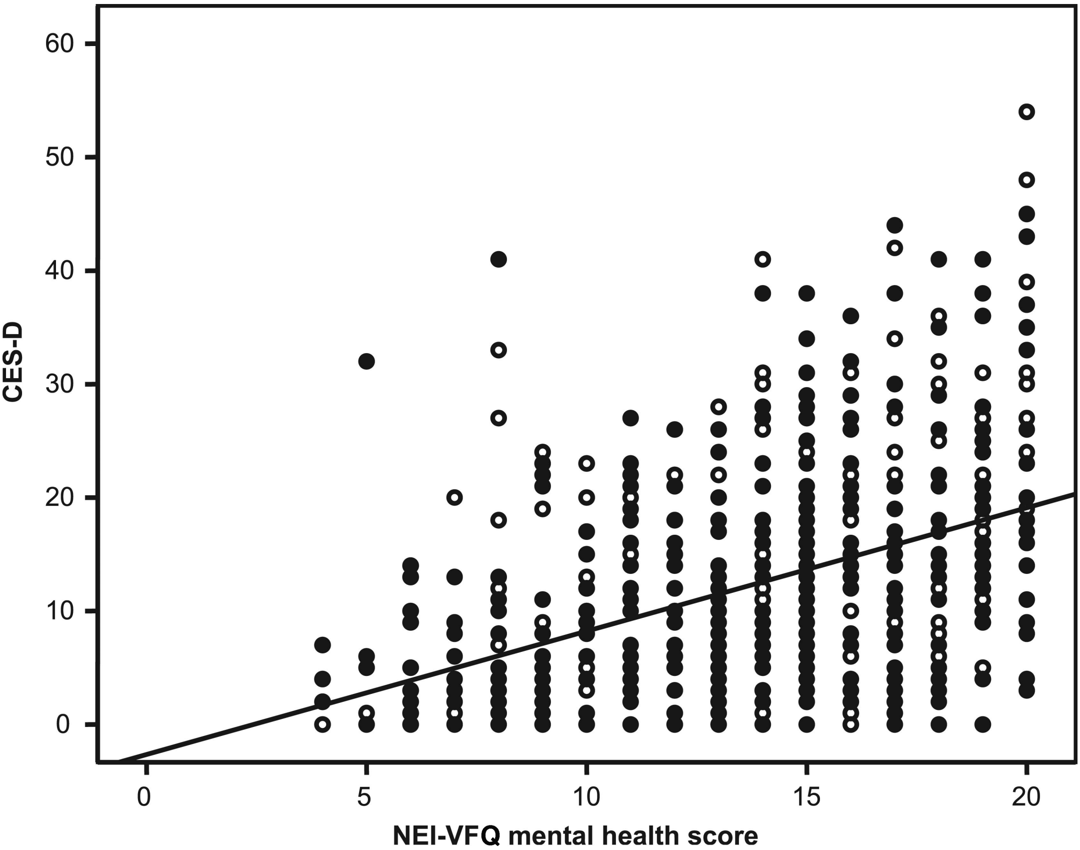

Figure 2. Scatter plot of observed scores on the CES-D and the NEI-VFQ mental health subscale.

factor analysis model, whereby the second-order constructs were the initial true starting position of adaptation to vision loss and the change in adaptation over two specific assessment occasions in adaptation.

In the first of three models, the first of the second-order constructs was the initial starting position, and the second was latent change (change in adaptation) from Time 1 to Time 3. The results showed that this model fit acceptably well (chi-square = 327.114, $p < .001$, $df = 132$, RMSEA = .050, CFI = 0.96, weighted RMR = 0.50). The initial status and change in adaptation to vision loss were not significantly correlated (covariance estimate = −0.017, *SE* = 0.017, $t = -.963$), and thus their correlation can be treated as 0 in the older adult population with recent vision loss. The mean of the adaptation-to-vision-loss change variable was not significant either (covariance estimate = 0.043, SE = 0.027, $t = 1.602$). Thus, on average, the level of adaptation of older adults to vision loss did not change across the three assessment points. However, the variance of the change variable was significant (covariance estimate = 0.067, *SE* = 0.033, $t = 2.054$), as was the variance for the initial starting position (covariance estimate = 0.499, *SE* = 0.031, $t = 16.116$). Thus, it can be concluded that the older adults started with a substantial amount of interindividual variability in adaptation to vision loss, and there were marked interindividual differences in the amounts of change in adaptation from the first to the third time point (one year after the baseline).

In the second model, the first of the second-order constructs was again the initial starting position, but the second was change in adaptation to vision loss from the first to the second assessment only. This model was equivalent to the first fitted model with the same overall fit indices as those reported for the initial model, with some of the parameter estimates different from the first model (see Raykov & Penev, 1999). As in the first model, the initial status and change in adaptation to vision loss from the first to the second assessment were not significantly correlated (covariance estimate = −0.019, *SE* = 0.019, *t* = −1.002). Also, the variance for the change along the adaptation latent dimension from the first to the second assessment was significant (covariance estimate = 0.087, *SE* = 0.032, *t* = 2.736), as was the variance for the initial starting position (covariance estimate = 0.499, *SE* = 0.031, *t* = 16.116). Thus, as we stated earlier, the older adults started with interindividual variability in adaptation to vision loss, and there was significant individual change from the baseline to the six-month follow-up.

In the third model, the first of the second-order constructs was again the initial starting position on adaptation to vision loss, but the second was change from the second to the third assessment. This model was equivalent to first and second models, with the same overall fit indices as reported for them (Raykov & Penev, 1999). Again, initial status and change in adaptation to vision loss were not significantly correlated (covariance estimate = −0.008, *SE* = 0.011, *t* = −0.776). However, while the variance for the initial starting position was significant (covariance estimate = 0.548, *SE* = 0.033, *t* = 16.828), the variance for the change in adaptation from the second to the third assessment was nonsignificant (covariance estimate = 0.001, *SE* = 0.003, *t* = 0.412). See Figure 3 for a plot of the AVL12 mean scores over time associated with their standard errors. The figure indicates individual variability in the change across assessments even though the average change in level of adaptation across the three assessment points was not significant.

The findings from this final group of analyses suggest that the older adults started with marked individual differences in adaptation to vision loss and showed pronounced individual differences from the first to the second assessment in their adaptation to vision loss, but not from the second to the third assessment. Nonetheless, the individual differences from the first to the second assessment were strong enough to induce marked individual differences in the overall change from the first to the third assessment.

Discussion

This article has presented evidence for the reliability and validity of the shorter, and thus more efficient, version of the AVL scale, and therefore we recommend that the AVL12 version of the scale be used with the 4-point response categories. The AVL scale was intended to be used, and has been used, in a number of ways. First, it can be incorporated into cross-sectional and longitudinal survey research to help understand

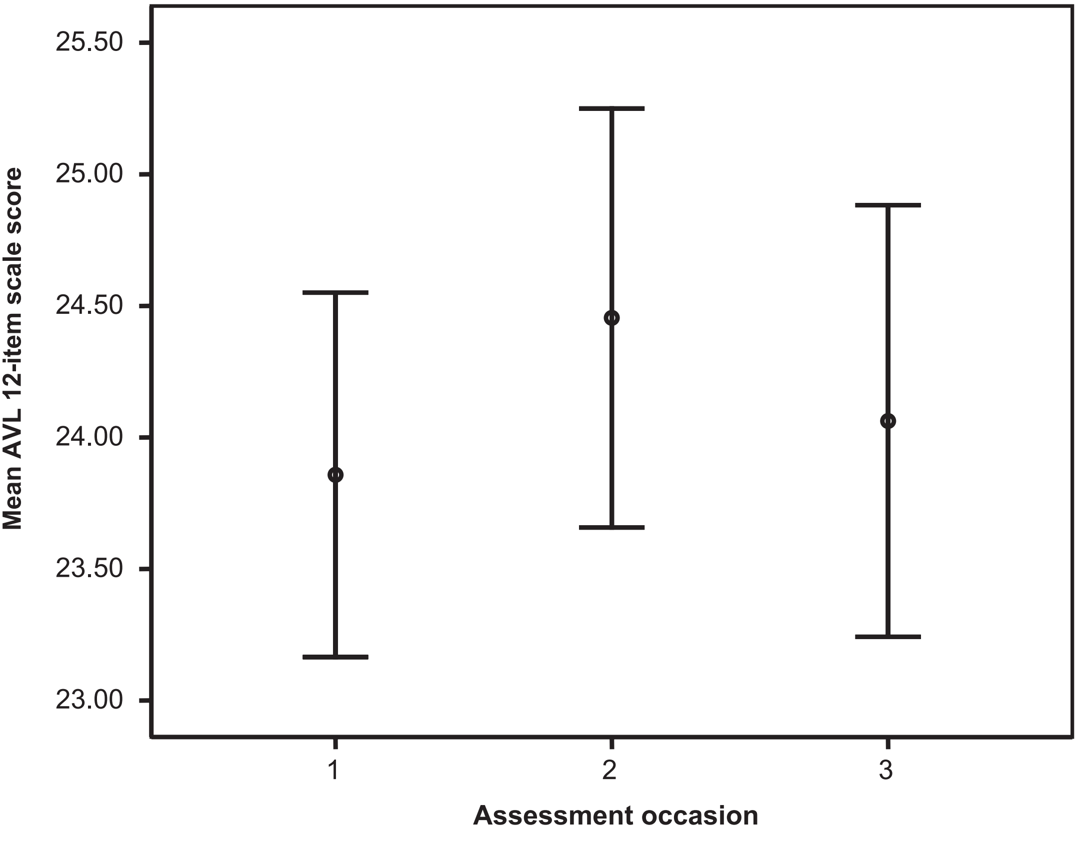

Figure 3. Plot of the mean scores on the AVL over time, with standard errors.

the experience of older adults of vision loss over time. Second, in clinical settings, it can help the service provider assess fears, misconceptions, and general attitudes toward visual impairment and thus target interventions (Blanks, 2001). Third, the AVL scale can serve as an important tool in the evaluation of vision rehabilitation interventions, serving as an adjunct to measures of functional ability and the acquisition of skills and a complement to global measures of subjective well-being. Although the scale was administered in this research as part of a structured interview, we believe it can also be successfully used as a self-report instrument in a large-print format.

The lack of average change over time in the scores on adaptation to vision loss may have several explanations. First, on a substantive level, while one may expect improvement in adaptation following vision rehabilitation, older adults with age-related eye disorders often experience significant declines in their visual status, as well as in their general health status over time, which, in turn, can influence the process of adaptation. Second, there was significant variation in the extent and type of rehabilitation services received, with approximately 11% of prospective clients failing to follow up on their applications and receiving no services. Third, in such a heterogeneous sample, variation in the amount and direction of change in adaptation should be expected. What we found is that with some older adults changing little and others evidencing positive or negative change in adaptation, the overall sample did not show an average positive change in adaptation to vision loss.

At the same time, however, the findings indicated that nonrandom, significant change did occur on the individual level; that is, some people evidenced better adaptation over time, the level of adaptation of others declined, and yet the level of adaptation for these others remained stable, underscoring the importance of analytic methods in longitudinal research that focuses on understanding individual, rather than average, change. With advances in both measurement and analytic tools, future research needs to focus on identifying the factors that can help professionals understand the different patterns of change in psychosocial adaptation to vision loss over time among older adults with age-related vision loss. Specifically, future research should examine social factors (such as support by family members and friends), psychological factors (like coping style), and visual factors (such as the severity of the initial vision loss and change over time) that influence the observed pattern of change in psychosocial adaptation to vision loss.

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Amy Horowitz, D.S.W., Ph.D., *director of research, Jewish Home and Hospital Life Care System, 120 West 106th Street, New York, NY 10025; e-mail: <ahorowitz@jhha.org>, and Anna A. Greenwall professor of geriatrics and adult development, Mount Sinai School of Medicine.* ***Joann P. Reinhardt, Ph.D.,*** *associate director of research, Jewish Home and Hospital Life Care System; e-mail: <jreinhardt@jhha.org>. At the time of the study, Drs. Horowitz and Reinhardt were at the Arlene R. Gordon Institute, Lighthouse International.* ***Tenko Raykov, Ph.D.,*** *professor, Department of Counseling, Educational Psychology, and Special Education, Michigan State University, 443A Erickson Hall, East Lansing, MI 48864-1034; e-mail: <raykov@msu.edu>.*