

March 2004 • [Volume 98](#) • [Number 3](#)

## A Writing Assessment for Persons with Age-related Vision Loss

*Gale R. Watson, Valjean Wright, Erica Wyse, and William De l'Aune*

**Abstract:** This article describes the development and evaluation of a five-item writing assessment for persons with age-related vision loss. It provides a standard for measuring the baseline ability and the effectiveness of interventions to improve the writing ability of this population.

---

The development of this assessment was funded by the National Institute on Disability and Rehabilitation Research. The evaluation of the assessment was funded by the Atlanta VA Rehabilitation Research and Development Center on Vision Loss and Aging.

---

Although most discussions of the literacy abilities of persons who are visually impaired (that is, those who are blind or have low vision) have focused on reading ability, writing ability is equally important to daily life.

Writing may be severely hampered by the onset of age-related vision loss and may disrupt daily life. Because writing has not been studied as extensively as reading with visually impaired persons, the extent of the difficulty it causes in daily life is unknown. One survey of caregivers for persons aged 50 and older found that 73% of the primary caregivers assisted older adults with financial management (Wagner, 1997). Financial management is one of the major functional literacy tasks of adulthood that requires the ability to write.

## **Background**

### **Literacy**

Koenig (1992) proposed a framework for understanding the literacy needs of individuals with visual impairments. According to the framework, literacy, that is, the successful communication with a desired audience through the completion of meaningful tasks that require reading and writing, is demonstrated at different levels throughout the life span. A person who is visually impaired must go beyond the basic level of literacy to independently gain access to materials in small print (for example, print used in newspapers, magazines, and bills). Koenig's model includes a description of functional literacy, which has two characteristics: the ability to (1) accomplish "real-life" literacy tasks and (2) to gain access independently to standard print, when required, to communicate with an intended audience. A functionally literate person in

this context may be considered able to read and write a letter, read a recipe or cooking directions, select and take medication appropriately, read a newspaper advertisement, read prices of shopping items, make a grocery list, pay bills, keep financial records, and so forth.

Koenig further emphasized that in assessing the literacy abilities of persons who are visually impaired, one must acknowledge and evaluate both the primary literacy medium and the secondary medium. In addition to reading and writing with magnification devices, braille and audiotaped materials, a computer with speech equipment, radio reading services, and the like may also allow older persons with adventitious vision loss to reacquire basic and functional literacy. In some cases, persons with low vision may find it more efficient to use an auditory or tactile medium for accomplishing tasks than to use vision. However, Koenig emphasized that all media must be appropriate to the audience for which they are intended. For example, older persons with diabetic retinopathy may not be able to read braille markings because of the loss of sensitivity (peripheral neuropathy) in their fingertips. A letter written by an older person with low vision to a family member that is not legible because the print runs downhill and the words overlap is also inappropriate.

## **Other writing assessments**

Although writing assessments are available for young sighted children and for sighted adults, there are no functional writing assessments for adults with low vision. The two writing assessments for sighted adults are the Functional Writing Assessment (Comprehensive Adult Student Assessment System, 2002) and the Brigance Diagnostic Inventory of Essential Skills (Brigance, 1999). The Functional Writing Assessment requires a 30-minute evaluation and uses a two-page form, a picture prompt, and a process description to evaluate writing ability. It was developed and is primarily used for programs in adult basic education and English as a second language. For standardized scoring, the administrator must be trained by a company representative; for informal scoring, training is not required. The Brigance tests 203 skill sequences, including handwriting. It is usually administered to elementary and middle school students, but may be administered to adults. Neither of these assessments includes instructions for modifying the administration or scoring for persons who are visually impaired. These instruments were standardized on populations that did not include adults with visual impairments.

### **Writing by people with low vision**

Little research has been conducted on the written-communication ability of persons with low vision. However, one study of veterans who completed low vision rehabilitation services at the Department of

Veterans Affairs found that the veterans wrote an average of once a week for about 30 minutes, depending on the type of device and the severity of the impairment, and typed an average of once a week for about 30 minutes using electronic magnification systems for typing (Watson, De l'Aune, Stelmack, Maino, & Long, 1997).

Writing is a skill that involves coordination of the eye and hand. For handwriting to be legible, a person must continuously monitor visually where the hand is on the page to ensure that the writing stays on the line.

Without appropriate visual-motor skills or assistive devices to guide the hand, handwriting tends to drift up or down as the person writes. As a result, the person is unable to stay on line, and the legibility of the handwriting diminishes. The inability to see what is written may also cause the older person to form letters that are too small and that run together, making them indiscernible.

Persons with low vision often exhibit handwriting problems because they lose sight of the line and pen tip and/or their field of view is too small to keep writing in a neat line. Field of view can greatly affect the writing of older persons. Central scotomas obscure the central visual field if the person is using the damaged fovea as the retinal locus; however, almost all persons with macular degeneration quickly and reliably develop a preferred retinal locus (PRL) that they use for viewing (Schuchard & Fletcher, 1994). After the quick

development of the PRL, the central scotoma obscures to the right, left, or downward, depending on the position of the PRL in relation to the scotoma. If the PRL develops below the scotoma, the scotoma does not obscure the writing field. Restricted visual fields obstruct all directions; homonymous hemianopsias can obstruct the field to the right or left. If the writer with low vision is using an optical device, the device itself diminishes the field of view.

Ultimately, handwriting must be legible to the intended reader, even if the task is making a shopping list for the person's own use. If the person's writing is not legible to the intended reader, even after rehabilitation, then other methods of keeping notes and writing to others must be sought, such as typing and word processing.

Although the ease and accessibility of long-distance telephoning and electronic mail has drastically reduced the need to communicate through print letter writing, many activities of daily living still require the ability to write legibly. Writing is needed to complete checks and financial records, sign documents, address envelopes, take telephone messages, make personal notes, complete applications, order merchandise, file income tax returns, make shopping lists, mark personal items for identification, and the like (Luxton-Gourgey, 2000; Soucy-Moloney, 1998; Watson, 2000).

## **Methods**

To assess functional writing ability specifically for older persons with low vision, we developed and evaluated an assessment instrument, the Low Vision Writing Assessment, that could prove useful for research and could be used as a clinical test by low vision therapists, rehabilitation teachers, eye care specialists, and others who may require information about the written literacy ability of this population. (A copy of the Low Vision Writing Assessment and instructions are available from the first author on request.) The assessment consists of five writing tasks: writing a grocery list that can be read by the person and others, writing a check, balancing a check register, writing a paragraph of prose, and filling out a medical form. These tasks were chosen because they are common, everyday writing necessities; are difficult for persons with age-related vision loss; and use a variety of visual, motor, and cognitive skills. For example, balancing a check register requires arithmetic ability, and writing a paragraph of prose requires language ability. Instructions to the participant for each task are shown in [Sidebar 1](#).

If the writer with low vision is using alternative forms of communication, such as a listening device (audiotape or computer speech output), or a tactile communication mechanism (such as braille), then the medium chosen for response to an item must be appropriate to the intended audience, as specified by Koenig (1992). For example, the writer can write a note to himself or herself or balance a checkbook using

a computer with speech output, which is appropriate, since the writer is also the intended reader. However, when filling out a medical form or writing a note to a sighted family member, the output must be appropriate for the sighted reader. The five items on the assessment are weighed equally. The assessment is scored by assigning points for each item. A scoring legend and method of assigning points for each item is explained in the instruction manual that accompanies the assessment. The highest overall raw score is 50 points; a percentage score is computed for each individual writer by dividing his or her score by 50.

## **Participants**

The participants in the initial evaluation of the Low Vision Writing Assessment were 35 persons, aged 59 to 89 (mean age 75.8), who were scheduled for low vision services at low vision clinics in Atlanta, Georgia; Salisbury, North Carolina; and Philadelphia. All the participants had age-related vision loss, such as age-related macular degeneration or diabetic retinopathy, that was confirmed by ophthalmological reports. The participants had no other disabilities that prevented their ability to read and write and were in good-enough health to be tested at a research site other than their homes.

Although the participants had not received rehabilitation in the clinic where they were recruited at the time of this testing, five participants had previously



received low vision devices from a rehabilitation source or had purchased low vision devices on their own; these devices were two optivisors, one 7X illuminated stand magnifier, one 5X stand magnifier, and one pair of +8d aspheric half-eye spectacles. The five participants used their devices during the assessment, and we observed them using the devices correctly. The standardized testing sequence asks if participants use "tools" for writing and allows the use of these tools (see Sidebar 1).

## Procedures

The participants were informed of the procedures of the research project and gave their full consent to participate via procedures approved by the Human Investigations Committee of Emory University. The Minnesota Low Vision Reading Acuity Chart (with habitual spectacle correction for reading if appropriate) was used to test the participants' visual acuities. The participants were administered the writing assessment and 15 literacy-related items from the National Blind Rehabilitation Outcomes Survey (NBROS) ([see Sidebar 2](#)). The NBROS is a self-report outcomes instrument that was developed to measure outcomes in the Department of Veterans Affairs Blind Rehabilitation Centers and civilian rehabilitation centers (De l'Aune, Williams, & Welsh, 1999). The participants were randomly assigned to take either the writing assessment first or to answer the NBROS questions first. Six participants were administered the

writing assessment in a slightly different form within one week. The slightly altered format of the writing assessment was developed in order to prevent subjects memorizing the items on the test, which would have altered their test-retest scores.

In the sample of participants that we used to determine reliability and validity, none of our sample of 35 subjects with low vision used an alternative literacy medium. Although we were prepared for the use of alternative media in the study, all the participants used print as their only medium for writing and for reading; none used a secondary medium, such as speech output or braille.

## **Results**

The participants had a mean visual acuity of 0.9 logMAR OU (range 1.38 logMAR to 0.5 logMAR). The Snellen equivalent for the mean acuity is 20/160; Snellen equivalents for the range of acuities are 20/63 to 20/400. The participants' scores on the Low Vision Writing Assessment ranged from 9 (18%) to 50 (100%) out of 50; the mean score was 30.5 (61%) out of 50.

### **Reliability and validity**

Test-retest reliability was determined from two administrations of the assessment that were conducted approximately one week apart to six subjects. Test-

retest reliability yielded a coefficient of stability for the two administrations of the Low Vision Writing Assessment of 0.99 ([see Figure 1](#)). The content validity of the assessment instrument is supported by the inclusion of all domains that were determined to be important in a review of the relevant literature and consultation with experts and consumers in the field.

Construct validity was evaluated via comparison of the Low Vision Writing Assessment and the 15 items from the NBROS administered in the same visit. The 15 items from the NBROS are daily tasks that require reading and/or writing and measure a construct that is closely related to that measured by the Low Vision Writing Assessment. The summed score that was computed for the NBROS reading/writing items was correlated with the Low Vision Writing Assessment score. The correlation coefficient was 0.84, supporting the construct validity of the instrument ([see Figure 2](#)).

## **Discussion**

### **Limitations**

In our reliability evaluation, the 6 participants studied may not be appropriately representative of the population of persons with age-related vision loss. These 6 subjects were chosen for the test-retest reliability because we were able to schedule the test-retest sessions in the week prior to their attendance at the low vision clinic. The reliability coefficient of

stability was high, however, and the participants' scores represent a wide range of writing abilities as measured by the instrument. The 35 participants may not be representative of older persons who are either congenitally visually impaired or adventitiously visually impaired from an early age. Furthermore, none of them used speech output or braille as a medium for accomplishing functional writing tasks. More research is required to understand whether the assessment is reliable and valid for different populations and for interventions that do not require the use of vision.

## **Implications for practice**

The Low Vision Writing Assessment was determined to be a quick, reliable, and valid assessment of the writing ability of these persons with age-related vision loss for functional literacy writing tasks. It requires approximately 10–15 minutes to administer. The assessment may be used for research; for clinical low vision evaluations; and during home visits to obtain quick, reliable, and valid information about the writing abilities of adults with age-related vision loss. The test can be used to obtain baseline information; to understand writing difficulties; and to assess the effectiveness of interventions that assist in writing, such as optical or electronic solutions, bold-line pens and paper, and writing templates.

## **References**

Brigance, A. H. (1999). *Diagnostic Inventory of Basic Skills*. North Billerica, MA: Curriculum Associates.

Comprehensive Adult Student Assessment System. (2002). *Functional Writing Assessment*. San Diego, CA: Foundation for Educational Achievement.

De l'Aune, W., Williams, M. D., & Welsh, R. L. (1999). Outcome assessment of the rehabilitation of the visually impaired. *Journal of Rehabilitation Research and Development*, 36, 273–293.

Koenig, A. (1992). A framework for understanding the literacy of individuals with visual impairment. *Journal of Visual Impairment & Blindness*, 86, 277–283.

Luxton-Gourgey, K. (2000). Devices for people who are blind. In B. Silverstone, M. A. Lang, B. Rosenthal, & E. E. Faye (Eds.), *The Lighthouse handbook on vision impairment and vision rehabilitation* (pp. 937–950). New York: Oxford University Press.

Schuchard, R. A., & Fletcher D. C. (1994). Preferred retinal locus: A review with applications in low vision rehabilitation. *Ophthalmology Clinics of North America*, 7, 243–256.

Soucy-Moloney, L. A. (1998). Labeling and marking: A rehabilitation teacher's perspective. *RE:view*, 30,

33–39.

Wagner, D. L. (1997). *Comparative analysis of caregiver data for caregivers to the elderly, 1987 and 1997*. Bethesda, MD: National Alliance for Caregiving.

Watson, G. R. (2000). Functional assessment of low vision for activities of daily living. In B. Silverstone, M. A. Lang, B. Rosenthal, & E. E. Faye (Eds.), *The Lighthouse handbook on vision impairment and vision rehabilitation* (pp. 869–889). New York: Oxford University Press.

Watson, G. R., De l'Aune, W., Stelmack, J., Maino, J., & Long, S. (1997). A national survey of the impact of veterans' use of low vision devices. *Optometry and Vision Science*, 74, 250–259.

**Gale R. Watson, M.Ed., CLVT**, research health scientist, Rehabilitation Research and Development Center on Vision Loss and Aging, Atlanta VA Medical Center, 151-R, 1670 Clairmont Road, Decatur, GA 30033; e-mail: <[gale1@att.net](mailto:gale1@att.net)>. **Valjean Wright, M. A., M.Ed.**, reading specialist, 18 Walnut Road, Wallingford, PA 19086; e-mail: <[vjwseas@aol.com](mailto:vjwseas@aol.com)>. **Erica Wyse, B.A.**, research coordinator, Atlanta VA Medical Center, RR&D Center on Vision Loss and Aging, 1670 Clairmont Road, Decatur, GA 30033; e-mail: <[erica.wyse@med.va.gov](mailto:erica.wyse@med.va.gov)>. **William De l'Aune, Ph.D.**, biostatistics research consultant, Rehabilitation

*Research and Development Center on Vision Loss and Aging, Atlanta VA Medical Center, 151-R, 1670 Clairmont Road, Decatur, GA 30033; e-mail: <[bill.delaune@med.va.gov](mailto:bill.delaune@med.va.gov)>.*

[Previous Article](#) | [Next Article](#) | [Table of Contents](#)

*JVIB, Copyright © 2005 American Foundation for the Blind. All rights reserved.*

[Search JVIB](#) | [JVIB Policies](#) | [Contact JVIB](#) |  
[Subscriptions](#) | [JVIB Home](#)

If you would like to give us feedback, please contact us at [jvib@afb.net](mailto:jvib@afb.net).

[www.afb.org](http://www.afb.org) | [Change Colors and Text Size](#) | [Contact Us](#) | [Site Map](#) |

Site Search

[About AFB](#) | [Press Room](#) | [Bookstore](#) | [Donate](#) | [Policy Statement](#)

---

**Please direct your comments and suggestions to [afbinfo@afb.net](mailto:afbinfo@afb.net)**  
**Copyright © 2005 American Foundation for the Blind. All rights reserved.**