

INSTRUCTION MANUAL

Morgan

**Low
Vision
Reading
Comprehension
Assessment**

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LUVReading Series

MORGAN LOW VISION READING COMPREHENSION ASSESSMENT, LUV Reading Series, 2017

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Edited by Monica Ehret

The LUV Reading Series is a unique group of research-based, field-tested assessments and training materials designed to improve the reading skills of people with low vision. Other LUV Reading materials include:

Pepper Visual Skills for Reading Test (VSRT) (2010)
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Purpose and Rationale of the Morgan LVRCA

The Morgan Low Vision Reading Comprehension Assessment (LVRCA) is a measure of reading comprehension that is designed for use with adults who have low vision due to macular degeneration. The test can be used to determine an approximate reading level in order to assist the professional in suggesting reading materials of appropriate difficulty for these readers. It can also be used to evaluate the effectiveness of instruction and/or practice in increasing reading comprehension.

The Assessment Model

The assessment model for the Morgan LVRCA is based on "cloze procedure" (Taylor, 1953). This evaluation is structured as a series of "cloze" tasks. In "clozing," a lexical word (a noun, main verb, adjective or adverb) is chosen and deleted from a meaningful reading passage, such as a sentence, paragraph or story. Words chosen to be deleted are ones that a reader could decide by using contextual clues. The reader is required to determine the missing word(s) using clues from the passage. This kind of task requires the reader to exercise a variety of comprehension and vocabulary skills. "Clozing" has been shown to be a valid procedure for evaluating reading comprehension ability (Taylor, 1953), and is currently used to structure a number of reliable and valid standardized reading comprehension assessment tests, including the *Woodcock Reading Mastery Tests* (1987), the *Gates-MacGinitie Reading Tests* (1964) and the *Stanford Diagnostic Reading Test* (Karlsen, Maddon & Gardner, 1984).

The usefulness of this technique for assessment and instruction related to the reading comprehension abilities of individuals with low vision due to macular loss has been shown (Watson, Wright & De l'Aune, 1992). Reading comprehension is a process which involves the integration of visual information from the printed page with cognitive information stored in the memory. Combining this information to achieve comprehension or understanding of print materials can be seen as a compensatory task (Smith, 1978). In other words, when an individual has difficulty in one area, he may compensate by developing greater skill in another. Readers with low vision can develop the ability to compensate for gaps in visual information by learning to use contextual clues.

The Morgan LVRCA administration time is short compared to other reading comprehension evaluations. Previous investigations (Watson, Wright & De l'Aune, 1992; Watson, Wright, De l'Aune & Long, 1996) have revealed that lengthy administrations of standardized reading evaluations to low vision readers can be daunting for both examiners and readers and can require more time than is available in a clinical setting. The shortened format of the Morgan Low Vision Reading Comprehension Assessment was developed so that professionals can easily assess the comprehension of low vision readers who may have slow rates of reading when compared to the rates of normally sighted readers.

Development of the Morgan LVRCA _____

In developing this reading comprehension assessment for low vision readers, three major areas involved in print reading were considered: a) visual difficulty, b) structural or linguistic complexity, and c) concept difficulty. The criteria used for decision-making in each of these areas follows.

Visual Criteria

In structuring the visual tasks on the Morgan LVRCA three elements were considered: font type, print size, and line-spacing. The font type was determined by the kind of print that the average person was likely to encounter in reading. The font that is used throughout this test is *Palatino*. This font was selected because the character shape, size and spacing most closely resembled a wide variety of newspaper, magazine and book print. The sentences on the test are double-spaced in order to allow for easier scanning.

The test is printed in a variety of sizes to accommodate the different visual abilities of low vision readers and the various sizes of print materials that are available to them. The print sizes for the test are:

- 9 point - corresponding to 1M print, approximating newspaper print
- 12 point - corresponding to 1.5M print, approximating textbook/typed print
- 18 point - corresponding to 2M print, approximating large print
- 24 point - corresponding to 3M print, approximating newspaper sub-headlines

The point sizes chosen were compared to the print of a variety of near reading acuity charts by measuring the height of the ascender to descender and comparing the size in millimeters to the print on the chart.

Structural Criteria

In each test item, the reader is given a sentence with a word missing. A blank line indicates the missing word. Each blank is of uniform length to eliminate word length as a complicating factor in the task. The reader is asked to read the sentence once silently and then decide the correct word that will fill in the blank. A correct response demonstrates that the reader has comprehended the sentence.

Sentence items were selected according to a number of fixed criteria:

1. All sentence items chosen have only one or two acceptable concepts as an answer (synonyms are acceptable) to fill in the blank. In a preliminary item selection, possible sentences were read by college-level normally sighted readers and individuals with low vision, and all sentences with more than two possible correct concept responses were eliminated.
2. All sentence items are structured so that the reader will be required to read the entire sentence in order to derive enough contextual information to fill in the blank. These items are arranged so that the reader is not likely to provide an acceptable response based on reading just a few words on either side of the blank. The items with the blanks at the end are generally easier to answer since the reader has read the complete sentence before he reaches the blank and, therefore, has more information. In some sentences blanks are positioned nearer to the beginning of the sentence to increase the difficulty of the task. The items with the blank closer to the beginning are generally more difficult because the reader must continue to gather more information before he can guess the word. The reader must then remember where the blank was located.
3. The sentence items are arranged in order of increasing difficulty according to reading level. The reading level of each sentence was found by the method used by reading specialists and publishers to determine reading level: a standardized readability formula (Frye, 1987; Klare, 1963). The formula used to level the sentences in this test was McElroy's Fog Count (Kincaid, Fishburne, Rogers & Chissom, 1975; Wright & Watson, 1991). In this formula, difficulty is judged according to the structural complexity of the language of the sentence. The variables in the formula are word length and sentence length. This formula was chosen because it can determine the readability of single sentences. The sentences are arranged in six steps of increasing difficulty with two reading levels per step: 1-2, 3-4, 5-6, 7-8, 9-10, 11-12. If the reader is able to complete level 11-12, he or she should have little difficulty with most printed materials. As the items on the test increase in structural complexity, the length of the sentences generally increases as well. The first items cover only one line, while several of the later items cover two. The ability to scan a line of print, to recognize that a statement is continued on the next line, and to be able to locate the beginning of the next line are visual skills that readers with low vision must have to be able to complete these sentences. For this reason, items which cover more than one line can be more difficult.

4. Sentences were selected by their appeal to the interest and maturity level of the adult reader. The sentences include facts, proverbs and humor.

Conceptual Criteria

Sentence items are arranged according to conceptual difficulty. The mechanism for this task was structured according to a simple system that is a synthesis of contemporary theories of cognition (Piaget, 1977; Luria, 1981; Woodcock, 1987). In these theories, thought processes are categorized in a hierarchy of difficulty in which concrete concepts are considered to be easier to grasp than abstract concepts. No items that required abstract concepts were included. In a preliminary screening of test items, abstract concepts proved too difficult for adult college educated readers to grasp in a short time.

The test items were analyzed in terms of three categories or types of concrete concepts: a) antonyms or opposites, b) characteristic of, part of, or function of, c) generalization.

According to this hierarchy of difficulty, the items with antonyms are easiest to discern. The items that are characteristic of, or function of, are more difficult, and the generalizations are most difficult. Sentences were analyzed according to the nature of the cognitive task that the reader had to perform to yield the correct response. To do this the missing word was categorized according to the kind of contextual clue that was required to derive it correctly. For example, in the sentence "The first in the _____ has the choice of the oars." The word that triggers or gives a clue to the missing word is "oars." The missing word is "boat." Oars are a part of or a characteristic of a boat. In this test each step includes two sentences that requires the reader to make a concrete association on the lower levels (antonym, part of or function of) and one sentence that requires the reader to make a generalization.

Characteristics of the Morgan LVRCA ---

1. The Morgan LVRCA measures an approximate grade or reading level equivalent of comprehension skills in print reading for individuals with macular degeneration. The score derived with the Morgan LVRCA is called a grade level, or reading level, because it is based on the Woodcock Reading Mastery Test. Reading level or grade level score on the test refers to the level of the print material that the reader is able to understand at that point in time, but should not be confused with level of education, school grade or intellectual level of the reader.
2. The test was developed and evaluated with adults who were former readers, or had learned reading skills with macular loss. Damage to the macula had made visual skills more difficult and had slowed their reading speed. If the test is used as an assessment mechanism with a reader who is not of this population, the examiner cannot be sure that the score derived will be reliable or valid.

3. To obtain a more complete picture of the rehabilitation needs of the reader, the Morgan LVRCA should be used in conjunction with other assessments, e.g., the reader's eye report, low vision examination report, the individualized vision rehabilitation plan, the medical report, psycho-social report, and other reading tests such as the *Pepper Visual Skills for Reading Test*.
4. The Morgan LVRCA was designed so that sentences are arranged in order of difficulty. The beginning sentences are 1-2 grade level equivalent. However, some readers, as they become more practiced in using their visual skills during the test, may read more difficult sentences correctly, while missing important information in the beginning sentences.
5. The Morgan LVRCA is intended to be an individually administered test. This enables the examiner to establish a more personal relationship with the reader and elicit a more optimal performance. This is especially important with the individual who is not accustomed to using vision after experiencing macular loss. Such readers may be uneasy about reading, feeling that their performance is not "up to par", and would highly object to reading in front of others.
6. The Morgan LVRCA is an untimed test. The examiner can allow breaks and the test can be administered in more than one sitting if the reader is too fatigued to finish.
7. Objective error marking, which is accomplished while the test is being administered, allows the test to be easily scored in a few minutes following the test administration. Correct and incorrect answers are given for test items on the examiner's answer copies.
8. The Morgan LVRCA yields a score which is an approximate grade level equivalent (GLE) of 1-18, corresponding to the grade level equivalents of the test used for validity comparison, the Woodcock Reading Mastery Test, Passage Comprehension Subtest.
9. The Morgan LVRCA was designed to measure comprehension skills only. Because visual skills, rate and endurance of reading are not measured by this test, no information about those aspects of reading can be derived from its score.

Potential Uses of the Morgan LVRCA —————

The Morgan LVRCA was designed to be used by a wide variety of professionals for several different purposes.

1. The LVRCA will aid in planning individualized instruction. The test will establish a baseline performance for readers who have sustained macular loss and wish to improve their reading. It will predict the kinds of reading comprehension problems the reader will make with print reading material and allow the rehabilitation instructor to tailor an instruction program which can increase the reader's awareness of problematic areas and remediate these problems. If the comprehension problems cannot be adequately met in the instructor's present program, a referral can be made to a reading specialist who has expertise in low vision.
2. The LVRCA can provide an objective measure of progress for instructional programs in which the goal is continuous text reading. Once the reader has improved comprehension skills to the desired level, then rate and endurance can take over as the focus of instruction.
3. The LVRCA can be used as a measure of the effectiveness of instructional programs. The reader's achievement on post-test administration can assess improvement if an appropriate intervention strategy has been applied. In this way, failures to progress can be documented without continuing to struggle with ineffective procedures. If a reader's failure to progress or worsening performance on the LVRCA appears to indicate changes in vision, referral should be made to the eye care specialist.
4. The LVRCA can be used as a measurement tool in research. Here the instrument can be used to test the effectiveness of various methods, conventional and experimental, which are designed to help readers with macular loss to comprehend print materials more effectively.

Qualifications of the Examiner —————

While no formal training is required to administer the Morgan LVRCA, it is important that certain prerequisites be met. The detailed administration and scoring instructions outlined below should be studied thoroughly by persons preparing to administer the test for the first time. Experienced examiners should also review these from time to time to insure the continued use of appropriate administration techniques. For the scoring to be accurate, it is crucial that all of these instructions be followed precisely. It is also imperative that the examiner be completely familiar with the test materials and the appropriate procedures for using them. The examiner *must practice* administering the instrument prior to its use as a measurement tool. If the examiner is able to establish rapport with the reader to elicit an optimal performance, and if directions are followed precisely, meaningful results should be obtained with the Morgan LVRCA.

Because no formal training is needed to administer the Morgan LVRCA, a broad range of professionals in low vision services should be able to administer the test accurately. Technicians or inexperienced professionals should be effective in administering the Morgan LVRCA and obtaining accurate numerical scores. However, if clinical insights into the rehabilitation or educational needs of the reader are required, then experienced professionals with expertise and experience in both low vision and reading should be better able to discern significant response patterns which will indicate the type of instructional program the reader may require.

Test Materials -----

The Morgan Low Vision Reading Comprehension Assessment (LVRCA) contains the following materials:

1. **LVRCA Test** -The test consists of 10 rigid cards with a flat white finish printed in four print sizes: 1 M, 1.5M, 2M, & 3M. There are two equivalent forms of the test, A and B. The two different forms contain different sentences that are equivalent in construction. The two forms allow pre- and post-testing without the reader learning the test.
2. **Instructor's Manual** - This instructor's manual contains information about a) the assessment model, b) the test development, c) instructions for administering the test, d) instructions for scoring the test and e) suggestions for interpreting the test results.
3. **Examiner's Answer Copies (Form A & Form B)** -The examiner's answer copies give correct and incorrect responses for each sentence of the test.
4. **Examiner's Scoresheets (Form A & Form B)** -The scoresheet provides a record of the reader's performance for each administration. The scoresheet allows the examiner to record pertinent information about the reader's assessment conditions and reading background, as well as recording errors and scores.

Instructions for Administration of the Morgan LVRCA — — — —

Prior to Test Administration

The test should be administered only after the reader has had a low vision examination and has received a spectacle refractive correction if needed. If the reader requires a low vision device for reading, he or she should be thoroughly instructed and comfortable with its use. The examiner should determine that the reader has the visual skills to recognize the print words correctly. If the reader is unable to visually recognize a sufficient number of words in the sentences, the results of the test will not be useful. If the examiner is unsure of the reader's visual skills for print recognition, a word or vocabulary list could be used. If the reader has had a low vision examination and a word card such as the *Feinbloom Subnormal Vision Reading Card*, the *Pepper Visual Skills for Reading Test*, or other reading card is used and the reader is able to recognize the words on the card, then the test may be given. Because the test begins with 1-2 grade level equivalent sentences, even very basic comprehension skills can be measured.

The number of words in continuous text that a reader should be able to recognize in order to comprehend print materials is unknown. Some readers may see very few words correctly, yet still be able to grasp the meaning of a sentence. Others may see all the words and still be unable to comprehend the meaning. There is currently no research on the interaction of visual and cognitive skills for readers with low vision.

Preparation of the Test Setting

Choosing the Print Size

The print size used should depend upon the type of information needed. For example, if the aim is to determine the best level of materials at which to begin instruction, choose the print size that is most comfortable for the reader. In this case, ***a print size should be selected that is at least one acuity size larger than the reader's threshold visual acuity.*** For most readers the most comfortable print size will be two or three acuity sizes larger. The best print size can be determined by first administering the *Pepper Visual Skills for Reading Test*, the *Minnesota Low Vision Reading Test*, or having the reader look at the practice sentences in several print sizes and choose the one that he feels is easiest to read. Or, if the aim is to determine how the reader performs in his or her goal materials, for example, the newspaper, administer the test in the print size of those materials. Consult the list on page 2 for the approximate print sizes of some common goal materials. In choosing the print size the examiner should be aware that the test results could be different in different print sizes.

Seating

Make sure that the reader is seated in a comfortable and supportive chair.

Lighting

Provide illumination that is optimal for the reader. The reader should have the opportunity to select and position the lighting using other print or the practice sentences.

Optical Device Use

The reader should be familiar with his prescribed low vision device and be practiced in its use before the administration of the test.

Non-optical Devices

Use colored filters or a typoscope if necessary. Remove the appropriate form of the test from the test binder and place it on a clipboard to assure that the reader can maintain the proper focal distance if a low vision device is being used. Provide a reading stand to maintain focal distance if necessary.

Scoresheet and Examiner's Answer Copy

Complete the information required by the scoresheet. Position the scoresheet so that it is easy to mark during the test. Position the examiner's answer copy so that it is easy to read during the evaluation. The examiner will use the answer copy during the evaluation to make decisions about whether or not to score an answer as an error and to prompt the reader if he skips a line.

When the above steps have been completed, the examiner is ready to begin administering the test.

Rules for Test Administration -----

1. Before handing the test to the reader, explain the test procedure by saying:

I am going to ask you to read some sentences silently to yourself. In each sentence, there is a blank where a word has been removed. The word may be missing from any part of the sentence. Be sure to read the sentence completely. Some sentences have more than one line. Give each sentence one good reading, but do not read it a second time. After you finish a sentence, tell me a word that you think fits in the blank. If you are not sure of the correct word, give your best guess. Keep reading until you come to the end of the test or until you cannot keep going. If you get tired, we can take a break and finish the test afterward. While you are reading the sentences, I cannot tell you how you are doing, but we will discuss the results as soon as you are finished.

2. Clarify that the reader understands these directions by showing the practice sentences. Point to the practice sentences and say:

These are practice sentences that will help you to understand how to take the test. Read each sentence silently and say the missing word.

If the reader misses a practice sentence, explain the correct answer and go on. Have the reader complete *all three* of the practice sentences before beginning the test.

3. Direct the reader's attention to the first sentence of the test. Always begin with the first sentence and continue until the test has been completed or until the reader makes four consecutive errors. The examiner should point out the beginning sentence of the test by placing a finger near the first word.
4. Have the reader read each sentence item in order. As the reader answers each item, be sure to record whether the response was correct or incorrect by putting a check in the appropriate box under the 1 column or the O column for that answer on the scoresheet. Sometimes the reader will give a response that does not appear on the answer copy but may be acceptable. If you are not sure at the time the response is

given whether it is acceptable or unacceptable, record the reader's response in the column headed "Error Response". After the test is completed, consult the "Directions for Scoring the Morgan LVRCA" below for guidelines on how to score the item.

5. After each response is made, whether or not the answer was correct, you may make a positive statement that reassures and encourages the client to continue, such as **"You are doing fine. Keep going."** or **"That's good, go on."** If the reader expresses uncertainty by making comments such as, "I'm not sure," or "I can't be certain," encourage him or her by saying, **"Take a guess."**

Encourage the reader whenever necessary. At times, a reader with low vision will need encouragement to continue or will be anxious during the evaluation. However, telling the reader whether or not the correct response has been given is never appropriate. To address this issue, use the positive statements given above as the reader completes each item. This must be done consistently after each response and must be consistent for both the pre-test and post-test. If you find that extraordinary encouragement was necessary during the pre-test, the nature of this encouragement should be noted in the comments section of the scoresheet and continued during the post-test to insure uniformity of administration.

6. Although the test is untimed, the reader should not be allowed to struggle with frustration. The reader can take as many breaks as desired during the test. If the reader begins to show signs of frustration, such as sighing, crying, nervousness, or making statements about the difficulty of the test, the examiner should ask the reader if a break is needed. The test can be resumed after the break or at another time. The examiner will want to record the total amount of time it took to complete the test.
7. Sometimes the low vision reader may make regressive eye movements when reading a sentence in order to clarify a word or two. This can be true of even the most proficient reader with low vision. Therefore, the examiner should closely watch the reader's eye movements and be aware of when the sentence has been read through once. The reader should be allowed to review and "clarify" one or two isolated words. If the reader returns to the beginning of the sentence and begins to reread the entire sentence, give the reminder that only one reading is permitted and encourage the reader to make a guess.
8. If the reader skips a line or loses a line of print at any time during the evaluation, the examiner should direct the reader back to the correct line by pointing and saying: **"Read this sentence, too."** If the reader has begun reading another sentence, allow him to finish and answer, then direct him to the one missed.

9. This test is meant to be read silently. However, if the reader directly expresses the desire to read aloud, or begins to read aloud during the test, it should be allowed.
10. Continue with the test until the reader has made four consecutive mistakes, or the reader finishes the test without making four mistakes consecutively. If the reader makes the fourth consecutive mistake, say, "**Thank you, that was fine. You may stop now.**" The remainder of the test sentences are marked as zeros.

Directions for Scoring the Morgan LVRCA _____

The possible correct and incorrect responses for test items appear on the Examiner's Answer Copy. In some cases, a response not shown on the answer copy will be acceptable, but only if it is a synonym of one of the correct responses given (that is, if it expresses the same concept). For example, in the sentence "An object in possession seldom _____ the same charm that it had in pursuit." the answer is "retains" or "keeps." Both have the same conceptual meaning, and are considered correct. If the reader gives an answer that is different from this concept, for example "gives," then it is marked incorrect. If the reader gives an answer that does not appear on the answer copy but seems acceptable, make a judgment as to whether the response *within the same concept* as the correct responses listed on the answer copy. If the examiner is not sure whether an answer is acceptable or not, score the first of such answers as correct, the second as incorrect and so on.

To score the test, add the total number of items which were answered correctly. This will give the Morgan LVRCA raw score. To find the approximate grade level equivalent (GLE, or reading level), the following formula is used:

$$\text{GLE} = \text{LVRCA Raw Score} \times 1.266 - 5.066$$

For example, if the Morgan LVRCA raw score is 12, multiply this number by 1.266. The result is 15.19. Then subtract 5.066. The grade level equivalent (or reading level) is 10.1. Appendix D on page 27 contains a table showing all possible Raw Scores and their Grade Level Equivalents for the Morgan LVRCA.

While the examiner will want to record the reader's answers to the three practice sentences, they are never scored and do *not* become part of the final raw score.

Interpretation and Implications of Test Results

The final score on the evaluation is expressed as a reading level. Because of the brevity of the evaluation, this is an *approximate* level that is within three grade equivalents of the Woodcock Reading Mastery Test comprehension level. For example, if a level of 6.0 is scored, the reader will probably be able to read printed material that is structured to the 6th level as determined by readability indices appropriate for adult materials in the print size used to administer the test. To establish an instructional program, the reading material selected should be *three grade levels below* the grade level scored on the test. For example, if the reader scored a level 6 on the Morgan LVRCA, the instructor should prepare the beginning reading material at a level 3 to insure success in reading comprehension. Then the instructor can gradually increase the difficulty of the material as the reader shows the ability to comprehend higher levels. The instructor can continue to challenge the reader with higher level material until the reader reaches a plateau.

The examiner should not assume that the reading level score obtained using one print size will be the same in other print sizes. It is possible that a reader may score a different reading level if tested in a different print size.

If the reader achieves 5 or fewer correct test items on the LVRCA, he will receive a GLE of 0. In this case, he may be able to comprehend very low level materials, of up to level 3, but will probably be unable to read print material that is written for most adults. This score may be due to a lack of sufficient vision for reading continuous text, the need for a different optical device or the need for instruction in the use of visual or comprehension skills.

For an explanation of how to choose print materials for low vision readers according to print reading level, see Wright & Watson (1991). A study series titled *Learn to Use Your Vision for Reading Workbook* has been developed and tested to assist readers with macular loss in re-learning reading skills (Wright and Watson, 1995). The Morgan LVRCA was designed to help clinicians choose appropriately leveled materials for readers with low vision, to assist readers in understanding their current reading abilities and to determine the effectiveness of instruction.

Summary of the Reliability and Validity of the Morgan LVRCA

Reliability evaluations included: test-retest, internal consistency and form equivalency. The validity evaluation compared scores on the Morgan LVRCA to those on the Woodcock Reading Mastery Test (Passage Comprehension Subtest, Form G).

Subjects

Fifty individuals with macular degeneration were recruited from the Pennsylvania College of Optometry Feinbloom Vision Rehabilitation Center, and from the Low Vision Services at the Atlanta VA Medical Center (25 subjects from each site). The two sites were utilized in order to provide access to women with macular loss because the veteran population at the Atlanta site is almost entirely male. Other than gender there were no major differences in the two subject pools related to age, number of years of education, or acuity loss. Subjects had been prescribed a low vision device for reading and had previously been instructed in its use.

Methods

Subjects were tested in their home environments. Lighting was determined by subject preference and kept constant during all test administrations. Subjects were administered a battery of tests. These tests included Forms A and B of the Morgan LVRCA, the Woodcock Reading Mastery Tests (Passage Comprehension Subtest, Form G), and the Slosson Intelligence Test. The Slosson Test was utilized to assure that all subjects were able to cognitively understand written materials which they had read. This is an oral evaluation and was administered between the two forms of the Morgan LVRCA. Subjects used the same low vision device throughout the testing. The print size selected for all test administrations was 2 sizes larger than the subject's near acuity with the preferred low vision device. Administrations of the test were untimed; subjects took as long as needed to read. A 30 minute rest break was given between Morgan LVRCA and Woodcock administrations.

Test Sequence

A test sequence was developed to insure equal representation of all tests in the separate orders. Tests were administered to subjects via four sequences. They were:

Sequence I -Morgan LVRCA Form A, Slosson Intelligence Test, Morgan LVRCA Form B, break, Woodcock Test.

Sequence 2 -Morgan LVRCA Form B, Slosson Intelligence Test, Morgan LVRCA Form A break, Woodcock Test.

Sequence 3 -Woodcock Test, break, Morgan LVRCA Form A, Slosson Intelligence Test, Morgan LVRCA Form B

Sequence 4 -Woodcock Test, break, Morgan LVRCA Form B, Slosson Intelligence Test, Morgan LVRCA Form A

The sequences were equally administered to subjects in random order. All tests were administered in one session.

Results

Inter-rater Reliability

Inter-rater reliability was measured between the two persons administering the tests at two sites, Philadelphia and Atlanta. The first five subjects' scores at each site (N=10, 20% of the sample) were used to calculate inter-rater reliability on the Woodcock Reading Passage Comprehension Test. The correlation coefficient on the Woodcock was .986. The last five subjects' scores at each site were used to compute the Morgan LVRCA inter-rater reliability (N=10, 20% of the sample), the correlation coefficient was .968.

Test-retest/Form Equivalency Reliability

The test-retest reliability was assessed by Pearson Product moment correlation. Overall, the correlation coefficient was .753. For Sequences 1 and 2, in which the Morgan LVRCA was administered prior to the Woodcock, the correlation coefficient was .871. For Sequences 3 and 4, in which the Woodcock was administered before the Morgan LVRCA, the correlation coefficient was .551.

Internal Consistency

Chronbach's Alpha yields a coefficient of internal consistency. It allows the user to assess the consistency of responses across test items, i.e., it measures the extent to which various test items are related to one another. It gives the mean of all possible split-half reliability calculations. Inter-item reliability for Form A was .737; Form B was .853.

Validity

Validity was computed by Pearson Product moment correlation between the Morgan LVRCA and the Woodcock Reading Passage Comprehension Test grade level equivalents. Correlation between the first Morgan LVRCA administered (Forms A and B in Sequence 1 and 2) and the Woodcock was .827.

Discussion

Correlation coefficients for reliability and validity show the Morgan LVRCA to be a reliable and valid tool for assessing the reading comprehension for adult readers with macular loss. The sequence of test administration showed important differences in performance, however, related to fatigue effects. In the evaluation of test-retest/form equivalency reliability, subjects showed much greater reliability when the Morgan LVRCA was administered prior to the Woodcock. The investigators speculate that this was related to the amount of time generally required to administer each test and the visual fatigue of the subjects. The Morgan LVRCA mean time for Form A was 9 minutes, 37 seconds. The Morgan LVRCA mean time for Form B was 9 minutes, 14 seconds. In contrast, the mean time for Woodcock administration was 47 minutes. The correlation coefficient between the Morgan LVRCA Forms A and B when administered prior to the Woodcock was .871. When the Woodcock was administered first, the correlation dropped to .551.

Validity of the first administration of the Morgan LVRCA, whether Form A or B, gave a correlation with the Woodcock of .827, the second administration gave a correlation of .749. During the test administration, it seemed clear to the evaluators that some subjects required extra time to understand and respond to the cloze format of the Morgan LVRCA and Woodcock tests. Because of this factor, additional practice items were added to both forms of the Morgan LVRCA in order to give future readers practice with the “cloze” format of the test and to assure that administration elicited the best possible performance from the reader.

A scoring mechanism for the Morgan LVRCA was developed based on reliability and validity results. A Least Squares Best Fit line was generated to predict Woodcock grade level equivalent (GLE) from Morgan LVRCA scores on the first test administrations in Sequence 1 and 2. This best fitting line is reflected in the following formula: $WGLE = (1.266 \times LVRCA) - 5.066$. This formula will derive a grade point equivalent that is within ± 3.0 grade levels (95% confidence limit).

Mean grade level equivalents (GLEs) were computed for both the Woodcock Passage Comprehension Subtest and the Morgan LVRCA. The Morgan LVRCA scores were generated from the Morgan LVRCA administered first in Sequences 1 and 2. The mean for the Woodcock GLE was 11.9, the mean for the Morgan LVRCA was 10.7. These scores indicate that GLEs for both tests are very similar.

References- -----

Frye, E. B. (1987). The varied uses of readability and measurement today. Journal of Reading, January, 338-43.

Gates-MacGinitie Reading: Tests (1964). New York: Teachers College Press, Columbia University.

Karlsen, B., Maddon, R. & Gardner, E.F. (1984). Stanford Diagnostic Reading Test (3rd ed.). Orlando, FL: Harcourt, Brace, Jovanovich.

Klare, G.K. (1963). The Measurement of Readability. Iowa: Iowa University Press.

Kincaid, J.P., Fishburne, R.R., Rogers, R.L., & Chissom, B.S. (1975). Derivation of new readability formulae (Automated readability index, fog count, and flesh ease formula} for Navy enlisted personnel. Springfield, VA: National Technical Information Service, U.S. Department of Commerce.

Luria, R. (1981). The investigation of concept development, in Language and Cognition. New York: John Wiley and Sons.

Piaget, J. (1977). The development of thought: Equilibration of cognitive structures. New York: Viking Press.

Slosson, R.L. (1963). Slosson Intelligence Test for Children and Adults. East Aurora, NY: Slosson Educational Publications, Inc.

Smith, F. (1978). Understanding Reading. New York: Cambridge University

Press. Taylor, W. L. (1953). Cloze procedure: A new tool for measuring readability. Journalism Quarterly, 30, 415-433.

Watson, G.R., Whittaker, S., & Steciw, M. (2010). The Pepper Visual Skills for Reading Test. Madison, WI: Fork in the Road Vision Rehabilitation Services.

Watson, G.R., Wright, V., & De l'Aune, W. (1992). The efficacy of comprehension training and reading practice for print readers with macular loss. Journal of Visual Impairment and Blindness, 1(86), 37-43.

Watson, G.R., Wright, V., De l'Aune, W., & Long, S. L. (1996). The development and evaluation of a low vision reading comprehension test. Journal of Visual Impairment and Blindness, 6(90), 486-494.

Woodcock, R.W. (1987). Woodcock Reading: Mastery Tests - Revised Examiner's Manual. Circle Pines, MN: American Guidance Service.

Wright, V., & Watson, G. (1991). Readability as a criterion for selecting reading materials for adult readers with low vision. Journal of Vision Rehabilitation, 5, 23-35.

Wright, V., & Watson, G.R. (1995). Learn to Use Your Vision for Reading Workbook. Madison, WI: Fork in the Road Vision Rehabilitation Services.

—————EXAMINER'S ANSWER COPY – FORM A —————

PRACTICE SENTENCES

1. He who is quick to borrow is slow to _____

Correct: repay, return

Incorrect: burn

2. What is born with fins is born to _____

Correct: swim, water

Incorrect: fish

3. Friendly words cost _____

Correct: nothing

Incorrect: money

TEST SENTENCES

1. A hard beginning has a good _____

Correct: ending, end, finish

Incorrect: start

2. Empty bags cannot _____ upright.

Correct: stand, sit, be, remain

Incorrect: turn

3. Better lose the anchor than the whole _____

Correct: ship, boat, vessel

Incorrect: thing, line

4. One cup of rice becomes three cups when _____

Correct: cooked, steamed, boiled, done

Incorrect: moist, frozen

5. The first in the _____ has the choice of oars.

Correct: boat, canoe

Incorrect: water, store, line, race, ship

6. In all things it is _____ to hope than to despair.

Correct: better

Incorrect: possible, frivolous, right, best

7. An ice cube will raise the water level in a glass even before it _____

Correct: melts, defrosts, thaws, dissolves

Incorrect: fills, is filled

8. In skywriting, the average letter is nearly two miles _____

Correct: long, wide, tall, high

Incorrect: apart, away

9. An object in possession seldom _____ the same charm that it had in pursuit.

Correct: retains, keeps, holds, has, possesses

Incorrect: had, enjoys

10. A flea is capable of moving a weight hundreds of times _____ than itself.

Correct: heavier, greater, more, larger, bigger

Incorrect: smaller, longer

11. More than a quarter of a pound of _____ is found in every gallon of seawater.

Correct: salt, minerals

Incorrect: impurities, fish, seaweed, algae

12. Happiness doesn't make you forgive your enemies, but it can make you forget you _____ any.

Correct: have

Incorrect: had, lost

13. A family can bear up under tragedy but go to _____ when the water is turned off for a while.

Correct: pieces

Incorrect: town

14. The highest _____ in the world, Angel Falls in Venezuela, has a drop of 3,121 feet.
Correct: waterfall, falls
Incorrect: mountain, place, peak, river
15. A small town is the place where a fellow has to _____ around a dog enjoying a nap on the sidewalk.
Correct: walk, detour, go, step, move
Incorrect: look, hang, stand
16. A free society could be defined as one in which it is _____ to be unpopular and outspoken.
Correct: acceptable, okay, allowable, possible
Incorrect: good, legal, better, easy
17. The down from at least forty cashmere goats is required to produce enough _____ to make one cashmere overcoat.
Correct: material, fabric, wool, cloth, yarn, goods
Incorrect: cashmere, down, feathers, fur, skins
18. Animals tend to develop social organization; the herd offers greater _____ than could be achieved in a solitary life.
Correct: safety, protection, security, socialization, strength, success, companionship, togetherness, stability, unity
Incorrect: freedom, satisfaction, instinct

———— EXAMINER'S ANSWER COPY – FORM B —————

PRACTICE SENTENCES

1. An error once learned is _____ to forget.

Correct: hard, difficult

Incorrect: easy, mistake, wrong

2. _____ where it itches.

Correct: Scratch

Incorrect: Hurt

3. Even a stopped clock is right _____ a day.

Correct: twice, once

Incorrect: throughout, during

TEST SENTENCES

1. The ear helps us _____ our balance.

Correct: keep, maintain, retain, regulate, hold, control, with, have

Incorrect: feel

2. An athlete runs faster _____ than indoors.

Correct: outdoors, outside

Incorrect: fresh

3. When you deal with _____, learn to bark.

Correct: dogs, puppies

Incorrect: noise

4. No more leaves fall in autumn than grow in _____.

Correct: spring, summer

Incorrect: winter

5. The fish can never grow as _____ as the pond.

Correct: big, large

Incorrect: much, fast

6. The afternoon _____ what the morning never suspected.

Correct: knows, brings, delivers, reveals, gives, sees, is, was, has, shows

Incorrect: wants

7. Henry Ford did not put a reverse _____ in his first automobile.

Correct: gear, transmission, shift

Incorrect: brake, clutch

8. The oldest recorded _____ of a horse is sixty-one years.

Correct: age, life, birthday, lifespan

Incorrect: birth certificate, years

9. To fall in _____ with yourself is the beginning of a lifetime romance.

Correct: love

Incorrect: together

10. Ninety-seven percent of all people offered a new pen, try to write their own _____.

Correct: name, signature

Incorrect: story, way

11. Ducks do not get wet because their _____ are kept in an oily condition by small oil glands.

Correct: feathers

Incorrect: backs, body, wings

12. The worst trouble with the future is that it seems to get here _____ than it used to.

Correct: sooner, quicker, faster, earlier

Incorrect: later, slower

13. It is as important to recognize and support the good as to find and punish the _____

Correct: bad, evil, wicked

Incorrect: culprit, guilty, criminals

14 There never was a person so poised that he wasn't disconcerted when a door _____ came off in his hand.

Correct: knob, handle

Incorrect: hinge

15 Defeat begins in the heart; we must not _____ the recklessness of despair to find any lodging in our hearts.

Correct: allow, permit, encourage

Incorrect: accept

16 Researchers have found that a sick plant runs a temperature from one-tenth of one to two degrees centigrade higher than a _____ one.

Correct: healthy, well

Incorrect: blooming, live

17. America is a nation of immigrants, built by men and women who came here to live from many _____ in all parts of the world.

Correct: countries, places, nations, lands, continents

Incorrect: governments

18. Under the most normal conditions of respiration, the average person will take about seventeen _____ each minute.

Correct: breaths, inhalations

Incorrect: puffs

CONVERSION TABLE TO DETERMINE GLE FROM RAW SCORE

The following table will assist the examiner in converting the reader's raw score to its reading or grade level equivalent (GLE):

Raw Score	X	1.266	-	5.066	=	Grade Level Equivalent
1	X	1.266	-	-3.800	=	0
2	X	2.532	-	-2.534	=	0
3	X	3.798	-	-1.268	=	0
4	X	5.064	-	-0.002	=	0
5	X	6.330	-	1.264	=	1.3
6	X	7.596	-	2.530	=	2.5
7	X	8.862	-	3.796	=	3.8
8	X	10.128	-	5.062	=	5.1
9	X	11.394	-	6.328	=	6.3
10	X	12.660	-	7.594	=	7.6
11	X	13.926	-	8.860	=	8.9
12	X	15.192	-	10.126	=	10.1
13	X	16.458	-	11.392	=	11.4
14	X	17.724	-	12.658	=	12.7
15	X	18.990	-	13.924	=	13.9
16	X	20.256	-	15.190	=	15.2
17	X	21.522	-	16.456	=	16.5
18	X	22.788	-	17.722	=	17.7