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AVLT and HVLT Learning Tests Scoring Manual

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Auditory Verbal Learning Test (AVLT) / Hopkins Verbal Learning Test (HVLT) Scoring Manual

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1. Introduction to the purpose and scoring of the AVLT and the HVLT

The Auditory Verbal Learning Test (AVLT) is a measure of the subject's ability to form and retain new verbal memories. Alternative forms of the AVLT word lists are used at each study visit. The test is administered in two parts, with the first part consisting of five learning and recall trials, followed by an interference trial and a short-term retention trial. The second part consists of a recognition trial employing a word list with items from the learning and recall trials plus distractor items.

In the first part, subjects hear a 15-item word list, with a two second pause between each word. Subjects are then asked to write down in any order as many words as they can remember, including any words recalled correctly on previous trials. Subjects are allowed two minutes for writing down the words they can recall. This is repeated five times. Subjects are then read a new 15-item word list and asked to remember as many words as they can this is a measure of interference from the previous word list. Subjects are then asked to recall the original list one more time without hearing the words read again. The subjects' responses are then scored in a standardized manner in order to compare results across intervention groups and across time (i.e., from baseline to follow-up). In the second part, subjects are asked to identify words that had been presented on the first five learning and recall trials by marking down Y (for YES) if the word is from the original list and N (for NO) if the word is from the interference list or is a new word.

The Hopkins Verbal Learning Test (HVLT) is a test of new verbal learning and memory. Alternate forms of the test will be used at each test administration. Like the AVLT, the test is administered in two parts, with the first part consisting of three learning and recall trials and the second part consisting of a recognition trial. In the first part, subjects hear a 12-item word list, with a two second pause between each word. They are then asked to write down, in any order, all the words that they can remember, including any words recalled correctly on previous trials. Subjects are allowed exactly two minutes after each trial to write down as many words as they can remember. The subjects' responses are then scored in a standardized manner in order to compare results across intervention groups and across time (i.e., from baseline to follow-up). In the second part, subjects are asked to recognize words that have been presented during the three learning and recall trials by marking down a Y (for YES) if the word appeared on the original lists and a N (for NO) if the word is a new word.

This manual explains how to score the AVLT and the HVLT.

2. General scoring rules for the AVLT/HVLT

The HVLT and AVLT consist of word lists of 12 and 15 words, respectively, repeated over a series of learning trials. There are three learning trials on the HVLT and five learning trials on the AVLT. You score the correctness of subjects' recall of **Each Word** on these lists. A recall score on each trial is calculated in the following way: **1 point** is awarded for each word from the list that is recalled correctly or with close accuracy. **No points** are awarded for inaccurate or missing words. Partial credit is not given. Once the recall trial has been scored, all points are summed by the computer to arrive at a total recall score for that trial. On the HVLT, a perfect recall score is 12 words; on the AVLT, a perfect recall score is 15 words. Once each recall trial has been scored, the scores are summed by the computer to arrive at a total learning score, which is the sum of the scores across all trials. On the HVLT, a perfect learning score would be 36 (i.e., 12 words recalled on each of the three learning trials); on the AVLT, a perfect learning score would be 75 (i.e., 15 words recalled on each of the five learning trials).

Assign 1 point (circle 1 on the scoring form) for words that:

- 1. are **minor misspellings**, e.g., "horese" for horse; "saphire" for sapphire; "opral" for opal, "voda" for vodka, "hud" for hut, "peral" for pearl
- 2. are **common misspellings**, e.g., "dessert" for desert; "win" for wine; "riffle" for rifle
- 3. are **homophones**, e.g., "hoarse" for horse
- 4. are **reasonable attempts at phonetic spelling**, e.g., "sord" for sword, "tigar" for tiger
- 5. are **singularized** (if plural), i.e., "shoe" for shoes; "nail" for nails; "lemon" for lemons
- 6. are **pluralized** (if singular), e.g., "hats" for hat, "chickens" for chicken

Scoring major misspellings and poor phonetic attempts:

The scoring of words that are major misspellings or that represent poor phonetic attempts is a particularly difficult scoring challenge. When in doubt about how to score, you should complete a Scoring Assistance request form. The following are examples of the types of misspellings or phonetic attempts and the values you should assign them.

**If any misspellings, including illegible handwriting, <u>form identifiable other words on the list (e.g., "tint" for "tent")</u> then apply the following scoring rules:

Assign no points (circle 2 on the scoring form) for words that:

- 1. are **identifiable incorrect words not** on the list. These include words that:
 - **A) rhyme** with the test word, e.g., "horn" for corn, "force" for horse, "mouse" for house, "cat" or "pat" for hat, "vine" for wine
 - B) have a similar sound and spelling, e.g., "run" for rum, "pen" for pan, "tint" for tent
 - C) have a **similar sound but different spelling**, e.g., "week" for wheat, "mouse" for mouth, "fort" for fork, "lying" or "line" for lion, "death" for desk, "fruit" for flute, "balm" for bomb, "pike" for pipe, "cold" for coal
 - **D)** have a **different sound but similar spelling,** e.g., "loin" for lion, "peal" for pearl, "ban" for bean, "hot" for hat, "ford" for fork
 - E) have the same or similar meaning, e.g., "gun" for pistol, "cap" for hat, "drapes" for curtain.
 - **F)** have been **shortened** or abbreviated, e.g., "phone" for telephone; "b-ball" for basketball.
 - **G)** have been **lengthened** or expanded, e.g., "eye glasses" for glasses, "baseball" for ball.
- 2. are **duplicates** of words already written on the list for that recall trial, e.g., "drum" written down a second time (also known as <u>perseverative errors</u>). (See below for scoring perseveration errors).
- 3. were **not presented** but **were introduced** by the subject, e.g., "house" for hotel or tent (also known as intrusion errors). (See below for scoring intrusion errors).
- 4. are completely illegible and impossible to make out

Exception to rules 1B, 1C, and 1D: Assign <u>1 point</u> for incorrect words according to #1B, 1C, or 1D above if they follow a trial in which the correct word has been recalled.

EXAMPLE A: If the subject writes down the correct word on the first trial, e.g., *rum* on Trial 1, but writes down an incorrect word according to #1B above on both of the remaining trials, e.g., *run* on Trials 2 and 3, assign 1 point on each trial (3 points total).

EXAMPLE B: If the subject writes down the correct word on Trial 2, e.g., *lion*, but writes down an incorrect word according to #1C above, e.g., *lying* on Trials 1 and Trial 3, assign 1 point each for Trials 2 and 3 (2 points total). Assign 0 points for Trial 1.

EXAMPLE C: If the subject writes down the correct word on Trial 3, e.g., *hat*, but writes down an incorrect word according to #1D above, e.g., *hot* on Trials 1 and 2, assign 1 point for Trial 3 but 0 points for Trials 1 and 2 (1 point total)

It is important to pay close attention to <u>rules 1B through 1D</u> for consistency. It is unknown to the scorer whether or not the word is incorrect because the subject did not hear the word correctly (i.e., "cave" for cage), because the subject is used to hearing the word pronounced differently (e.g., "line" for lion), or because the subject had difficulty in recalling the exact word.

Scoring Intrusion & Perseveration Errors

Rationale: When scoring for HVLT/AVLT certification purposes, higher than expected rates of intrusion and perseveration errors were noted in the HVLT/AVLT learning trials data. These types of errors are of scientific interest to the ACTIVE Investigators because of the association of these types of errors with functional disability. Hence, in January of 1999, the Steering Committee approved the development and distribution of new coding Forms 310 (HVLT) and 619 (AVLT) for scoring intrusion and perseveration errors in the HVLT/AVLT learning trials. Starting with Replicate 3, scoring of these errors were completed concurrently with other HVLT/AVLT scoring.

A description of these errors and scoring rules follows.

Intrusion Error: An intrusion error is a word that was not presented during the learning trial but was introduced by the subject in their written recall (e.g., "house" for hotel or tent).

Identifying Intrusion Errors: Check the words that were presented during the learning trials. If the subject has written an identifiable word that was not on the learning trial list, then it should be scored as an intrusion error. Intrusion errors may be words that are related or not related to those on the learning trial list.

Perseveration Error: A perseveration error is a word that is a duplicate of a word that the subject has already written down in their written recall (e.g., "drum" written down a second time).

Identifying Perseveration Errors: Check the list of words that the subject has written down in their written recall. If the subject has written any word more than one time, then score the additional, duplicated word(s) as perseveration errors. Each duplicate of the word is scored as a separate perseveration error.

Counting and Scoring Errors: Count up the number of intrusion errors and the number of perseveration errors for each learning trial. Enter the total number of errors of each type in the appropriate spaces on the AVLT and HVLT coding forms.

5. Scoring rules for AVLT/HVLT Recognition

The AVLT and HVLT recognition tests consist of word lists of 50 and 24 words, respectively. The lists are presented one time following the learning and recall trials. Half of the words on the AVLT are old words from the learning trial lists (Trials 1-5) and half of the words are new words or words that appeared on the interference trial (Trial 6). For the HVLT, half of the words are old words from the learning trial lists (Trials 1-3) and half of the words are new words. The subjects' task is to identify words that appeared on the learning trials, by marking down Y for YES. If the words are new words or are words from the interference trial, subjects are asked to mark down N for NO, indicating that the words were not on the learning trial lists. The data entry person at your site will enter whether the subject marked the **old words** as correct (Y for YES) and the **new words** or **interference words** as incorrect (N for NO). The computer will later compute a total recognition score for total number of target words (i.e., old words) correctly identified. On the AVLT recognition test, a perfect recognition score is 15 (i.e., all 15 target words on the learning trial identified as correct). On the HVLT recognition test, a perfect recognition score is 12 (i.e., all 12 target words on the learning trial identified as correct).

Although you will not need to score the AVLT and HVLT recognition tests, there are some situations that may arise that will require you to answer questions about how they should be scored and entered into the computer. The following rules are designed to cover those situations.

Score as **incorrect** all words for which:

- 1. two answers have been given (i.e., both Y and N written in the same answer box)
- 2. the answer cannot be distinguished (i.e., the Y looks like an N, the N looks like a Y)
- 3. an answer other than Y or N has been given (e.g., subject writes down a question mark, subject writes down MAYBE)

Although subjects are asked to write down Y or N, there is no penalty if they write down YES or NO.