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Rey auditory-verbal learning test norms for preadolescents

Donna Homer
University of Nebraska at Omaha

REY AUDITORY-VERBAL LEARNING TEST NORMS FOR PREADOLESCENTS

A Field Project

Presented to the

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and the

Faculty of the Graduate College

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In Partial Fulfillment

of the Requirements for the Degree

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by

Donna Homer

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ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

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Committee

Name	Department
	Psychology
	Psychology
	Psychology
	Counseling and Special Education

Chairman

4-19-88

Date

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Donna Homer

University of Nebraska at Omaha, 1988

Advisor: Dr. Robert Woody

The Rey Auditory-Verbal Learning Test is an easily administered assessment technique designed to measure immediate memory span and provide a learning curve. It consists of six trials of a 15-word list with an intervening task between Trials 5 and 6. However, norms were established in France several years ago. To update the norms the AVLT was administered to 236 children between the ages of 9 and 12. The students are representative of preadolescents in a large urban school district. Means and standard deviations are provided for each of seven trials, their repetitions, and additions.

Findings from this study generally show one or two words less recalled for each trial. However, immediate memory span is within expected limits and a normal learning curve was found for each age group.

Although norms for the current sample are lower than the French norms, based on recent research with older subjects, the norms from this research appear appropriate for American children today. However, caution in using them is necessary until further studies are conducted.

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INTRODUCTION

Everyday great amounts of time, energy, and money are invested in formal and informal learning experiences. Although often the emphasis is on what has been learned, over the years much research and study have been concerned with understanding of the learning process, individual expectations, and reasons for learning-related problems. School psychologists are especially interested in assessing not only how much a person has learned but also how it is learned, the potential for learning, optimal conditions for success, and identification of contributing factors when problems exist.

In order to investigate how and why learning takes place, it is important to understand what learning is. Its definitions usually refer to a relatively stable change in an organism that comes about as a result of experience. Adams (1980) includes the role of memory in his definition which states:

> The learning of a response is an inferred state of the organism. Learning results from defined kinds of experiences which produce a relatively stable potential for subsequent occurrences of the response. The storage and retrieval of this relatively stable potential is the topic of memory. (p. 6)

He sees memory and learning as two sides of the same coin. One does not exist without the other. Therefore, any discussion of learning or attempt to assess it must consider the functions of memory in the process.

Although many kinds of behaviors are learned, within the school setting verbal learning is of particular importance. It is most unusual when material to be learned does not require receptive and/or expressive language skills. Verbal learning is also significant in interpersonal relationships and thought processes. Because of the importance of the acquisition of language skills, this type of learning has been a subject of much interest for hundreds of years. It was Hermann Ebbinghaus, however, in the 19th century who first objectively studied verbal learning by memorizing numerous lists of nonsense syllables. He used a serial-learning approach where each list was repeated in the order given. This method continues to be used in the study of verbal learning. Other commonly used procedures are paired-associate learning and free recall. Paired-associate learning requires the subject to give a response that has been paired with a stimulus. In free recall the subject recalls as much as possible in any order. (Adams, 1980).

According to Hintzman (1978), free recall has become the most widely used of the three procedures though some still question its use in research because of the examiner's lack of control. However, three characteristics of free recall provide valuable insight into the learning process. First, as in serial learning, it provides a serial-position curve. For example, in the recall of word lists, words near the end of the list are usually recalled best, the recency effect. Beginning list words are not remembered as well but recall is better than for words in the middle. This is referred to as the primacy effect. Second, although no order is required,

subjects tend to bring their own order and organization to the task. Third, it is found that often the free recall task does not exhaust the subject's memory. When a recognition or cued-recall task follows, additional words are remembered.

In addition to a variety of methods for assessing verbal learning, there are also modality differences. Stimuli can be presented auditorily or visually. Research in laboratory-type settings indicates that input through the auditory channel should be learned more effectively as trace decay does not occur as quickly. While a visual memory trace lasts only a fraction of a second, an auditory memory trace persists for several seconds (Adams, 1980). However, such studies control stimuli exposure time. In the natural setting of a classroom, it is likely exposure to a visual presentation is not as controlled or as brief. Depending on opportunity to rehearse and presence or absence of visual support materials, classroom auditory presentations may more closely resemble laboratory conditions.

Studies have shown that 45% of a student's school day is spent listening (Petty, Petty, & Becking, 1976). Even though not all of this instruction is totally dependent on auditory processing, it shows the importance of understanding and assessing the auditory processing and memory functions of a student when a school-related psychological evaluation is conducted.

While many factors influence learning outcomes, it seems likely that much failure to follow directions and to learn on rote tasks is because of too much information given auditorily at one time with little visual support and/or insufficient repetitions to facilitate

learning. An overload of auditory input can be difficult for many students but especially so for those with auditory impairment.

As important a part as auditory memory plays in understanding a student's learning capacity and style, tests to provide this information are not routinely a part of many school psychological evaluations. Many tests have been designed to assess auditory functioning with subjects recalling digits, letters, syllables, words, sentences, or paragraphs. However, one reason these tests are not used more extensively may be because few have reliable norms (Lezak, 1983).

The Digit Span Subtest of the Wechsler Intelligence Scale for Children-Revised and the Wechsler Adult Intelligence Scale-Revised provides one measure of auditory short-term memory. However, performance may be influenced by the subject's facility with numbers and ability to process the information when digits are repeated backwards. Also, though the subtest shows if immediate memory span is within the normal range of seven plus or minus two (Miller, 1956), learning across trials is not considered. It is not possible to compare a subject's learning curve with usual expectations where there is a fairly steep rise during early presentations with a leveling off as trials continue.

Lezak (1983) lists five components of memory that should be included in any memory examination: Span of immediate retention, learning as related to recent memory, capacity to learn, retention of newly-learned material, and efficiency of retrieval for both recent and remote memories.

The Rey Auditory-Verbal Learning Test, AVLT, (Rey, 1958) is a test that lends itself well to the assessment of auditory verbal learning and memory by providing much useful information in a relatively short time. It consists of six trials of a 15-word list with an intervening task between Trials 5 and 6. Lezak (1983) describes it as an easily-administered assessment tool designed to measure immediate memory span and provide a learning curve. It is helpful in the examination of possible learning strategies, as well as tendencies to confabulate or confuse on memory tasks. The effects of retroactive and proactive interference can also be measured.

Rey's test has been recognized in clinical settings for several years. Taylor (1959) refers to its importance in her assessment of children with cerebral defects. Lezak (1983) routinely includes it in a basic neuropsychological evaluation. Recent research (Mungas, 1983) shows it may be useful in the differential diagnosis of memory disorders. Rosenberg, Ryan, and Prifitera (1984) used the technique to compare the performance of memory-impaired psychiatric and neurological patients with those who were not memory-impaired. Results of their study indicate the AVLT may quickly provide information for the diagnosis and treatment of suspected memory impairment.

An assessment tool of this nature can also be helpful in discovering learning styles and planning instructional strategies for more academic success. The Rey Auditory-Verbal Learning Test is also useful in the school setting because of its age norms for children 5 through 15 (Rey, 1958). The means and standard deviations of each trial's words recalled for Rey's sample are shown in Table 1. However,

Table 1

Means and Standard Deviations for Number of Words Recalled

Rey Auditory-Verbal Learning Test 1958 French Norms

	Trials				
	1	2	3	4	5
Age 5 Mean	4.1	6.2	7.7	7.7	8.8
SD	(1.3)	(1.9)	(2.2)	(1.1)	(2.1)
Age 6 Mean	5.0	6.5	8.2	10.2	10.4
SD	(1.9)	(2.1)	(2.5)	(1.8)	(2.4)
Age 7 Mean	4.6	7.6	8.2	9.2	9.9
SD	(1.2)	(1.5)	(1.9)	(2.0)	(1.9)
Age 8 Mean	5.8	8.8	9.8	11.0	11.4
SD	(1.2)	(1.7)	(2.3)	(1.8)	(2.4)
Age 9 Mean	6.6	10.1	11.0	12.4	12.4
SD	(1.6)	(1.9)	(1.5)	(1.7)	(1.5)
Age 10 Mean	8.6	9.5	11.8	12.3	12.9
SD	(1.8)	(2.1)	(1.6)	(1.5)	(1.4)
Age 11 Mean	7.1	10.6	12.4	13.3	13.3
SD	(2.3)	(2.0)	(1.8)	(1.6)	(1.6)
Ages 12-14					
Mean	7.1	10.4	12.5	12.3	13.0
SD	(1.8)	(1.8)	(1.6)	(1.9)	(1.9)
Ages 14-15					
Mean	8.3	12.0	13.6	14.1	14.6
SD	(1.8)	(1.2)	(1.1)	(0.8)	(0.4)

because the test was normed in France with French children about 30 years ago, the norms must be cautiously used with American children.

Data are not available for current functioning of children in this country but recent studies have resulted in updated norms for older, special populations. Rosenberg et al. (1984) tested 45 psychiatric and neurological inpatients with normal memory functions. Query and Megran (1983) did a more extensive study with 677 adult male inpatients who were ambulatory and being treated for physical problems. Based on mean education for both groups at about a twelfth-grade level, some comparisons can be made between the patient groups and Rey's adult manual laborer group (Rey, 1958). The more recent findings suggest Rey's norms may not be appropriate for use today in that his group recalled one to four more words per trial. Although there are many differences between the samples, their similarities seem to support the concern that the 1958 norms are not reflective of normal learning expectations in America today.

Even though the words are concrete, rather common objects, it is also possible that because the original lists were French words, word frequency differences between French and English terms could affect recall. Table 2 shows frequency comparisons. The List A English word frequencies were checked in three sources (Carroll, Davies, & Richman, 1971; Dahl, 1979; Francis & Kučera, 1982) and the French in one source (Juilland, Brodin, & Davidovitch, 1970). All are written language frequencies except the Dahl source which uses spoken language. Although individual words differ in frequency from source to source, the English word list frequencies appear to be

Table 2

Frequency Comparisons for AVLT List A Words

Source	Sample Size	Frequency Range	Average Frequency
Carroll et al. (1971)	5,088,721	.001% to .053%	.015%
Dahl (1979)	1,058,888	.0001% to .062%	.0092%
Francis & Kučera (1982)	1,000,000	.0003% to .041%	.0091%
Juilland et al. (1970)	400,000	0% to .048%	.0095%

comparable to those of the French list. Therefore, the language difference appears to be of little consequence in recall.

Additional concerns include the limited number of subjects in Rey's sample (20 per age group) and the lack of descriptive information about the subjects. Rey (1958) states only that they were carefully selected.

The purpose of this research is to provide current norms for a sample of American children between the ages of 9 and 12. As in Rey's norms, the mean and standard deviation for the number of words recalled for each of five trials and the mean number of repetitions and additions for each trial are given. Also, means and standard deviations are provided for the single presentation of a second list, as well as the sixth trial of the first list after the intervening task. Data for repetitions and additions are included for each of the seven trials.

Chapter II

METHOD

Subjects

Subjects are students at the magnet science center for grades four through six in the Omaha Public Schools, an urban district of 41,532 students. Each of the 296 students at the science center was given the opportunity to participate. Permission was obtained for 239 students (80.7%). Three moved before they could be tested so that 236 (79.7%) actually participated. The students who completed the study were 56 nine-year-olds, 70 ten-year-olds, 70 eleven-year-olds, and 40 twelve-year-olds.

Of the 57 who did not return permission slips, 10 (17.6%) did not take the test because parents did not give consent, 18 (31.6%) chose not to be involved, and 29 (50.9%) either forgot to return the forms or lost them. Students were given at least two opportunities to return the consent forms.

Students at the magnet science center are chosen from those making application to attend there. It is not a "home school" for any student in that the school has no attendance boundaries and its students come from all over the city. In the selection process of the students for the magnet school, consideration is given to keeping race and sex ratios of the student body proportionate to those found in the district as a whole. Table 3 compares the norming sample with the population of the science center and the entire school district.

Table 3

Race and Sex Percentage Comparisons of Norming Sample with Total Science Center and Total School District

	Sample	Science Center	District
Whites	68.2	65.9	67.3
Blacks	25.8	28.4	27.1
Hispanics	1.7	2.0	3.3
Indians	1.7	1.4	1.3
Asians	2.5	2.4	1.1
Boys	45.8	48.6	51.4
Girls	54.2	51.4	48.6

Past academic success or ability level of the student is not taken into consideration. It is possible that only those who are truly interested in science will apply, making the sampling population somewhat unusual. However, it is likely that other factors also influence some students' interest in attending. Other reasons for choosing the science center may be the school's swimming pool (other elementary schools are not so equipped), more field trips, the computer lab, a smaller school, a newer facility, or dissatisfaction with the home school.

To determine if these students are scholastically representative of the district as a whole, one-way analyses of variance were computed comparing California Achievement Test scores for each grade level at the science center with the same grades from five other elementary schools in various areas of Omaha. These are considered to be middle socioeconomic-class schools. Scaled scores for the 1987 California Achievement Test total battery were used for comparison.

For fourth-graders the ANOVA showed a significant groups effect, F (5, 380) = 3.210, $p < .01$. T-tests comparing each possible pair of schools were computed with five pairings reaching significance ($p < .05$). However, only one school differed significantly from the science center (t = 3.263, $p < .01$). There also was a statistically significant difference between this school and three of the other four.

The ANOVA using fifth-grade data also found a significant groups effect, F (5, 308) = 3.888, $p < .01$. T-test comparisons showed that two schools were significantly different from the science center (t = 4.203, $p < .001$, and t = 2.171, $p < .05$). However, for one of

the schools, there was a statistically significant difference between it and all five of the other schools.

The ANOVA for sixth-graders found no significant groups effect, F (5,343) = 0.297, p = .914. Since Cognitive Skills Indexes, similar to group intelligence test scores, are available for sixth-graders, another one-way analysis of variance was computed using these data to compare the six schools. Again there was no statistically significant difference between the science center sixth-graders and those from the other five schools, F (5,343) = 0.316, p = .903. Therefore, the science center students appear to be a representative sample of the entire school district.

Procedure

Subjects were tested individually. The 15 List A words are as follows: Drum, curtain, bell, coffee, school, parent, moon, garden, hat, farmer, nose, turkey, color, house, river. The words were repeated at the rate of about one per second, preceded by the following directions:

> I'm going to read a list of words. Listen carefully because when I stop, you are to say back as many of the words as you can remember. It doesn't matter in what order you say them. Just tell me as many as you can remember.

As the subject recalled the words, the examiner numbered them in the order repeated. A check was placed by the number if a word was said more than once and additions for each trial were also tallied. If the subject asked if he had already said a word, that information was provided but was not volunteered.

After the first trial, the subject was given instructions similar to the following:

> Now I'm going to read the same list to you again. When I stop, you tell me as many as you can remember, including the ones you said before. The order doesn't matter. Just tell me as many as you can remember whether you said them the other time or not.

When it seemed apparent that the subject did not understand the directions, a reminder was given to say all the words that were remembered. These same instructions preceded Trials 2, 3, 4, and 5.

After Trial 5, the subject was told:

> Now I'm going to read a second list of words. This time when I stop, you are to say back as many words from this second list as you can remember. The order doesn't matter. Just tell me as many as you can remember.

The 15 List B words are: Desk, policeman, bird, shoe, stove, mountain, glasses, towel, cloud, boat, lamb, gun, pencil, church, fish. After one trial using this list, the subject was asked to recall as many words as possible from the first list. Repetitions and additions were recorded for each trial.

The directions given are similar to those used by Lezak (1983) and Rey (1958).

Thirteen of the subjects (5.6%) had difficulty with the directions, making it necessary to readminister the test. Because Lezak (1983) points out that practice effects exist even when the test is given after a six- or twelve-month interval, the alternate word list was used. List C words are: Book, flower, train, rug, meadow, harp, salt, finger, apple, chimney, button, log, key, rattle, gold. A study by

Ryan, Geisser, Randall, and Georgemiller (1986) found the forms to be equivalent measures.

To check scorer reliability 9.2% of the trials were tape recorded. Only three errors were made. One repetition was missed, one repetition was incorrectly recorded as a repetition of another word in the same list, and an addition (collar) sounding like a word in the list (color) was scored as a list word. These errors had very little, if any, effect on outcomes.

Chapter III

RESULTS

Tables 4, 5, 6, and 7 give the means and standard deviations (shown in parentheses) for each trial, its repetitions and its additions by age group. A comparison with the French norms (Rey, 1958) is provided and mean score differences between the two sets of norms are also given. It should be noted that the norms for the twelve-year-olds are compared with French norms for twelve-to-fourteen-year-olds.

A breakdown by race and sex of the Sum of Trials 1-5 shows little variability. Table 8 shows the mean and standard deviation in each age group for whites, blacks, boys, and girls. Because only six Asians, four Hispanics, and four Indians were in the total sample, data for them are not included.

For the Sum of Trials 1-5 girls on the average remembered .9 words more than boys and whites remembered 2.6 words more than blacks.

Table 4

Number of Words Recalled Across Trials for Nine-Year-Old Sample

	Trials							
	List A							
	1	2	3	4	5	Sum of 1-5	6	List B
Mean	5.5	7.8	9.3	10.4	11.2	44.2	9.0	4.8
SD	(1.3)	(1.4)	(2.3)	(2.1)	(2.0)	(7.0)	(2.7)	(1.2)
Repetitions	.4	.8	1.5	1.7	1.7	6.1	1.3	.2
	(.6)	(1.1)	(1.9)	(2.0)	(2.1)	(5.9)	(2.1)	(.5)
Additions	.7	.4	.5	.4	.3	2.3	.2	.4
	(.9)	(.8)	(1.0)	(.7)	(.5)	(3.0)	(.5)	(.5)
French Norms for Nine-Year-Olds								
Mean	6.6	10.1	11.0	12.4	12.4	52.0		
SD	(1.6)	(1.9)	(1.5)	(1.7)	(1.5)			
Differences between Sample Norms and French Norms								
	-1.1	-2.3	-1.7	-2.0	-1.2	-7.8		

Table 5

Number of Words Recalled Across Trials for Ten-Year-Old Sample

	Trials							
	List A							
	1	2	3	4	5	Sum of 1-5	6	List B
Mean	5.6	8.4	10.1	11.4	11.9	47.3	10.4	5.2
SD	(1.1)	(1.9)	(2.1)	(1.8)	(1.9)	(6.8)	(2.3)	(1.4)
Repetitions	.4	.7	1.4	1.8	1.7	6.0	1.3	.1
	(.6)	(1.0)	(1.4)	(1.6)	(2.2)	(4.5)	(1.8)	(.3)
Additions	.7	.5	.3	.3	.2	2.0	.3	.3
	(.9)	(.7)	(.6)	(.5)	(.5)	(2.3)	(.6)	(.6)
French Norms for Ten-Year-Olds								
Mean	8.6	9.5	11.8	12.3	12.9	55.1		
SD	(1.8)	(2.1)	(1.6)	(1.5)	(1.4)			
Differences between Sample Norms and French Norms								
	-3.0	-1.1	-1.7	-.9	-1.0	-7.8		

Table 6

Number of Words Recalled Across Trials for Eleven-Year-Olds

	Trials							
	List A							
	1	2	3	4	5	Sum of 1-5	6	List B
Mean	5.6	8.5	10.2	11.3	11.8	47.3	10.2	5.5
SD	(1.3)	(1.9)	(1.8)	(1.8)	(1.9)	(7.0)	(2.4)	(1.4)
Repetitions	.4	.8	1.3	1.6	1.6	5.7	.9	.2
	(.6)	(1.0)	(1.4)	(1.5)	(1.4)	(3.9)	(1.0)	(.5)
Additions	.7	.2	.3	.2	.2	1.6	.3	.3
	(.9)	(.6)	(.7)	(.5)	(.6)	(2.6)	(.6)	(.5)
French Norms for Eleven-Year-Olds								
Mean	7.1	10.6	12.4	13.3	13.3	56.5		
SD	(2.3)	(2.0)	(1.8)	(1.6)	(1.6)			
Differences between Sample Norms and French Norms								
	-1.5	-2.1	-2.2	-2.0	-1.5	-9.2		

Table 7

Number of Words Recalled Across Trials

for Twelve-Year-Olds

	Trials							
	List A							
	1	2	3	4	5	Sum of 1-5	6	List B
Mean	5.7	7.9	9.7	10.2	11.5	45.8	9.1	5.4
SD	(1.4)	(1.5)	(1.9)	(2.8)	(1.8)	(5.5)	(2.5)	(1.2)
Repetitions	.4	.9	1.1	1.9	2.2	6.4	1.0	.2
	(.9)	(1.0)	(1.4)	(2.4)	(3.0)	(7.5)	(1.7)	(.5)
Additions	.7	.4	.5	.5	.5	2.6	.6	.2
	(1.1)	(.8)	(1.1)	(.9)	(.9)	(4.4)	(.8)	(.5)
*French Norms for Twelve-Year-Olds								
Mean	7.1	10.4	12.5	12.3	13.0	55.3		
SD	(1.8)	(1.8)	(1.6)	(1.9)	(1.9)			
Differences between Sample Norms and French Norms								
	-1.4	-2.5	-2.8	-2.1	-1.5	-9.5		

*French Norms are for Twelve-to-Fourteen-Year-Olds

Table 8

Breakdown of Sum of Trials 1-5 by Race and Sex

	9-Year-Olds		10-Year-Olds		11-Year-Olds		12-Year-Olds	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Whites	44.4	7.3	47.6	6.8	48.0	6.5	47.1	4.9
Blacks	43.6	6.8	45.2	7.6	46.4	7.8	42.3	5.5
Boys	44.2	7.0	45.9	6.0	46.2	6.6	46.3	5.9
Girls	44.2	7.2	48.3	7.2	48.4	7.2	45.3	5.4

Chapter IV

DISCUSSION

Generally, on each of the first five trials the students in this study remembered one or two words less per trial than the French children did in 1958. Current norms for twelve-year-olds show larger differences but the comparison is with children ages 12 to 14. The largest difference is a three-word decrease on Trial 1 for ten-year-olds. However, Rey's ten-year-old sample may have been unusual in that they remembered more on Trial 1 than any group through age 15 but remembered less on Trial 2 than any group age 9 or older.

The lower norms found in this study may be a reflection of the impact of television on our society. Students today may be better visual learners because of its influence but at the expense of impaired auditory functioning. No doubt more visual materials are also found in today's classrooms than were available thirty years ago. In addition to a wide variety of printed materials, it is not unusual for teachers to use films, slides, television, and computers in the presentation and reinforcement of concepts to be learned. However, it is also not uncommon to hear concerns about the listening skills of students.

Methods of instruction, as well as materials, have also experienced change. Rote learning and memorization are still essential in the acquisition of certain basic skills but they now receive less emphasis. Learning how to learn and problem-solve and where to find

information is becoming more important as it is recognized that many of today's facts will no longer be true in a few years.

Although it may appear logical to expect American children today to remember less than French children did 30 years ago, it is also possible Rey's 1958 norms may be somewhat inflated because of small sample sizes that did not accurately represent a larger population. Norms were not found for comparing the findings of this study with those for a comparable current sample. However, the most recent norms for older, special populations showing similar decreases in number of words recalled per trial support the possibility that lower norms are currently more realistic.

Even though mean number of words recalled per trial is less for this study's sample, the mean increase in number of words learned from Trial 1 through Trial 5 is comparable except for the ten-year-olds where the French sample shows a mean increase of two less words. Current norms indicate there is a doubling of information recalled after five trials, supporting the value of repeated presentations to improve the learning of important, perhaps lengthy, auditory classroom instruction.

Rey's mean scores for words recalled on Trial 1 show 1.6 to 2.3 more words recalled. However, the mean immediate memory span for all groups is within expectations (Miller, 1956), ranging from 5.5 to 8.6.

Normal learning curves are also found in both sampling groups with the largest jump in learning taking place between Trials 1 and 2. The only exception is the French ten-year-old group where most learning

occurred between Trials 2 and 3. Because of several statistical differences noted for this group, it seems likely that data for it are particularly inappropriate for use today.

In the restricted age range of this study a significant increase in the sum of Trials 1-5 as age increases was not found. Amount recalled was comparable for the four age groups. A more dramatic pattern of increase may be seen if students aged 7, 9, 11, and 13 are compared. However, it is also possible there is not a greal deal of developmental growth in the area of auditory processing and memory for preadolescents. Perhaps with the importance of learning abstract reasoning skills during these years, growth in other abilities is not as obvious. One implication of such a finding would be a need to evaluate curriculum expectations for intermediate-grade students. This study would indicate it may not be suitable to expect twelve-year-olds to at least auditorily remember more than younger students who are preadolescents.

As beneficial as the Rey AVLT may be in the assessment of auditory-verbal learning, users of the technique need to be aware of the possible inappropriateness of Rey's norms. Further research is necessary to establish reliable norms for preadolescents, as well as other age groups. Because of the need to exercise strong caution in the use of norms currently available, the AVLT should not be used by school psychologists in the making of placement decisions except to confirm findings from other more reliable assessment tools. It also has much value in the qualitative analysis of a student.

Qualitative aspects to consider include the pattern of the learning curve--if performance improves with repeated presentations, how many trials are required before a large jump in learning occurs, if there is a decrease in the amount recalled as testing continues. It is also important to note the order in which words are recalled, looking at primacy and recency effects, discovering if words remembered previously are said first or if the subject begins with new ones that can be recalled, finding out if learning is cumulative. Ability to organize can also be evaluated by noting if recall begins to follow a pattern after the first trials are completed. Unusual amounts of repetition, addition, and interference may signal the possibility of self-monitoring deficits (Lezak, 1983).

Taylor (1959) in her discussion of the Rey Auditory-Verbal Learning Test states that interference between the first and second lists is very unusual for normal children. In this research 21 of the subjects (7.1%) included words from the other list during recall. Only three showed more than one instance of interference and none had more than two. Proactive interference occurred 45.5% of the time and retroactive 54.5%.

Another factor to consider is comparison of words recalled for Trials 5 and 6. Average performance between the two trials for this sample shows a decrease of about two words recalled. This appears to be in line with a study done by Lezak (1983). Using older subjects, she found that a decrease of more than three words was abnormal and was indicative of retention or retrieval problems.

Taylor (1959) further suggests that awareness of test-taking behaviors during the presentations is also an important part of the evaluation process. Included is the rate at which the words are recalled. Most subjects are able to say several words rather quickly before the response time slows down. She also notes how the subject responds to the demands of the task--if the repetition results in relief or boredom, if the subject gives up easily or puts forth adequate effort to recall as many words as possible, if responses are given at a pace to facilitate their recording or speeded up to make it difficult for the examiner.

Analyses of these types can be profitable not only in the diagnosis of learning problems but also in the designing of curriculum modifications and learning strategies to maximize academic progress.

It is apparent that one's success or failure in school is influenced by a multitude of factors. It is also recognized that auditory processing and memory functions may not be the most vital components. Yet its contribution can be appreciated when the role of memory in learning is considered, as well as the importance of the acquisition of verbal skills and the emphasis on auditorily presented material in the classroom. A technique to assess auditory verbal learning seems a necessary part of a school psychological evaluation. As efforts continue to be made to go beyond the measurement of the product of learning to the assessment of the process, the Rey Auditory-Verbal Learning Test demonstrates potential for becoming an integral part of efficient and effective evaluation in the school setting.

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APPENDIX A

	Year	Month	Day		
Test Date	_____	_____	_____	Grade	_____
Birth Date	_____	_____	_____	Sex	_____
Age	_____	_____	_____	Race	_____

List A	1	2	3	4	5	6	List B	1
Drum							Desk	
Curtain							Policeman	
Bell							Bird	
Coffee							Shoe	
School							Stove	
Parent							Mountain	
Moon							Glasses	
Garden							Towel	
Hat							Cloud	
Farmer							Boat	
Nose							Lamb	
Turkey							Gun	
Color							Pencil	
House							Church	
River							Fish	
Total							--	
Repeats							--	
Additions							--	
From Other List							--	

APPENDIX B

University of Nebraska at Omaha

College of Arts and Sciences
Department of Psychology
Omaha, Nebraska 68182-0274
(402) 554-2592

PARENT CONSENT FORM

Dear Parent:

I am writing to ask your consent for your child to be a part of a study to look at how children remember information given to them orally when nothing is written down to see.

Your child would be one of about 300 fourth, fifth, and sixth graders chosen from regular classrooms. The purpose is to help establish local norms for an auditory verbal learning test that was developed in France several years ago. This test measures immediate memory span and provides a learning curve for material presented orally. Results of this study will be helpful in the diagnosis of some learning problems.

This research is a project by Donna Homer, Psychological Assistant with Omaha Public Schools, under the supervision of Dr. Hans Langner, School Psychologist with Omaha Public Schools, and Dr. Robert Woody, Department of Psychology, University of Nebraska at Omaha.

If you give your consent for your child to be a part of this study, he/she will spend 10 to 15 minutes with me listening to lists of words and recalling as many as possible. I will arrange the time in school with the teacher so that no important classroom instruction will be missed.

Participation is completely voluntary. Your child will in no way be personally identified and participation will in no way affect school. You are also free to withdraw your consent at any time, even if you should give consent at this time. There are no risks or discomfort involved. I would very much appreciate your allowing me to work with your child to complete this project.

If you are giving consent, please send this signed consent form and your child's signed form to school in the enclosed envelope. Thank you.

Sincerely,

Donna Homer
Psychological Assistant
Omaha Public Schools
978-7394

YOU ARE VOLUNTARILY MAKING A DECISION WHETHER OR NOT TO ALLOW YOUR CHILD/LEGAL WARD TO PARTICIPATE. YOUR SIGNATURE INDICATES THAT, HAVING READ THE INFORMATION PROVIDED ABOVE, YOU HAVE DECIDED TO PERMIT YOUR CHILD/LEGAL WARD TO PARTICIPATE. YOU WILL BE GIVEN A COPY OF THIS CONSENT FORM TO KEEP.

Signature	Date
Relationship to Child	Child's Name
Donna Homer	
Investigator	Child's Date of Birth

University of Nebraska at Omaha

College of Arts and Sciences
Department of Psychology
Omaha, Nebraska 68182-0274
(402) 554-2592

CHILD CONSENT FORM

I would like to ask your help in something I am doing. I am interested in knowing more about how children remember things when they do not see anything written down but just have to remember what has been said. You can help me by working with me for about 10 or 15 minutes one day at school. I will find a time that your teacher says will be all right.

You will hear some lists of words and after each list you will tell me as many of the words as you can remember. There is no grade for this and no one else will know how you did. It is kind of fun and nothing we are doing will hurt you in any way.

You do not have to do this if you do not want to. If you say "Yes" now and change your mind after we start, you can do so.

You should talk it over with your mom and dad before you say "Yes" or "No."

I will answer any questions you might have. If you want to do this, please sign and date this paper and return it with the signed letter from your parent. You may give them to your teacher.

I WANT TO HELP. I KNOW WHAT I WILL BE DOING AND UNDERSTAND THAT I CAN CHANGE MY MIND AND STOP, EVEN THOUGH I AM SAYING "YES" TODAY.

_____ _____

Your Name Date

Donna Homer

Investigator