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ABSTRACT

A study compared the effectiveness of the multisensory and auditory teaching methods on the promotion of memory among adults with learning problems. Subjects were 10 adult learners with learning problems, aged 19-31, from an adult basic education program in a large urban area. Two lists of nouns were prepared, each containing 10 words. The lists were taught to the test subjects using first the auditory teaching mode and then the multisensory teaching mode. An analysis of the results demonstrated a positive correlation between the multisensory teaching method and adult learning. An examination of the mean scores for each teaching trial/experience indicated that learning from the multisensory and auditory teaching approaches was significantly different across each teaching trial. This finding and other information permitted the conclusion that these two teaching approaches were never equivalent in student learning. The t-test scores for the first, second, and third trials all showed significant difference in the rate of learning between the auditory and multisensory teaching methods. This seemed to indicate that the multisensory teaching approach encouraged the test takers to learn more holistically and recall more words than the use of any single sensory teaching method. A 2 x 3 FANOVA (factorial analysis of variance) illustrated that the multisensory effect showed statistically significant differences. The retention rate for subjects was systematically higher during the multisensory trials. (YLB)

Adult Learning and Multisensory Teaching

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Abstract

It has been claimed that multisensory arousal causes a narrowing of attention, and therefore, improve memory encoding. In this study we compare the effectiveness of the multisensory and auditory teaching methods on the promotion of memory among adults with learning problems. We found that use of the multisensory teaching method seems to promote the memory among low achieving adult learners in ABE classrooms.

Adult Learners and Multisensory Teaching

What teaching method can be effective in helping adults with learning problems learn best? This question is pregnant with importance given the large number of adults with learning problems in adult basic education (ABE) programs.

There are 27 million Americans over the age of sixteen that are learning disabled (Pues 1990). Many of these adult learners suffer from learning/cognitive disabilities. A cognitive or developmental disability is a disorder in the processing, recalling and storing of information by the learner.

Disabled adults represent only 15 percent of the adult population. Yet 50 - 60 percent of the students in adult basic education (ABE) have a learning disability (Malcolm, Polatajko & Simons 1990 ; Ross 1987).

Learning disabilities do not disappear when children become adults. Many LD children drop out of school (Ysseldyke, Algozzine & Thurlow 1992) .

The LD adult dropout often suffers years of underemployment or unemployment. This lack of opportunity often leads these adults to seek ABE services at local agencies and Community Colleges .

Each person has a way in which s/he learns best. Many adults in ABE programs have positive attitudes about education (Quigley 1992). These adults usually had bad experiences while they were

attending school so they dropped out. Quigley (1992, 26) reported that although adults who drop out of ABE programs liked school, they felt that they had not "received adequate attention from their teachers--a position repeated by RLs [reluctant adult learners] in ABE".

The RLs have different modes of response, intact for acquiring knowledge (Johnson 1990, 25). Some of these learners have retrieval problems which negatively impact on their recall of words and processing information.

Adults can respond to one or more teaching modalities, including the multisensory approach , visual approach and auditory approach. These learning modalities correspond to three teaching methods: the multisensory , auditory and visual teaching approaches.

Research indicates that the first three weeks of the adult learner in the ABE classroom will determine if the student will remain in the program or dropout (Quigley 1992). This suggest that many adult learners because of their poor academic skills might benefit from more direct instruction, rather than facilitation. This results from the fact that altnough these adults bring considerable life experience to the ABE classroom they lack good word attack and reading comprehension skills which will allow them to do well in their ABE courses without help.

This makes the problem of retaining adult students who like education, but dislike school an important issue in adult education. It also highlights the fact that the learning style of

adult learners can play an important role in determining the success or lack of success of adults in ABE classrooms. Doris Johnson (1990, 25) has observed that:

> "While individuals with learning disabilities general -ly have a wealth of information to share with others , because of various output problems, they cannot always express what they know....Some may respond best to multi-sensory approach (hearing, seeing, and doing). Others may respond to a visual approach (books, movies, or demonstration), or an auditory approach (lectures or tapes)."

One teaching procedure that might benefit many low achieving ABE students is the multisensory teaching approach. The multisensory teaching procedure encourages the use of several sensory input pathways simultaneously to enhance learning (Gearheart 1985). The multisensory teaching method has proved to be successful among remedial learners (Myers & Hammill 1992).

The purpose of this case study was to determine the relationship of learning modes to adult cognition. It was hypothesized that students taught using the multisensory teaching approach would learn more efficiently then adults taught using the auditory (or lecture) instructional method.

Method

Subjects. Subjects were ten adult learners with learning problems form an ABE program in a large urban area. They ranged in age from 19 to 31. The subjects were not paid. This

population possessed reading level scores ranging from the 5th to 6th grades. The population in this study had been in the ABE classroom for at least five weeks

Stimuli. Two sets of nouns were prepared. Each list consisted of 10 words. The words were one syllable words totalling three letters.

Procedure. Each subject was told before the experiment began that they would be required to listen carefully to each term recited by the examiner and, or pay close attention to the words spoken and shown to them during the multisensory segment of the test.

In this study two list of ten words were taught to the test subjects using first the auditory teaching mode, and then the multisensory teaching mode. Each of the ten words in the word lists were nouns of the consonant-vowel-consonant variety.

I. TERMS USED FOR THE AUDITORY TEST

1. Men
2. Lid
3. Pot
4. Rib
5. Rat
6. Dog
7. Van
8. Mop
9. Gum
10. Bug

II. TERMS USED FOR THE MULTISENSORY TEST

1. Fig
2. Pin
3. God
4. Log
5. Lip
6. Hog
7. Hen
8. Ham
9. Wig
10. Pop

The test subjects had three trials to learn and write down each term they remembered from the auditory and multisensory list of terms. Each test subject was provided six sheets of paper to complete this teaching activity.

Each word was either said aloud during the auditory part of the test, or shown and said aloud to the student during the multisensory segment of the test. The test subjects were not to write down the words until all ten of the terms in the word list had already been recited by the instructor.

Before the test was began the test subjects were given the following instructions:

AUDITORY TEST: "I will read to you ten words. After these words have been read to you I want you to write down on your paper as many words you remember from the list I am about to recite, on the paper

placed in front of you. You will be given the same words three times. Please place your pencils on the desk and listen carefully.

MULTISENSORY TEST: I will show and say ten words to you. Remember, after you see and hear the words I want you to write down on your paper as many words from the list that you remember that I have shown and said to you , on the paper placed in front of you. You will be given the same words three times. Please place your pencils on the desk. Now look directly at the sheet of paper I am holding in my hands and listen carefully.

The students were taught the ten words for the auditory segment of the test first. After the auditory part of the test was completed the students were taught ten words using the multisensory approach.

RESULTS

An analysis of the results from this case study demonstrated a positive correlation between the multisensory teaching method and adult learning. An examination of the t test ($p < .05$) for independent sample was done on these three sets of scores to determine if there was a statistically significant difference in learning when the auditory and multisensory teaching methods were used after three trials. Table 1, summarizes the statistical analyses.

TABLE 1

MEANS, STANDARD DEVIATIONS, AND t TESTS FOR EACH MULTISENSORY AND AUDITORY TEACHING EXPERIENCES

FIRST TEST

N=10

	Auditory	Multisensory	t-Test
M	1.5	6.3 *	6.76
S.D.	1.56	2.19	

SECOND TEST

N=10

	Auditory	Multisensory	t-Test
M	3.6	7.6 *	6.31
S.D.	2.17	1.28	

THIRD TEST

N=10

	Auditory	Multisensory	t-Test
M	5.2	8.2*	5.0
S.D.	0.98	1.11	

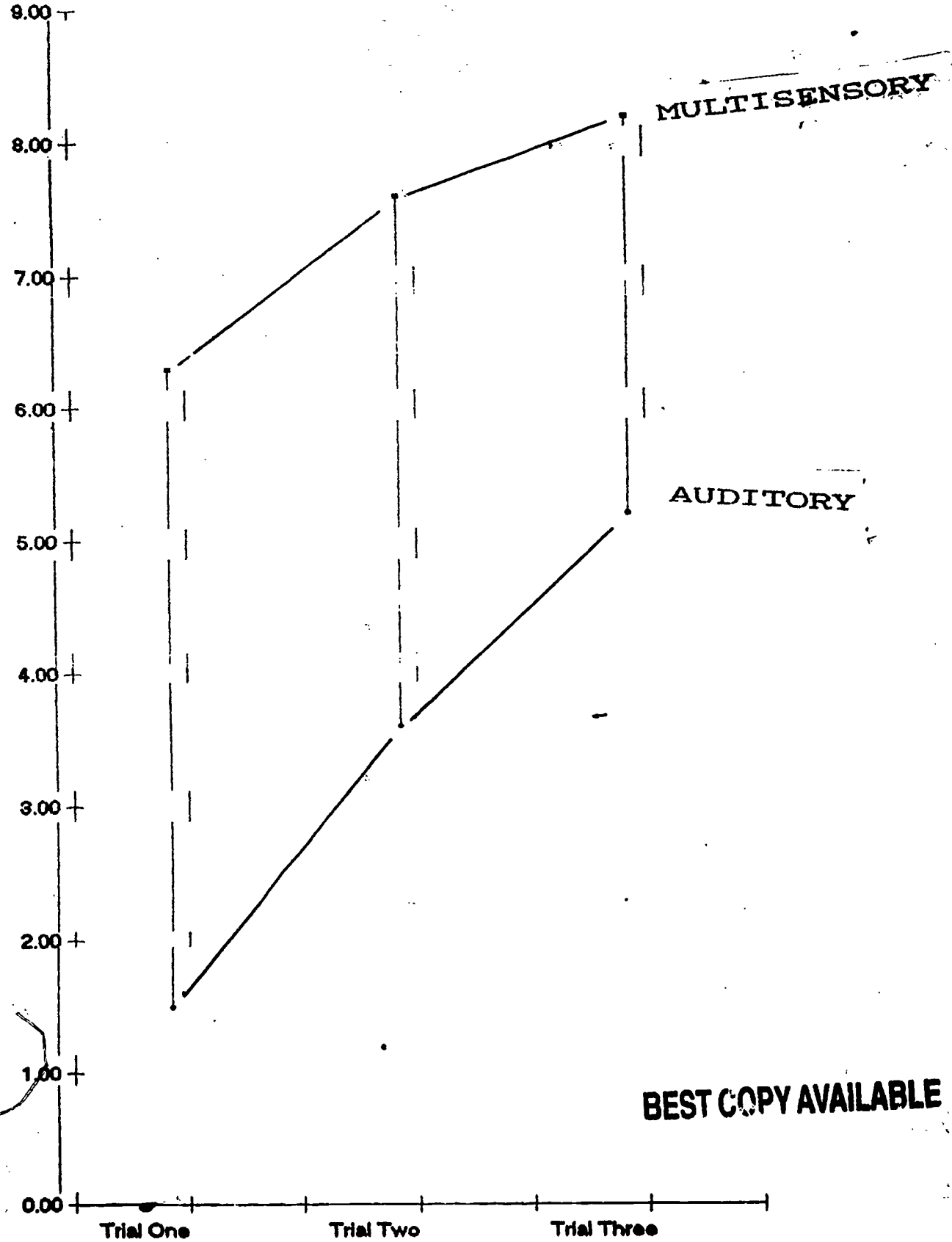
* Significant at the .05 level

Examination of the mean scores for each teaching trial/ experience in this study indicate that learning from the multisensory and auditory teaching approaches were significantly different across each teaching trial. This finding and other information presented in Table 1 permits the conclusion that these two teaching approaches were never equivalent in student learning.

We also examined the t-Test scores for the auditory and multisensory teaching experiences. The t-test scores for the first trial (6.76), second trial (6.31) and third trial (5.0) show significant difference in the rate of learning between the auditory and multisensory teaching methods. This leads one to believe that the multisensory teaching approach encouraged the test takers to learn more holistically and recall more words than the use of any single sensory teaching method.

A 2 x 3 FANOVA (method x treatments) shown in Table 2, illustrate that the multisensory effect showed statistically significant difference. The subjects' retention rate for the terms during the auditory and multisensory effects showed improvement after each trial. But, clearly the retention rate for subjects during the three trials for each teaching method was systematically higher during the multisensory trials than the auditory trials.

Table Two



DISCUSSION

The t-test and FANOVA make it clear that the retention performance was better using the multisensory approach than the auditory teaching approach. This confirms the hypothesis that the multisensory teaching method is more effective in the instruction of adults, than the auditory teaching method.

The FANOVA supports the view that adults with learning problems were more motivated to recall words which they had already seen prior to writing them down.

In conclusion, subjects recall of words during the auditory and multisensory teaching experiences differed. Subjects across three learning trials recalled significantly more terms using the multisensory teaching approach, than the auditory teaching approach.

The results suggest that adults with learning problems can learn best using the multisensory teaching approach. Although these results reject the null hypothesis, we believe that if this test was replicated in a more heterogenous population of adult learners in an ABE setting we might find more variance in the results. The evidence that the subjects had difficulty with just about all the words in the auditory section of this experiment indicate that a group of adults with better word attack skills might do well on both the auditory and multisensory parts of this experiment.

The data in this study also highlights the fact that among adults with learning problems in ABE classrooms teachers should use direct teaching methods. This is due to the deficits exhibited by many adults in low level ABE programs ,who may lack the language skills necessary to learn from a single teaching approach .

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