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Thomas R. Schnell  
*University of Missouri, St. Louis*

Daniel J. Rocchio  
*Affton High School*

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# A COMPARISON OF UNDERLYING STRATEGIES FOR IMPROVING READING COMPREHENSION AND RETENTION

*Thomas R. Schnell*

UNIVERSITY OF MISSOURI, ST. LOUIS, MO.

*Daniel J. Rocchio*

AFFTON HIGH SCHOOL

Much interest currently exists in topics related to the improvement of learning through such avenues as "mathemagenic activities," and a considerable amount of research has been done recently in the area of visual cueing as a learning enhancement technique. This paper is restricted to a discussion of one visual cueing technique—underlining—and some implications arising from underlining research.

## Review of Related Literature

Matthews (1938) studied high school students to see if the underlining of important concepts and ideas by the students was more effective than outline notes or reading without notes. He reported no significant differences on two comprehension measures between the treatment groups.

Similar studies done by researchers such as Arnold (1942) and Idstein and Jenkins (1972), which compared underlining done by students and other forms of study or repetitive reading, have consistently failed to show the effectiveness of underlining of this type as a learning aid.

A second type of underlining research is exemplified by the work of Cashen and Leicht (1970). They studied a group of college freshmen, using passages underlined by the examiners to determine if reading underlined passages facilitates comprehension; and, if so, what the effect was on learning adjacent, non-related items. They found their experimental group scored significantly higher on the criterion tests than the control group did.

Related studies by Klare, Mabry and Gustafsen (1955) and by Crouse and Idstein (1972) also found that prior instructor underlining of prose passages can facilitate immediate comprehension.

A third variation of underlining research is the type done by Willmore (1966). A group of college students were taught how to underline, then were compared experimentally to students taught other study techniques. On criterion measures, the underlining (following instruction) group scored significantly higher than any other.

### Statement of the Problem

The authors of this paper, after examining the existing work in underlining, designed a study to incorporate the various techniques already described into a single experiment. The approaches examined sought to: 1. determine if underlining of various types improved immediate and delayed recall of textbook-like material; 2. determine which technique was most effective; and 3. determine whether prior reading ability affects the value of these techniques for certain students.

### Procedures

The study examined two populations, one at the senior high school level and one at the junior college level, each of which was divided into four groups for experimental purposes. Group one received 110 minutes of instruction and practice in underlining prior to the experiment in which they were asked to read and underline the experimental passage. Group two received no instruction or practice in underlining but read the experimental passage which had been previously underlined by the examiners. Group three received no prior instruction or practice in underlining, but was told to underline the passage as they read. Group four was the control group, and was told only to read the passage.

Immediately following their completion of the passage, each person returned the passage to the examiner and received a 20-item multiple choice test over the passage. Delayed recall was assessed by administering the same criterion test eleven days later (no reviewing or re-reading was allowed).

The instruments used were an 1100 word passage on neural maturation adapted from an educational psychology textbook by Cronbach (1963) which has a Dale-Chall readability of college level, and a 20-item multiple choice test developed and used in earlier studies by Schnell (1973). The test has a split-half reliability of .70 and overall item discrimination in the .40-.60 range.

The underlining strategy taught and also used by the examiners in underlining the passage for Group 2 was based on three criteria found in *Read, Underline, Review* (McGraw-Hill, 1970). Those criteria are: 1) Underline the right amount by selecting key words and phrases which, when read together, make smooth, flowing sense; 2) Underline completely by making sure all main ideas are included; and 3) Underline correctly so that the information underlined and read in review will reveal in capsule form the same information as the original passage.

The sample populations consisted of 88 high school students (grades 10-12) from a suburban St. Louis school district and 53 junior college students from a school in the same approximate location as the high school. The students were assessed on prior reading ability with one of two instruments – the *Gates-MacGinitie Reading Test*, Survey F, Form 1M, or the *Nelson-Denny Reading Test*, Form A. The groups were found to be equal in terms of standard score means and ranges on the reading tests.

## Results

Data gathered in the experiment were analyzed by computer, using a multiple regression analysis technique. The major findings (significant at a level of at least .05) include:

1. The groups which underlined for themselves and the group which received instructor-underlined material all scored significantly higher on the criterion test than the control group on immediate recall.
2. There were no significant differences between groups on delayed recall, but scores approached significance in the hypothesized direction.
3. The groups which did their own underlining scored significantly higher than the instructor-underlined group on immediate recall, but not on delayed.
4. There was a significant interaction between prior reading ability for all groups and the criterion test scores on delayed recall, but not on immediate.

## Summary and Conclusions

Based on the data gathered in this experiment, plus data found in the existing literature on underlining, it appears that the use of underlining can result in significant improvement in reading comprehension and retention of textbook type materials. An analysis of the various cueing methods used in this study indicated that active participation by the reader in underlining is more beneficial than using material underlined by the instructor.

Several implications for instruction in content area classes are suggested by these results and observations. Teachers who selectively underline (i.e. up to 20% of the material) major ideas for the students, or students who underline material immediately before some evaluative activity such as a test, are likely to find improved literal comprehension. Since literal comprehension is necessary for students to reach interpretive and applied levels of understanding, these techniques should be employed before group activities which require the higher levels of understanding.

Suggestions for the teacher should include such ideas as giving students a minimum of 5 hours of instruction and practice in underlining before expecting them to use the skill. Lessons should start with short paragraphs which have been underlined in various ways, with the students asked to select the one which is best (multiple-choice). The next step would be to have them do their own underlining on easy, short paragraphs, increasing the length and difficulty as skills improved. The final stage would be practice in underlining longer selections such as chapters.

Another suggestion would be to allow students to review the underlined parts of their materials at regular intervals to provide maximum retention possibilities.

It seems that underlining is a viable "mathemagenic activity," and should be taught as a regular part of any class which requires retention of prose material.

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