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Release from PI and the physical aspects of words*

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Three experiments were conducted using the release from PI method to measure encoding in memory of: one- vs two-syllable words; two and three vs four and five phonemes; and locus of pronunciation, namely, closed-front vs open-back. The Brown-Peterson paradigm was employed with at least 160 Ss in each experiment, and shifts were made in both directions. No significant release effects were found for number of syllables or number of phonemes, but the locus of pronunciation produced a small but significant effect. It is concluded that these physical characteristics of words are of some, but of minor, importance in encoding words for memory.

The present article reports the details of research whose results have been briefly described previously (Wickens, 1970, 1973). Specifically, it is concerned with the degree to which certain physical, but not orthographical, characteristics of words play an encoding or tagging role in word memory. The technique employed is the release from proactive inhibition method (Wickens, 1970), a method in which items from the same conceptual class are presented in the Brown-Peterson paradigm for three trials, and on the fourth trial materials from a new class are employed. If performance is improved on the fourth trial, it is assumed that the two classes of materials differ from each other at the depth of encoding required for this type of memory task. Further, it is assumed that the degree of differential encoding is measured by the fourth trial performance gain. In the present report three types of potential encoding dimensions were employed, namely, one- vs two-syllable words, two and three vs four and five phoneme words, and locus of pronunciation of words that is, closed-front vs open-back.

METHOD

The three experiments to be described are alike except for the specific materials which were employed. Each used the Brown-Peterson design (Peterson & Peterson, 1959) in which a target item of three words was presented for 2 sec, it being followed by a rehearsal-preventative activity (subtracting by threes from some three-digit number) for 20 sec and a request for recall. The next item was presented after the 8-sec recall period, and so on for four triads. On the fourth trial, the control group remained with the same class of materials, but the experimentals shifted. Counterbalancing was employed so that the fourth trial items were the same for the control and experimental groups being compared on Trial 4, the critical trial.

In Experiment I, the characteristics being measured were one- vs two-syllable words. The specific items employed were: bread, Maine, nose; gun, bee, sale; house, nurse, fox; green, train, rose; saw, mumps, flute; woods, nun, yacht; boat, hill, pearl; stove, prose, dime; lake, chair, wool; deer, tea, church; elm, skirt, crow; soap, trout, pen; beer, golf, mile; storm, pea, hour; aunt, door, gold; France, school, pear; vs butter, Texas, finger; rifle, spider, pepper; hotel, doctor, rabbit; yellow, airplane, daisy; hammer, measles, trombone; forest, pastor, sailboat; wagon, valley, ruby; furnace, poem, nickel; river, table, cotton; lion, coffee, temple; maple, sweater, eagle; towel, salmon, pencil; whiskey, tennis, meter; lightning, carrot, minute; uncle, window, silver; England, college, apple.

It will be noted that the semantic characteristics of the one- and two-syllable triads were matched, as were the word frequencies. If a given triad was used during the first three trials, its semantic parallel was not presented to that S on the fourth critical trial.

Experiment II employed the same design using the number-of-phoneme dimension, specifically 2 and 3 vs 4 and 5. The triads employed were: dumb, hay, eel; log, toe, day; edge, fog, ear; odd, debt, ash; vs smart, field, shark; branch, wrist, month; fringe, breeze, throat; freak, thrift, slag.

Experiment III used locus and type of pronunciation as illustrated in the vowel triangle (Black, 1963) in Fig. 1. The dimensional locations employed were closed-front vs open-back. The specific triads used were: pig, lid, hip; niche, fierce, east; sea, wheat, inch; flea, ditch, sleet; skiff, disc, twig; sheep, yeast, wind; eel, sleeve, bee; dish, splint, finch; vs hog, cork, jaw; slot, harsh, north; shore, corn, yard; wasp, gorge, fog; yacht, orb, straw; fox, lard, storm; cod, smock, moth; fork, gauze, swan.

In the first two experiments, 192 Ss were employed, and in the third there were 160 Ss. These numbers were determined so as to counterbalance triad position, to shift in one vs another direction, and to have two control groups, one on one dimension and one on the other. All of these data are combined in the results since direction of shift did not appear to be a significant variable.

RESULTS AND DISCUSSION

In all three experiments the various groups showed a significant decline in performance across the first three trials, showing a buildup of proactive inhibition. The control groups dropped slightly from Trial 3 to Trial 4. As a single measure of release from PI, one computes the degree of superiority of the shifted (experimental groups) on Trial 4, with the total decline of the control groups from Trial 1 through Trial 4. In addition, probability of difference between the controls and the experimentals are computed on Trial 4. The percentages of release were about 22, 20, and 25 for Experiments 1, 2, and 3, respectively. The difference between the

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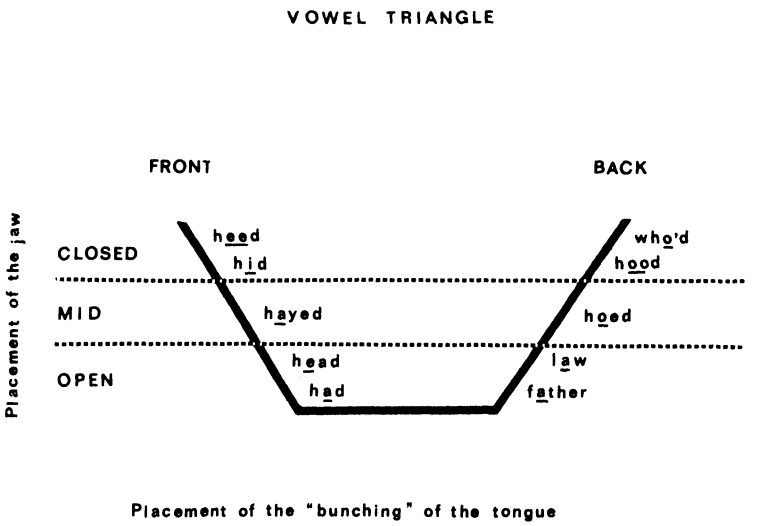

Fig. 1.

controls and the experimentals were $> .05$ for the first two experiments, but $< .01$ for the third experiment, all ps being computed on a two-tailed test.

When these data are compared with the percentage of release from other manipulations, they appear to be positive but not highly potent in their effects. It would appear that people do encode or tag words according to their physical characteristics, but these encodings do not represent a salient characteristic of memory.

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