Chapter - V

S U M M A R Y

Following the scientific logic of operationism, whereby facts and concepts are related to the concrete operations and with the model provided by Ebbinghaus, the behaviourists have dealt with the phenomena of memory mainly in quantitative terms. They have regarded memory as the maintained association of a response with a stimulus, generated through successive repetitions of the association. The Gestalt and the dynamic approach to memory, on the other hand, emphasizes the importance of the factors of perceptual organisation, set and motivation as the determenants of memory. As in the case of memory phenomena, in general, the behaviourists have also explained forgetting in terms of their basic stimulus and response constructs. Thus forgetting, according to the behaviouristic interference theory, is a direct function of the degree to which substitute responses are associated with the original stimuli during the retention interval. The essence of the Gestalt theory is that memory traces of relatively isolated or dissimilar items, standing out as figure on a ground, persist longer and resist interference and assimilation as compared to those of similar or massed items which suffer the fate of assimilation and loose their identity. Although

there are differences in the concepts on which the two theories are based, and the procedures through which they are derived, the behaviouristic and Gestalt theories do not differ to a great extent with respect to the explanatory principles they employ. These are important considerations which have guided us in formulating the problem of the present study.

Instead of a negative approach of trying to find out the conditions which bring about decrement in retention, the present research attempts to discover the factors which enhance retention under interfering conditions or in other words counteract the effect of retroactive inhibition. Set, motivation and perceptual organisation are the three factors which have been selected for this purpose. Temporal position of the interpolated activity and to a greater extent, similarity between original and interpolated activities have been considered to be the major determinants of retroactive inhibition. The problem of the present research necessitates the use of retroactive inhibition situations where interpolated activity is introduced immediately after original learning and the dynamic factors of set, motivation and perceptual organisation are introduced without simultaneously varying the similarity between original and interpolated activities. Thus the present study is mainly concerned with determining the extent to which set, motivation and perceptual organisation influence the susceptibility of learned materials to retroactive inhibition.

Numerous studies of retroactive inhibition have demonstrated the detrimental effect of interpolated activity but there are very few studies dealing with the factors which minimize the inhibitory or detrimental effect of interpolated activity. With respect to the factor of set the only major study is that reported by O.P. Lester. . With the help of set established by directions, urging the subject to resist the inhibitory effect of interpolated activity, she was able to demonstrate that retention can be enhanced under interfering conditions. In her experimental arrangement the interpolated activity was introduced immediately prior to recall. Although there is evidence which suggests that interpolation prior to recall is equally effective, the question still remains as to whether the results obtained by Lester would change if the interpolated activity is introduced immediately after original learning. The role of motivation as a determiner of retention has been emphasized particularly by Lewin and his co-workers. A number of studies suggest that ego-involvement as a form of motivation does facilitate retention. In none of the earlier studies, however, motivation has been employed to minimize the inhibitory effect of interpolated activity.

An equally important aspect of the present research concerns the manner in which perceptual organisation of materials can resist interference and assimilation and thus facilitate retention. Studies bearing directly on this point are those reported by Von Restorff (1933) and

Siegel (1943). The results of these studies have been interpreted as substantiation of the Gestalt hypothesis which states that memory traces established in original learning will be resistant to assimilation and interference if the materials are well structured. One of the inherent difficulties with these studies is that the factor of similarity has not been controlled and, therefore, the behaviourists may interprete the results in terms of reduced intraserial interference.

The present study marks an improvement over previous research in some important respects. By inducing set in the subject at the time of original learning and by introducing interpolated activity immediately after original learning, the present study attempts to clarify the uncertainty and to fill up the gap left by O.P. Lester. This would decide the question as to whether interference with any hypothetical perseverative tendency would in any way change the results obtained by Lester. The present study is the first of its kind in which motivation, defined in terms of positive ego-involvement, has been used together with set to counteract the inhibitory effect of interpolated activity.

As pointed out above, an important aspect of the present research concerns the manner in which organisation of material resists assimilation and interference or in other words, facilitates retention. As already indicated, the studies dealing with this problem could not permit sufficient control over the factor of similarity, and therefore the results of these studies have also been interpreted in terms of reduced intraserial

interference. In order to provide a fair test of the Gestalt hypothesis, an attempt has been made to overcome the difficulties inherent in the design of the previous researches. To achieve this purpose we have introduced the factor of perceptual organisation in the learning material, without simultaneously varying the similarity between original and interpolated activities.

The present study consists of two experiments. One of them was designed to determine the extent to which set and motivation can minimise the inhibitory effect of interpolated activity. The purpose of the second experiment was to study the effect of perceptual organisation on the susceptibility of learned materials to retroactive inhibition.

EXPERIMENT - I

The material employed in this experiment were nonsense syllables chosen from Glaze's classification according to association value. Subjects of this experiment were 80 German students of degree classes. They were randomly assigned to five groups according to the specific condition of the experiment. Thus there were 16 subjects in each group. The five conditions used in this experiment were as follows:

<u>Condition I</u>

Learn O (original list)	Recall & relearn O after 24 hours

<u>Condition II</u>

Learn O with knowledge of recall	Recall and relearn O after 24 hours

Condition III

Learn O No knowledge of recall No knowledge of interpolation	Interpolated list introduced immediately after original learning	Recall and relearn O after 24 hours.

Condition IV

Learn O knowledge of recall Knowledge of interpolation Told of its possible interference effects Urged to resist these effects	Interpolated list introduced immediately after original learning	Recall and relearn O after 24 hours.

Condition V

Learn O with the instructions given under condition IV plus increased ego-involvement aroused by praise and competition	Interpolated list introduced immediately after original learning	Recall & relearn O after 24 hours.

It may be readily observed that experimental conditions consist in different instructions given to the subject at the time of original learning. The interpolated learning was introduced immediately after original learning and the time interval between original and interpolated learning was 24 hours. Retention was measured in terms of recall and relearning.

Each subject was tested individually. The apparatus used in this experiment was an automatic slide projector in which the timing device was so set as to allow a constant exposure of one second for each nonsense syllable at a fixed regular interval of 2 seconds in between the two

syllables. The practice trials, original learning, interpolated learning, recall and relearning were carried out by anticipation method.

This experiment was started in December, 1958 and completed in February, 1959.

EXPERIMENT - II

The materials employed in this experiment were vague drawings representing various classes of objects. These visual drawings could be made highly similar in form but different in meaning. Subjects of this experiment were 56 German students of degree classes. They were randomly assigned to four groups according to the specific conditions of the experiment. Thus there were 14 subjects in each group. The experimental conditions consist ' only in different arrangement of the stimulus forms. Four conditions were used in this experiment. No interpolated activity was introduced in the first two conditions of this experiment. Material presented for original learning in condition I was unorganised, while the material presented in condition II was well-organised. Organisation was introduced by grouping the stimulus items according to their class membership. The arrangement of stimulus items in conditions III and IV was the same as in conditions I and II respectively. In these two conditions, however, the interpolated material, consisting of similar items, was introduced immediately after original learning. In both the conditions the corresponding items of the original and interpolated lists were kept similar in form but different in meaning.

Thus the stimulus materials could be easily manipulated to introduce the factor of perceptual organisation in condition IV without simultaneously varying the similarity relations in the two RI conditions.

Each students was tested individually. As in the case of the first experiment, every student was required to come twice, first day for the learning session and second day for the recall and relearning session. The apparatus used here was the same as in the case of the first experiment. The practice trials, original learning, recall and relearning were carried out by anticipation method.

This experiment was conducted in the second half of February and during June, 1959.

The data obtained in the two experiments described were tabulated separately and statistically analysed for drawing necessary inferences. The median test was used to test the significance of difference between the median recall scores and median saving scores of various groups. Medians were also computed separately for each of the comparison groups to compare their recall scores and saving scores. Such a comparison helped in ascertaining which of the two groups had larger median as compared to the other.

The main findings of the two experiments are reported below:

EXPERIMENT - I

1. The knowledge of recall given to the subjects at the time of original learning does not seem to have any marked facilitative effect on the retention of the materials learned.

2. Comparing condition IV with III we find that set established by directions urging the subjects to resist the inhibitory effect of interpolated activity introduced immediately after original learning, results in a significantly greater recall.

3. When we compare condition V with III we find that additional motivation, involving praise and competition, added over and above the directions urging the subjects to avoid interference effect of interpolated activity, results in much greater recall than in condition IV where only set was given.

EXPERIMENT - II

1. Conditions I and II were introduced to study the effect of organisation or lack of organisation on retention in the absence of interpolated activity. Organisation introduced in the learning material of condition II does not yield significantly greater retention as compared to condition I in which no such organisation was introduced.

2. When a comparison is made between group III and IV, it is found that statistically significant difference exists between the recall scores of the two groups. No significant difference is observable in the case of saving scores of the two groups.

One of the findings of experiment I provides considerable support to the hypothesis that the amount of retroactive inhibition can be reduced and retention can be increased if the subjects are forewarned and urged to resist the detrimental effect of interpolated activity at the time of original learning. The findings of Lester, and, to some extent, of Schwarz, agree with the above conclusions.

Another finding of this experiment suggests that the greater the strength of the motivation during original learning, the less the likelihood that the residue of the learned material will be subject to post-learning interference. The results of these studies provide a

reasonable support to the hypothesis that if motivation can enhance retention it can also facilitate retention by curtailing the inhibitory effect of interpolated activity.

The main outcome of the second experiments is its demonstration that perceptually organised material is less susceptible to retroactive inhibition than unorganised material. This finding substantiates the Gestalt hypothesis which states that memory traces of organised material are more stable and resistant to assimilation and interference than those of the unorganised material.