CHAPTER III

REVIEW OF RESEARCH LITERATURE

1. General Psychological Studies on Sense-modalities

The research literature on the relation between sensory modalities and learning or retention has been adequately reviewed in a number of publications (73,51,20,60,101,36). Therefore, the writer does not intend to discuss each individual study in detail. Rather, in this section, the reader's attention is drawn to certain generalizations that can be arrived at from these studies.

(i) In many cases the differences in the amount of learning and retention have been small and irregular in direction. The examples of these studies are the ones by Abbott (1), Barlow (5), and Larson and Fedder (56). Sometimes the auditory presentation has been consistently superior. The examples are Schuyten (84), Erickson and King (25), Seibert (85), Greene (32) and Young (97).

(ii) At other times the visual presentation has been consistently better. Such were the findings of Munsterberg and Bigham (68), Lay (57), Gates (30), Corey (17) and Krawiee (55).

(iii) The use of both visual and auditory presentation in combination has usually been better than the poorer of the two used separately, and in some cases, superior to either one used alone. Such results were obtained by Munsterberg and Bigham (68), Smedley (86), Quantz (77), Von Sybel (93), Henmon (34), and Koch (51).

(iv) Further, when kinaesthetic stimulation in the form of vocal articulation has been added to the visual presentation, to the auditory presentation or to the two combined, in most cases there has been an increase in learning. The examples of these studies are the ones by Frankfurther and Thiele (27), O'Brien (73), Seibert (85), Koch (51), and by Forster (26).

(v) This superiority of kinaesthetic stimulation plus either visual or auditory presentation is more uniformly effective, and usually to a larger degree than is a combination of visual and auditory presentations.

(vi) The particular mode of presentation is a function of a number of accompanying conditions of which the following are identified:

(a) the learner's habit or experience;

(b) the learner's age;

(c) the learner's own response to the presentation;

(d) the learner's ability to utilize cues; and

(e) the type of material.

If the background of these generalizations is kept in mind, the need of a study which makes fuller use of the potentialities of visual presentation is apparent. Perhaps the best way to attract the learner to use the modality presented is to make full use of that modality in the presentation of material. In the opinion of this writer, the still-picture method, and the motion picture method are two additional ways, by which the visual modality could be strengthened. Secondly, the types of material used in the past studies may not have exercised a motivating influence on the subjects. This could be more satisfactorily achieved by substituting

lists of English-Russian nouns and verbs, provided the latter are equated in difficulty. A third point, worthy of mention, is that the previous studies did not try to match the groups of subjects, except on certain hypothetical measures such as I.Q., age, etc. The more satisfactory method is to try to match the groups on some measure which is closely related to the learning task itself. The present study tries to solve this difficulty by the analysis of covariance, in which the subjects' initial scores on a measure similar to the main learning task, are taken into account to adjust the scores on the main learning task itself. Similarly, the subjects' initial scores on a measure close to the retention test can be taken into account to adjust the scores on the retention test itself.

2. General Psychological Studies Using Foreign Language Vocabulary

The use of foreign language material for psychological studies is not a novelty. Miller (65, chaps. 8 & 9), and Stevens (87, chap. 15) cite examples where foreign words have been used for psychological experiments. Turkish words were used by Solomon (cited in 65, p. 203) to study reaction time. Chinese characters were used by Hull (cited in 65, p. 238) and Moore (cited in 65, p. 238) to study concepts. Turkish words were used by Garrett (cited in 87, p. 559) to deal with the common abilities in memory experiments, by the method of factor analysis. Morgan and Foltz (67) have used French vocabulary to study the effect of context on memory. Wolfle (96) used artificial language material to study associative connections.

The use of foreign language material with the specific object of research in language learning or language teaching is still not very

common. The first study of this type is traced as far back as 1900, when Kemsies (49,50), a German researcher, found that the visual presentation is better than auditory presentation in the learning of German-Latin vocabulary. Fränkl (28), in a study similar to that of Kemsies, reports similar results. In the United States, Swift (89), in 1906, conducted an experiment on himself and studied the increments in learning that he was able to show over a period of three months. For this study, he used Mott's "Elementary Russian Grammar" and "Russian Reader" by Werkhaupt and Roller. He got very fluctuating results, because the difficulty of chapters varied from day to day. Lay (57), in 1910, reported that the visual method is better than auditory for German spelling. Seibert (85) used 81 college girls, who had one year of French, to test the learning of English and French vocabulary. He compared the methods of reading aloud, silent reading, and reading-and-writing for immediate and delayed recall. He found that the method of reading aloud was better than the method of silent reading in delayed recall. The method of reading aloud and writing actually proved distracting.

It will be noted that the studies using foreign language material report more uniformly than other studies that a combination of the different modalities gives better results, although they are very few in number. However, in these studies, too, we do not find any attempt to introduce pictorial methods, or to induce higher motivation in subjects.

3. General Psychological Studies Using Emphasizing Devices, and Pictorial Methods

The studies using techniques which make a more serious effort to attract the learner's attention to the material learned are quite important

film-o-graphs to investigate if words and pictures are best used on the stimulus-side or on the response-side. The use of pictures was found to be more effective if pictures are used as stimuli (S) and the use of words is more effective if they are used as responses (R). At present, some studies are being carried out as pilot investigations on a program similar to our study. Roshal and Kopstein (54,80,81) are conducting experiments on pictorial aids to memorizing English-Russian pairs of words. The full details of this study are not, yet, available; but, the interest of this study is to compare the effectiveness of pictures and words as modalities of presentation, and transfer from word-learning to picture-learning and vice versa. Hermann, Broussard and Todd (35) investigated the effect of pictorial vs. verbal presentation in the serial learning of names of objects. The material was presented by a filmstrip projector. This study reports that the pictured words are learned more easily than non-pictured words, at .05 level of confidence.

The pictorial methods have not as yet been investigated as much as they should. The results of the present study may, therefore, help us to carry this investigation a few steps ahead.

4. Studies in Mass Media - Film, Television, Radio - Bearing on the Hypotheses of this Experiment

The importance of mass media - also called audio-visual aids in a restricted sense - is now recognized to such a degree that it is no longer open to question. The purpose of this section is to review some work in the general field of mass-media which throws some light on the variables used here.

The problem of the modalities of presentation in the psychology of

verbal learning has its counterpart in the mass-media as well. The modalities may be called the audio and video channels respectively. Sometimes a mass-medium may use only one of these channels exclusively. Radio which uses only the audio-element, is such an example. A silent film on the other hand uses the video channels exclusively. The sound motion picture and television are examples of mass media which use both channels - audio and video.

Taking the studies in the field of radio and television first, Wilkie (95) studied the relationship between the medium of communication used - such as direct speech, loud speaker, or printed text - and the shift in attitude in subjects regarding various social problems. He found by using the Lickert method that the largest shift - 4% - takes place by the direct speech method. This would favor the use of television - or the combined use of video and audio elements. Elliot (23) in a study sponsored by the C.B.S. examined the effect of the visual-auditory (projection on screen and hearing aids), the visual-alone, and the auditory-alone methods of advertising commercial products. He found that the visual-auditory (film or television) method is better than the auditory-alone (radio) method but the auditory-alone is better than the visual-alone method (e.g., newspaper or silent film). Barr, Ewbank and McCormick (6) did not get satisfactory results, in their studies on broadcasting programs teaching music, geography, speech, and English language courses. This may or may not show the comparative ineffectiveness of auditory method alone. Rock, Duva, and Murray (78) report the superiority of telecast lessons over the conventional method.

There has been some research on the audio and video elements in

instructional films teaching other facts and skills than language learning. Nelson (69), Nelson and Moll (70) conducted the only experimental research that deals directly with the relative contributions to learning made by the visual channel, the auditory channel, and the combined visual-auditory channels. The video factor is more important for one of the two films used while the audio factor is somewhat more important in the other film. The visual-auditory factor was positive for each of the two films indicating that a combination of the audio and the video elements was important for certain items of information. In the second study, the group which both saw and heard the film obtained the highest scores. The one finding, borne out in this study, is that both the audio and the video channels are much more effective together than either alone, if the original production was not so planned that either channel would be independently effective in presenting the material. Nelson and Moll point out the difficulty of making an exact study of the relative efficiency of the video and the audio elements of a film. It should be noted, however, that for our study we are more concerned with the additive effects of the two elements, rather than any element taken separately.

It is worthwhile, here, to review a few studies in the audio-visual aids or mass media that emphasize other variables in which we are interested. Thus, the variable important in the motion picture method as against the still picture is the element of motion or action. So also the difference between the "sound motion picture" method and the sound motion picture method with audience participation consists in the opportunity of participation provided for the learner.

Many studies which deal with the comparison of filmstrip vs. film

indirectly deal with the aspect of motion. James (41, p. 421) emphasized long ago the power of a changing or moving stimulus to attract attention. In a study on the movement of stimulus as a factor in perception, Warden (94) reports that when units to be remembered are shown in rapid succession or in the process of being written, they are reproduced better. Many writers like Irwin (40) and Schreiber (83) urge the use of the element of motion in instructional films, or the use of only those instructional films in the classroom which contain real motion. It is, however, implied in this plea that motion should be a crucial cue in the films so used. Holaday and Stoddard (37), Vernon (92), Hovland, Lumsdaine and Sheffield (39), Gibson (31), and Roshal (79) report studies in which the perception of motion was a crucial cue. Here the film was better than a filmstrip. From these studies, the question arises: Is the element of motion a crucial cue in the learning of English-Russian verbs? If so, what kind of uniform action-scenes should be used? It was decided that a simple side-to-side movement of each model used in making the film would satisfy the requirements of "action in the significant part of the picture" mentioned by Irwin (40). This kind of action is called "kinematic dynamic" by Campbell-Fisher (11) in a study on the relation between art and movement.

Turning to another variable viz. the audience participation, a study by Hovland, Lumsdaine and Sheffield (39, chap. 9) reports that active participation by the learner in the mastery of phonetic alphabet from filmstrips improves learning greatly. At present, Kanner and Lumsdaine (45,46,47) replicating in part the Boston University study by Michael (64) are studying the effects of complete vs. partial and covert vs. overt participation. Forster (26) exposed words and phonetic symbols on ground

glass to 80 adult subjects. In this experiment the "look-and-say" method proved superior to the "look-and-write" method.

5. Previous Research in Language Teaching Films

The use of film-projectors, or filmstrip projectors has been urged for quite some time, in the field of psychological testing and language training. Thurstone (90) has expressed the view that the microfilm projector method is superior to the traditional method of presenting cards to subjects and that the former will be of great value in improving the reliability and validity of psychological tests - such as word association test, numerical association test, or digit span test. Saul and Osgood (82) report that presenting pairs of syllables by the Eastman overhead slide-projector as compared with presenting them by cards, made a good deal of difference in learning. The former method gave consistently higher results.

The use of 16 mm. films or filmstrips for research in language teaching is not very extensive. Brickman (8, 70) reports two studies on teaching foreign languages with films. The first study is by Bernard, who after a class experiment, recommends the following procedure in teaching the French language with films:

(a) the teacher should first preview the film;

(b) the class is prepared by a preliminary study of the content of the film;

(c) the showing of the film; and

(d) a thorough discussion of the content, after the film showing.

The second study is by Greene, who, while discussing the film dialogue project on "Emil and die detektive" recommends firstly, reading of the text, then study of the dialogue project, followed by viewing of the film,

dramatization of the several scenes of the dialogue project, and finally by a second film presentation. "Both enjoyment of the picture and comprehension of the spoken dialogue were greatly increased." Pervey (74,75,76) used the film "Dolley et Michel a Montreal" in studying the problem of the number of film repetitions required for complete learning. According to his formula, the films in the present study would require ten repetitions for the subject to learn to get all the words right. Brown (9) used Nelson Denny Reading tests, both initially and finally (in a project on teaching Latin grammar, by tachistoscope), to measure the improvement of subjects over a certain period. There was an improvement of 11 percentile ranks at the end of the course. In reading speed and comprehension, the class made an equivalent of two years' progress in 17 sessions. By the end of the course, the class showed an improvement of 13.75 percentile ranks.

6. Increasing Instructional Film Production in the Language Teaching Field

Before the second world war, the emphasis in language teaching through audio-visual aids was mainly on phonographic records, filmstrips, radio broadcasts, etc. But the second world war changed the situation considerably.

The first source of this change of emphasis is found in the various branches of the United States Army and Navy. Angiolillo (4, p. 110) quotes a remark from a booklet published by the U. S. Office of Education:

> A prime objective of all the armed forces is the Maximum learning in the Minimum time. To attain this objective, the services are increasingly turning to the audio-visual aids commonly called 'training aids'.

He also quotes another remark (4, p. 233):

> Perhaps the most conspicuous feature of the Army's training program is the wide-spread use of the visual aids. Most of these aids, the filmstrip, the motion picture, etc., had already been successfully employed in our schools. But it remained for the Army to demonstrate how widely they could be applied and how efficient they could prove in an educational program seeking rapid mastery of certain skills.

A number of films and filmstrips produced either commercially or by OWI were used during this time. A major complaint against these films was that they were acoustically defective. Yet as the Commission on trends in Education (112) reports some bold attempts were made by instructors to apply psychologically sound procedures such as repetitions, discussion and drill sessions. In the wake of this program, several films to teach Japanese language and other filmstrips were produced by the Army and Navy (104,105,106,107). The approach of the Army and Navy was quite different in that it emphasized the "aural-oral" school of thought. As Melva (63) points out, this may not be applicable to the conditions of civilian instruction. But it is, nevertheless, true that the interest in the instructional films for language teaching grew rapidly because of the Armed Services Training Programs during the second war. These Programs have been more thoroughly described by Agard and Dunkel (2), by Angiolillo (4), and by Mathew (62).

As a result of this movement, the academic institutions also became more actively interested in this field than before. During the last few years, this interest has been on the rise, because of the research on second-language teaching at the University of Chicago (2), and because of the annual conferences on Language Laboratory held by the Georgetown University (15,108). Instructional films and filmstrips in German (103), in Spanish (88,99), in French (24,109,111), and in Hebrew (98) were produced by institutions like Purdue University, Harvard University and commercial

agencies like the Society for Visual Education. At other academic institutions like Teachers' College, Columbia University (102), the existing films on language teaching in high schools have been occasionally evaluated by graduate student teachers. Recently the UNESCO[1] has also shown a great interest in the extension of visual aids like films and filmstrips for the literacy campaign in many parts of the world.

The above review of the pertinent literature suggests that sound motion pictures are likely to prove useful in the learning of English-Russian vocabulary. But many specific factors, like the addition of the still picture, addition of the element of motion through action-scenes, the addition of sound, and the word-to-word pronunciation by the subjects have not been tested before. The present experiment proposes that such tests are theoretically and practically desirable.

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[1]From the correspondence between the UNESCO, and the Instructional Film Research Program.