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SOME FACTORS INFLUENCING REMEMBERING OF
PICTORIAL AND PROSE MATERIAL

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SOME FACTORS INFLUENCING REMEMBERING OF PICTORIAL AND PROSE MATERIALS

CHAPTER I

BACKGROUND AND PROBLEM

Literature

It is common knowledge that perfect recall of something one has experienced is the exception rather than the rule. Furthermore, there is abundant evidence that memory is not required to be a matter of perfect recall or no recall. More commonly than black or white, one finds shades of gray, where a memory is partially correct and partially incorrect. Psychologists have devoted considerable time during the past sixty years to the investigation of these phenomena. They have sought to discover the extent of memory distortion, its direction, its cause, and, behind these, the nature of memory itself.

The pioneer in the scientific study of memory is, of course, Ebbinghaus[1]. Using himself as a subject, Ebbinghaus studied the retention of nonsense syllables after they had

[1]H. Ebbinghaus, Memory, trans. H. A. Ruger and C. E. Bussenuis (New York: Teachers College, 1913).

been barely memorized. His classic work, published in German in 1885, demonstrated that a typical forgetting curve existed for the memory of nonsense-material. This curve of retained material showed an initial drop followed by a flattening out. He computed loss by testing the number of presentations necessary for him to relearn the syllables. This is usually designated as a "savings" score, and is the most accurate for measuring actual retention. Most experimenters in the field of remembering have since used either reproduction, in which the subject is asked to recall and repeat as much of the stimulus as he can, or recognition, in which the subject is asked to select the correct stimulus from among a group of foils. Reproduction, as compared with the relearning method, has the disadvantage that subjects may differ in the material they put down on paper for a variety of reasons other than merely having forgotten it. Recognition is not exactly the same process as recall, so its use still leaves questions of applicability unsolved. However, Ebbinghaus' method has not been used often because it is virtually impossible to learn complex stimuli to perfection.

Philippe[2] did the first work on the behavior of the "memory trace" in 1897. He found (1) detail becomes lost, vague, and confused, "useless" details disappear, (2) new

[2]J. Philippe, "Sur les Transformations de nos Images Mentales," Revue Philosophique, XLII (1897), pp. 481-493.

details replace old, and (3) material takes on generalized form, and approaches the typical. However, Binet and Henri[3] had previously reported some observations on changes in the memory of sentences.

Whipple[4] in 1915 reported his conclusions and those of other experimenters regarding memory of prose passages. Among their conclusions were the following:

1. Logical and rote memory are best at about the age of puberty.
2. Girls are superior at every age tested.
3. Aall found an "after-memory" of details (now called "reminiscence") 48 hours after presentation, which were not remembered in the first test.
4. Place-names are lost sooner than object-names.
5. Memories originally left correctly vague were later logicized.
6. Heymans and Brugmans found a correlation of .08 between reproduction at intervals of an elaborate story and the learning of nonsense syllables, but a correlation of .55 between memory of details of a story and details of a picture.

No explanation for changes was attempted.

After the early exploratory studies had established the existence of changes in the memory of perceived stimuli, the psychologists interested in such research gradually divided into two groups, on the basis of their interpretation

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[3]Alfred Binet and V. Henri, "La Mémoire des Phrases," L'Année Psychologique, I (1894), pp. 24-59.

[4]G. M. Whipple, Manual of Mental and Physical Tests, Part II, Baltimore: Warwick and York, 1915.

and explanation of the changes. One group, principally Gestaltists, have hypothesized a "memory trace" which is established neurally in some manner. Wulf[5] outlined the Gestalt interpretation in 1922: the memory trace changes in the direction of leveling (toward a "good" form), object assimilation, and emphasis (sharpening) because of tendencies inherent in the structure of the perceived figure. The other group, represented more recently by the social psychologists, believe that perception consists of fitting a stimulus into the individual's attitudinal "frame of reference" and that remembering involves reconstruction of the memory on the basis of this frame. Changes in the memory of a stimulus occur because the stimulus was not completely consonant with the attitudinal frame, and such changes serve to make it "fit". The Gestaltists have usually used abstract geometric figures as the stimuli for their experiments, while most social psychologists have favored prose passages.

As a background for the present study, representative experiments, first by the Gestaltists, then by the social psychologists, will be reviewed at this point.

Using abstract geometric figures as stimuli, Wulf[6] concluded that the final reproduction in each series of his

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[5]F. Wulf, "Über die Veränderung von Vorstellungen (Gedächtnis und Gestalt)," Psychologische Forschung, I (1922), pp. 333-373.

[6]Wulf, op. cit.

experiment constituted a "more characteristically and distinctly pregnant structure" than the initial reproduction. According to his theory, changes from original stimulus are always in definite directions, which are generally foreshadowed in the first reproduction, and which may be interpreted in terms of "sharpening" and "leveling". He credited these trends of change to three causal factors: normalization, emphasizing or pointing, and autonomous change toward greater symmetry, stability, or pregnancy (Prägnanz).

Perkins[7] presented abstract geometric figures to college students for five seconds with instructions merely to "look at the card". He then asked students to draw the figures from memory immediately, and at intervals of 2, 3, 9, 16, 30, and 49 days later. He reported changes in the shape of the figures in the direction of symmetry. He subdivided these changes into the following classification: (1) equalization (of parts), (2) orientation (verticalization), (3) standardization, (4) simplification, (5) complication (adding or increasing parts), (6) completion, (7) proportioning the relations (toward balance), (8) shifting toward bi-lateral symmetry, and (9) shifting toward radial symmetry. Most changes occurred in the first reproduction and the tendency toward symmetry was most pronounced after the longest time

[7]F. T. Perkins, "Symmetry in Visual Recall," American Journal of Psychology, XLIV (1932), pp. 473-490.

intervals between reproductions.

In 1933 Lewis[8] reported a comparable experiment using two 100-word prose passages as stimuli. He compared his results with those achieved on abstract figures. The same group of details was omitted by all six subjects. His subjects remembered the pattern of the story rather than its contents, and the persistence of those details which were remembered accurately was a matter of their relevance to the story rather than their content. This interpretation is consonant with general Gestalt theory.

Eight years later Tresselt and Spragg came to similar conclusions and set down a dichotomy for translating between verbal materials and figures in memory experiments:

> Changes in the serial reproductions of verbally presented prose materials may be described according to the same principles used to describe changes in visually presented geometric forms . . . the changes which occur in each can be affected by the induction of a "mental set" prior to presentation of the material . . . . Using Wulf's terminology . . . levelling can be defined as the dropping out early in the series of certain (minor) elements, and the instability in form of certain others. Sharpening, as applied to the prose material, refers to the retention and even heightening of certain ideas over and above the original. As Allport found in the visual field, there was also found here: (a) a decrease in excellence with the number of reproductions; (b) progressive alterations toward smaller size; (c) displacements; (d) assimilations; and (e) omissions. In our results we have tended to group several of Allport's classifications under a single heading; for example, simplification has included such things

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[8] F. H. Lewis, "Note on the Doctrine of Memory Traces," Psychological Review, XL (1933), pp. 90-96.

> as omission, assimilation, some alterations in size, and decrease in excellence. Transposition of words or phrases seems to fall into Allport's category of displacement.
>
> Gibson's results are described in terms which seem to be most pertinent to visual geometrical material, but his classifications of changes toward the more familiar, and changes described as completion and disintegration are clearly relevant to changes observed in the present prose materials.[9]

They found that girls held to correct versions longer than boys. However, the latter were less interested in the selections. There was no difference between the sexes in "suggestibility".

Hebb and Foord[10] designed a multiple-choice experiment to measure closure and sharpening, using an incomplete circle and an arrowhead as the stimulus forms. They found some changes which could be described by these terms, but they were neither universal nor progressive. Changes occurred early and then remained stable.

An early exponent of the reconstruction theory of memory was Kuhlman. In an experiment reported in 1906[11], he found errors resulting from verbalization when the subject was initially describing geometric figures, and he identified two types: (1) "object assimilation"--remembering the ob-

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[9] M. E. Tresselt and S. D. S. Spragg, "Changes Occuring in the Serial Reproduction of Verbally Perceived Material," Journal of Genetic Psychology, LVIII (1941), pp. 262-263.

[10] D. O. Hebb and E. N. Foord, "Errors of Visual Recognition and Nature of the Trace," Journal of Experimental Psychology, XXXV (1945), pp. 335-348.

[11] F. Kuhlman, "On the Analysis of Memory Consciousness," Psychological Review, XIII (1906), pp. 316-348.

ject he perceived the drawing to be, and (2) "regularization" --distortion in the direction of symmetry or conventional form. These were the same changes later found by the Gestaltists but Kuhlman explained them differently. Recall, he indicated, was actually not construction but reconstruction, with memory being only one of the factors involved.

Henderson[12] pioneered in the use of prose selections in memory experiments. In 1903, he reported finding simplification and generalization by combining similar items (condensation), modification of details to make them more meaningful, or more consistent with the preconceptions of the individual, omission of incongruous and superfluous details, intrusion of certain dominant ideas into any congruous situation, and domination by the general meaning of the story. He also found tendencies toward symmetry. For example, in recalling the description of a house, subjects often "moved" a spinning wheel inside the house and then filled the empty space with some invented article of furniture in order to balance the churn which stood on the other end of the porch.[13] Henderson found that children remembered stories more literally than adults, and that when children did generalize, they generalized poorly. Thus they rarely deduced the moral of a story.

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[12]E. N. Henderson, A Study of Memory for Connected Trains of Thought ("Psychological Monographs," Vol. V, No. 23; Lancaster, Pa.: Review Publishing Co., 1903).

[13]Ibid., p. 71.

By asking for introspections, he found his subjects were using three methods of recall: (a) they assumed a general attitude of attention like that obtaining when the passage was learned, (b) they thought of the meaning of the passage, or (c) they waited for details or reasoned them out. The meaning was then created out of the details, but the details were modified through this reproductive process.

In 1921 Crosland reported an introspective study using a large variety of stimuli--short prose passages, concrete objects, pictures, etc. He found[14] that essential details tended to change to fit the schema, and that non-essential details, when remembered, were preserved unchanged by verbal clues, but frequently dropped out later. He found no evidence of pleasant experiences being remembered better than unpleasant ones or of the feeling content outlasting the facts. However, Crosland is open to the criticism that his subjects were a few "highly trained introspectionists" and that the study is almost wholly subjective.

Gibson emphasized the importance of past experience in determining how the observer shall perceive a figure:

> The types of change . . . may all be explained . . . by the supposition that experience of the individual has brought into existence certain habitual modes of perception, and that these perceptual habits, rather than the laws of configurations, condition the changes observed. . . . In general, the nature of a change found in the reproduction depends upon the manner in which the

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[14]H. R. Crosland, A Qualitative Analysis of the Process of Forgetting ("Psychological Monographs," Vol. XXIX, No. 130; 1921), p. 75.

figure was apprehended.[15]

During most of this time Bartlett was conducting experiments at Cambridge. These were summarized in his book "Remembering"[16] in 1932. He discarded the trace theory and proposed that remembering is a conscious reconstruction of the details from a few images and a schema or attitude, and thus it is subject to error due to whether the person is a "visualizer" or a "vocalizer", his attitudes and experiences, and the society in which he lives. The change is not inherent in the trace. Bartlett used, in addition to nonsense material, meaningful stimuli such as pictures and stories. His findings and theories are discussed in detail in Chapters III and IV of this dissertation. Bartlett's influence has been indicated well by Zangwill who, in discussing his own experiment, wrote:

> Bartlett's work has unequivocably established the fact that normal remembering typically displays an essentially constructive or reconstructive character. Much of the material from this investigation supports his conclusion, and were it not for the fact that progressive trends of deviation in the direction of certain types of symmetrical structure do undoubtedly occur, one would be tempted to interpret every process of reproducing as essentially a reconstructive process.[17]

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[15] J. J. Gibson, "Reproduction of Visually Perceived Forms," Journal of Experimental Psychology, XII (1929), pp. 1-39.

[16] F. C. Bartlett, Remembering, (Cambridge: University Press, 1932).

[17] O. L. Zangwill, "An Investigation of the Relationship Between the Processes of Reproducing and Recognizing Simple Figures, with Special Reference to Koffka's Theory," British Journal of Psychology, XXVII (1937), p. 259.

Zangwill[18] found it almost impossible to explain changes in the more complex of his abstract figures in terms of Wulf's Gestalt formulation. He defined two trends as examples of reciprocal sharpening and leveling of the principal structures in the figures. Changes which appeared in the first reproduction and remained relatively unaltered throughout the succeeding reproductions, were designated stereotyped deviations. Changes which appeared in the first reproduction and continued to change in the same direction during the succeeding reproductions, were designated continuous deviations. Both classes of change were designated persistent deviations. Of the total persistent deviations Zangwill found 52 per cent were of the stereotyped and 48 per cent of the continuous variety.

For the numerous stereotyped deviations he found, he offered four possible explanations. First, it is possible that the most "characteristically pregnant" structure is attained in the time interval preceding the first reproduction. If this be the case, one would expect no further change. Next, it is possible that other factors come into play which counteract or interfere with the postulated continuous change of the Gestaltists. Thirdly, it may be that Wulf's conclusions are valid only for a restricted number of conditions. However, hypotheses which explain continuous change should

[18] Ibid., pp. 251 ff.

certainly extend to the stereotyped deviation obtained under the same conditions. Lastly, the stereotyped deviations may be the result of verbal formulations and analysis, which explanation points to the reconstruction theory of remembering.

The classic experiment of Carmichael, Hogan, and Walter[19] further weakened the Gestalt position, while it lent strength to those who favored the attitudinal frame-of-reference theory. They showed ambiguous geometric figures to three groups and suggested different object-identifications for each figure presented to the two experimental groups. (For example, a trapezoidal figure was called a hat when shown to one group and a bee-hive when shown to the other group.) They made no suggestion as to the identity of the figures presented to the control group. Their question--"Are changes in form caused by the influence of the memory of past experiences on perception, or by the nature of the structure of the perceived form itself?"--was answered when 74 percent of the figures were modified in recall to resemble the object named. They concluded that it is not the visual form alone, but the method of its apprehension by the subject, which determined in some cases the nature of the reproduction.

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[19]L. Carmichael, H. P. Hogan, and A. A. Walter, "An Experimental Study of the Effect of Language on the Reproduction of Visually Perceived Form," Journal of Experimental Psychology, XV (1932), pp. 73-86.

In the field of law, Stern[20] was among the investigators who demonstrated the importance of memory distortion in the testimony of witnesses. He showed the suggestive effects of leading questions and demonstrated that the effect of such suggestions often became "stabilized" to influence later or allied judgments. He also showed how persons tend to describe events in a way which is the "customary" or "usual" way for them to occur. Witnesses' attitudes, he indicated, have considerable influence on their testimony.

Convinced of the influence of past experience, set, frame of reference, attitudes, or schema, upon remembering, social psychologists set about discovering, defining, and delimiting these influences. Bogardus defined an attitude as follows:

> An attitude is a tendency to act toward or against some environmental factor which becomes thereby a positive or negative value. It is less innate than a desire, more clearly defined, more definitely selected by a person, more cognitive. It incorporates not only affective and cognitive, but volitional elements. Attitudes are as numerous as the valuable objects in social environments. . . . An attitude . . . is disclosed by acts in relation to past acts. The real source of attitudes thus is in personal experiences.[21]

According to Cantril[22], an attitude is learned, affec-

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[20]W. Stern, "The Psychology of Testimony," Journal of Abnormal and Social Psychology, XXXIV (1939), pp. 3-20.

[21]E. S. Bogardus, Fundamentals of Social Psychology (New York: Century Company, 1926), pp. 45 ff.

[22]H. Cantril, General and Specific Attitudes ("Psychological Monographs," Vol. XLII, No. 192; Princeton: Psychological Review Company, 1932).

tively charged, more or less enduring and constant even though the situations which envoked it have fluctuated, and it can be quite independent of the experiences which established it. It has a directive influence on the specific reactions to which it is related. Sherif and Cantril further elaborated:

> Attitudes, then, are among the various psychological factors which determine the individual's selective reaction to his environment . . . . An attitude, whatever else it may be, denotes a functional state of readiness which determines the organism to react in a characteristic way to certain stimuli or stimulus situations.[23]

They define "set", "stereotype", "prejudice", and "opinion", as special cases of "attitude".[24] A "set" is a relatively restricted temporary attitude or a momentary state of readiness. A "stereotype" is an intense and rigid attitude, not necessarily conforming to fact, which results from defining the name first and then fitting one's observations into the existing scheme. A "prejudice" is an even more rigid and intense attitude, usually based on false information. An "opinion" is an attitude that is or has been expressed, based on more objective observations than a stereotype or prejudice. Social attitudes are response tendencies toward other people or identifiable groups of people. They are not coincident with behavior, but may be inferred from behavior.

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[23]M. Sherif and H. Cantril, The Psychology of Ego-Involvements (New York: John Wiley and Sons, 1947), p. 17.

[24]Ibid., p. 26.

Katz and Braly[25] differentiate between private attitudes, expressed only to intimate associates, and public attitudes, expressed for community consumption. Public attitudes generally represent a more complete form of stereotype than private attitudes. Racial prejudice is more a public, or institutionalized response than a private attitude. They identify racial prejudice as "a generalized set of stereotypes of a high degree of consistency which includes emotional responses to race names, a belief in typical characteristics associated with race names, and an evaluation of such typical traits."[26]

Allport[27] suspects that the "prejudice" which questionnaires elicit is largely an aversion to a name or label. He believes that such labels do not represent a group of physically distinguishable individuals, but are instead an abstract group institution.

With necessary terms defined, the next task for the social psychologists was to examine the influence of specific attitudes on remembering. First, would material consistent with a person's attitude be remembered more often than ma-

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[25]D. Katz and K. W. Braly, "Racial Prejudice and Racial Stereotypes," Journal of Abnormal and Social Psychology, XXX (1935), p. 181.

[26]Ibid., p. 191.

[27]D. Katz and F. H. Allport, Student's Attitudes, (Syracuse: Craftsman Press, 1931).

terial inconsistent with it? An affirmative answer was given by numerous studies. Allport and Kramer[28] found that anti-semitic persons were the best judges of "Semitic" characteristics of pictures. Zillig[29] found that women tend to remember more items favorable to their sex, and men the reverse. Watson and Hartman[30] found that material supporting subjects' attitudes on athiesm was remembered better than material opposing it. Levine and Murphy[31] found that pro-Communist students remembered more from a pro-Russian prose selection, while anti-Communists remembered more from an anti-Russian selection. The difference between groups increased continuously over the five weeks, and were significant at the .01 level of confidence. Edwards[32] tested students on recognition of items contained in a speech about the New Deal. Persons with a pro-New Deal attitude made more correct

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[28] G. W. Allport and B. M. Kramer, "Some Roots of Prejudices," Journal of Psychology, XX (1946), pp. 9-39.

[29] M. Zillig, "Einstellung und Aussage," Zeitschrift für Psychologie, CVI (1928), pp. 58-106.

[30] W. S. Watson and G. W. Hartman," Rigidity of a Basic Attitudinal Frame," Journal of Abnormal and Social Psychology, XXXIV (1939), pp. 314-36.

[31] J. M. Levine and G. Murphy, "The Learning and Forgetting of Controversial Material," Journal of Abnormal and Social Psychology, XXXVIII (1943), pp. 507-17.

[32] A. L. Edwards, "Political Frames of Reference as a Factor Influencing Recognition," Journal of Abnormal and Social Psychology, XXXVI (1941), pp. 34-50.

responses on the pro-New Deal test than on the anti-New Deal test, whereas persons with an anti-New Deal attitude did just the opposite. In a similar study, Edwards showed that students' attitudes caused them to rationalize their answers: "Instead of marking the correct answer and thus making an item express a point of view which is in conflict with their frame of reference, our subjects mark as correct an answer which allows them to rationalize the conflict."[33]

This last study provides a transition to the next question: "In what direction do specific attitudes cause memories to change?" This question has been explored much less than the previous one. Two studies which bear on this question are those of Seeleman and Wood. Seeleman showed pictures of Negroes to her subjects and later asked them to pick the pictures they had seen from among a large number of other Negroes' photographs. Then she asked them to pick descriptive phrases for each picture. Her conclusions indicate that attitude toward Negroes affects both perception and memory:

> Unfavorable attitude toward the Negro tended to obliterate recognition of individual differences among Negro pictures, whereas favorable attitude tended to heighten recognition of these differences . . . Individuals with an unfavorable attitude toward the Negro assigned more unfavorable phrases to Negro pictures than did individuals with favorable attitudes . . . Differences

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[33] A. L. Edwards, "Rationalization in Recognition as a Result of a Political Frame of Reference," Journal of Abnormal and Social Psychology, XXXVI (1941), p. 231.

in religion, national background, and socio-economic status were found between the pro-Negro and the anti-Negro groups, but these differences do not bear upon the major results obtained from the experimental tasks.[34]

Wood[35] asked subjects with favorable and unfavorable attitudes toward Negroes to read an article describing differences between Negroes and white people. The subjects were then asked to write abstracts of the article. They omitted and distorted items in accordance with their attitudes. When similarly biased subjects read and rewrote these abstracts, the omissions and distortions were even greater than in the first abstracting.

Social psychologists have also compared the influence of group attitudes (stereotypes) and private attitudes on perception and memory. "Polls show that, once the vast majority of individuals become aware that a social, economic, or political problem exists, they do develop attitudes toward that problem: the proportion of people who remain neutral or have no opinion about an issue they are aware of is very small indeed."[36]

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[34]Virginia Seeleman, The Influence of Attitude upon the Remembering of Pictorial Material ("Archives of Psychology," Vol. XXXVI, No. 258; New York City: Columbia University Press, 1940-41), p. 61.

[35]C. Wood, "An Analysis of Changes Occurring in Successive Stages of Abstracting," (unpublished Master's thesis, Iowa University, 1944).

[36]Sherif and Cantril, op. cit., p. 79.

When one does not have an attitudinal frame of reference with which to judge an indefinite situation, he tends to accept an imposed norm, especially if the scource of the norm is a congenial group. He tends to reject the judgment of an antagonistic group.[37]

Investigators such as Lasker[38] have found that children's racial attitudes are due chiefly to the absorption of adult attitudes, especially those of their parents. Blake and Dennis asked elementary pupils in a southern school to compare Whites and Negroes on sixty characteristics. They found that younger children showed less consistency than older ones, and concluded that "the young white child acquires first of all a generally unfavorable attitude toward the Negro, which makes him unwilling to attribute to the Negro any "good" traits. With increased age and experience, the child gradually learns to apply the adult stereotypes, a few of which are complimentary."[39]

One further experiment on remembering, important for methodological reasons, should be cited at this point. Almost all the earlier experiments on memory-changes involved

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[37]S. E. Asch, "Studies in the Principles of Judgments and Attitudes: II, Determination of Judgments by Group and by Ego Standards," Journal of Social Psychology, XII (1940), pp. 433-465.

[38]B. Lasker, Race Attitudes in Children (New York: Holt and Company, 1929).

[39]R. Blake and W. Dennis, "The Development of Stereotypes Concerning the Negro," Journal of Abnormal and Social Psychology XXXVIII (1943), p. 531.

testing the same group of subjects repeatedly at varied time intervals. This "method of repeated reproductions" thus required subjects to review the original stimulus each time they were tested, with the possibility that each test amounted to a learning situation. If this were true, then such experiments could not reveal the behavior of a "memory trace" in a strictly remembering situation. The experimenter's conclusions would thus be cast in doubt. In 1937 Hanawalt[40] carried out an experiment using some of Wulf's abstract figures, with one group of subjects tested repeatedly at intervals, and with other groups tested only once after varying lengths of time. His non-repeating subjects produced an Ebbinghaus-type forgetting curve,[41] while with successive reproductions the frequency of correct responses remained almost constant. However, he found no consistent changes in any direction, and decided that errors were due partly to inability to copy the figure the first time.

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[40] N. G. Hanawalt, Memory Trace for Figures in Recall and Recognition ("Archives of Psychology," Vol. XXX, No. 216; New York: Columbia University Press, 1937).

[41] Cf. above, p. 2.

Statement of the Problem

This study was stimulated by two experiments which Bartlett identified as "the method of description" and the "method of repeated reproduction".[42] In the first experiment he employed five cards containing pictures of English military personnel. He showed these to adult subjects, then asked for descriptions of the pictures following various intervals of time. In the second experiment he asked adult subjects to read an Indian legend entitled "The War of the Ghosts" and reproduce it (i. e., write it from memory) after different time intervals. Bartlett's work was more exploratory than definitive. He was quite informal in his experiments, did not keep close check on time or conditions, and used only sophisticated adults as subjects. He made no attempt to isolate attitudinal variables and he told subjects they would be tested on the material. In each experiment he tested a single group repeatedly, disregarding the possibility that each re-testing amounted to a learning situation.

The purposes of the present experiment were: (1) to measure the influence on perception and memory of one attitudinal variable--racial distance; (2) to compare the Gestalt and frame-of-reference theories as they relate to the

[42]Bartlett, op. cit., pp. 47-94. These experiments are described more fully in Chapters III and IV of the present dissertation.

remembering of pictorial and prose material; (3) to check Bartlett's conclusions, using children as subjects; and (4) to check his conclusions when groups are not repeatedly re-tested.

The null hypotheses to be tested were:

1. Memory of pictures of men of different races is not related to the racial attitude of the subject.

   a) Persons who perceive the pictures as being close to the racial stereotype, or who move toward the racial stereotype in remembering, do not differ in measured racial attitude from those who avoid the racial stereotype.

   b) Persons who remember the pictures accurately do not differ in measured racial attitude from those who remember them inaccurately.

2. Changes in details during the eight weeks of the experiment follow no pattern of continuity or stereotyping.[43]

3. There is no difference in accuracy of memories or types of memory-changes between the groups tested repeatedly and the groups tested a single time.

4. There is no difference between children and adults in accuracy of recall and in susceptibility to influence by stereotypes.

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[43] Cf. above, p. 11.

CHAPTER II

GENERAL PROCEDURE

General Methodology

The procedures used were modified from those used by Bartlett in order to test both perception and recollection, and to minimize the set to remember. An attempt was made to put Bartlett's conclusions to a more objective test through the use of matched groups, standardized procedures, more carefully planned time intervals, and quantitative methods of analysis. In addition, the experiment was designed to compare the effect of repeated reproduction (as used by Bartlett) and non-repeated reproduction on recall.

Materials

At the beginning of the experiment, the Bogardus Ethnic Distance Scale was administered. This was followed by the stimulus materials, which consisted of five photographs and a printed story. Perception and recollection were tested through the use of a "test-sheet" and a "checklist" for the pictures, and a blank sheet of paper for the story. A more complete description of the materials follows.

The Bogardus Ethnic Distance Scale

This scale is one section of the Bogardus Social Distance Scale[1], the other sections being Occupation Distance, Religious Distance, and Economic Distance. This scale is one of the oldest tests of social attitudes. According to one reviewer, "The Bogardus Social Distance Scale is probably the most used single test of social attitudes . . . and is so good, and so naturally suited to its purpose, that if Bogardus had not invented it, someone else would have".[2] The Ethnic Distance Scale[3] allows subjects to check their feeling reaction toward thirty[4] "ethnic groups". "Ethnic" is used largely in the cultural sense, since the ethnic groups listed include some races (e.g. Negroes), some nationalities (e.g. Germans), one religious group (Jews), and some combinations of these (e.g. Japanese Americans). The scale as published has a checklist at the bottom, which permits the respondent to indicate his race, religion, urban or rural background, educational level, age, occupation, and annual income. In the present study, this was detached by the subject and turned

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[1]E. S. Bogardus, "Measuring Social Distances," Journal of Applied Sociology, IX (1925), pp. 216-226

[2]D. T. Campbell, "Social Distance Scale, Seventh Experimental Edition," The Fourth Mental Measurements Yearbook, ed. O. K. Buros (Highland Park, N. J.: The Gryphon Press, 1953), p. 150.

[3]See Appendix A, p. 98.

[4]Subjects in this experiment responded to ten groups only. See p. 31 below.

in separately, with his name written on it. The scale thus appeared to the subject to be anonymous, but actually it was invisibly marked for later identification. The scale is customarily scored by using the smallest number (the most favorable phrase) checked for each ethnic group.

The Pictures

The five photographs[5] used as stimulus materials were 3" x 5" glossy prints of men, placed in this order in an envelope: (1) Negro, (2) Jew, (3) Mexican, (4) Chinese, and (5) White American. These designations and numbers appeared on typed labels at the top of each picture. The pictured men appeared to be of the same general socio-economic class and were dressed similarly. Only the upper portion of the body was shown. In choosing the pictures, the racial stereotype was avoided as much as possible to allow conventionalization[6] in the subjects' recollection. The particular numerical order was chosen to put the more detailed pictures at the end of the series. The men represented by the photographs were not further identified to the experimental subjects. Actually they were, respectively: Booker T. Washington, an

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[5] See appendix B, p. 52

[6] Conventionalization, also called "object-assimilation" and "normalization", is a tendency for the memory of a stimulus to change so that it comes to resemble some familiar object more than it resembles the original stimulus. In the present study, a change toward the commonly-held racial stereotype was assumed to be an example of conventionalization.

unidentified German Jewish motion picture actor, Ezequiel Padilla (the foreign minister of Mexico), a Chinese artist of San Francisco, and a professional model portraying a father advising his son in a magazine advertisement. None of the subjects indicated recognition of any of the men.

The Story

The story[7], mimeographed on a single sheet, was "The War of the Ghosts", a North American Indian legend translated by Franz Boas, as quoted by Bartlett[8]. Coming from a culture and level of civilization quite different from that of modern America, the story seemed likely to appear disjointed and puzzling to the subjects in the experiment. Therefore it could afford good material for rationalization and conventionalization, if such processes were to occur. The story contained three hundred twenty-eight words and was arbitrarily divided, for analysis, into sixty-two subtopics by the experimenter. These subtopics are numbered and printed on separate lines in the example included in the appendix. Of course, the paper which the subject read contained no indication of division into subtopics.

The Test-Sheet

The test-sheet[9] included blanks for writing in the names

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[7] See appendix C, p. 107.

[8] Bartlett, op. cit., p. 65.

[9] See appendix D, p. 110.

at the tops of the pictures (ethnic groups) as the subjects recalled them, spaces for brief descriptions of the five men in the pictures, and "boxes" for checking those which were remembered best.

The Checklist

The checklist[10] was composed of five mimeographed sheets, all alike except that the ethnic group of one of the five men was printed at the top of each sheet. The sheets were stapled together in the same sequence as the stimulus photographs were numbered. The checklist used to measure perception was identical to that used to measure memory, except for the covering instructions. Each page of the checklist contained eleven items. Items 1-7 were multiple-choice items which allowed the subject to check one or more descriptive phrases for each of the following elements of the pictured man's appearance: (1) direction of facing, (2) appearance of hair, (3) color of skin, (4) appearance of nose, (5) thickness of lips, (6) apparent degree of wealth, and (7) apparent degree of kindness. Item 8 allowed the subject to check his general feeling about the man in the picture. It was a modification of rating steps 1-5 of the Bogardus Ethnic Distance Scale[11], step 1 having been changed from "I would

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[10] See appendix E, p. 112.

[11] See appendix A, p. 97

marry him" to "I would not object to a member of my family marrying him", so it might be answered by both sexes. Item 8 also contained three statements designed to elicit the subject's attitude toward the pictured man in social situations. Item 9 asked the subject to guess at the pictured man's occupation, while Item 10 asked for a description of his clothes. Item 11 suggested other details such as mustache, glasses, etc., which were either in this picture, in another picture in the series, or not in any of the pictures. This followed Bartlett's procedure.

Experimental Design

The subjects in this experiment were fifty-three college students and fifty-three seventh grade students. As is indicated in Table 1, each population was composed of two class sections.

One class section, designated "Group A", was shown the stimulus items during the initial session and was tested at the end of one, four, and eight weeks. Five persons in Group A were designated "sub-group B" for analysis of the story only. These five were tested on the story at the end of the initial session, as well as at the end of one, four, and eight weeks.

The other class section was divided into three "non-repeating" groups. After experiencing the stimulus items together, Group C was tested at the end of one week, Group D at the end of four weeks, and Group E at the end of eight weeks.

TABLE 1

EXPERIMENT SCHEDULE

(Same Schedule for both College and Junior High Groups)

	Repeating Group	Non-Repeating Groups		
Group	A	C	D	E
Number of Subjects	20 subjects (sub-group B: 5 out of 20)	12 subjects	12 subjects	9 subjects
Preliminary Session	Fill out information blank and Bogardus Scale			
Initial Session	Read Story twice. Fill out checklist while looking at pictures. Test Story (sub-group "B" only)			
1 week later	Test Pictures and Story	Test Pictures and Story		
4 weeks later	Test Pictures and Story		Test Pictures and Story	
8 weeks later	Test Pictures and Story			Test Pictures and Story

Subjects

The two groups of subjects participating in the experiment were 53 seventh grade pupils in the Monroney Junior High School of Midwest City, Oklahoma, and 53 University of Oklahoma undergraduate students enrolled in 2 sections of a course in Human Growth and Development. The seventh graders included 34 boys and 19 girls, while the college group included 15 men and 38 women. Midwest City is a "melting-pot" community of about 15,000, which has grown up around a large Air Force base since World War II. Monroney Junior High did not exist until this year. The 53 children were born in a total of 16 different states. Their fathers were mostly of professional, skilled, and semi-skilled occupations, with a few managerial and clerical persons, but none were farmers. The college students were from Oklahoma or surrounding states, and their fathers were mostly professional persons, farmers, or retail businessmen. The median age of the seventh graders was 12.5 and that of the college students was 20.4 years.

Division into Experimental Groups

The Bogardus scores which each subject assigned to ten selected ethnic groups were averaged to obtain average ethnic distance scores. Subjects were then placed in experimental groups in such a way that each group had approximately the same distribution of average ethnic distance scores. The result was a fairly equal distribution of such scores for the

individual races also, as is indicated in Table 2.

TABLE 2

MEAN BOGARDUS SCORES FOR EXPERIMENTAL GROUPS

Ethnic Group	College Groups				Seventh Grade Groups				All Groups
	A	C	D	E	A	C	D	E	
Negro	3.5	3.6	3.7	3.2	3.2	3.4	2.7	3.2	3.3
Jew	2.3	2.4	2.5	2.1	2.4	2.1	2.7	1.8	2.3
Mexican	3.1	3.3	3.4	2.9	2.2	2.8	2.2	2.1	2.7
Chinese	2.9	2.8	2.8	3.2	2.8	2.1	2.6	3.0	2.7
American	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Avg. of 5 Ethnic Groups	2.6	2.6	2.7	2.5	2.3	2.3	2.2	2.2	2.4
Avg. of 10 Ethnic Groups	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.2

It was felt that ten scores would provide a better measure of the individual's racial attitudes than five. In addition to Negro, Jew, Mexican, Chinese, and White American, he was asked to respond to English, German, American Indian, Japanese, and Mexican-American. Katz and Braly also used ten ethnic groups in their study[12], differing from the selection listed above in that Italian, Irish, and Turk were used instead of Mexican, Mexican-American, and Indian.

[12]D. Katz and K. Braly, "Racial Stereotypes of One Hundred College Students," Journal of Abnormal and Social Psychology, XXVIII (1933), p. 287.

Students of racial attitudes have found a surprising unanimity of opinion across the United States on preferential ranking of ethnic groups. Bogardus[13] in California and Thurstone[14] in Chicago found the five groups concerned in this experiment to be ranked (most preferred to least preferred): White American, Jew, Mexican, Chinese, and Negro. Students from six different colleges across the nation[15] ranked them: White American, Jew, Mexican, Negro, and Chinese. Sixty Princeton students[16] ranked four of the five groups: White American, Jew, Chinese, and Negro. In the present experiment the order of preference was White American, Jew, Mexican, Chinese, and Negro, as in the first two studies cited above.

Method of Presentation

Stimulus materials were presented in a group setting, during a single regular class period. The experimenter gave all presentations and tests. First he gave a brief introduction in which he explained that there is still much un-

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[13]E. S. Bogardus, "Measuring Social Distances," Journal of Applied Sociology, IX (1925), pp. 299-308.

[14]L. L. Thurstone, "An Experimental Study of National Preferences," Journal of Genetic Psychology, I (1928), pp. 405-425.

[15]J. P. Guilford, "Racial Preferences of a Thousand American University Students," Journal of Social Psychology, II (1931), pp. 179-204.

[16]D. Katz and K. W. Braly, "Racial Prejudice and Racial Stereotypes," Journal of Abnormal & Social Psychology, XXX (1935), pp. 175-193.

known about the way that people perceive stimuli, and that they could contribute useful data by participating in the experiment. Thus the set was aimed toward perception rather than toward remembering. The mimeographed story was then distributed, the subjects were directed to read it silently while the experimenter read it aloud, and then to read it again silently. The papers were then collected, and the envelopes of pictures were passed out along with the check lists. The following directions were attached to the check lists:

> Directions: In the envelope are 5 pictures of men of different races or groups, picked at random from books. They are <u>not</u> intended to be the average of their group. Look at each picture, and while looking at it, fill in the check list for it. Keep only one picture in view at any time. Put check-marks by the words or phrases which best describe the man. If none of the words fit him, write your own words in the blank provided.

They were also read aloud to the seventh graders. The subjects were asked not to discuss their evaluations, and to make evaluations on the basis of how the man compared with <u>all</u> men, not with his own race only. After the check lists were collected, sub-group B was asked to write the story "The War of the Ghosts" from memory.

<u>Method of Testing</u>

During each testing session, the experimenter passed out the test-sheets and blank note-paper for the story, then gave the following directions:

Write the story "The War of the Ghosts" as you remember

it. Try to remember the exact words. If you cannot do that, try to remember the general ideas. But first, read the directions on the test-sheet. When you have finished with both sheets, hold up your hand and I will give you another check list.

The directions printed on the test-sheet were:

Do you remember the 5 pictures of men I showed you? Please describe them very briefly on this sheet as you remember them. If you can remember which came first, second, third, fourth, and fifth, list them that way. If not, write them down as you remember them. Put an "x" in the box by the one which is clearest in your memory.

The directions were read aloud to the seventh graders. After these two sheets were collected, the check lists were given out with these directions attached to each booklet:

These are like the check sheets you filled out while you were looking at the 5 photographs. Put check-marks by all the words or phrases which best describe each man as you remember him. If none of the words fit him, write your own words in the blank provided.

Experimental Situation

Seventh Grade Subjects: These subjects were members of two mathematics classes. Mathematics is required of all students and thus enrollment in the course does not constitute a selective factor. These classes were selected because they were convenient to the schedule of the school and that of the experimenter. Group A was always met in the regular classroom. Groups C, D, and E were presented with the Bogardus Scales and stimulus materials in their regular classroom, but were tested in a vacant classroom nearby. The mathematics instructor sent each of Groups C, D, and E to the

testing room on the arranged testing day. After the test, the students returned to their classroom. The children did not see the experimenter at any other time.

Motivation appeared to be at a high level in all but a few children. They seemed genuinely impressed with the importance of being subjects in this experiment, almost all were sufficiently ego-involved to make a genuine effort to recall. They expressed much interest in the pictured men. One girl went so far as to create a complete imaginary family for the White American. Only in Group A, during the third testing session, did subjects show some mild resentment at the imposed task.

College Subjects: The subjects were students in two sections of Human Growth and Development, a lower division course in the College of Education, intended for prospective teachers. All experimentation was performed by the experimenter in the regular classroom, and any students not involved on a particular day were excused from class for that day. This created a somewhat different atmosphere from that of the seventh grade--the alternative to participation being arithmetic in one case and a free hour in the other. Nevertheless, several students expressed interest in the experiment and no one refused to participate. Some antagonism toward participating was expressed, especially by Group

A, who were tested three times. The college students' motivation did not appear to be as high as that of the seventh graders. Except for chance meetings, the subjects saw the experimenter only during the experimental sessions.

Methods for Analysis of Results

Results were examined for the trends mentioned previously, and for any correspondence between ethnic attitudes, perception, and the way that the pictures were recalled. Differences between adults and children were analyzed. Analysis of variance was used along with other non-parametric methods to estimate significance of differences.

The story was divided into "subtopics" in the manner used by Henderson[17]. His procedure was used in examining changes. The original subtopics were numbered, then the reproductions were taken apart and each subtopic was assigned the number of the subtopic it appeared to have come from. Trends were noted for adults and children.

With the repeating groups and non-repeating groups, reproductions were examined for trends, which in turn were examined for presence of certain Gestalt principles (closure, Pregnänz, symmetry, sharpening, and normalization) for a reversal of trend (which would be contrary to Gestalt principles), and for tendencies toward the racial stereotype.

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[17]Henderson, op. cit., pp. 70-74.

Changes in serial order of pictures were noted, using the unstructured test-sheet. Transfer of details from one picture to the other, and transfers of pictures themselves within a series were noted. This sheet also showed which pictures and which details stood out sufficiently in the subject's memory to be recalled without the "prompting" effect of the check list.

The check lists were analyzed by copying the check-marks from the test papers onto the original paper used for registering perception of the pictures. Direction of change could then be indicated by using vectors and a color code for the time intervals. "Change" was always defined as a difference from the subject's original perception. Except for "direction of facing", the experimenter did not designate a "correct" or an "incorrect" response.

The stimuli to be remembered were broken up into their parts--complexion, lips, hair, etc. This might be regarded as somewhat artificial. It may be argued that the unit of remembering should be the whole rather than the part. Although this may be a just criticism, the practical difficulties of such an approach would make quantitative analysis impossible. For example, a subject might change toward the cultural norm on skin color, while he changed away from it on thickness of lips. Other experimenters have noted this[18].

[18]Zangwill, op. cit., p. 266.

All subjects who showed a trend in a certain direction for a picture were checked for other similarities and their Bogardus scores for that race were compared. Average Bogardus scores for groups showing the same perception or trend were also compared. Amounts of change for different lengths of time were compared to see if the change was continuous and progressive, and the Repeating Group (A) was compared with the non-repeating groups at each time-stage, (1 week, 4 weeks, 8 weeks) to see if change was more accelerated in the latter groups.

Since it could not be assumed that there were equal intervals between the rating steps on the Bogardus Scale or on the check list, rank-order statistical methods were used. White's test[19] or the Median test[20] were used for testing the significance of differences between two groups, while the Kruskal-Wallis[21] was used for testing differences between more than two groups. Spearman rank-order correlations were used.

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[19]Allen L. Edwards, Statistical Methods for the Behavioral Sciences (New York: Rinehart and Company, 1954), p. 417.

[20]Ibid., p. 387.

[21]Ibid., p. 423.

CHAPTER III

EXPERIMENT I: PICTURES

Introduction

This experiment was modeled after an experiment which Bartlett designated "Method of Description"[1]. He used as stimulus materials five cards containing faces of English military types with a 4-line verse and a name on each. Subjects, tested individually, looked at each card 10 seconds, knowing they were to answer questions later. The first interval was 30 minutes, then a week or two, then "longer intervals". He asked questions--again not standardized--on position and direction of facing, questions about details, questions suggesting details not present but found elsewhere in the series, and questions suggesting non-existent details.

Bartlett reported a number of results. Order of sequence was quite disturbed, except for the first card. Names (words) were better for remembering order of sequence, while visualization was better for remembering detail. The first and last picture in a series were remembered most accurately. A rule (generalization) of order seemed to help on remembering "direction of regard" (facing). Pictured faces aroused atti-

[1]Bartlett, op. cit., pp. 47-62.

tudes conventional to the type of person pictured. This changed memory of details such as facial expressions. Some of the detail was evidently being constructed rather than remembered. Details were transferred often from an earlier to a later card. Bartlett suggested this might be due to the fact that his first picture-cards contained more detail than the last ones. Importance of detail occurred mostly with salient details, or those having special interest for the subject. Subjects acted as if they were building up their descriptions as they proceeded; they were most concerned to make their remarks hang together, and consciously resorted to inference. "Vocalizers" did this, but "visualisers" did not. Accurate recall was rare.

He drew the following conclusions:

1. Even with short, simple series, remembering is rapidly affected by unwitting transformations.
2. Transforming agencies fall into two groups:
    a) The method of recall adopted.
        1) Visualization (remembering an image or picture) leads to confusion of the sequential order, favors the introduction of extraneous material, and sets up a false confidence in the accuracy of the recall.
        2) Vocalization (translating the picture into words and remembering these) favors classification of

pictures according to a verbal rule and sets up a false lack of confidence.

b) Individual or group interests, feelings, or attitudes.

3. Factors which lead to grouping around some salient detail include over-potency of that detail.

4. Transfer of detail is more common in the early stages of successive remembering, while introduction of new detail is more common in later stages.

5. The transforming effect of affective attitudes increases with lapse of time.

6. Transformation occurs most frequently with details which the interests of the individual make salient or psychologically clear.[2]

In the present experiment, the exposure was not timed, and the subjects were asked to fill out a checklist while looking at each picture-card. Thus it was possible to measure perception, and then to interpret change in terms of this original perception--keeping the two variables separate. The racial aspect was emphasized by labeling each picture. The experimenter made no mention of the tests to be given over the pictures, since it was felt that this would lead to reviewing and would destroy, to some extent, the significance of the time intervals between presentation and testing.

Perkins has suggested four rules for distinguishing a

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[2] F. C. Bartlett, op. cit., p. 61.

memory experiment from a learning experiment:[3]

1. Stimulus material should be presented to the subject only once.

2. Stimulus material should be simple enough for a single presentation to be sufficient.

3. Only a few stimulus figures should be included.

4. Material should be reproduced entirely from memory at stated intervals to determine the trend, direction, and extent of changes.

One deviation from these rules was made in the present experiment. The open test-sheet, which Rule 4 would require, was followed by a multiple-choice checklist containing the cue-word "Negro", "Jew", "Mexican", "Chinese", or "White American".

Results

The data obtained in Experiment I have been analyzed and summarized in six general areas:

1. The order of secuence of the five pictures was examined to learn how pictures changed their place in the series and which subjects made the changes.

2. Checklists were examined to determine trends in the number of changes which subjects made away from their original perceptions of the pictured men.

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[3]Perkins, F. T.,"Symmetry in Visual Recall,"American Journal of Psychology, XLIV (1932), p. 474.

3. Changes which certain subjects made on certain details of the pictures were followed over an eight week period to discover patterns of change.

4. The qualitative ways in which recalled details deviated from perceived details were summarized to identify the direction of changes for each picture.

5. Bogardus scores were compared with perceptual patterns to ascertain relationships between ethnic distance and perception.

6. Bogardus scores were compared with changes in the details of the pictures to ascertain relationships between ethnic distance and remembering.

Order of Sequence

During each testing period the subjects were asked to list on a test-sheet the five pictures in their original order of presentation. This provided data for observing changes in the order of sequence of the pictures when they were recalled. This test-sheet was always followed by the picture checklist, on which the names of the pictures were printed. Therefore, the repeated-testing group, A, experienced a review of the series in correct order during each testing period. As one would expect, the number of these subjects giving correct responses remained constant or increased on the one-week, four-week, and eight-week tests. As Table 3 indicates, non-repeating subjects produced correct sequences

only in the group tested at the end of one week--Group C. College Group C remembered much better than seventh grade Group C. Groups D and E showed widely scattered versions of the sequence, amounting almost to guesswork. However, 57 per cent of the seventh grade tests and 70 per cent of the college tests included all five races in some order. The Negro remained in first position in 87 per cent of the cases and was missing from only 4 of the 186 papers. None of the other four pictures differed significently in frequency of exclusion, the figures being: Jew 16, Mexican 18, Chinese 14, and American 16. However, the Chinese was remembered as "Japanese" 25 additional times.

TABLE 3

PERCENTAGE OF SUBJECTS REMEMBERING CORRECTLY THE NAMES OF THE FIVE PICTURES

Group	Time Interval	Percentage of Correct Responses Seventh Grade	College
	1 week	50	30
A	4 weeks	55	50
	8 weeks	65	45
C	1 week	17	58
D	4 weeks	0	0
E	8 weeks	0	0

The picture of the Mexican was displaced from its original position more times than any other picture (79), followed by the Chinese (68), Jew (51), White American (26), and

Negro (21). As Table 4 indicates, the most common changes on the 186 papers were the following: (a) moving the Chinese to a position earlier in the series (61 cases), (b) moving the Mexican or the Jew to a position later in the series (46 cases each), and (c) moving the Mexican to an earlier position (33 cases). The Chinese was moved to a later position seven times.

Table 5 illustrates the general superiority of the college subjects in remembering the names of pictures. In Table 6, one may observe the preponderance of serial order changes involving the interior members of the sequence, and the positional stability of the first picture.

These results may be explained in terms of the well-established laws of sequential learning. The Negro and American retained their places because they were first and last in the series. The Mexican and Chinese occupied the middle and just-past-the-middle positions which are "weak spots" for remembering. However, the White American, being the last in the series, should not have been forgotten as often as he was. The alternation of pictures three and four and the strong memory of the first were identical with Bartlett's results. However, practically all his subjects retained the same sequence expressed on their first test.[4] In light of the low scores made by the single-tested subjects

[4]Bartlett, op. cit., p. 49.

TABLE 4

FREQUENCY OF CHANGES TO EARLIER OR LATER POSITIONS IN THE SERIES OF FIVE PICTURES

Name of Picture	Moved To Earlier Position				Moved To Later Position			
	1 Step	2 Steps	3 Steps	4 Steps	1 Step	2 Steps	3 Steps	4 Steps
Negro					12	6	2	1
Jew	5				31	9	6	
Mexican	25	8			40	6		
Chinese	43	16	2		7			
W.American	11	2	6	7				

TABLE 5

PERCENTAGE OF REPRODUCTIONS IN WHICH SUBJECTS REMEMBERED NAMES OF ALL FIVE PICTURES, WHETHER OR NOT IN CORRECT ORDER

Seventh Grade Groups	Percentage of Reproductions	College Groups	Percentage of Reproductions
1 week	55	1 week	80
A 4 weeks	85	A 4 weeks	80
8 weeks	75	8 weeks	95
C	42	C	83
D	33	D	17
E	11	E	22
All Subjects	57	All Subjects	70

in the present experiment, one might attribute Bartlett's findings to the practice-effect of repeated testing.

TABLE 6

MOST COMMON SEQUENTIAL ARRANGEMENTS OF PICTURES

Sequence	Frequency	Sequence	Frequency
NJMCA*(original)	68	NJMAC	3
NJCMA	31	NAJCM	2
NMJCA	11	NMJAC	2
NCJMA	6	NJ-CA	2
NJMC-	4	NJCAM	2

*Letters refer to Negro, Jew, Mexican, Chinese, and White American, respectively. A hyphen represents the omission of one picture.

Trends in Number of Changes

The effects of repeated reproduction and the nature of the perceived item on retention were examined by observing trends in the number of changes made by the college subjects. First, the experimenter determined the percentage of subjects in each experimental group who changed from their original perception on each of the first eight items on the checklist. Then, for each item, the percentage for Groups C, D, and E were placed together so that they formed a "series". This series indicated the number of deviations at the end of one, four, and eight weeks for groups tested a single time. The percentages from the one-week, four-week, and eight-week tests of Group A were placed together so that they formed another "series". This series indicated the number of deviations at the end of one, four, and eight

weeks for a group tested repeatedly. These percentages were placed in a table which appears in Appendix F. The trends indicated were summarized in Table 7 by using "i" to indicate an increasing number of deviations over the eight weeks period, "d" to indicate a decreasing trend, and "n" to indicate that no change occurred.

The following facts were noted:

1. The percentage of series showing an <u>increase</u> in changes, varied from 50% for "color of skin" to 100% for "direction of facing".
2. The percentage of series showing a <u>decrease</u> in changes, varied from 40% for "color of skin" to 0% for "direction of facing".
3. The percentage of series which showed neither an increasing nor decreasing trend, varied from 20% for "thickness of lips" and "perceiver's attitude toward the pictured man" to 0% for "nose".
4. Perceptions of the White American were apparently unstable, since 88% of the series showed an increase of changes. Percentages for the other pictures were: Jew 75%, Negro 63%, Mexican 63%, and Chinese 56%.
5. A decreasing trend was exhibited by 31% of the series for the Negro and Chinese pictures, while the other three pictures elicited a smaller percentage.
6. Only 22% of the series showed a <u>continually increasing percentage of changes over the eight-week period and less</u>

TABLE 7

TRENDS IN THE NUMBER OF DEVIATIONS FROM PERCEPTION, AS EXHIBITED BY REPEATED-TESTING GROUP (A) AND SINGLE-TESTING GROUPS (C, D, AND E) ON ITEMS 1-8 OF THE CHECKLIST

Picture	Negro		Jew		Mexican		Chinese		White American		Totals		
Groups	CDE	A	CDE	A	CDE	A	CDE	A	CDE	A	i	d	n
Item													
1. Facing	i*	i	i	i	i	i	i	i	i	i	10	0	0
2. Hair	i	i	d	i	n	i	d	d	i	i	6	3	1
3. Color	i	d	i	n	i	d	d	i	i	d	5	4	1
4. Nose	i	i	i	i	d	i	d	i	i	i	8	2	0
5. Lips	i	d	d	i	i	n	i	n	i	i	6	2	2
6. Richness	d	d	i	d	n	i	i	i	i	i	6	3	1
7. Kindness	d	n	i	i	i	d	i	i	i	i	7	2	1
8. Perceiver's Attitude	i	i	i	i	i	i	n	d	i	n	7	1	2
Totals i	6	4	6	6	5	5	4	5	8	6	55		
Totals d	2	3	2	1	1	2	3	2	0	1		17	
Totals n	0	1	0	1	2	1	1	1	0	1			8

*"i" indicates that the number of deviations on the 8 weeks test has <u>increased</u> over the number on the 1 week test.
"d" indicates that the number of deviations on the 8 weeks test has <u>decreased</u> from the number on the 1 week test.
"n" indicates that there is <u>no difference</u> between the number of deviations on the 1 week and 8 weeks tests.

than 3 % showed a continually decreasing percentage.

7. In 28 % of the cases, the CDE (single-test groups) series showed a different trend from its accompanying A (repeated-test group) series, that is, one showed a general increase in percentage of change, while the other showed a general decrease during the eight weeks. However, the same number of series in the two groups showed each trend. There was no significant difference between repeated-testing and single-testing groups in trends shown.

If one may assume that an increasing number of changes indicates either an unstable memory trace or a weak attitudinal frame to support the learned fact, and that a decreasing or constant number of changes indicates a strong trace or schema, then it may be observed that the one purely factual item in the series of questions--direction of facing--showed by far the weakest trace or schema. This would support Abramowski's theory that feeling content outlasts facts, or as modified by Bartlett, that memory is more a reconstruction on the basis of an attitudinal frame than it is the preservation of images in a "trace". It could also be that the cue-word (e.g. Negro) which appeared on each checklist closely restricted the choice of most items, but had no effect on direction of facing because there was no logical or psychological relationship between the two. In other words, direction of facing had no emotional connection with racial attitude.

These results differed from the findings of Bennett et al.[5] that response stability (test-retest after four weeks) on a questionnaire, while greater than chance for all questions, was highest for background data and lowest for items of opinion or feeling.

Figure 1 shows the average number of changes which subjects in each experimental group made on the first eight items of the checklist. Horizontal distance represents time between perception and test, and vertical distance represents the number of changes. If the groups had been completely matched, those tested at the end of one week should have scored the same number of changes, since repeating and non-repeating groups were dealt with in the same way up to that time. It may be noted that, except for three cases, this is approximately true. All curves show an Ebbinghaus-type shape. From Hanawalt's study[6] one would expect repeated-testing groups to show a flatter curve than the single-testing groups after one week, due to the practice effect of re-testing. This was found to be true in practically all cases.

A strong memory for the Negro was again evident. The American, the final picture in the series, ranked second in the reproductions of Group A, but Group E dropped him to

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[5]E. M. Bennett, R. L. Blomquist, and A. C. Goldstein, "Response Stability in Limited-Response Questioning," Public Opinion Quarterly, XVIII (1954), pp. 218-223.

[6]Hanawalt, loc. cit.

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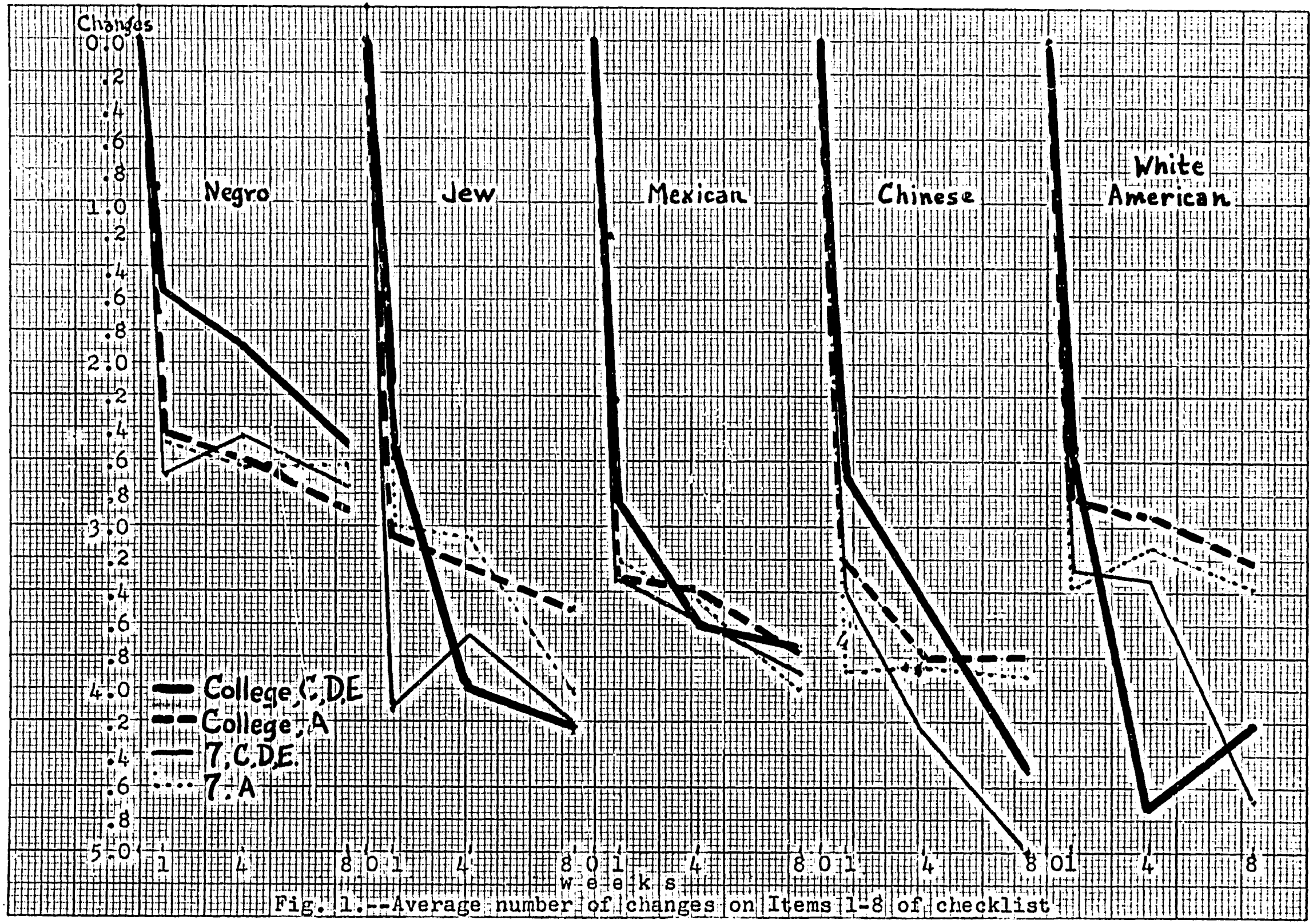

Fig. 1.--Average number of changes on Items 1-8 of checklist

fourth place.

The first item on the checklist asks which direction the pictured man was facing. This question was inserted to test imagery and also to provide one objective question with which to test accuracy of recall. Of the 59% of the students who changed their answer on a subsequent test, 35% changed to a different but still correct answer, while only 24% changed to a completely wrong answer. For example, the Chinese might be described on the perceptual questionnaire as "looking to the right" and on the first test as "looking down". Both answers were right. This indicated first that the subject was remembering the picture and not the particular answer which he had checked on paper. Secondly, it indicated that the subject had retained some sort of visual image, for if he had described the picture to himself verbally, he could have checked all possible right answers while looking at the picture during the perceptual session. Group A was excluded from Table 8 because repeated testing magnified the errors of a limited number of subjects and distorted the results. It may be noted that 45% more subjects "changed but remained correct" than "changed and were wrong"; that when changes were made on the Negro and American, they tended to be wrong; and that subjects often changed their description of the Chinese but were rarely wrong. The children tended to make more wrong changes than the adults but the difference was not significant.

TABLE 8

FREQUENCIES OF SUBJECTS IN GROUPS C, D, AND E WHO CHANGED FROM ORIGINAL PERCEPTION ON CHECKLIST ITEM 1

	Changed and Wrong			Changed but Still Correct			Number of Responses Possible		
	College	Seventh Grade	Total	College	Seventh Grade	Total	College	Seventh Grade	Total
Negro	7	7	14	0	4	4	33	33	66
Jew	9	10	19	15	16	31	33	33	66
Mexican	7	10	17	18	19	37	33	33	66
Chinese	4	4	8	19	15	34	33	33	66
W.Amer.	8	14	22	4	6	10	33	33	66
Total	35	45	80	56	60	116	165	165	330
Percentage of Responses Possible	21%	27%	24%	34%	36%	35%	100%	100%	100%

Patterns of Change

Whether the results of an experiment support the Gestalt or frame-of-reference theories of remembering depends largely on the patterns of change found. As was mentioned before, Zangwill[7] found two patterns of "persistent deviations", which he named "stereotyped deviations" and "continuous deviations". There was little difference in the frequency of the two patterns.

In the present experiment, subjects in the two "A"-groups were tested after one, four, and eight weeks on their memory of the five pictures. Thus they had three opportunities to alter the descriptions which they had given during the stimulus session. Four items on the check list contained the graduated steps in one dimension which were necessary for making the indicated comparisons. These items were: (3) skin color (from very light to very dark), (5) lips (from very thin to very thick), (6) richness (from very rich to very poor), and (7) kindness (from very kind to vicious). It was found that patterns of change on these four items could be grouped under five headings, as follows:

1. Stereotyped deviations. On the one-week test the subject changed from his original perception. On subsequent tests he gave the same answer that he gave on the one-week test.

2. Continuous deviations. On the one-week test the subject changed from his original perception. On subsequent tests he continued to change in the same direction.

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[7] See above, p. 11.

3. Circular deviations. The subject changed from his original perception but reverted to it later.

4. Delayed stereotyped deviations. The subject did not change from his perception until the four or eight weeks tests. He made no further change subsequently.

5. Erratic deviations. The subject changed from his original perception in a way which did not fit any of the four previous classifications.

Table 9 shows the number of subjects whose patterns of change were classified under each of the above headings. The figures are broken down by check list item and name of picture. Seventh grade and college subjects are listed separately.

While college students and seventh graders showed almost the same number of deviation sequences, the former group showed more stereotyped and circular deviations, while the latter showed more erratic and delayed stereotyped deviations. The number of continuous deviations was negligible for both groups. This differs markedly from Zangwill's findings, but it offers additional evidence that distortion was due to the frame of reference into which the perception was incorporated rather than to autonomous change in the "memory trace" itself. It may be hypothesized that the memory was reconstructed during each test on the basis of an unchanging frame of reference. In the numerous cases where the perception fitted the applicable frame of reference, the same answer was given for perception and for all tests. Where the perception did not fit the frame of reference, stereotyped

TABLE 9

FREQUENCIES OF DEVIATION PATTERNS FOR SEVENTH GRADE AND COLLEGE GROUP A ON ITEMS 3, 5, 6, AND 7 OF CHECKLIST

Dev. Type	Stereotyped					Continuous					Circular					Delayed Stereotyped					Erratic					Total Deviations	Unchanged
Item	3	5	6	7	Total	3	5	6	7	Total	3	5	6	7	Total	3	5	6	7	Total	3	5	6	7	Total		
GR. 7																											
Neg.	2	8	4	4		0	0	1	0		1	2	3	7		3	3	2	1		1	2	0	1		45	35
Jew	4	7	5	3		1	0	0	1		1	2	1	2		5	2	5	2		2	0	0	6		49	31
Mex.	1	2	2	4		0	0	0	1		0	3	4	2		6	2	4	3		3	5	0	5		47	33
Chin.	1	2	1	5		1	1	0	0		5	2	7	3		2	5	4	5		4	2	2	4		56	24
W.Am.	1	2	4	2		0	0	1	2		4	1	4	3		2	3	1	4		1	2	4	3		44	36
Total	9	21	16	18	64	2	1	2	4	9	11	10	19	17	57	18	15	16	15	64	11	11	6	19	47	241	159
COLL.																											
Neg.	4	3	3	5		0	0	0	0		2	5	5	3		2	2	2	1		3	0	0	1		41	39
Jew	6	4	4	2		1	1	0	0		3	1	4	3		2	2	0	6		1	4	1	1		46	34
Mex.	5	4	4	3		0	2	0	1		6	4	3	3		2	3	2	1		2	1	1	1		48	32
Chin.	8	7	4	4		0	1	0	0		0	6	3	1		3	1	5	4		4	2	1	1		55	25
W.Am.	8	5	2	5		0	1	0	0		4	4	1	2		0	2	3	2		3	1	1	3		47	33
Total	31	23	17	19	90	1	5	0	1	7	15	20	16	12	63	9	10	12	14	45	13	8	4	7	32	237	163

deviations occurred.[8] Circular deviations (similar to "reminiscence") might be the result of a change in the frame of reference itself, due partly to the incorporation of the original perception. Possibly the original perception grew in importance in the frame of reference and over-shadowed previous influences. Delayed stereotyped deviations are explicable as cases where a frame of reference, not well-established, changed during the eight weeks experimental period. First, the frame was consonant with the perception but later it became conflicting. Erratic changes could be due to guessing, which was required by the lack of a solid frame of reference. The last two classifications were more common among the seventh grade subjects, as one would expect where there has been less experience out of which to form frames of reference. As further evidence for this explanation, one may note that college subjects exhibited many more stereotyped deviations on skin color than seventh graders, while the reverse was true of delayed stereotyped deviations. Skin color would seem to be a more integral part of the racial stereotype than the other three items.

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[8] A Gestalt explanation is also possible. Suppose the Mexican's color was perceived as "light", while "good" form or consistency with the norm would require him to be "dark" but not "very dark". Normalization would then be expected to cause a change in the memory trace only as far as the "dark" category.

Direction of Changes[9]

Negro. Kinky hair was a stable perception. Light or average color was unstable, especially among seventh graders. College adults tended to change the Negro's nose toward "wide and short", the description "curved" being especially subject to change. Seventh grade children were much less influenced by the racial stereotype of the Negroid nose. A large majority of those who changed their description of his lips made them thicker and most of those who changed his wealth made him poorer. College subjects tended to make him kinder than originally, while seventh graders showed an unusually large number of "circular" changes--moving away from their original percept and then back.

Jew. Several persons changed to wavy or curly hair. Most of the color changes were toward darker. The expected change to a curved nose was not especially evident, but there were numerous shifts to a "long" nose. On the other hand, practically all the subjects who first perceived his nose as "long" changed to another description when they were tested. There was a tendency to remember him as less rich and less kind. The college people who changed his occupation tended to put him in an occupation of lower status. His mustache was not mentioned often, but the old-fashioned suit was.

Mexican. Color percepts were unstable and most subjects

[9]Appendix G contains the data on which this summary was based.

changed. College students showed no particular pattern, often changing away from their percept and then back toward it, but most of the seventh graders who changed made him darker. Most subjects who changed made his lips thinner, and made him poorer and also kinder. These were very strong trends. Several subjects--especially the seventh graders--remembered the Mexican as standing with one foot on a chair or sitting on the edge of a table. Some of the latter group refused to believe they were looking at the same picture when they were shown it after the conclusion of the experiment. This elaboration could be regarded as evidence of the importation of detail to support a concept. However, if the nature of the picture itself caused the change, the Gestalt term "completion" would be more appropriate.

Chinese. Because the Chinese had one slight wave in his hair, the perceptions and recollections shifted between straight and wavy. Practically all of the numerous skin color changes were alterations toward a lighter complexion. This was regarded as a clear example of deviation toward the racial stereotype. Most college subjects changed the lips so they were thinner. The seventh graders were more undecided, but tended toward thicker lips. There was a strong tendency to make him less wealthy. The college people tended to make him kinder. The flowered background and the brush in his hand were well-remembered details, probably because they "fitted"--several remembered him as a Japanese and two subjects put

glasses on him.

White American. A very large number changed from straight to wavy or curly hair, while most complexion changes tended toward "average". Practically all changes in lips were away from "thin" and toward "medium", as were changes in wealth. On the item relating to kindness, the college students tended to change from their percept in the direction of "kind", while the seventh graders moved in the opposite direction. The American seemed to be remembered as the "average man" or "John Q. Public". A very few subjects moved the newspaper from his lap to his out-stretched hands. This change could be described in Gestalt terms as "closure".

General Tendencies. A tendency to change toward the racial stereotype was evident, especially in the case of the Negro. Details tended to be forgotten, especially if they were not essentially a part of the picture. Very few details were transferred between pictures.

Ethnic Distance and Perception

The next question to be examined was the possibility of a relationship between "ethnic distance" (as measured on the Bogardus Scale) and the way subjects perceived the five pictured men. A large Bogardus score indicates an unfriendly feeling toward the race (or ethnic group), while a small score indicates a friendly feeling. Figure 2 shows the distribution of the average Bogardus scores assigned to ten se-

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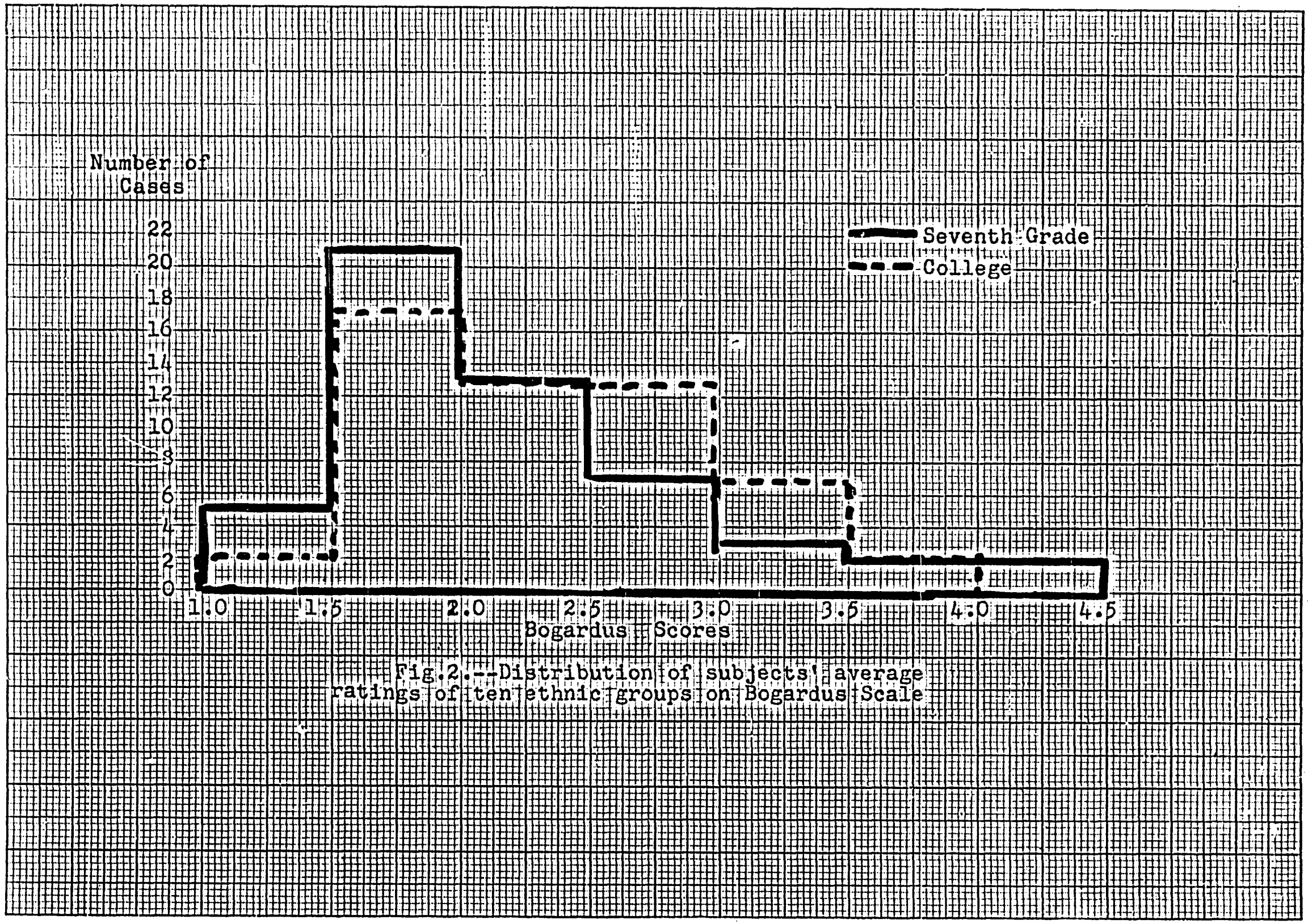

Fig.2.--Distribution of subjects' average ratings of ten ethnic groups on Bogardus Scale

lected ethnic groups by college and seventh grade subjects.

There was a slight tendency for persons who indicated a strong recollection of one of the pictures, to have a more favorable Bogardus score for that race than the other subjects had, but the difference was not statistically significant according to the "t-test".

Perception of skin color showed interesting differences in Bogardus scores, as is indicated in Table 10.

TABLE 10

AVERAGE BOGARDUS SCORES OF SUBJECTS PERCEIVING THE COMPLEXIONS OF THE PICTURED MEN DIFFERENTLY

Subjects	Perceived Color	Negro	Mexican	Chinese
Seventh Grade	Light	2.9	2.3	2.7
	Average	2.9	2.2	2.9
	Dark	3.3	2.5	2.3
College	Light	2.9	3.4	2.0
	Average	3.3	2.8	3.0
	Dark	3.7	3.5	3.4

All subjects assigned a Bogardus number "1" to the White American, so he was excluded from the comparison. The Jew received practically identical average Bogardus numbers in all cells of the table. Two of the variances proved significant according to the Kruskal-Wallis test: the college subjects' ratings of the Mexican (.01 level of confidence) and Chinese (.02 level of confidence). It appeared that

those who ranked the Negro's and Chinese's color as light, and the Mexican's color as average, were more favorable toward those races than persons who ranked the Negro and Chinese as dark, and the Mexican as either light or dark. From a comparison of the size of the variances, it appeared that the seventh graders' racial attitudes probably did not influence their perception of skin color as much as did the attitudes of the college students.

TABLE 11

AVERAGE BOGARDUS SCORES OF SUBJECTS PERCEIVING DIFFERENT DEGREES OF KINDNESS IN THE PICTURED MEN

	Degree	Negro	Jew	Mexican	Chinese
Seventh Grade	Very kind	2.0	1.4	1.7	2.8
	Kind	2.8	2.6	1.7	2.4
	Neither	3.2	2.8	2.6	2.3
	Unkind	4.0	2.0	2.9	
	Vicious	7.0		1.8	3.0
College	Very kind	3.0	2.0		
	Kind	3.3	2.2	2.4	2.6
	Neither	3.7	2.7	3.5	3.0
	Unkind	3.0		3.7	3.0
	Vicious			2.5	6.0

Table 11 shows a tendency for persons who perceived a pictured man as unkind, to be more antagonistic toward his race than those who perceived him as kind. The American is again excluded for the reason given previously.

Subjects were asked to guess at the pictured man's occupation. From the results, it appeared that subjects used a combination of two frames of reference in making their choices: (1) the clothing and equipment pictured, and (2) the racial stereotype. All occupations mentioned more than once by the college subjects are listed below, followed by their frequencies.

Negro: preacher (8), teacher or educator (8), waiter (6), executive (6), lawyer (4), doctor (3), politician (3), musician (3), businessman (2), office worker (2).

Jew: retail store (11), musician (7), doctor (4), business executive (4), minister (4), scientist (3), banker (3), office worker (3), educator (2), writer (2), "professional (2), businessman (2).

Mexican: musician (8), businessman (7), politics (5), actor (5), executive (5), movie star (4), artist (4), gambler, racketeer (4), government official (3), plantation (ranch) owner (3), businessman (3), restaurant owner (2), banker (2).

Chinese: artist (18), small business (9), architect, draftsman (8), office worker (3), executive (3), diplomat (2), scientist (2), author (2), teacher (2).

American: "small" business (19), lawyer (9), "big" business (7), executive (6), banker (5), minister (3), doctor (2), teacher (2), insurance agent (2), stockbroker (2), counselor (2), politician (2).

Rank-order correlations were computed between Bogardus scores and the social prestige of the assigned occupations according to the North-Hatt Scale.[10] All correlations were close to zero, indicating that guesses about a pictured man's occupation were not determined by the subjects' attitude toward the man's race.

Ethnic Distance and Remembering

If attitude affects remembering, then there should be a relationship between the Bogardus score and the change of the memory of a racial picture. As shown in Table 12, the subjects who remembered direction of facing correctly had a more favorable Bogardus score than those who remembered it wrong, in seven out of eight averages computed. For college students' memory of the Jew, the difference was significant at the .05 level of confidence, with a chi square of 3.84. This finding is consonant with the conclusions of other experimenters, who have found that people tend to remember best those social stimuli toward which they hold favorable attitudes.[11]

When the data were examined for a relationship between racial attitudes and the direction of change of specific details, only isolated instances were found. For example, college students whose memory of the thickness of the Chinese

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[10] Carroll L. Shartle, Occupational Information. (New York: Prentice-Hall, Inc., 1952), p. 115.

[11] See Chapter I, p. 16.

TABLE 12

AVERAGE BOGARDUS SCORES OF THOSE SUBJECTS REMEMBERING CORRECTLY A PICTURED MEN'S DIRECTION OF FACING, AND OF THOSE REMEMBERING IT WRONG

Subjects	Memory of Facing	Negro	Jew	Mexican	Chinese
Seventh Grade	Correct	3.19	2.17	2.13	2.42
	Wrong	2.80	2.36	2.54	3.06
College	Correct	3.48	2.13	3.13	2.75
	Wrong	3.50	2.75	3.25	3.41

man's lips did not change, had a more favorable Bogardus score than those who changed them in a "thinner" direction, and these in turn were more favorable than those who made them thicker. This variance was significant at the .02 level of confidence.

On Item 8 of the checklist,[12] subjects were asked to register their feelings about each pictured man on a scale similar to the Bogardus Ethnic Distance Scale. When a subject's rating of his feelings about the man differed from his Bogardus rating of the man's ethnic group, one might expect him to move back toward his Bogardus score in subsequent remembering. This could be explained in more than one way. In Gestalt terms, the discrepency might be viewed as a state of incompletion, and one would expect closure to relieve the

[12]See Appendix E.

TABLE 13

NUMBER OF SUBJECTS CHANGING IN THE INDICATED DIRECTIONS IN THEIR ATTITUDES TOWARD FIVE PICTURED MEN

7th Grade	No Change	Changed Back Toward Bogardus Score	Changed in Opposite Direction	Total
Negro	7	8	2	17
Jew	10	13	2	25
Mexican	15	15	3	33
Chinese	11	9	2	22
W. Amer.	1	6	0	7
Total	44	51	9	104
College				
Negro	10	9	2	21
Jew	8	10	3	21
Mexican	12	15	4	32
Chinese	10	8	1	19
W. Amer.	1	3	0	4
Total	41	45	10	97

tension; or the ethnic attitude might be thought of as a frame of reference upon which the subject could reconstruct the feeling which he had held for the man in the picture. In any case, what was expected did happen, as is indicated in Table 13. The total represents the number of subjects whose Bogardus score was different from their perception score on

Item 8 of the checklist.

In recalling his feelings about the picture, the subject could choose one of five phrases. If he were merely guessing, he would have one chance in five of picking his original answer. On the average, he would have two chances in five of moving back in the direction of his Bogardus score, and two chances in five of moving in the opposite direction. A chi square test permitted the rejection of the chance hypothesis at the .01 level of confidence for both college and seventh grade groups. If memory were the only factor operating here, all subjects would be expected to fall in the "no change" column of Table 13. The elimination of both these hypotheses left little doubt of the influence of ethnic attitude on the recall of one's feelings about a pictured man. An interesting application of the table is to use the "total" column as a measure of how far a pictured man differed from the racial stereotype. This column indicates the number of people who felt differently about him than they did about the race in general. Here, the pictured Mexican was evidently farthest from the stereotype for Mexican.

CHAPTER IV

EXPERIMENT II: STORY

Introduction

In order to examine further the mechanics of the remembering process, the examiner submitted a prose passage to the subjects who participated in Experiment I. Experiment II was based on an experiment which Bartlett designated the "Method of Repeated Reproduction".[1]

Bartlett gave the story "The War of the Ghosts" to adults who read it and then retold it after 15 minutes and "various longer periods". He found that general form or outline persisted, while style and construction changed. With frequent reproduction, some detail became stereotyped and persisted. With infrequent reproduction, omission of details, simplification of events and structure, and transformation into familiar forms went on indefinitely but importation[2] also increased. Details fitting interests of the subject were remembered, and the influence of affective attitudes inten-

[1]Bartlett, op. cit., pp. 63-94.

[2]"Importation" or "invention" is the introduction of details not originally in the stimulus.

sified with lapse of time. Rationalization supplied the necessary "ground" or connected unrelated details. Material was initially connected with an explanation and treated as a symbol of that explanation, but later it was replaced by what it symbolized. Rationalization could be unconscious, involving no symbolization; this was individual and was due to the individual's temperament. Names and phrases were sometimes changed to fit current speech patterns. Transformations were often fore-shadowed by weeks or months; that is, a major change in a story would be preceded by a hint or minor tendency in the same direction in an earlier reproduction. Details were moved up toward the first of the story, whereas in groups of pictures, details were transferred toward the end of the series. The most common omissions were: (1) title, (2) proper names, (3) definite numbers, (4) precise significance of the ghosts, and (5) canoes. The "general impressions" and "general outline" were very important and remained, but the primitive, disjointed style of the narrative was rapidly transformed.

Bartlett found that "outstanding" details tended to be remembered. Popular words and comic elements were two examples of such details. Comic elements were likely to be changed, however. Pleasant details which evoked an interest or bias were not only preserved, but elaborated, while unpleasant details which were thus ego-involving were distorted.

Some "trivial" items were preserved.

In the present experiment, Bartlett's procedure was followed with Sub-groups "B". These 5 seventh grade pupils and 5 college students read the story "The War of the Ghosts" and then were asked to write it from memory within the same hour. Administration of the five pictures and checklist provided a uniform experience to fill the interval (approximately 30 minutes) between the reading of the story and its written recall. These sub-groups were subsequently tested at the end of one week, four weeks, and eight weeks. Thus they were tested earlier and more often than the other groups.[3] Except for the frequency of testing, the same experimental procedure was used with all subjects.

Results

The story "The War of the Ghosts" was arbitrarily divided for analysis into sixty-two "subtopics".[4] "Subtopic" is a term used by Henderson[5] to describe a group of words which conveys a single impression of a scene, action, or thought. Subtopics which were reproduced in precisely the original wording were designated as correct. Those in which all or part of the idea was preserved but the wording was

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[3]See "Experimental Design", p. 28.

[4]See Appendix C.

[5]Henderson, op. cit., p. 35.

changed, were designated as changed. Those subtopics which were completely different were designated as invented. Results have been grouped in the present chapter according to these three classifications.

Subtopics Reproduced Correctly

As Table 14 indicates, both seventh grade Group B and college Group B reproduced more subtopics correctly than the corresponding groups tested after an equal time interval.

TABLE 14

AVERAGE NUMBER OF CORRECTLY REPRODUCED SUBTOPICS ON EACH TESTING OF THE STORY

Group	Time Intervening	Average Number of Correct Subtopics	
		Seventh Grade	College
B	30 min.	2.70	2.70
	1 week	2.40	2.40
	4 weeks	2.00	1.20
	8 weeks	1.40	1.60
C	1 week	.75	.42
D	4 weeks	.17	0
E	8 weeks	0	.11

For example, members of seventh grade Group B recalled an average of 2.00 subtopics correctly after four weeks, while members of seventh grade Group D, who had not been tested until that time, recalled an average of only .17 subtopics correctly at the end of four weeks. The table illustrates the "preserving" effect of immediate testing and repeating

a test. The more rapid drop in accuracy shown by those groups which were tested only once, may be compared to a similar trend found in Experiment I.[6] This supports Bartlett's observation that repeated testing causes some details to become stereotyped and persist. Furthermore, the close similarity between the average figures for college and seventh grade groups indicates that Bartlett's conclusion holds regardless of the age of the subject. Of the sixty-two subtopics in the story, the fourteen most frequently remembered verbatim are listed in Table 15.

TABLE 15

SUBTOPICS MOST FREQUENTLY REMEMBERED CORRECTLY FROM THE STORY

Subtopic Number	Subtopic	Frequency
2	went down to the river to hunt seals	7
3	and while they were there	2
5	Then they heard war-cries	3
9	and hid behind a log	9
14	and they said	2
15	"What do you think?"[7]	4
18	To make war on the people	4
22	they said	3
24	I might be killed	2
34	and many were killed	4
57	When the sun rose	3
58	he fell down	10
59	Something black came out of his mouth	33
62	He was dead	43

[6]See Figure 1, p. 52.

[7]One subject was responsible for all four occurrences.

Almost all of the subtopics frequently remembered verbatim were at the beginning or end of the story. It would appear that the principles governing the recall of items in a series apply here as they did in Experiment I.[8] One would expect first and last items of a series to be remembered most accurately and items just past the center of the series to be remembered least accurately. While few of the subtopics just past the mid-point of the story (subtopics 34 to 52) were remembered verbatim, there were five exceptions. It may also be noted that although subtopics 59 and 62 accounted for the bulk of phrases remembered correctly, subtopics 60 and 61 were <u>never</u> reproduced verbatim. Evidently factors in addition to position were operant in determining which subtopics were remembered correctly. The unpleasant nature of subtopics 59 and 62 precluded their explanation on a hedonic basis. Lewis[9] found that exact memory was directly dependent on the relevancy of the phrase to the whole selection. Henderson[10] believed exact memory of words was mostly accidental, and memory of such common phrases as "he said" in the present study might be attributed to chance. The one feature which most of the correctly remembered subtopics had in common was

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[8] See above, p. 45.

[9] F. H. Lewis, "Note on the Doctrine of Memory Traces," <u>Psychological Review</u>, XL (1933), p. 95.

[10] Henderson, <u>op. cit.</u>, p. 43.

strong emotion; the phrase either evoked such emotion or indicated it. Emotional connection, together with the position of the item in the series, and its essentiality to the whole story would appear to account for the perfect retention of certain items.

Subtopics Changed

Reproductions were analyzed qualitatively to determine whether the types of change found by Bartlett would be present in stories recalled by children or by subjects who were not tested repeatedly. Examples of conventionalization, simplification, assimilation, and emphasizing were found, as well as some changes for which no explanation was obvious.

Conventionalization. This type of change, sometimes called "normalization" or "object assimilation", is the tendency to transform a memory into a more familiar form. Changes toward the racial stereotype in Experiment I were examples of conventionalization. All groups of subjects produced examples of this type of deviation. Among the words and phrases which were altered in this way were the following: "hunting seals" was changed to "fishing"; "one night" at the beginning of the story became "one day"; "young men" was changed to "boys", especially by the seventh graders; "canoe" became "boat"; "war-party" was changed to "raiding party" and then to "hunting party". The ghosts were forgotten quickly or were never recalled, even though the title

"The War of the Ghosts" was used as a cue for recall at each testing. Subject 42 (a college male in Group B) produced this sequence of reproductions after the indicated intervals of time:

Original: I accompanied the ghosts and we went to fight.

30 minutes: . . . the fight with the Indians, how he fought the ghosts.

1 week: . . . the battle of the ghosts.

4 weeks: . . . encountering the tribe and fighting with them.

8 weeks: . . . fought these tribes.

Subject 105 (a seventh grade female in Group E) changed "two young men from Egulac went down the river to hunt seals" to "there were two men walking along the shore". Subject 30 (a college female in Group E) changed "We wish to take you along . . . to make war on the people" to "They wanted them to go to a dance or celebration with them".

Situations which impressed the subject as contradictory, such as hunting in a river were altered to a more familiar terminology. Situations alien to the modern American culture, such as the war-party, were changed into situations more common to this culture.

Simplification. This type of change has been reported by Gestalt psychologists in their experiments with abstract geometric figures, and designated as "leveling".[11]

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[11] See above, p. 6.

Simplification included summarizing, shortening of subtopics, and the dropping out of non-essential or redundant elements. It was present in all groups of subjects. Quotations were usually changed from direct to indirect, especially by college students. The children commonly simplified the two subtopics "they heard war-cries". . . and "they heard the noise of paddles" to "they heard a noise". The four subtopics "Quick let us go home . . . So the canoes went back to Egulac, and the young man went ashore, to his house" were summarized as "They (he) went back home". The man's quoted narrative about his adventures (subtopics 48 through 54) was summarized in a phrase such as "He told his friends (relatives) about it" or "He told his story". The elimination of time intervals in the story accompanied the dropping of details which had occurred in those intervals. Subject 119 (a seventh grade male in Group D) wrote "As soon as he got through with the story he fell over dead". Subject 25 (a college female in Group C) wrote "After telling his story, he fell over dead and black stuff came out of his mouth". "He fell down . . . He was dead" was often reproduced as "He fell down dead".

Assimilation. This process is said to occur when details of two geometric figures are combined to produce a new figure, which then replaces the two original figures. The process is equally applicable to experiments with prose selections. Henderson observed that the process was especially

characteristic of children: "The literalness and love of concrete in the child does not mean inability to generalize. It means inability to keep generalizations from absorbing each other."[12] In the present study, only one example of true assimilation by an adult was discovered. Subject 43 (a college female in Group B) produced this sequence of reproductions after the indicated intervals of time:

Original:	and saw one canoe coming up to them. There were five men in the canoe.
30 minutes:	Soon they saw a canoe that had five warriors in it.
1 week:	Canoes came down the river and there were five warriors in the first canoe.
4 weeks:	They saw five canoes coming.
8 weeks:	They saw five canoes coming.

Assimilation by children was found only in Group B, which may indicate that the process is associated only with repeated reproduction. Subject 156 (a seventh grade male) produced the following series of reproductions after the indicated intervals of time:

30 minutes:	One of the Indians had been hit but the Indian who was shot did not feel any pain.
1 week:	One of the Indians had been hit but the Indian said that he felt no pain.
4 weeks:	one of our men has been hit, then the Indian who was shot said I do not feel any pain.

[12]Henderson, op. cit., p. 81.

8 weeks: one of us has been hit . . . and he said I have not been shot.

Subject 160 (a seventh grade female) produced the following example of both assimilation and importation:

Original: two young men from Egulac went down to the river to hunt seals . . . There were five men in the canoe . . . We wish to take you along.

30 minutes: two young men were going seal hunting in Equa. Pretty soon they saw a young Indian Brave. Will you come with us they said.

1 week: There were two men in a boat. They met with a young Indian Brave . . . when they came by he jumped up and asked them where they were going. We are going to make war on some Indians. Do you want to go?

4 weeks: Almost identical with the one-week version.

8 weeks: Almost identical with the one-week version.

Emphasizing. Equivalent to the Gestalt term "sharpening", emphasizing refers to the retention and heightening of certain ideas above the original. The only certain example of emphasizing found was that of Subject 161 (a seventh grade female in Group B) who changed "fire" to "great fire" and then to "great bonfire" in her thirty minute and one week tests. The phrase remained "great bonfire" through the remaining two reproductions.

Unexplained Changes. All groups produced changes which did not appear to fit any of the previous classifications. Possibly they might be explained as examples of individualistic distortion due to the reconstructive nature of remembering. "Up the river" commonly became "down the river".

The phrase "When the sun rose", giving the time of the man's death, was changed in some cases to "When the sun set" or "in the evening", or "that night". Bartlett found the same tendency and attributed it to an association of death with the setting of the sun. However, since subjects often recalled the action as having occured during the day, "sunset" would have been a logical substitution for "sunrise". Subject 160 (a seventh grade female in Group B) produced this sequence of reproductions after the indicated intervals of time:

30 minutes:	some black stuff came out of his mouth and his face looked consorted.
1 week:	his face turned yellow, black stuff came out of his mouth.
4 weeks:	turned purple and black consorned from his mouth.
8 weeks:	black stuff came from his mouth.

Importation or Invention

When completely new ideas were introduced into reproductions, they seemed to serve one of two purposes. Either they served as connectives to hold the disjointed story together and give it more continuity, or they served as rationalizations, introduced to force the recalled ideas into consistency with each other and with the subject's frame of reference. Both categories of importations were numerous among all groups of subjects. A few importations appeared to be memories from some other context, which the subject

had confused with the stimulus story. The presence and usage of importation provides substantial evidence of the reconstructive nature of remembering. Importation might appear to be an example of the Gestalt concept of "closure" when it has as its purpose the creation of "good form" by filling gaps in the story. There are important differences, however. When a broken circle is "closed", it is completed with a predictable arc. The nature of the figure determines the pattern of closure; the closure is made of the same material as the figure, as it were. No such unanimity was observed in the importations used by subjects in the present experiment. The importations were not absolutely determined by the nature of the story. Illustrative examples follow, with the importations underlined:

Subject 35 (a college female):
the Indian was hit by an arrow but didn't fall. They got in the boat and returned.

Subject 31 (a college female):
One of them fell down, beating the earth and fire came out of his mouth.

Subject 126 (a seventh grade male):
The Indians asked them if they wouldn't come along. One of the two said yes . . . The other Indian was shot with an arrow . . . he began to tell the Indians about the strange war and before he finished he died.

Subject 102 (a seventh grade female):remembered only "fight", "ghosts" and the feeling of doubt expressed by the man who was hit. She reconstructed the story around those elements:

Some way or another two groups of ghosts came upon each other and began to fight. It didn't seem as though they could realize they were ghosts. One was brought

back to his home, and couldn't believe he was really a ghost.

Subject 105 (a seventh grade female):
The man then knew they were ghosts because he did not hurt.

Subject 125 (a seventh grade male):
and when they told the story to the town the people said that the boat and the people in it were ghosts from the last war and the boy was dead.

Subtopics 23, 24, and 25 are "I will not go along. I might be killed. My relatives do not know where I have gone." Subject 32 (a college female) rationalized these as follows: "One of the men said he couldn't go because he had a wife and family to take care of and couldn't afford to be killed." Subject 22 (a college female) treated the same part of the story in this manner: "No, because my family doesn't know where I am and they will worry. The second boy said he would go." Subject 20 (a college male) reproduced subtopics 15 through 47 as follows:

> The party asked which boy wanted to go and one volunteered and asked if they had arrows. He rode down the river with the party on the raid. When they were fighting the boy saw an arrow coming toward him--then all was blank. The story resumes when this Indian boy is at home telling his parents or relatives about the fight.

Movement of Details

Successive reproductions of the story were examined to locate any details which changed position in a consistent manner. Only one person, Subject 156 (a seventh grade boy in Group B), produced a series of stories in which a detail moved consistently. The word "fire" moved toward the first

of the story, changing its meaning as it did so. This subject's four reproductions are quoted below in full because they illustrate the movement of a detail, and because they contain an intriguing example of the invention of details to connect elements which were recalled.

Reproduction after 30 minutes:

Two white men went on a seal hunt and it was quiet and then they heard a noise and then a canoe came up the river and they asked them to join them. So one man did not want to go so he went back home and the others went on, and the people on the river were getting shot and so were the Indians. One of the Indians shouted out come, let us go home. One of the Indians had been hit, but the Indian who was shot did not feel any pain. Then he went into his tent and built a fire and went to sleep. The next morning the Indian woke up and a black piece of something fell out of his mouth and some one said the Indian was dead.

Reproduction after 1 week:

These men went out on a seal hunt and they came to this island and saw another man and they said we are going to make war on the people down the river and one man said I am not going then he said I would rather be at home by the fire in our home. So he went home and the others went out to make war on the people down the river. So when they began to fight the people on the shore were getting shot up then one of the Indians called out one of us has been hit. Let us go back home quickly. So they went back home and told that one of the Indians had been hit but the Indian said that he felt no pain. Then he went into his tepee to build a fire, then he laid down to go to sleep. Then the next morning the Indian got up and came out side then something black fell out of his mouth and then a woman said the Indian was dead.

Reproduction after 4 weeks:

There were four Indians in a boat and then they saw a fire light. So they went to the light and said we are going to make war on the people down the river. Do you want to help us? Then they said no then one of the Indians said I do not want to go. So the three Indians

took the other Indian home. Then they went to make war on the people. When they started fighting everyone was getting hit then one of the Indians stopped fighting. One of us has been hit. So they went home and said one of our men has been hit. Then the Indian who was shot said I don't feel any pain. So he went into his tepee and went to sleep. Then the next morning he awoke and when it was time to eat, an Indian woman came into the tepee and said are you ready to eat? Then as the Indian man said yes something black fell out of his mouth and then fell dead. Then the woman called out he is dead.

Reproduction after 8 weeks:

There were four men and they went in a canoe. Then the four men saw a campfire in the distance and one said let us see who it is. They went to see who it was. When they got there they said are you a fur trapper? Then the man said no. Then the other man said we are going to make war on the people down the river do you want to help us? Then the man said no. Then one of the other men said I want to go home so they took him home and came back to make war on the people down the river. When they began to fight one of the men said let us stop. One of us has been hit. So they took the man home and said I have not been shot. Then he went in to his bed room to lie down. When he awoke the next morning his wife walked into the room and said here is your breakfast. Then the man got up and then something black fell out of his mouth. He fell over and died. Then the woman screams out he is dead.

Summary of Results of Experiment II

In reproducing a story from memory, subjects who were tested repeatedly recalled more subtopics correctly than subjects tested only a single time. The age of the subjects did not affect the number of correct memories. Apparently the position of a subtopic in the story, its essentiality to the whole story, and its emotional tone were the principal factors that determined which subtopics were remembered verbatim.

The changes which occurred in subtopics were divided into four types. Conventionalization and simplification were found in the stories reproduced by adults and children, and by both repeated-reproduction and single-reproduction groups. Examples of assimilation occurred only in the repeated reproduction groups, and (with one exception) were found only in children's reproductions. Only one example of emphasizing (sharpening) was found. Certain changes which did not fit any of the four classifications were credited to differences in the subjects' frames of reference.

Importations or inventions appeared to have two closely related functions: (1) to connect the recalled items into a continuous, unified narrative, and (2) to rationalize the recalled items into consistency with each other and with the subject's frame of reference. A few importations seemed to have resulted from the confusion of the experimental story with some other narrative. Examples of importation were found among the reproductions of all groups of subjects. In his experiment, Bartlett found that some details were moved to an earlier position in the story. Only one example of such shifting was found in the present experiment.

CHAPTER V

SUMMARY AND CONCLUSIONS

Two experiments, suggested by Bartlett's work, were conducted in order to determine the influence of the factors of time, age, attitude, frequency of testing, and social norms upon the perception and remembering of photographs and meaningful prose material.

The same persons--53 University of Oklahoma undergraduates and 53 seventh grade pupils--were subjects for both experiments. Each set of 53 subjects was divided into successive-reproduction and single-reproduction groups, matched on the basis of Bogardus Ethnic Distance scores.

Five labeled photographs of men of different ethnic groups (Negro, Jew, Mexican, Chinese, and White American) were used as the stimulus material for Experiment I. An effort was made to select men of apparent equality in socio-economic level, who differed from the racial stereotype. Perception and recollection were tested with a test-sheet and a checklist. Rank-order non-parametric statistical procedures were used to test the significance of difference in results. In Experiment II, the same groups read and reproduced an Indian legend, "The War of the Ghosts".

The results of these experiments lead to the following conclusions:

1. Memory of pictures of men of different races is related in certain ways to the racial attitude of the subject. The null hypothesis is rejected.

a) Persons who differ in perception of skin color and in evaluation of the "kindness" of a pictured man, also differ in measured racial attitude. The relationships between the variables differ with the pictured race. When a subject's attitude toward a picture conflicts with a racial attitude, there is a strong tendency to change the memory of the former toward agreement with the latter. The hypothesis of no relationship between racial attitude, perception, and remembering, is rejected.

b) Persons who remember correctly the direction a pictured man is facing are more favorable toward his race than those who remember it incorrectly. The hypothesis of no difference in racial attitude between those remembering pictures accurately and those remembering them inaccurately is rejected.

2. Changes in details during the eight weeks of the experiment follow three deviation patterns, which can be described as stereotyped, circular, and delayed stereotyped. Continuous deviations are almost non-existent. Patterns

support the frame-of-reference theory of remembering rather than the Gestalt theory. The null hypothesis is rejected in part, in that patterns of stereotyping do exist, but continuous patterns are rare.

3. Subjects who were tested repeatedly retain pictorial and prose material more accurately than subjects tested a single time. The process of "assimilation" with prose materials occurs only in repeated testing groups. The hypothesis of nc difference in accuracy of memories or types of memory changes is rejected.

4. Children are less influenced by racial stereotypes than adults, both in perception and remembering. Their attitudinal frames of reference appear to be more fluid. Of the type of materials used in this study, adults excel only in remembering names of pictures in a sequence. The hypothesis of no difference between adults and children is rejected, but the differences are quite limited.

5. A tendency to change toward the racial stereotype is evident, especially with the picture of the Negro.

6. Memory of the order of sequence of a series follows the well-established laws concerning the remembering of members of any series. Serial position, essentiality to the whole, and emotional tone determine whether an idea will be retained accurately.

7. Conventionalization and simplification occur in the remembering of prose material, whether subjects are adults or

children, with both single and repeated testing. Importations are common, serving as a frame to bind details together and make them consistent.

Suggestions for Further Research

1. A similar experiment in which the order of sequence of the pictures was varied would determine whether the advantage held by the Negro's picture was due to the race, to its position in the series or to other reasons. Other conclusions drawn about changes in position could be checked similarly.

2. If the pictures were used without their racial labels, either allowing the subjects to guess at the race or verbally designating the race at the stimulus session only, the changes could be examined without the cue-value of racial label being a factor in remembering. In the present experiment, the racial aspect was deliberately emphasized by use of the racial name as a cue; it is thus not purely a reproduction experiment.

3. The procedure of Carmichael, Hogan, and Walter[1] could be adapted to the pictures used here as stimuli. By assigning different race-names to a picture when it was shown to different groups, the experimenter could partially eliminate the influence of such factors as the age and appearance of the pictured man.

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[1]L. Carmichael, H. P. Hogan, and A. A. Walter, "An Experimental Study of the Effect of Language on the Reproduction of Visually Perceived Form," Journal of Experimental Psychology, XV (1932), pp. 73-86.

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APPENDIX A

ETHNIC DISTANCE SCALE

APPENDIX A

ETHNIC DISTANCE SCALE (1st ed. 1925; 9th, 1954) E. S. Bogardus
(Ethnic is used here largely in the cultural sense.)

1. To keep Scale anonymous, do not sign name, but give yourself as much freedom as possible; use only check marks.
2. Please give your first feeling reactions in every case.
3. Give your feeling reactions to each ethnic group in terms of the chief picture or stereotype you have of the entire group. Mark the 10 groups indicated.
4. Check as many of 7 columns in each case as your feelings dictate.
5. Work as rapidly as possible.

	1. Would marry into group	2. Would have as close friends	3. Would have as next door neighbors	4. Would work in same office	5. Have as speaking acquaintances only	6. Have as visitors only to my nation	7. Would debar from my nation
Armenians							
Americans (U.S.White)							
Canadians							
Chinese							
Czechs							
English							
Filipinos							
Finns							
French							
Germans							
Hollanders							
Indians (American)							
Indians (of India)							
Irish							
Italians							
Japanese							

	1. Would marry into group	2. Would have as close friends	3. Would have as next door neighbors	4. Would work in same office	5. Have as speaking acquaintances only	6. Have as visitors only to my nation	7. Would debar from my nation
Japanese Americans							
Jews							
Koreans							
Mexicans							
Mexican Americans							
Negroes							
Norwegians							
Poles							
Russians							
Scots							
Spanish							
Swedish							
Turks							

APPENDIX B

PICTURES

1

Negro




Jew


3
AMERICAN

4

CHINESE




5
WHITE AMERICAN

APPENDIX C

STORY

APPENDIX C

The War of the Ghosts

One night two young men from Egulac
sent down the river to hunt seals,
and while they were there
it became foggy and calm.
Then they heard war-cries,
and they thought:
"Maybe this is a war-party".
They escaped to the shore,
and hid behind a log.
Now canoes came up
and they heard the noise of paddles,
and saw one canoe coming up to them.
There were 5 men in the canoe,
and they said:
"What do you think?
We wish to take you along.
We are going up the river
to make war on the people."
One of the young men said:
"I have no arrows".
"Arrows are in the canoe",
they said.
"I will not go along.
I might be killed.
My relatives do not know where I have gone.
But you may go with them"
he said, turning to the other.
So one of the young men went
But the other returned home.
And the warriors went on up the river
to a town on the other side of Kalama.
The people came down to the water
and they began to fight,
and many were killed.
But presently the young man heard
one of the warriors say:
"Quick, let us go home;
that Indian has been hit".
Now he thought:
"Oh, they are ghosts".

41. He did not feel sick
42. but they said
43. he had been shot.
44. So the canoes went back to Egulac,
45. and the young man went ashore
46. to his house,
47. and made a fire.
48. He told everybody and said:
49. "Behold I accompanied the ghosts,
50. and we went to fight.
51. Many of our fellows were killed,
52. and many of those who attacked us were killed.
53. They said I was hit,
54. and I did not feel sick."
55. He told it all,
56. and then he became quiet.
57. When the sun rose,
58. he fell down.
59. Something black came out of his mouth.
60. His face became contorted.
61. The people jumped up and cried.
62. He was dead.

328 words 62 subtopics

APPENDIX D

TEST-SHEET ON PICTURES

TEST-SHEET ON PICTURES

DIRECTIONS: Do you remember the 5 pictures of men I showed you? Please describe them very briefly on this sheet as you remember them. If you can remember which came first, second, third, fourth, and fifth, list them that way. If not, write them down as you remember them.

☐ FIRST PICTURE
Word typed at top of picture_____

Describe him:

☐ SECOND PICTURE
Word typed at top of picture_____

Describe him:

☐ THIRD PICTURE
Word typed at top of picture_____

Describe him:

☐ FOURTH PICTURE
Word typed at top of picture_____

Describe him:

☐ FIFTH PICTURE
Word typed at top of picture_____

Describe him:

PUT AN X IN THE BOX BY THE ONE WHICH IS CLEAREST IN YOUR MEMORY

APPENDIX E

SPECIMEN PAGE FROM CHECKLIST

SPECIMEN PAGE FROM CHECKLIST

Word at top of picture: NEGRO Picture number 1

1. He is looking
__to your left__toward you__to your right__up__down_____

2. His hair is
__straight__wavy__curly__kinky__covered__partly by hat bald_____

3. The color of his skin seems to be
__very light__light__average__dark__very dark_____

4. His nose is
__straight__curved__long__short__wide_____

5. His lips are
__very thin__thin__medium__thick__very thick_____

6. He seems to be
__very rich__richer__avg.__poorer__very poor_____
than avg. than avg.

7. He appears to be
__very kind__kind__neither__unkind__vicious_____

8. How do you feel about him as a person? (Check all that apply to him.)
__I would not object to a member of my family marrying him.
__I would have him as a close friend.
__I would have him as a nextdoor neighbor.
__I would work in the same office with him.
__I would have him only as a speaking aquaintance.
__I would eat with him in a restaurant.
I would have him as a guest in my home__alone__with my friends.
I would be seen in public with him__alone__with my friends.

9. What would you guess his job to be?_____

10. Describe his clothes. He is wearing_____

11. Tell any other details that you notice about his hands, eyes, mustache, handkerchief, pencils, glasses, hat, jewelry, the background of the picture, etc:

APPENDIX F

TABLE 16

APPENDIX F

TABLE 16

PERCENTAGE OF ADULTS WHO DEVIATED FROM PERCEPTIONS ON ITEMS 1 - 8 OF CHECKLIST

Item	Group	Negro			Jew			Mexican			Chinese			W. Amer.		
1	CDE	0	25	33	25	8	42	17	25	22	8	8	22	8	42	22
	A	10	30	35	5	15	30	30	35	35	35	30	40	25	25	40
2	CDE	17	33	56	42	42	22	33	25	33	50	33	45	42	42	56
	A	30	25	35	30	20	35	35	40	50	25	20	15	30	35	45
3	CDE	8	33	33	8	42	67	17	25	22	33	75	22	50	92	56
	A	35	25	30	50	50	50	60	60	50	65	75	70	70	50	55
4	CDE	50	75	67	42	83	67	50	58	17	75	58	67	42	58	45
	A	20	35	55	40	55	70	45	45	50	60	70	70	35	25	55
5	CDE	25	25	45	42	67	33	42	67	67	17	50	33	42	75	67
	A	35	35	15	45	30	55	45	55	45	55	70	55	45	50	50
6	CDE	33	42	0	8	50	33	25	58	25	33	17	56	25	58	67
	A	30	35	25	40	25	25	25	58	40	30	45	55	20	15	30
7	CDE	33	42	22	42	58	56	33	58	67	8	42	22	33	83	67
	A	40	35	40	25	45	45	40	35	30	25	55	45	45	45	50
8	CDE	25	42	56	33	42	45	25	50	89	33	17	33	8	0	22
	A	15	35	40	35	50	45	50	70	65	50	50	45	45	35	45

APPENDIX G

TABLES OF RAW DATA

TABLES OF RAW DATA

The tables which follow comprise the responses made to Items 1 to 8 of the checklist, first by the college subjects, then by the seventh grade subjects. The data are organized by experimental groups (A, C, D, and E), and within the experimental groups by name of picture (Negro, Jew, Mexican, Chinese, and White American).

The first column lists the subjects by numerical designators. The next column lists the Bogardus Ethnic Distance Score which the subjects assigned to the pictured man's ethnic group. The other eight columns correspond to Items 1 to 8 of the checklist.

Except in Item 1, the first number in each cell of the table indicates the perceptual response, and the numbers which follow it indicate test responses. (Group A was tested three times.) One number placed above another indicates that two responses were checked, while an "n" shows that no response was checked. If only one number is given, perceptual and test responses were identical.

The code listed on the following page was used in recording the data.

Item 1 (direction of facing):
The letters show how each test response compared with the perceptual response:
(s) Test response was the same as the perceptual response.
(w) Test response was changed from percept, and was wrong.
(r) Test response was changed from percept, but was still right.

Item 2 (hair):
(1) straight, (2) wavy, (3) curly, (4) kinky, (5) covered by hat, (6) partly bald.

Item 3 (color of skin):
(1) very light, (2) light, (3) average, (4) dark, (5) very dark.

Item 4 (nose):
(1) straight, (2) curved, (3) long, (4) short, (5) wide.

Item 5 (lips):
(1) very thin, (2) thin, (3) medium, (4) thick, (5) very thick.

Item 6 (apparent wealth):
(1) very rich, (2) richer than average, (3) average, (4) poorer than average, (5) very poor.

Item 7 (kindness):
(1) very kind, (2) kind, (3) neither, (4) unkind, (5) vicious.

Item 8 (subject's feeling about the man):
The number indicates the most favorable phrase selected from among the following:
(1) I would not object to a member of my family marrying him.
(2) I would have him as a close friend.
(3) I would have him as a nextdoor neighbor.
(4) I would work in the same office with him.
(5) I would have him only as a speaking acquaintance.

COLLEGE GROUP A

Subj.	Bog. Negro	Items 1	2	3	4	5	6	7	8
39	5	sss	4	2324	5522	4344	2333	2	5
40	3	sss	4343	4	5544	2333	2332	3	3
42	2	sss	4	2	444n 11	3343	2	3222	2
43	4	sss	4344	3334	3333	4	4	4333	4
47	2	www	4	3444	5553	3334	2	3	3nn2
50	2	sww	4221	2	5551	3233	3323	2232	1
51	5	sss	4	4333	5	3322	2322	3	4
52	2	sss	4	4	4	2	2	2	2
56	4	sww	4	4	4544	2111	4	3	n5n4
57	2	sww	4	2433	1355 222	4	3	2	2246
58	4	sss	4332	4424	4442	4333	3	3322	4
59	2	sss	4233	4443	1	3	3	3222	2
60	4	sss	4443	3	5 4	3	3332	3	3
62	5	sss	4	4	5	2233	2	2	nn54
63	6	sww	4	5444	5	4	3233	3233	6656
65	4	ssw	4121	4222	5222	2322	2333	2323	n443
68	2	sss	4	4333	5111	3	3323	3222	2211
69	2	sss	4	3343	2255 44	2444	3344	3	33nn
71	5	ssr	4433	4423	5555	3343	2333	2122	4445
73	4	www	4	4	1112	4	3	3222	4

COLLEGE GROUP A

Subj.	Bog. Jew		Items 1	2	3	4	5	6	7	8
39	1	ssr	2121	1222	1	3112	3	3331	3211	
40	2	sss	2226	2322	3444	2223	3	3322	n311	
42	2	sss	6	1222	111n	1222	3	2	2	
43	3	ssw	6	2333	3332	2333	3232	3	2232	
47	1	rrr	6312	1233	3113	4333	1	1332	2nn1	
50	1	rrr	6	3323	1	3222	3444	1	1	
51	3	rrr	6	2233	3323	1322	3444	2332	nn23	
52	2	srs	6	2	3111	2	3	2	2212	
56	3	srr	6	2	2223	2232	4	1	3232	
57	2	sss	6	2322	3331	1233	2	2	2	
58	3	sww	6	3222	3312	2	2122	2233	3	
59	2	rrr	6	3	1431	1322	3233	2233	2	
60	3	wss	6222	2333	2111	3	3	2333	1321	
62	2	rrr	6	2223	3311	2	4222	3	nn46	
63	2	ssr	1	2343	1133	3332	2333	2233	2122	
65	3	rrr	6663	2	1113	2	3233	3	4534	
68	2	ssw	6244	2333	2	3	3	2122	2211	
69	1	srr	6	2	3111	1322	4	2223	1	
71	2	sww	2	2	31n3	2	2232	1222	2224	
73	5	sww	6111	3	3232	2	2	3	3nn4	

COLLEGE GROUP A

Subj.	Bog. Mexican	Items 1	2	3	4	5	6	7	8
39	1	sss	2	3212	1222	4454	1211	2	2211
40	3	sss	2221	3443	1111	3322	2	3	n312
42	2	ssw	2223	1222	111n	333n	1122	2	2
43	5	srr	2	2333	1331	3	2	3	1222
47	2	wss	2322	4222	5314	3323	1222	2223	1nn2
50	2	srr	3211	3223	1	43nn	2212	2333	2
51	4	rrr	2	3232	1	3	2	3443	nn32
52	2	rrr	2	4	1	4222	2	2	2
56	4	snn	21nn	43nn	21nn	43nn	22nn	33nn	45n4
57	2	rrr	2663	4334	1515	3	2333	2322	2
58	3	www	2233	4433	5554	4343	1212	4333	3322
59	2	wws	2	4344	2314	3233	2223	3344	3232
60	5	sss	2	3	1	3	2332	3	1222
62	4	rrr	3	4343	1	4333	2	3	nn21
63	5	rrr	2112	4	3113	2233	2333	3233	225n
65	5	snw	2116	2	3221	4322	3	3	n533
68	2	www	2	3	1	3322	2	3212	1211
69	2	www	2	2232	5431	3	2	2	11nn
71	2	rrr	3222	2333	1	4322	1222	2	1233
73	5	www	2211	2232	1112	3223	2	3444	43n4

COLLEGE GROUP A

Subj.	Bog. Chinese	Items 1	2	3	4	5	6	7	8
39	1	rrr	2211	1113	2322	3222	2333	433n	2n11
40	2	www	1	3222	441n	3122	2	3	n311
42	2	sss	1	2244	444n	333n	1112	2	2
43	2	sss	1	3	5541	4333	3	2n33	2
47	3	www	1	3222	4414	3323	1222	3	2nnn
50	2	sss	1	3222	5111	2232	2223	2221	2
51	2	sss	2122	3222	4114	3323	2233	2	nn23
52	2	rrr	1	2	4111	2	23n2	3222	2
56	5	nnn	21nn	33nn	5nnn	12nn	33nn	33nn	5
57	2	sss	1626	3212	4311	2	33n3	332n	2
58	3	www	1	3222	5234	2333	2333	3	3
59	2	www	1	4323	4123	3222	2233	3223	2
60	3	sww	1	4333	1114	3	2333	2333	2322
62	5	sss	1	4333	4111	3222	2	3	nn24
63	5	www	1	5444	5335	2333	3	4333	5455
65	3	ssr	1216	2	4445	3323	3332	2211	n422
68	2	rrr	1	34nn	1	2322	3	2	2n12
69	2	ssw	1	3121	4	1121	2	33nn	1nnn
71	6	rrr	2112	4223	5114	2123	2323	3322	3n44
73	4	www	1	3322	2111	1333	2232	2	2nn3

COLLEGE GROUP A

Subj.	Bog. American	Items 1	2	3	4	5	6	7	8
39	1	ssw	1622	1212	1114	2	2333	3354	1
40	1	sww	1222	1232	1	2332	2	2333	n111
42	1	sss	1nn2	2	111n	333n	2333	2	1
43	1	sss	1211	3	1311	2333	1221	1211	1
47	1	sww	1	3232	1113	1	2	3233	2nn1
50	1	ssr	1	3222	1	2232	3	2	1211
51	1	sss	1	2333	1	3233	2	2333	nn12
52	1	sss	122n	3222	1	2	2	1	1212
56	1	rrr	1	3	1113	1121	2	2131	1
57	1	asw	1112	2322	1	2333	2	2	1
58	1	www	1122	1222	3111	3	3	2	1
59	1	www	1121	3233	3111	2333	3	2233	21n1
60	1	www	1161	2333	1	2333	2223	2333	1
62	1	sss	1	2	3111	3222	1112	2121	nn11
63	1	www	1	2122	4111	3	2	1	1
65	1	sss	1621	3	4443	1223	3	2	n2n1
68	1	sww	1112	2333	1	2323	2323	2111	1211
69	1	sss	1	2111	1131	3332	2	2233	1nnn
71	1	rrr	1112	2232	1	2233	2211	2111	1
73	1	srr	1112	1222	1212	3	2	2	1nnn

COLLEGE GROUP C	Subj.	Bog.	1	2	3	4	5	6	7	8
Negro	1	4	s	41	3	33 4	32	3	3	4
	4	5	s	4	4	5 3	3	3	3	5
	6	2	s	4	4	5	3	23	2	2
	9	5	s	4	4	5 4	34	34	2	3n
	11	2	s	4	2	25 1	3	12	21	2
	13	5	s	43	4	55	2	3	23	4
	17	3	s	4	4	5 2	3	3	32	4
	18	4	s	4	4	4	4	3	2	34
	20	2	s	4	3	24	3	2	2	2
	22	2	s	4	43	21	32	32	23	2
	25	5	s	4	4	5	3	3	2	65
	32	4	s	4	4	15	3	3	2	4
Jew	1	4	w	6	2	3	23	2	23	23
	4	2	s	16 1	2	1 1	3	3	2	23
	6	3	w	6	2	35 1	32	3	1	2
	9	3	r	23	3	33 1	3	4	32	23
	11	2	n	21 1	3	31 1	3	3	21	1
	13	2	w	6	3	3	12	3	3	2
	17	2	s	6 1	2	1 21	32	2	23	3
	18	1	s	6	3	33 1	3	3	2	1
	20	2	r	32	2	33	23	34	2	2
	22	2	s	2	2	1	21	2	1	12
	25	4	r	6 3	2	3	32	2	3	2
	32	2	r	6	23	1	2	2	12	2

COLLEGE GROUP C	Subj.	Bog.	1	2	3	4	5	6	7	8
Mexican	1	4	r	24	n3	31	4	1	3	1
	4	4	r	2	3	1 3	3	12	3	2
	6	5	s	2	4	51 11	24	1	32	3
	9	4	r	32	4	34 1	3	2	4	3
	11	2	s	23	3	3 1	43	12	51	1
	13	2	r	3	4	5 1	3	2	3	24
	17	5	s	2	3	5	3	2	32	23
	18	1	w	2	34	51 1	43	2	3	1
	20	2	w	2	3	13 1	23	12	32	2
	22	5	s	2	32	5	3	2	3	4
	25	2	r	21 2	3	31 4	23	2	3	32
	32	3	s	3	4	54	3	2	3	3
Chinese	1	4	s	2	3	1	2	32	2	2
	4	4	r	1	3	4 4	3	3	3	4
	6	2	s	21	42	14 4	21	3	2	2
	9	3	w	2	3	52 4	2	3	3	34
	11	1	r	1	32	51 4	2	32	2	21
	13	2	r	1	3	5n	2	3	3	2
	17	6	r	21	32	4 14	2	3	3	34
	18	3	s	2	4	55	3	2	3	1
	20	2	r	1	3	4	2	32	32	2
	22	2	r	21	2	21 1	2	32	3	2
	25	2	r	1	43	41 4	32	3	3	42
	32	2	s	21	3	51	3	3	3	3

COLLEGE GROUP C	Subj.	Bog.	1	2	3	4	5	6	7	8
W.Amer.	1	1	s	1	24	13	3	3	12	1
	4	1	s	1	23	1	3	2	2	1
	6	1	s	12	2	12	1	2	21	1
	9	1	r	1	2	14	23	21	1	1
	11	1	s	12	23	1	3	2	2	1
	13	1	s	1n	1	1n	2n	3	3	1
	17	1	s	1	23	1	23	2	2	2
	18	1	s	1	2	12	23	3	2	1
	20	1	r	12	12	143	3	12	2	12
	22	1	w	1	32	1	2	32	23	1
	25	1	s	1	2	1	2	3	2	1
	32	1	s	12	2	1	12	3	23	2
COLLEGE GROUP D Negro	2	4	w	4	4	453	3	3	3	4
	3	2	s	4	24	25	3	3	21	2
	8	3	w	4	34	25	4	3	3	4
	10	5	s	4	1	5	43	23	31	5
	12	5	s	4	4	45	4	23	3	5
	14	3	s	46	4	554	34	34	1	32
	15	5	w	4	4	254	3	3	21	45
	16	2	s	43	43	1	3	3	2	2
	19	5	s	4	4	153	4	32	3	45
	21	2	w	42	4	25	4	3	23	3
	24	5	s	43	45	45	45	32	32	32
	26	3	s	4	2	2	3	3	2	23

COLLEGE GROUP D	Subj.	Bog.	1	2	3	4	5	6	7	8
Jew	2	3	r	63	2	12 3	23	4	3	2
	3	2	r	6	23	12 2	3	21	23	2
	8	1	r	62	2	33	2	43	23	31
	10	3	w	61	1	13	23	32	2	32
	12	3	r	6	23	13	32	3	23	32
	14	2	r	6	3	13	31	24	34	2
	15	3	r	63	23	12	3	2	3	23
	16	2	r	6	2	1	32	3	12	2
	19	2	r	6	3	31 2	2	2	12	2
	21	2	s	6	2	13	32	3	3	2
	24	5	s	62	14	13	24	12	23	3
	26	2	s	6	23	1	23	23	2	32
Mexican	2	4	n	2	2	3 1	43	2	43	54
	3	2	r	2	3	3 1	43	21	3	2
	8	3	r	2	3	51 1	4	12	54	3
	10	4	r	2	13	31	32	13	3	24
	12	4	s	23	4	14	42	13	3	24
	14	2	r	2	23	1 12	3	2	43	12
	15	5	w	21	3	54	42	2	43	54
	16	2	r	32	3	1	3	2	2	1
	19	5	r	2	4	1	43	12	42	3
	21	2	s	2	34	41	43	12	3	1
	24	5	w	2	4	14	32	23	42	42
	26	3	r	2	3	14	3	2	32	3

COLLEGE GROUP D	Subj.	Bog.	1	2	3	4	5	6	7	8
Chinese	2	2	r	1	31	1 4	32	3	3	1
	3	2	r	1	31	54 4	2	3	2	1
	8	4	r	1	3	51	23	2	3	54
	10	3	s	2	1	21	32	21	3	43
	12	4	w	21	43	42	2	3	23	3
	14	2	r	1	42	1 4 5	2	3	32	2
	15	3	r	1	31	4	2	3	21	4
	16	2	s	21	43	1 4	32	32	2	2
	19	3	s	1	31	5	31	3	2	3
	21	2	s	1	3	41	31	3	32	2
	24	4	r	21	42	24	3	2	21	2
	26	3	r	12	31	24	2	3	2	3
W.Amer.	2	1	w	1	21	31	2	2	23	1
	3	1	r	16	23	12	21	12	2	1
	8	1	w	1	2n	1n	2n	3n	2n	1
	10	1	w	1	13	1	21	23	32	2
	12	1	w	12	23	1 1	3	23	12	1
	14	1	s	16	23	13	3	2	23	1
	15	1	s	12	2	13	21	2	21	1
	16	1	s	12	23	1	21	3	12	1
	19	1	s	1	12	13	21	23	12	1
	21	1	s	1	23	1	21	21	2	1
	24	1	w	1	23	1	21	2	12	1
	26	1	n	1n	3n	1n	2n	3n	2n	1n

COLLEGE GROUP E	Subj.	Bog.	1	2	3	4	5	6	7	8
Negro	23	4	s	43	43	54	3	3	2	34
	27	5	s	4	3	43	3	3	21	32
	28	4	w	4n	3	5	34	3	2	43
	29	5	w	43	34	25	3	3	3	4
	30	2	s	4	4	25	34	3	2	32
	31	2	w	43	3	15	3	2	42	3
	33	1	s	4	4	4 1	34	3	2	4
	34	4	s	4	4	5	23	3	2	4
	35	2	s	43	43	42	3	3	3	32
Jew	23	2	r	61	23	31 2	2	3	2	2
	27	1	r	3	23	33	23	23	21	1
	28	2	r	6	23	23	32	3	3	32
	29	4	w	6	2	3 2	3	3	3	1n
	30	2	w	6	2	13	2	2	21	2
	31	3	w	2	2	1	2	3	2	1
	33	1	w	61	23	1	23	23	23	4
	34	2	s	1	32	13	2	23	13	24
	35	2	w	6	23	32 1	3	3	23	2

COLLEGE GROUP E	Subj.	Bog.	1	2	3	4	5	6	7	8
Mexican	23	3	r	21	3	2	32	2	2	34
	27	1	r	32	3	32	43	1	43	61
	28	3	r	2	43	4	4	2	32	21
	29	5	w	2	3	1n 1	4	1	2	12
	30	2	r	2	3	5	34	21	3	32
	31	5	r	2	3	1	34	1	35	43
	33	1	r	23	3	15 1	3	23	2n	24
	34	4	r	2	43	3 1	43	12	43	4
	35	2	w	2	3	5	32	1	32	21
Chinese	23	3	r	1	3	41 4	2	3	2	33
	27	6	r	1	32	54	1	3	53	65
	28	5	n	1	4	4	3	3	3	42
	29	4	r	21	32	2	2	34	3	4
	30	2	r	21	3	21	32	32	3	2
	31	2	r	21	4	1	3	21	32	1
	33	1	w	21	2	41 4	32	3	2	4
	34	4	r	1	3	54	32	34	2	4
	35	2	s	1	3	24	2	32	3	21

COLLEGE GROUP E	Subj.	Bog.	1	2	3	4	5	6	7	8
W.Amer.	23	1	s	16	32	41	12	2	2	1
	27	1	n	1n	2	1n	3	3n	3n	1
	28	1	r	1n	23	1n	2n	3n	12	1
	29	1	n	1n	2	3n	2n	2n	3n	1
	30	1	s	1	2	1	2	3	3	1
	31	1	s	1	32	1	13	23	32	1
	33	1	s	2	3	1	3	32	23	1
	34	1	s	1	12	1	32	23	12	12
	35	1	s	1	32	4	23	2	2	21

SEVENTH GRADE GROUP A

Subj. Negro	Bog.	Items 1	2	3	4	5	6	7	8
141	2	sss	4122	3	2222 4311 1551	2433	2333	3233	3
142	2	rss	4443	3222	4433	2	2	3223	2
144	2	sss	4312	4	1513	4443	3	3	2n33
145	4	sss	4	4	2244 4445	3	3	3443	1444
146	3	sss	4	4	2222 44	4443	4	3	3444
149	3	sss	4	4	5545 44	4333	3	3323	3
150	4	sss	4443	3322	2222 4443	2333	2333	3233	4433
151	4	sss	4	4	1111 5	2444	3	3222	4
152	4	sss	4	4	1 2434	2444	3323	3	3
153	4	rss	4	4	5555	3454	3	3443	4
154	3	sss	4	4	2242 4 34	4	3222	3323	1222
155	2	sss	4	4333	2155 2	3	3	2	2
156	2	ssw	4	4	3511 42	4333	1333	2323	n44n
157	3	www	3334 33	3424	5322	3443	2233	4333	3
158	5	sss	3444	3	5511	3	2334	4333	3344
160	2	sss	4	4	4 4	3444	2322	3	5235
161	3	sss	4 23	1222	5 4	4433	3	3334	4345
162	5	sss	4432	5554	5 4 44	4344	3332	2	4
164	4	sws	3441	4	5355	1333	2212	4222	5442
165	2	rss	4	3343	5525	4333	3	3	2122

SEVENTH GRADE GROUP A

Subj.	Bog. Jew		Items 1	2	3	4	5	6	7	8
141	3	sww	11 6624	1233		1 1433	3443	3323	2343	3
142	2	sss	1 6	2		1114 3333	3	4555	1	2121
144	3	sss	6123	3		3142	3	3332	3223	2
145	2	ssw	6	3322		3332	3	3344	1	1
146	2	snn	111 6661	3222		11 33n1	3	2	22n3	2333
149	2	sss	1 6666	3		1131	3	2233	2333	1222
150	2	sww	6	1232		1311	3222	3322	21n1	1
151	2	www	11 6621	2		3111	2	3	2	2
152	6	sss	6126	2333		3111	2332	2333	2313	1222
153	1	ssw	1 6666	2223		5 3113	2333	3222	1212	1
154	2	sss	6	2		1121	3322	4555	2111	1
155	1	www	6	3		5 1 1434	2333	3	2	2111
156	2	rsr	6644	3		4	2333	3	2223	54nn
157	1	rrr	2 3 6662	2233		1313	3	3332	1222	1
158	6	ssw	2 6326	2333		1	3	3444	2323	1
160	2	srr	6	3232		1311	2233	3	1	1112
161	2	rrr	6	3322		111 4443	3222	3	2	1
162	2	ssr	6112	3322		5 4444	3	2	1223	1
164	2	rss	6	2322		15 4412	4222	4445	3233	5242
165	2	rrr	6	1222		3311	1222	2	4433	2122

SEVENTH GRADE GROUP A

Subj.	Bog. Mexican	Items 1	2	3	4	5	6	7	8
141	2	www	3241	4333	2242 3	3343	2	5541	3nn2
142	3	wsw	2	3322	513n	3232	2223	2445	1n5n
144	2	rrr	4332	4343	5322	5343	2	4222	2
145	2	srr	2223	3	3324	3	2	4333	1
146	2	www	2	4	31nn	4333	2	3	1333
149	2	sss	2	4	3121	3	2	3	1333
150	4	wss	3222	4	2114	3	2111	4323	3211
151	2	www	3112	1332	1312	4323	3	2323	2
152	1	wsw	2223	3	3414	3	2332	3232	2111
153	1	www	3232	3334	1133	4433	1	5111	1111
154	2	rrr	2	3344	5115 11	3344	2112	4445	121n
155	2	ssr	2	3	5531	3	2233	2	1
156	2	www	2444	4442	1455	3	3	1n33	1242
157	1	www	2	3	1214	3	2	3233	1113
158	4	sww	2221	3	1	3	1222	3222	1
160	2	sss	2	4433	2111 3 1	4333	2233	3332	1112
161	3	srr	2	4433	5224	44n5	2	4334	2111
162	2	sss	2223	4	14n4 11	3323	1211	21n1	1
164	2	rrs	2214	3324	5323	3324	2232	5	555n
165	2	www	2	3	1n43	3323	1112	5n33	3322

SEVENTH GRADE GROUP A

Subj.	Bog. Chinese	1	2	3	4	5	6	7	8
141	2	rww	2133	3	5414 32 53	2333	2213	3	3
142	2	rrr	1222	3212	411n	2	3322	2	2211
144	2	ssw	2111	4333	1124	3223	2	2	3444
145	2	rrr	1	4334	2244 2	2323	3	3	534n
146	2	srr	1222	4434	41n2	3	3	1122	3
149	3	sss	1	4	4414	3233	3	3233	3
150	2	sss	1	2221	5244	3221	3332	3222	3222
151	4	wrw	1	4243	5113 5	2223	1213	1222	2444
152	5	ssw	1112	4443	4324 2	2223	1131	3222	3112
153	2	ssw	2212	1121	4444	3331	2232	1122	1112
154	2	ssr	2132	4343	1331 143	1212	3323	3	4111
155	2	wrw	2	3	5554 2 4	3	3223	2	1
156	3	ssw	1523	2334	5335 15	3332	3	2233	1242
157	3	www	2412	3223	4432 1	3	22nn	53n3	3223
158	6	sww	2	3	4111 55	3	2212	3323	3111
160	2	wws	1	4	4422 21	2	2232	3322	1211
161	3	ssw	1	2	3332	2	3	211n	2133
162	5	sss	1322	4344	4 1 3	2	2111	2	1
164	2	www	1233	4323	4111	1333	2nn3	3n23	22nn
165	2	ssw	2	3332	5334	3332	1121	333n	2121

SEVENTH GRADE GROUP A

Subj.	Bog. American		Items 1	2	3	4	5	6	7	8
141	1	rrr	1 2262	3		44 3123	3	1222	2nn3	1112
142	1	sss	1 1121	3		3 4 1411	3	3	2	1
144	1	www	2	3		4412	3	2111	1	1
145	1	rww	112n	2		2344	3	1212	2233	1
146	1	sss	1112	2322		4 15n1	3	3	1222	1333
149	1	rrr	1	2		3444	2	3	2	1333
150	1	sss	1112	3		4222	4	1232	1212	1
151	1	sss	1116	3123		3113	2223	3	1112	2
152	1	srr	1616	3		1	3323	2223	2323	1
153	1	swr	2221	2233		3343	3	1132	1121	1
154	1	sww	1	32nn		3111	1333	1231	2232	1
155	1	rsr	2	3		131 1555	3	2122	2	1
156	1	sss	2554	3213		1444	3	3	1223	2111
157	1	www	1366	3		33 1522	3	1332	1222	1
158	1	sns	1	3		2111	3	1223	1221	1
160	1	sss	1211	2332		1	2223	1222	3322	1
161	1	sss	1222	3332		1 1 3n33	2322	232n	2	1
162	1	wwr	2	3222		4 4 3333	3n22	1311	2311	1
164	1	sww	1324	3324		4 1424	1433	3n22	2344	221n
165	1	ssw	1	2		1213	2233	2	3	1121

SEVENTH GROUP C	Subj.	Bog.	1	2	3	4	5	6	7	8
Negro	100	5	w	3	4	53 4	4	23	23	45
	101	5	s	4	4	55	4	3	2	2
	103	2	s	3	34	2 4	3	23	2	2
	104	2	s	3	23	51 4	42	3	12	2
	106	4	s	4	4	5	3	3	3	24
	107	2	s	4	2	51	42	3	3	2
	108	2	w	4	4	2 4	4	3	2	2
	112	3	r	4	4	55	2	3	2	31
	113	2	s	3	34	2	34	32	21	2
	115	n	s	34	43	24	23	3	32	nn
	143	7	s	43	34	5 4	3	43	3	54
	163	4	r	4	45	2	42	12	5	n
Jew	100	6	w	63	34	35	3	32	24	5
	101	3	w	6	3	21	3	3	2	2
	103	1	w	6	23	13 1	3	34	23	21
	104	2	s	62	12	4 21	23	3	2	2
	106	1	w	62	12	35	3	32	3	1
	107	1	s	6	2	1 2	3	2	12	1
	108	1	s	6	3	32 4	23	43	12	12
	112	1	s	61	23	5	23	34	1	1
	113	2	s	6	2	2	2	23	1	12
	115	2	s	62	3	32	3	3	2	23
	143	3	s	15	3	3 1	43	32	23	3
	163	2	s	6	32	32	42	51	43	5n

SEVENTH GROUP C	Subj.	Bog.	1	2	3	4	5	6	7	8
Mexican	100	6	w	2	4	34	3	13	43	54
	101	6	w	32	3	51	3	2	3	2
	103	2	r	2	3	52 1	43	32	3	21
	104	2	w	21	13	3	3	3	2	1
	106	6	r	32	2	1	3	13	43	12
	107	1	r	2	32	1	3	2	1	1
	108	1	w	2	3	13 4	3	3	3	1
	112	1	s	23	34	5	43	2	2	1
	113	2	r	2	4	52	4	1	4	12
	115	2	r	23	3	14 24	3	23	2	2
	143	2	s	2	4	35	24	2	4	3
	163	3	w	23	3	21	23	1	1	1
Chinese	100	2	w	1	43	24 4	3	23	1	5
	101	2	s	21	43	54	3	23	32	2
	103	2	r	2	32	4 4	2	23	32	2
	104	2	s	2	3	54 4	3	3	2	2
	106	2	s	2	43	52	23	3	23	2
	107	2	s	21	2	1	3	3	23	2
	108	2	r	1 1	42	21 4	23	3	2	2
	112	1	r	21	43	5	32	2	2	1
	113	2	s	2	32	21	2	2	2	2
	115	2	r	1	43	2 4	23	3	2	3
	143	3	r	24	2	54 2	43	34	2	3
	163	3	s	1	2	5	32	23	2	nn

SEVENTH GROUP C	Subj.	Bog.	1	2	3	4	5	6	7	8
W.Amer.	100	1	s	1	2	3	2	12	2	1
	101	1	s	12	3	1	23	2	3	1
	103	1	w	12	3	12	23	23	2	1
	104	1	s	23	2	1	3	3	1	1
	106	1	s	12	2	14	3	32	23	1
	107	1	w	12	3	13	3	3	12	1
	108	1	r	1	23	12	23	23	12	1
	112	1	r	13	2	1	23	2	2	1
	113	1	r	1	12	2	24	2	2	12
	115	1	s	16	3	12	3	3	2	1
	143	1	w	65	3	33	23	32	32	1
	163	1	s	12	3	21	43	1	2	21
SEVENTH GROUP D	109	5	s	4	4	5	4	3	3	4
	111	2	s	4	4	53	4	3	2	2
Negro	114	2	r	4	24	51	4	3	3	3
	116	2	w	43	24	45	34	23	2	2
	118	3	r	3	45	45	43	3	2	2
	119	2	s	3	45	53	4	3	2	2
	121	3	s	4	34	51	3	3	2	3
	125	2	s	4	4	55	34	3	3	2
	127	5	s	4	23	24	3	3	3	54
	129	2	w	4	4	55	3	3	32	2
	131	2	s	3	21	4	3	3	12	2
	159	2	s	32	3	2	23	3	23	2

SEVENTH GROUP D	Subj.	Bog.	1	2	3	4	5	6	7	8
Jew	109	3	r	6	3	34	3	3	2	2
	111	2	s	12	24	35	34	3	21	2
	114	1	r	61	34	211	3	4	12	1
	116	3	s	611	3	33	23	3	2	2
	118	2	r	662	3	51	3	13	nn	12
	119	2	w	611	23	323	3	2	2	12
	121	2	r	621	34	21	23	43	1	12
	125	2	s	61	2	31	23	2	2	1
	127	5	w	6	3	313	32	4	2	32
	129	2	r	6	12	22	3	3	3	1
	131	6	r	6	1	1	12	3	3	52
	159	2	r	63	2	21	32	3	12	21
Mexican	109	3	w	24	3	34	3	32	3	1
	111	2	r	32	4	5	4	23	2	2
	114	2	w	3	34	11	3	2	3	1
	116	1	s	2	2	41	3	12	23	1
	118	1	r	2	4	12	3	2	2	1
	119	4	r	32	34	141	3	2	32	2
	121	2	s	2	24	33	3	23	1	1
	125	1	s	21	3	31	3	3	3	1
	127	5	r	2	23	5	43	2	3	25
	129	1	r	32	23	1	32	2	42	1
	131	2	r	21	32	1	3	13	3	1
	159	2	r	42	3	12	3	3	23	21

SEVENTH GROUP D	Subj.	Bog.	1	2	3	4	5	6	7	8
Chinese	109	5	r	14	3	4	3	32	23	2
	111	2	r	21	4	45	4	2	2	2
	114	2	s	1	3	24	2	2	3	2
	116	2	r	2	12	52	32	13	12	2
	118	2	r	1	3	41	23	32	32	2
	119	2	s	12	43	4	3	2	32	2
	121	2	r	2	43	23	23	23	12	2
	125	2	r	1	42	4	2	2	3	21
	127	5	s	1	32	4	2	23	3	54
	129	2	r	21	42	54	2	3	2	1
	131	2	r	1	4	42	3	3	2	2
	159	2	s	nn	nn	nn	nn	nn	nn	nn
W.Amer.	109	1	s	1	23	43	3	2	2	1
	111	1	w	12	2	1	3	2	21	21
	114	1	s	1	3	1	3	2	2	21
	116	1	s	13	3	51	3	2	12	1
	118	1	w	14	23	14	2	3	1	1
	119	1	r	12	32	1	13	2	32	1
	121	1	w	12	13	14	3	13	1	12
	125	1	n	1	2	34	13	2	2	1
	127	1	s	12	32	3	23	3	2	1
	129	1	s	12	23	1	3	3	2	1
	131	1	w	1	23	1	3	3	23	1
	159	1	s	2	32	2	23	32	1	1

SEVENTH GROUP E	Subj.	Bog.	1	2	3	4	5	6	7	8
Negro	102	5	s	4 62	23	2 43	3	3	3	54
	105	5	s	4	34	51	4	2	32	35
	110	5	s	34	24	4	3	3	2	45
	120	4	w	4	4	3 1	3	3	23	41
	122	2	s	43	4	55	34	3	31	21
	124	2	w	3	3	1 43	4	23	2	2
	126	2	w	3	23	2	3	3	2	2
	128	2	s	46	4	1 33	3	3	2	21
	130	2	s	3	24	22 45	34	32	2	2
Jew	102	2	r	1 6	3	3	3	3	23	21
	105	2	s	1 6	3	2 31	34	43	2	1
	110	1	r	62	3	14	3	3	2	1
	120	2	r	1 62	n2	1 33	13	32	1	1
	122	2	w	61	13	31	1	1	1	21
	124	2	w	6	32	3	32	3	2	12
	126	2	r	6	13	nn	32	3	23	32
	128	1	w	1 61	23	12 33	23	3	13	1
	130	2	w	62	3n	1 31	32	32	2	2

SEVENTH GROUP E	Subj.	Bog.	1	2	3	4	5	6	7	8
Mexican	102	6	r	2	3	1 34	3	2	3	23
	105	2	r	2	23	1 4n	3	3	32	1
	110	1	w	2	23	1 44	3	13	2	1
	120	2	r	23	3	4 53	43	23	32	12
	122	2	r	2	3	21	3	1	53	21
	124	1	r	24	13	1 31	34	2	2	1
	126	2	r	2	2	15	2	2	3	1
	128	1	w	25	34	14 55	23	2	41	1
	130	2	w	2	23	1	32	2	2	12
Chinese	102	6	r	12	3	1 4	23	23	32	2
	105	5	r	21	3	21	23	2	12	23
	110	5	w	2	14	4	23	13	12	25
	120	2	r	2	32	4 51	3n	3	12	1
	122	2	n	2	3	1	3n	2n	3n	2
	124	2	r	12	3	4 54	3	2	2	21
	126	2	n	1	3	1	3n	34	2	23
	128	1	r	2	43	44 51	3	2	21	1
	130	2	w	2	23	42	32	n2	1	2

SEVENTH GROUP E	Subj.	Bog.	1	2	3	4	5	6	7	8
W.Amer.	102	1	s	12	3	14	3	3	2	1
	105	1	n	12	13	12 4	3	23	12	1
	110	1	s	12	32	54 1	3	23	12	1
	120	1	w	12	3	32	23	3	2	1
	122	1	r	1	31	1 4	23	1	2n	21
	124	1	w	16	3	5	43	2	2n	1
	126	1	w	12	2n	13 12	23	3	12	1
	128	1	w	15	2	44	13	2	2	1
	130	1	r	12	32	41	32	21	1	1