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## PREFATORY NOTE

The *Research Bulletin* of the American Foundation for the Blind is intended to be a means of publication for some scientific papers which, for a variety of reasons, may not reach the members of the research community to whom they may prove most useful or helpful. Among these papers one may include theses and dissertations of students, reports from research projects which the Foundation has initiated or contracted for, and reports from other sources which, we feel, merit wider dissemination. Only a few of these find their way even into journals which do not circulate widely; others may never be published because of their length or because of lack of interest in their subject matter.


The *Research Bulletin* thus contains both papers written especially for us and papers previously published elsewhere. The principal focus may be psychological, sociological, technological, or demographic. The primary criterion for selection is that the subject matter should be of interest to researchers seeking information relevant to some aspect or problem of visual impairment; papers must also meet generally accepted standards of research competence.

Since these are the only standards for selection, the papers published here do not necessarily reflect the opinion of the Trustees and staff of the American Foundation for the Blind.

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Since our aim is to maximize the usefulness of this publication to the research community, we solicit materials from every scientific field, and we will welcome reactions to published articles.

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Executive Director  
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for the Blind



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SUMMARY OF INVESTIGATIONS RELATING TO READING  
JULY 1, 1962 TO JUNE 30, 1963\*

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The preparation of the current summary has been guided by policies described in the previous summary (68) with respect to the nature, scope, and treatment of research articles reported. An unprecedented number of studies have appeared during this reporting period, especially in the psychology and teaching of reading. The reader's attention is also directed to other selective bibliographies appearing rather regularly in other journals.\*\*

The appearance of a comprehensive bibliography in book form by Deverell (44) should be especially noted, whose *Canadian Bibliography of Reading and Literature Instruction* includes relevant publications from 1760 to 1959. The bibliography includes most phases of the psychology and teaching of reading, of libraries and their use, and has special sections on book reviews and on books for children and youth. The bibliography is a valuable resource for making the writings of Canadian authors and scholars more accessible.

THE SOCIOLOGY OF READING

Environmental Influences Upon Reading

Children's Exposure to Mass  
Media and Its Effects

Bailyn (9) conducted a questionnaire study among 600 boys and girls in grades five and six of a Boston suburb to determine the exposure to mass media of these children and the effect of this exposure upon the four cognitive attributes of stereotyping,

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\* Reprinted from *The Journal of Educational Research*, Volume 57, Number 6 (February 1963), pages 283 to 327. The above was carried out with the assistance of Miss Anne Larson and Mrs. Carol Lindeman.

\*\* See other bibliographies and reviews of research in reading in *Elementary English*, *Journal of Developmental Reading*, *The Reading Teacher*, *Review of Educational Research*, and the *Proceedings of the International Reading Association* and the National Reading Conference.

perception of threat, protected self-image, and passivity. A subsample of 100 boys was later interviewed individually and given a comic book to read upon which they were questioned. The primary method of treating the data of the study was chi-square analysis. Among the more general findings of the study are the following:

1) "Children who listen to the radio and read books tend not to be highly exposed to the pictorial media and, conversely, those heavily exposed to the pictorial media do not spend much time listening to the radio or reading books."

2) "Girls are somewhat more often radio and book fans; boys concentrate more on the pictorial media."

3) Four factors which appeared to be independently related to amount of exposure were, in order of importance, those of parental restriction on amount of exposure, the child's IQ, father's occupation, and religion. High exposure to pictorial media was related to "lack of parental restriction, low IQ, fathers with worker or service occupations, and being a Catholic."

4) Boys with high exposure to pictorial media tended to react to a specific comic book with an aggressive hero quite realistically, and appeared to regard such a comic book not as a unique story but as a story type. "In their way of looking at the people in these stories, their emphasis is on physical characteristics, stereotyped evaluations, and explanations centering on social factors."

5) Boys with high exposure to mass media tended to classify people into stereotypes, to display "an attitude of acceptance of the socioeconomic situation of the father and a lack of interest in changing it," and to reflect in their fancied self-image, persons seen in the pictorial media. No similar cognitive correlates were found among girls.

6) "For certain children, under certain conditions, the mass media serve one function in particular - that of escape."

The study should be consulted for further particulars.

Witty and Kinsella (185) reported on the basis of a questionnaire study of 200 pupils per grade at both elementary and high school levels in the Chicago area that 78 percent of the elementary pupils said that TV helped them in reading and other subjects, while a lesser proportion of high school students, 48 percent, reported likewise. In addition to these findings with respect to grade level, it was noted that children in the upper fourth of a standardized reading test at the fifth and sixth grade levels watched TV for an average of 5 to 7 hours less than those in the lower fourth of the reading test.

## Cross-Cultural Use of Mass Media

Deutschmann, McNelly, and Ellingsworth (43) studied the mass media habits of a "subelite" group in Latin America in comparison with a cross-sectional sample of a general midwest urban population. Two hundred fourteen Latin Americans who were highly educated and held above average socioeconomic positions were interviewed concerning their recent use of mass media. It was found that the Latin American group made considerably more use of mass media than did persons in the American sample, and that they likewise read considerably more books, 79 percent, than did their American professional and managerial counterparts, 29 percent. The authors concluded that such upper middle class Latin Americans were hardly underprivileged in their use of mass communications in countries which themselves are undeveloped with respect to mass media.

## Characteristics of Reading Materials

### Oral and Written Style

Blankenship (17) used a modification of a linguistic analysis system by Fries to analyze samples of four speeches and four items of written discourse by Allen Nevins, Margaret Mead, Frances Perkins, and Adlai Stevenson. The investigator found relatively little variation between spoken and written discourse with respect to sentence length and sentence patterns. Furthermore, the linguistic differences among the speaker-writers were more pronounced than either the general differences between oral/written discourse or the differences between the oral and written discourse of each speaker-writer.

### Content Analyses of Printed Media

Hart (69) examined the extent of news about the United States in certain Canadian newspapers and in selected American newspapers from cities near enough the Canadian border to be considered interested in Canadian news. The sample consisted of 6 weekday editions of each paper drawn from one week in March, April, and May of 1962. Among the findings it was noted that the source of news for both countries was largely the same, but that Canadian newspapers devoted a larger total news space to American news than was done reciprocally by the American press. Canadian newspapers likewise devoted a larger amount of total space to the printing of foreign news than did their American counterparts.

Hachten (65) conducted a descriptive study of the United States Sunday newspaper to detect certain major trends in its content from the period 1939 to 1959. Samples were drawn at 5-year intervals during this period from 13 Sunday newspapers representing large cities distributed among the principal

geographical regions of the United States. Major trends noted included a marked increase in the size of the Sunday newspaper, about the same amount of absolute news (but relatively less in relation to the total size of the newspaper), more emphasis upon popular entertainment and less upon serious arts, more than double the amount of space devoted to leisure activities, and a much more varied and diversified newspaper in 1959 than in earlier years.

Newspaper advertising was likewise subjected to content analysis. A representative sample of 80 newspapers was used by Mullen (116) to analyze all the newspaper advertising for Nixon and for Kennedy during the 14 days prior to the election. Among the significant findings demonstrated by chi-square analysis, it was noted that 1) the Republican party used more and bigger advertisements and spent about twice as much money for them as did the Democratic party, 2) the Democratic party made more use of pictures, primarily for appeal purposes, and 3) the Republican party expenditures were closely related to the amount of circulation of newspapers regardless of the candidacy which the paper supported, while the Democratic party placed the heaviest amount of advertising in papers supporting that party. Berkman (15) made a comparative analysis of advertisements in *Life*, with a readership representative of middle class America, and of *Ebony*, a magazine read primarily by Negroes of lower socioeconomic status. Data were drawn from 4 seasonal issues of each publication in 1960 and were examined for quantitative and qualitative differences. While the amount of space devoted to advertising in these 2 magazines was approximately the same, *Ebony* contained over twice as many advertisements in these issues. The author concluded that differences in 12 out of 13 categories used in the analysis were quantitative and were a result purely of the differences in the economic levels of the readership of the 2 magazines and not in the differences in the race of the readership involved.

Kent (84) analyzed the adequacy of mental health coverage, in 1960, of 6 mass magazines of high circulation - *Reader's Digest*, *Life*, *Look*, *Ladies' Home Journal*, *McCall's*, and the *Saturday Evening Post*. Sixty-five relevant feature articles were judged with respect to the adequacy of their logic, use of language, use or misuse of quotations, references to authorities, and the overall tone of the article. On these bases, articles were shown to range from the trivial and possibly harmful to the serious and constructive. The adequacy of mental health coverage was discussed separately for each magazine. Stensaas (166) made a content analysis of 11 South Dakota daily newspapers to determine from front page articles how the teenager was being presented to readers. Over 1000 stories were found in a 3-month period and were classified as favorable, unfavorable, or neutral. More stories, 40 percent, were found in the favorable group and tended to be better displayed. A newspaper-by-newspaper analysis showed,

however, that a majority of the papers actually published more unfavorable than favorable news.

### Reading Habits

#### Nature and Amount of Children's Reading

Johnson (78) conducted a questionnaire survey of newspaper reading habits and interests of 295 boys and 269 girls in grades four, five, and six. Only 24 percent of the pupils reported that they were regular readers of the newspaper, although some 70 percent read the newspaper sometimes. Some increase was noted in the number reading newspapers in eighth grade but the order of preference of parts of the newspaper - comics, first page, sports, television - remained the same. The children revealed little experience in reading comparative reports of the same news, but a majority of the children said that newspaper reading helped them in their school work. Woolcock (187) administered a questionnaire to 85 intellectually gifted girls randomly selected from grades nine to twelve concerning their reading habits and judgments about reading skills. The results revealed that: 1) twice as much reading was assigned in English as in social studies but the students spent the greatest amount of time reading the social studies material; 2) almost 2 hours a day were spent in reading a wide range of books, magazines, and newspapers; 3) peers and parents appeared to be more influential than teachers in suggesting books for voluntary reading by this group; 4) only 26 of the group considered themselves fast readers, but 76 students rated themselves as strong to average in reading comprehension; and 5) all but 9 of the students said that they tried to influence friends to read the books they liked.

#### Children's Preference for Reading as an Activity

In a survey in which 1111 fifth grade children in Michigan were asked to rank subjects in order of preference, Curry (38) found that reading was ranked fifth in 9 areas of the curriculum, the areas of art, arithmetic, music, and spelling receiving higher rankings. A more extended study of academic interest patterns was conducted by Rice (141), using teacher ratings of academic interest patterns of 164 children in grades four through six. Subjects were randomly selected from 5 levels of homogeneous classes ranging from the gifted to the educable mentally retarded. A major finding of the study was that interest in reading as an activity showed a distinct pattern in relation to pupil ability, being the first choice of 9 interest areas for the 2 most able groups but dropping to seventh and eighth choice among the less able groups.

## Reading and the Library

Karlin (82) queried 145 children in upper elementary and junior high school at the time they returned books to the library, concerning their reading of these library books. Evidence was found that children in the upper elementary grades borrowed more books per child than did those at the junior high school level, and that the younger age group likewise completed a greater proportion of the books borrowed. The effectiveness of pupil use of the library was shown by El-Hagrasy (50) to be related directly to estimates of the teacher's background and interest in reading and by the library skills possessed by the teacher. The study involved 8 sixth grade classrooms in two New Jersey schools and the teachers at the intermediate grade levels in these schools. The effectiveness of three types of elementary school libraries was appraised by Gaver (56) using conventional criteria of library quality as well as pupil gains from fourth to sixth grade in 6 schools. The three categories of libraries studied were those schools with classroom collections only, those with central book collections but no employed librarian, and those with central collections and a librarian. Major findings of the study determined by analysis of variance were: 1) a school library with a librarian was significantly better in the range and quality of its book collection and in accessibility; 2) the librarian directed school library was significantly better in the extent of library related activities; 3) a test of mastery of library skills did not differentiate students by type of library, except that students in schools with a trained librarian scored significantly better than those with just classroom collections; 4) the librarian directed school library group was significantly better in the amount, quality, and range of interests in reading; and 5) the educational gain of children in schools with a librarian exceeded those in schools with classroom collections on subtests of the Iowa Tests of Basic Skills for vocabulary, reading, language, and in use of reference tools, the composite relationship being significant at the .01 level.

The size, content, and use of professional libraries for teachers in 424 elementary schools was investigated in a study by Peterson (127). The questionnaire results indicated that the great majority of schools had a collection of both professional books and periodicals, ranging in size from 5 to 500 volumes, with a median size between 46 and 50 volumes. A wide range in the use of professional libraries by teachers was reported, only 26 percent reporting greater than average use, while the highest single percentage of usage, 31 percent, was in the category "very little usage." The writer concluded that elementary teachers were not exactly avid readers of current professional literature, although 41 percent of the schools reported extensive use of educational journals exclusive of those published by state organizations.

## Psycho-Social Effects of Reading

### Persuasive Communication Effects

In an elaborate series of experimental studies, McGuire and his co-author, Papageorgis, examined various factors and conditions associated with the immunization of beliefs against persuasion, using cultural truisms, particularly health truisms, as examples of strongly held beliefs. The complexities of the studies are such that they should be consulted for details as to specific hypotheses examined, details of experimental design, and specific findings. McGuire and Papageorgis (104) hypothesized that "beliefs are more effectively immunized against persuasion by pre-exposure to counterarguments (in a weakened form that stimulates without overcoming, the receiver's defenses) than by preexposure to arguments supporting the belief. Second, since the person is unpracticed in the defense of such beliefs, it was predicted that the immunizing pretreatments would lose effectiveness to the extent that they required the person to participate actively, without guidance, in the defense." Both of these predictions were confirmed at the .001 level of significance for 130 college freshmen. In a second study, Papageorgis and McGuire (125) predicted "that preexposure to refutations of some counterarguments against the belief would have a generalized immunization effect, making the beliefs more resistant to strong doses not only of the specific counterarguments refuted but also of alternative counterarguments against the given belief." Seventy-three college students engaged in two experimental sessions, one devoted to preexposure to refuted counterarguments and a second session one week later to the presentation of strong counterarguments. The prediction that beliefs would prove to be highly vulnerable to strong counterarguments when there was no prior immunization was upheld. It was also found that "Immunization had a direct strengthening effect on the beliefs and also substantially reduced the effect of the subsequent strong counterarguments. Preexposure to refutations of some counterarguments produced significant resistance to later strong forms of, not only the same counterarguments, but alternative counterarguments as well, in accord with the predicted effect of generalized immunity."

McGuire (100) also examined the effect of four types of treatments for producing resistance to persuasion. The treatments were 1) supportive only, 2) refutational only, 3) supportive then refutational, and 4) refutational and then supportive. The major findings were that the attacks considerably weakened beliefs when they were not accompanied by any defense and that the overall effect of the defenses was to attenuate the amount of this weakening, effects which were significant at the .001 level in both cases. The relative effects of active and passive prior refutation of the same and alternative counterarguments upon resistance to persuasion was likewise

studied by McGuire (102). One hundred sixty-eight college students were assigned to four conditions - active, passive, passive-active, and active-passive refutations of counterarguments - to examine the "direct strengthening effect, and immunization against the same, and against novel counterarguments presented in strong form 2 days later." In the active defense condition, subjects were given a sheet with 200 counterarguments and were told to show how each could be refuted, while in the passive defense condition subjects were given a 600 word mimeographed passage that mentioned two counterarguments and refuted them in detail. For the single defense condition, passive defense conferred more immunity against the same counterarguments than active defense, while active defense was more effective against novel counterarguments. It was also found that "the immunizing superiority of the double over the single defense was found only when the subsequent attack involved the same counterarguments; against novel counterarguments, the single defense was as effective as the double," an interaction significant at the .01 level.

McGuire (101) later investigated the persistence of resistance of persuasion induced by various types of prior belief defenses among 160 college students. The study examined the hypotheses that "immunity conferred by refutational defenses would decay less rapidly than that conferred by the supportive defenses," "conferred resistance to attacks by counterarguments other than the explicitly refuted ones would decay less rapidly than resistance to attacks by the very counterarguments refuted," and "there would be a delayed action effect in the immunity to attacks by novel counterarguments conferred by the refutational defense." One hundred sixty subjects first read either arguments supporting a medical truism or refutations of counterarguments against the medical truism. A second experimental session was given to half the subjects 2 days later, and to half of the subjects 7 days later, in which a second defensive treatment of another truism was given and then attacks on the previously defended and undefended truisms presented. The beliefs of subjects on all truisms were measured and all three hypotheses were substantially confirmed. An additional study in this series of experiments was conducted by McGuire and Papageorgis (103) upon the effectiveness of forewarning in developing resistance to persuasion. One group of college subjects was given explicit forewarning of the purpose for reading the material presented while the other group was not, but was told to read the material as part of the study to determine scientific giftedness. It was found that forewarning effectively refuted the effects of attack at the .05 level of significance.

Crane (36) conducted an experimental study among 360 college students to determine if an immunization effect of a persuasive message required only awareness of a position opposed to that of the communicator and not familiarity with the arguments which support it. Two issues were presented to the subjects, one deal-



ing with the United States' recognition of Red China and one with juvenile delinquency, in three different versions: a one-sided message, an implicit two-sided message, and an explicit two-sided message. Subjects were randomly assigned to these three treatments and to a control group. Attitudes were measured on a 15-point rating scale and on 10 semantic differential scales before and after the first immunizing message, immediately after the second counter-propaganda message a week later, and after a 3-week period. The immunization effects of messages on juvenile delinquency were found to be substantially more effective at each point of attitude measurement than those on Red China, while two-sided messages tended to be superior to one-sided messages when measured by overt opinion measures immediately after counter-propaganda. Explicit messages were not found to be superior to implicit messages to a statistically significant degree in any of the comparisons. Lana (92) examined the effects of degree of controversy of material and order of presentation of pro and con arguments upon opinion change among 112 undergraduate students and 128 high school students. The controversial message was on nuclear weapons while the non-controversial topic was about the artist Picasso. Opinion questionnaires were first given to all subjects. Each group was then divided into halves according to topic, and then further subdivided into two groups to receive a differential order of presentation of pro and con arguments for the appropriate topic. The opinion questionnaire was then readministered. The application of "t" tests and covariance analysis indicated a significant interaction between controversy and order approaching the .01 level of significance, showing that order of presentation of arguments had the greater effect on opinion change for a controversial topic among college students. For the high school group a significant effect at the .05 level was found for the controversial topic. The author concluded that differences in the findings for the two groups may be explained in terms of different levels of sophistication by the subjects.

In a further study, Lana and Rosnow (93) used highly controversial and medium controversial messages to study the effects of a hidden versus an exposed pretest and a pro-con versus a con-pro order of presentation among eight groups of 16 college undergraduate students each. After taking the appropriate opinion questionnaire, four groups were given the pretest during a regularly scheduled class (the exposed treatment), while four groups took the pretest as a part of their examination (the hidden treatment). The groups were further subdivided by order of presentation of pro and con arguments. After treatment, the opinion questionnaire was administered. The hypothesis that subjects given a hidden pretest would reveal a significant recency effect while those given an exposed pretest would demonstrate a significant primacy effect was supported at the .025 level of significance. A significant order effect approaching the .001 level of significance was found by "t" test analysis under medium controversy

and hidden pretest conditions but for no other conditions explored in this study. The order of successive persuasive communications and the effect of familiarity with the topic was likewise examined by Thomas, Webb, and Tweedie (172) in three experiments with high school students. No significant primacy or recency effects on the acceptance of successive persuasive communications dealing with unfamiliar topics were noted. The authors concluded that "although the topic in these experiments was not familiar to the subjects, strong existing attitudes toward related topics may have been aroused that made a primacy effect less likely."

Weiss (181) measured the effects of a persuasive communication in a group of 141 college students randomly assigned to experimental and control groups. The experimental group received a communication advocating the abolition of capital punishment and then evaluated the communication, judged the scale value of 36 opinion statements, and revealed their own attitudes by responding to 20 opinion items. Attitude change in the direction advocated by the persuasive communication was found, but since the groups were alike in their judgment of the scale values of the related opinion statements, a change in scale judgments was not considered a necessary condition for attitude changes. In general, it was found that evaluations of the communications were not related to attitude change.

The topic of capital punishment was also used by Manis and Dawes (108) to determine whether persons who disagreed with a controversial statement would be relatively insensitive to the redundancy of the communicator's words. The attitudes of 72 college students toward capital punishment were first measured and two 400-word passages, one favoring and one not favoring capital punishment, were prepared. The cloze technique was applied to create a high deletion condition in which every fourth word was removed and the low deletion condition in which every eighth word was removed. The grammatical type of deletion was likewise subdivided into two groups, content deletions, and connective deletions for the purpose of analysis. Subjects were assigned to the high and low deletion conditions and cloze scores were computed by counting the number of blanks completed exactly as they appeared in the original passage. No consistent trend was found with respect to attitude for content-type deletions. For connective deletions, it was found that those who favored capital punishment did better on the pro-message than on the anti-message, while those who opposed it did better on the anti-message. The combined test results for type of deletion were found to be significant at the .05 level, a finding which likewise applied to the high deletion group.

#### Dimensions of Reader Judgment

Johnson (77) made a semantic differential analysis of the dimen-

sions of judgment along a communication chain for five different groups with respect to 40 science news stories. The 131 subjects in the study consisted of scientists, science writers, editors, frequent readers of science news, and nonreaders or only occasional readers of science news. Intercorrelations among each of 25 semantic differential scales were obtained and then factor-analyzed. The major factors extracted and used in categorizing the groups were an evaluation accuracy factor found in four of the five groups, a difficulty factor found in each of the five groups, and an excitement or sensationalism factor likewise found in four of the five groups. The editor group was also characterized by accuracy and newsworthiness factors. These factors accounted for 80 percent of the common variance for all of the groups. In general, it was found that science writers and editors were most similar and scientists and nonreaders the least similar in the groups compared, while the science writer was described as an excellent middleman. The dimensions of judgment employed by editors in evaluating science news stories were found to be unlike those of either scientists or readers, editors tending to evaluate such stories on the basis of color and excitement primarily, with readability and accuracy as secondary factors.

#### Reader Interests and Attitudes

Carter and Clarke (28) found through interviewing a representative sample of city and suburban readers of the *Minneapolis Evening Star* that a higher proportion of suburban residents, 63 percent, expressed interest in news about suburbs than did city residents whose percentage of favorable response was 43 percent. An analysis of the reasons for interest or lack of interest led the authors to conclude that interest in suburban news is largely a matter of audience involvement rather than the message content. Attitude toward the press as a function of the interest of newspaper readers toward controversial or non controversial topics was examined by Anast (5). A 130-item inventory designed to determine news interest in several controversial categories was administered to 241 residents of a Wisconsin city, while attitudes toward the press were measured with respect to 10 assertions about the press on an 11-point scale. The general finding of the study was that persons who displayed the greatest interest in controversial topics were less favorable to the press than persons with less interest or noninterest in controversial topics.

A study of Ellingsworth (51) indicated that elementary and secondary school teachers displayed a wide diversity in their preferences for types of news items to be used as class material. A group of 46 public school teachers in two separate but related studies used a Q-sort technique in judging 60 newspaper items in terms of their usefulness for their own classroom teaching.

The results, which indicate wide differences in preferences (apparently related to such factors as level of teaching, educational background, and personal reading preferences), are accompanied by a discussion of the implications of the study for the planning and teaching of courses in newspaper utilization.

#### Further Attitudinal Effects of Communications

Tarbarlet (168) analyzed the responses to three multiple-choice questions by 262 college and junior high school students to determine if they tended to react more to the names "communist," "Marxist," and "socialist" than to the idea suggested by these words. Roughly half of the subjects at each level were told that a brief passage they were to read was from a speech by Winston Churchill and half were told that it was from a speech by Jagan, an avowed Marxist and Prime Minister of British Guiana. The passage, which emphasized the importance of the individual, was actually written by Henry Wriston. The three multiple-choice questions dealt with the soundness of these ideas, what should be done with men who express such ideas, and what would happen to governments led by men expressing such ideas. Significantly higher acceptance of the passage at the .01 level - when attributed to Winston Churchill - was found among all college students and for the total group than when attributed to Jagan, although such differences were not significant for the small group of junior high school students. The author concluded that the "data suggest that this sample evaluated the statements more on the basis of what label the man making the statements wore than on the worth of the ideas expressed." Luchins and Luchins (96) investigated the personality impressions formed by college students from communications reflecting attitudes toward segregation. Three experiments were conducted, one involving 43 students strongly opposed to segregation and two involving 30 college students each. The latter groups were less homogeneous in their views on segregation and about half were members of sororities or fraternities. Four communications were prepared about a girl identified as Joan, one favoring segregation, one favoring integration, and two which were inconsistent in favoring segregation or integration. Subjects were asked to answer questions about Joan which transcended the information given in the communication and indicated their attitude toward Negroes. The general results of the study suggested that these subjects tended to associate different personalities or personality types with different views on segregation. Inferences were made about the appearance, personality, religion, campus status, and views on integration of the central character, Joan, in many other situations than the one given. Primacy effects were also found in every experiment on the integration items of the questionnaire.

Wales, Rarick, and Davis (177) tested the hypothesis that more people will exaggerate messages they receive than will minimize them in a study of 30 college students in a course in adver-

tising. Subjects read three types of materials - one, a fictitious news release regarding academic requirements, the second, an advertisement of a kitchen sink, and the third an advertisement for an oriental air line. Multiple choice test items were then given which had three responses - one correct, one an exaggeration, and one a minimization. The results showed that 81.7 percent of the responses were correct; however, for the erroneous responses, a chi-square analysis upheld the hypothesis at the .005 level of significance.

Adams (1) reported that 80 college students tended to accept among 20 different unnamed news sources those which referred to the government or to officials with a higher degree of credibility than other types. Sources which gave no clues as to the real source tended to be treated as the least credible.

### Parental Attitudes Towards Children's Reading

Cheyney (32) interviewed 121 sets of parents whose families contained one or more high ability children with IQ's of 125 and above. He reported that the majority of parents identified the superior abilities of these children before formal intelligence tests were administered, that many were aided in making this judgment through observing the reading practices of these children, and that most provided special reading materials in the form of books and encyclopedias. In another study related to the gifted child, Cappa and Schubert (25) found evidence from a questionnaire study of the home reading environment of 83 gifted intermediate grade children that their parents assumed considerable responsibility for extending the reading skills of their children. Evidence for this was found in the purchase of books and magazine subscriptions, provisions for a time and place for free reading in the home, and general encouragement of the quality and quantity of home reading. Macdonald (99) employed the parental attitude research instrument developed by Bell and Schaefer to compare the child-rearing attitudes of parents of unsuccessful and successful readers. The responses from parents of unsuccessful readers at a university reading clinic were compared with two groups of parents of unsuccessful and successful readers, respectively, in a public school. In general, it was found that the parents of the unsuccessful readers in the public school were more similar to the parents of the successful readers than to parents of the unsuccessful readers in the clinic. Additional findings are reported for mothers and for fathers respectively.

## THE PSYCHOLOGY OF READING

### Psychological Correlates of Reading

#### Intellectual and Achievement Correlates

Scott (156) made a correlation study of the relationship between

IQ's and gain in reading achievement, together with gains in arithmetic reasoning, social studies, and science, for 670 pupils who had taken the Stanford Achievement Test at the beginning of grade five and again at the end of grade six. Partial correlations were also computed to hold the IQ constant, and analyses computed for 390 pupils grouped as low, average, and high IQ. In general, the correlations were low but positive. Among the several specific findings reported, it was found that gain in reading achievement correlated highest with gain in social studies and lowest with gain in science. The low but positive correlation, not attributable to intelligence, between reading gain and gain in other curriculum areas led the author to conclude that reading skills should be generally developed and also specifically related to other curriculum areas. In a second study, Scott (157) investigated similar relationships for 193 pupils tested in grades five and six. In this study, however, the advanced battery of the Stanford Achievement Test was used at the end of sixth grade. The use of the advanced battery did not affect the degree of correlation reported previously for the intermediate test battery, but some differential effects were noted between gain in reading proficiency and gains in other subject areas.

Reger (139) reported moderately high correlations between scores on the Peabody Picture Vocabulary Test and the WISC; the correlations being .60 for the verbal scale, .55 for the performance scale, and .60 for the full scale. For 25 emotionally disturbed, mentally or academically retarded boys ranging in age from 9-9 to 14-6 years, rank-order correlations between the reading and arithmetic scores on the Wide Range Achievement Tests and on the Metropolitan Achievement Tests were reported to be .87 and .76 respectively. All correlations were significant beyond the .01 level.

#### Personality and Adjustment Correlates

Scarborough, Hindsman, and Hanna (154) investigated the relationship between anxiety level and performance of communication skills, including reading, and other achievement areas for a population of 162 boys and girls selected from approximately 1600 seventh graders in four Texas schools. Sex, three levels of intelligence on the California Test of Mental Maturity, and three levels of anxiety on the Castenada Anxiety Scale were used to identify categories to which subjects from the larger population were randomly assigned. The relationship among these variables was examined by a 2 by 3 by 3 factorial analysis of variance design. Grade placement scores in reading, language, and arithmetic were secured from the California Achievement Test; those for social studies, listening comprehension, and science were obtained from STEP tests. Evidence was secured that anxiety level was differentially related to the language arts performance of these subjects of high, average, and low intelligence. For example, it was noted that 1) high ability subjects with average or high

anxiety made significantly higher scores in all subjects than did children of low anxiety, 2) average ability subjects with low anxiety had significantly higher reading and language scores, and 3) low ability subjects with varying anxiety levels showed no significant differences in reading performance. The investigators concluded: "The data clearly indicate that for some students, particularly those of average and high intellectual ability, there is a significant relationship between anxiety level and reading and language performance...The fact that children of high IQ consistently achieved significantly higher scores in reading and language under high or average anxiety lends support to the thesis that for the more able children, language arts may serve as an adjustive medium for reduction of residual anxiety."

Grimes and Allinsmith (62) examined the hypothesis that there would be an interaction between personality characteristics and teaching method in determining school achievement among 228 third grade students of representative and balanced socioeconomic levels. Specifically, the effect of "structured" beginning reading methods stressing phonics was compared to those utilizing an "unstructured" whole word recognition approach in relation to compulsivity as determined by parental interviews, pupil anxiety as measured by the Taylor Anxiety Scale, and performance upon a standardized achievement test. Main effects and interactions were studied by analysis of variance. With respect to achievement, it was found that pupils in the structured approach achieved significantly higher scores at the .001 level, that high-compulsive, high-anxious children in structured schools were more than a year advanced in their achievement, and that in the unstructured schools, the high-compulsive, low-anxious children achieved significantly better than the low-compulsive, high-anxious pupils to a degree significant at the .01 level. With respect to compulsivity, highly compulsive children in structured school programs scored significantly better at the .001 level in achievement than did those in unstructured settings, but no significant differences were found in achievement between the high and low compulsive children in unstructured schools, an interaction between compulsivity and teaching method being significant at the .05 level. With respect to anxiety, it was found that highly anxious pupils in unstructured schools achieved significantly less well at the .001 level than did those in structured schools, but that anxious pupils did as in structured schools. It was found that anxiety and compulsivity were not correlated, but were found to interact with each other as well as with teaching method, thus children who were both highly anxious and low in compulsivity underachieved in the unstructured settings. The authors therefore concluded that "choice of instructional methods makes a big difference for certain kinds of pupils, and a search for the 'best' way to teach can succeed only when the learner's personality is taken account.

Crandall, Katkovsky, and Preston (35) touched upon some aspects of reading performance in an elaborate study of the motivational and ability determinants of young children's intellectual achievement in 40 children, equally distributed by sex, in the first three grades. Results of the Children's Intellectual Achievement Responsibility Questionnaire, which was especially constructed for this study showed that boys more proficient in reading felt more self-responsibility for intellectual performance at the .05 level of significance than did those less proficient in reading. This questionnaire was found to be the most useful of six instruments for predicting intellectual achievement, including reading.

Carroll (27) compared the reading and arithmetic achievement and the personality adjustment of 16 pairs of boys and 13 pairs of girls at the end of third grade. Children in each pair were matched for sex, IQ, socioeconomic status of family, and schools attended; however, one child of each pair was overage at the time of admission to first grade while the second child was underage. Each child was rated on 10 adjustment traits by the teacher. It was noted that over twice as many children in the overage group made reading grade placement scores above 5.0 as did those in the underage group. The mean ratings by teachers on the children's adjustment were slightly higher for the overage group in every instance except on the trait of responsibility. An analysis of the percentage of favorable ratings by traits showed that overage children made a better showing on the traits of persistence, self-confidence, initiative, social acceptance, social maturity, attention span, and independence. Ratings on the last two categories were significant at the .05 level.

Powell and Bergem (132) examined a variety of behavioral factors related to the performance of 50 conforming and 50 nonconforming male students at each of grades ten, eleven, and twelve. The boys, similar in intellectual level, were considered "conforming" if they had never been sent to the office for discipline, and "nonconforming" if they had been sent to the office three or more times during the school year. Data for the study were obtained on the California Reading Test, the California Test of Personality, the Thurstone Temperament Schedule, and a questionnaire designed by the authors to explore home and family conditions, attitudes, and friends. The data were analyzed by "t" tests. Differences were found favoring the conforming boys at the .05 level of significance or better in reading performance, in school grades, and in fewer examples of absence and tardiness in school. The study should be consulted for other findings. Adjustment factors were likewise a major focus in a study by McMurray (105). Of the 350 boys and 392 girls comprising the sample of third grade pupils randomly selected from schools in the Township of North York, Ontario, 640 were considered satisfactory readers. Teachers completed a check list entitled "Factors Which May Precipitate Specific Reading Difficulties" for all pupils and also marked a second check list de-



signed to analyze reading errors for all pupils below expectation in reading level. The most significant differences, at the .001 level, between satisfactory and unsatisfactory readers characterized an unsatisfactory reader as a child who has repeated a grade, lacks energy, has a short attention span, has difficulty assuming responsibility, is compared unfavorably with others, daydreams more than the average pupil, is seldom relaxed, and seldom completes assignments. While the teachers checked many types of errors made by unsatisfactory readers, the most frequent reason given by teachers as to why pupils could not read was their lack of acceptable phonic and word-attack skills.

#### Reading and Socioeconomic Status

Hill and Giammateo (73) examined the relationship between socioeconomic status and reading achievement among 223 third grade children in western Pennsylvania. The Iowa Tests of Basic Skills and the Scott-Foresman Basic Reading Tests yielded positive correlations with socioeconomic status as judged from an interview sheet consisting of 19 items. The highest correlations between socioeconomic status and reading were on the Iowa subtest of Vocabulary, .838, and the Iowa subtest of Reading Comprehension, .902. The correlations with the basic reading test were substantially lower, but it was noted that the low socioeconomic group had a lower percentage of students at or above the fiftieth percentile in five of the seven test areas on the basic reading test designed for the last half of the third grade than for that designed for the last half of the first grade. The authors concluded that socioeconomic status does affect school achievement, including reading, and that children from the lower socioeconomic levels do not overcome this cultural deficiency by the end of third grade.

#### Reading and Awareness of English Structural Relationships

O'Donnell (120) raised the question as to whether there is a higher correlation between reading comprehension and awareness of structural relationships of words and sentences than there is between reading comprehension and the ability to verbalize grammatical rules and terminology. Sixty-four boys and 51 girls in a senior high school class were the subjects of the study. They were given the Cooperative Test of Reading Comprehension, the Iowa Grammar Information Test, and a "Test of Recognition of Structural Relationships in English" devised by the author. A considerably higher correlation, .75, was found between the test of sentence structure and the Iowa Grammar Test than was found between reading comprehension and sentence structure, the correlation in the latter case being .44. The author suggested that the relationship between these tests is not sufficiently high to conclusively support the teaching of linguistic structure as a major means of developing reading comprehension, nor does it necessarily deny the importance of such an approach.

## Reading and Listening

Plessas (128) explored the relationship between auding, defined as the gross process of listening to, recognizing, and interpreting spoken symbols, and reading achievement. The California Auding Test was used to screen 112 high auders, 45 boys and 67 girls, in the upper quartile, and 104 low auders, 56 boys and 48 girls, in the lower quartile on the test. Subjects were drawn from a larger group of 414 eighth grade students in three junior high schools in California and had a mean IQ of 103 on the California Test of Mental Maturity. Nine reading test scores were derived from Section Four, Part II of the Diagnostic Reading Test, from the Gates Reading Survey, and from the Gates Basic Reading Tests. Critical ratios between performance of high and low auders on each of the nine subtests were computed and each was found to be significant at the .01 level. The writer thus concluded that a significant relationship exists between auding and certain reading skills at the eighth grade level. Canfield (24) reported a correlation of .64 between the STEP listening tests and the Reading Comprehension subtest of the Iowa Tests of Basic Skills for fifth grade children of similar intellectual ability. The same author reported that 12 lessons of direct instruction in listening skills produced significantly greater gains at the .01 level than did indirect or no listening instruction to other comparable groups.

## Reading and Visual-Motor Function

Walters (178) reported some evidence of a relationship between reading achievement in second grade children and visual-motor ability as measured by the Graham-Kendall Memory-For-Designs Test. The 35 subjects were grouped into a combined middle-high group of 24 subjects and a low group of 11 subjects. A higher proportion, significant beyond the .01 level, was found favoring good memory-for-designs scores in the group of better readers.

## Reading Interests

A questionnaire study of pupil interests, including reading, of 300 pupils in grades three to six in the Chicago area was presented by Witty (184). Among the data reported were interests, classified by sex, in types of reading, kinds of stories enjoyed, preferred storybooks, nonfiction reading, and magazines read. Stanchfield (165) used personal conferences to discover the current reading interests of 51 elementary school boys in each of grades four, six, and eight, and to relate these interests to reading achievement. Subjects were in the IQ range of 90 to 120, came from American born families representing a cross section of socioeconomic levels and included three levels of reading achievement - superior, average, and poor - in a large California city. Fifty categories of reading interests and 20 characteristics of reading interests were related by analysis of variance to the three grade

levels by three levels of reading achievement with respect to each category or characteristic. The most highly preferred interests were found to be outdoor life, exploration and expedition, and sports and games, in that order. Little interest was shown in such topics as plants, music, plays, art, and poetry. Of the characteristics of reading interests, unusual experiences and excitement were the most highly preferred in that order. The author concluded that: 1) there was an overwhelming preference for exciting, suspense filled, dramatic stories with an emotionally charged vocabulary, 2) the reading interests of superior, average, and poor readers were strikingly similar, and 3) the low achievers showed increased hostility and defensiveness as they progressed from the fourth to eighth grade.

In a questionnaire study of reading interests of 67 boys and 67 girls at the eighth grade level, Vaughan (176) reported evidence of a wider divergence of interests of the same students when classified by intelligence levels. A questionnaire technique was likewise used by Adams (2) to determine leisure time reading preferences of 60 ninth grade pupils in a California school with respect to their favorite magazines. The magazines thus identified were assigned quality ratings by the investigator. It was concluded from this analysis that there is a tremendous interest in sex, sensationalism, and escape from reality in adolescent reading today. A study of preferences as indicated by the amount of reading and type of reading material selected by 303 patients admitted to a Veterans Administration Hospital for psychiatric care was conducted by Gilberstadt, O'Toole, and Tingstad (59). Reading habits were observed in the use of the hospital library by schizophrenics and patients with anxiety reactions. It was found that the schizophrenics read mostly nonfiction, particularly in philosophy and religion, whereas patients with anxiety reactions read more fiction than nonfiction. These findings were interpreted to mean a search for identity and integration by the schizophrenics, and a mechanism of escape through fiction for patients with strong anxiety reactions.

## Reading and Learning Processes

### Effect of Mode of Presentation

Otto (124) conducted an experimental study of the differential effects of verbal and pictorial representation of stimuli upon responses made by 40 good and 40 poor readers at the fourth grade level. Subjects were in an average range of from 90 to 115 IQ. Twenty subjects from each level responded to pictorial stimuli and 20 to verbal stimuli. Cards representing line drawing of familiar objects and words describing objects were used as stimuli in sets consisting of 10 groups of three cards. Subjects were asked to indicate in what way the stimuli presented were alike under untimed conditions. An analysis of variance showed that mode of presentation, stimulus groups, and interaction were significant

beyond the .01 level, with a trend for pictorial presentation to evoke more responses than verbal presentation. It was noted, however, that the magnitude of the differences tended to be a function of the particular stimuli involved. No significant differences were found in the total number of responses given by good and poor readers. Some evidence was also secured to indicate that responses evoked by pictorially presented stimuli tended to differ in nature from those evoked by verbally presented stimuli. The relative effectiveness of verbal and pictorial representation of the stimuli was also of interest to Runquist and Hutt (148) in the learning of verbal concepts. Subjects were 60 high school students, 15 from each of grade levels nine, ten, eleven, and twelve. Three experimental groups of 20 subjects each were formed with five subjects from each grade level. Subjects ranged in IQ from 90 to 110. Three sets of stimuli were used, one consisting of words only, while the second and third sets consisted of line drawings of objects in one of which the pictorial design was de-emphasized. Each subject received 15 repetitions of the lists in a different order each time. An analysis of variance of the data showed that both mode of presentation and grade level were significant. Verbally presented concepts were learned better than picture emphasized concepts at the .01 level of significance, while picture emphasized concepts were learned better than picture de-emphasized concepts at the .02 level of significance. The authors suggested that verbal modes of presentation may have been better because the subjects were using the same medium as the stimulus in making the response or, more plausibly, that the findings may be a function of the particular concept used, since certain qualities of the stimulus concepts were tactual rather than visual.

#### Context Effects

Musgrave (117) used the cloze procedure in examining the effect of various types of broader context information upon the ability of 200 undergraduate college students to complete the meaning of a passage of about 200 words in which 1 word out of every 10 was deleted. The newspaper story which was read reported an interview with Eisenhower discussing the need for unity among free nations in a defense against Communism. Four experimental conditions were set up: 1) no information on who or what the passage was about, 2) advance information telling both the "who" and the "what," 3) only the "who" given, and 4) only the "what" given. An analysis of variance revealed no significant differences among the experimental groups in the average score for replacing words or in the average score for the substitution of popular words. The author concluded that the cloze and communality procedures employed are perhaps less sensitive than has been supposed, and suggested that the particular story topic may have been a crucial variable in the results obtained. Shepard (158) examined the relationship between the amount of context and the amount of guessing of omitted words thereby induced among 18 college students. Thirty-six words were randomly chosen from different newspaper passages and six cards

were prepared for each word in which the word itself was omitted but contexts of 1,2,4,6,10, or 40 words were included. The subjects were given 5 minutes to guess the missing word. Among the findings it was noted that the average rate of words misproduced monotonically dropped by a factor of 10, ranging from 20 words per minute with no context to 2 words per minute with 40 words of context. The writer concluded that in this task the rate of producing words was closely related to uncertainty which in turn, under some conditions, might be inferred from rate.

### Perceptual Discrimination

A number of studies have appeared recently having to do with various aspects of discrimination in relation to reading. Muehl (115) conducted an experimental study of the effects of learning letter names on the subsequent acquisition of word-name associations among 87 kindergarten children. Children were assigned in rotating order to relevant and irrelevant pretraining groups and to two modes of replication of the pretraining experience in order to balance differences in the difficulty of the letter names used as stimuli. The pretraining task was designed primarily to familiarize the students with the letter symbols and to give them practice in associating letter symbols and names. Two groups of letter names, *f,m,g*, and *j,u,d*, were used in the pretraining, the letters of each group being displayed singly and in all possible pairings to make a total of nine cards for each group. Subjects who correctly identified seven out of nine stimulus groups in 2 consecutive trials were placed in a criterion subgroup, while the other children formed a noncriterion subgroup after a maximum of 7 trials. A paired-associate presentation of four orders of the three-word picture pairs constituted the reading task for which all the subjects received 16 trials. Responses were scored as correct, errors, or omissions. No reliable differences were found for group means among the different pretraining conditions and criteria. On the reading task, it was found that the irrelevant group displayed significantly greater variability on correct responses at the .05 level. An analysis of variance for correct responses showed no significant interaction effects, but number of trials was significant at the .001 level. A similar analysis of omissions likewise showed no significant effects, although mean differences between relevant versus irrelevant and criterion versus noncriterion groups were significant at the .05 level. The author interpreted these results as supporting the assumption that the learning of letter names by kindergarten children interferes with their later association of picture names with nonsense words containing the same letters as critical stimuli.

In a second study, Hendrickson and Muehl (71) examined the success of 49 kindergarten children in learning to discriminate the letters *b* and *d* as a function of attention and motor response cues produced during pretraining. The children were divided into three groups: attention-consistent motor; attention-inconsistent

motor; and irrelevant control. In the pretraining task for the first two groups, the stimuli were the lower case letters *b* and *d* below which two arrows appeared. The arrows always pointed outward for the attention-consistent motor group, but for the attention-inconsistent motor group half of the arrows pointed inward and half outward. Subjects were instructed to push the handle of a lever below the arrow in the same direction as the arrow, while subjects in the irrelevant control group matched three patches of color used as the stimuli. Subjects were given two instructional periods and 30 trials in pretraining. Subjects were next given a transfer task involving paired-associate presentation of the letters *b* and *d* paired with pictures of a snowman and a pumpkin respectively, for eight such paired stimuli. Subjects were given a maximum of 30 trials in which to reach a criterion of eight consecutive correct responses. The major conclusions of the study, following an analysis similar to that in the preceding study by Muehl, were 1) that pretraining to attend to directional differences between *b* and *d* definitely facilitated the learning of the names for these letters in a transfer situation, 2) that pretraining designed to make a consistent motor response to directional differences between *b* and *d* did not add significantly to the transfer task performance, and 3) that most children who succeeded in the task used the direction of the letter as a discrimination cue, whereas two-thirds of those not succeeding did not recognize the difference in the letters.

Staats and others (164) examined the differential effects of discrimination pretraining for words and for letters upon learning textual responses by kindergarten children. Thirty-six children were matched according to MA on the Columbia Mental Maturity Scale and assigned to one of three groups, group one having discrimination pretraining with the same words as those used in the criterion task, group two receiving training with the letters making up these words, and group three having no training. Ten cards, each containing three stimulus components representing geometric figures, drawings of common objects, or combinations of letters printed upside down, were presented in pretraining in a task in which the subject was to tell which one was out of place and was given token reinforcement for correct responses. Further discrimination pretraining involved 48 additional cards of the same type, the stimuli for group one consisting of words which were later used in the task, while the stimuli for group two were individual letters which were to make up the words used in the task. Twelve presentations of each of the stimuli, organized into six blocks, constituted the learning task. The final 10 trials, in which a paired-associate method of presentation was used, constituted the criterion measure. An analysis of variance showed no significant differences between groups, but the Duncan Range Test indicated a significant difference at the .05 level between the means of group one which received direct discrimination pretraining and the means of groups two and three.

Gibson and others (57) experimentally studied the development of the ability to discriminate visually a set of letter-like forms by 167 children, aged 4 to 8 years. Twelve forms were derived from a study of actual letters and were selected as standard for the experiment. One-half of the forms were symmetrical and one-half were asymmetrical. Four types of transformations of these forms were introduced, three involving changes of line to curve or vice versa, five involving rotation or reversal, two involving changes in perspective, and two involving types of topological transformations. The children were asked to match a standard stimulus form with an identical standard form appearing in the top row of a display of three rows of letter forms, each row consisting of 13 characters. Among the findings it was noted: 1) that there was a decrease in errors with an increase in age; 2) that a comparison of the two youngest groups with the two oldest groups revealed a drop in error rate significant at the .01 level for all transformations except between perspective and topological transformations; and 3) that symmetrical standards were confused less often than asymmetrical standards in all age groups at a .02 level of significance. The authors concluded that children between the ages of 4 and 8 can learn the dimensions of difference that are critical for differentiating letters. In a second experimental investigation, Gibson and others (58) explored the hypothesis that an appropriate unit of language for analysis of the reading process is determined by its spelling-to-sound correlation. Subjects in the experiment were 21 members of a class in the psychology of language. Two lists of pseudowords were constructed, one with a high spelling-to-sound correlation (pronounceable pseudowords) and one with a low spelling-to-sound correlation (unpronounceable pseudowords). The pseudowords were constructed in three ways: 1) initial consonant-spelling with a single regular pronunciation, 2) a final consonant-spelling with a single regular pronunciation, and 3) a vowel-spelling placed between the two consonant-spellings having a single regular pronunciation. Subjects were instructed to write down what they saw from the tachistoscopic presentation of the pseudowords during five presentations of the lists given at increasing exposure times ranging from 30 to 250 milliseconds. A major finding of the study was that the difference between the total score for pronounceable pseudowords and the total score for unpronounceable pseudowords was significant beyond the .01 level in favor of the letter groups with high spelling-to-sound correlation. This finding led the authors to conclude: "The results suggest strongly that the proper unit for analyzing the process of reading (and writing) is not the alphabetical letter but the spelling pattern." A second portion of the same article demonstrated that differences between the two sets of words were due to differences in perceptibility and not to response bias introduced by previous experiences in perceptibility.

Otto (123) investigated the discrimination and association ability of 30 poor readers enrolled in a university reading clinic

on a paired-associate learning task. The subjects represented a range of 92 to 129 IQ and were drawn from grades four through seven. The experimental materials consisted of five familiar geometric forms paired with five low association CVC trigrams presented on a memory drum. Ten subjects were assigned to each of three modes of reinforcement: auditory, visual-auditory, and kinesthetic-visual-auditory. Discrimination training preceded the learning task. The experimenter also queried the subjects about associations evoked by each form and trigram. The total acquisition score was the sum of the trials required for one correct anticipation of the list presented in serial order plus one correct anticipation of the list presented in scrambled order. It was found that in the discrimination training no subject took more than two trials to learn the list of forms. No significant differences were found in acquisition trials as a function of mode of reinforcement although those receiving auditory reinforcement did the least well. No evidence was found to suggest associations formed by the subjects had a detrimental effect on acquisition. A low but positive correlation was found between IQ and acquisition. The writer concluded that the printed trigram does not appear to be a serious source of confusion for the poor readers in this study, nor could their inferior performance in reading be attributed to lack of discrimination as it was measured in this study.

#### Discriminability in Advanced Organizers

In an extension of earlier studies of the role of the advance organizers in the learning and retention of meaningful verbal materials, Ausubel and Fitzgerald (8) examined the relative effectiveness of comparative, expository, and historical advance organizers upon the learning of unfamiliar ideational materials by 155 university seniors. The specific purpose was to investigate whether a comparative organizer would facilitate learning and retention by presenting the similarities and differences between the subject matter taught, Buddhism, and a similar body of knowledge presumably established in the subject's cognitive structure, Christianity. The subjects were randomly distributed to three groups according to the type of advance organizer used to read the introductory material. Two days later all subjects read the same 2500-word passage on Buddhism and were tested for retention at intervals of three days and ten days later. On the whole, retention loss appeared to be slight although it was highest for the historical group at the .05 level of significance on the 10-day post test. In relation to a test given to determine prior knowledge of Christianity, it was found that subjects with a relatively superior knowledge of Christianity derived considerably less benefit from the comparative organizer. The authors concluded: "In the learning and retention of unfamiliar ideational material that is related to established concepts in the learner's cognitive structure, both comparative and expository organizers appear to be effective only in those instances where existing discriminability between



the two sets of ideas is inadequate"

#### Reading and Meaningful Association

Russell and Saadeh (150) investigated the level of meaning - concrete, functional, or abstract - selected by 257 third, sixth, and ninth grade pupils in a multiple-choice vocabulary test. The 40 words used on the test ranged from the first thousand to the sixteenth thousand in the Thorndike list. Each test item was presented twice orally, once for subjects to listen to the whole item and once to mark the best meaning. The test was untimed. It was found that concrete and functional choices tended to be preferred by third grade children, but that concrete choices tended to decline in the sixth and ninth grades, with a corresponding increase in functional and abstract choices in the latter grades. A series of "t" test analyses of differences of the means between sixth and third grade, ninth and third grade, and ninth and sixth grade were significant at the .01 level for each of the three categories except for the lack of a significant difference in functional responses between ninth and sixth grades. It was also found that errors in definition indicated by the selection of an incorrect choice decreased from grade to grade. A further analysis of the sixth grade group used for a reliability and validity check indicated that these subjects may be described as selecting meanings either in abstract or mixed and functional or mixed groups, but predominantly in abstract and functional groups.

Elder (49) examined the influence of associated word meaning at grade levels two through six. Unpronounceable nonsense syllables were substituted for words judged by the investigator to be important cues to total story comprehension. After reading, students were asked several questions such as "Did this part have too many strange or unfamiliar words?", "Could you guess many of the meanings of the strange or unfamiliar words?", and "Would you like to read the rest of this story if it had no strange or unfamiliar words?" Significance of rejection proportions were determined for each question. In general, it was found that students with different reading test scores did not respond in a significantly different pattern to the questions. Since high proportions of the pupils tended to reject the stories as equal and were disinclined to select similar material for further reading, the author concluded that the study reinforces the need for introducing a new vocabulary before it is encountered in a story.

In a study comparing associative clustering of normal and retarded children, Rossi (147) examined the hypothesis that retardates would not be able to cluster conceptually related words as well as normal children because of a deficit in the ability to utilize words as verbal mediators. A progressive increment in clustering performance was also hypothesized as a function of differences in mean mental ages for subjects in both normal and retarded groups. Word lists of 20 stimulus words were prepared by

randomization of four conceptual categories equated for mean log frequency of occurrence on the Thorndike-Lorge Word List. Each word was presented to each subject verbally. The subject repeated the word and afterward he was asked to recall it. Bousfield's ratio of repetition and a corrected density ratio was used in the analysis of associative clustering. The general findings indicated that normal subjects cluster more than retarded subjects and that clustering performance improved with higher mental age levels, thus supporting major hypotheses of the study.

McCreary (98) reported that special reading materials consisting of cards with pictures and associated sentences provided beneficial though not statistically significant association, reinforcement and transfer effects when used in conjunction with basal reading materials in a study of 308 first grade pupils in experimental and control groups.

Sines (161) examined the usefulness of the semantic differential as a technique for measuring the denotative meaning evoked by four common and four relatively uncommon words in the English language. A number of meanings attributable to each word was determined by reference to a standard dictionary. Each word was then rated on 16 semantic differential scales. Scores for each word were obtained by summing the deviations from the midpoint of the scale for each of the 16 scales. Deviation scores were also calculated for each of 34 college subjects on frequent and infrequent word groups. It was found that the mean total deviation score for frequent words was higher than that for infrequent words as indicated by a critical ratio significant beyond the .01 level. The author concluded that words which have a small number of dictionary meanings similarly evoked a lower total deviation score on semantic differential scales.

Staats, Staats, and Crawford (163) conducted an experimental investigation of first order conditioning of word meaning, its generalization to a synonym, and parallel conditioning of the galvanic skin response. Forty-seven students in an introductory college psychology course were randomly assigned to experimental and control groups. An unconditioned stimulus, a shock or noxious sound, followed the conditioned stimulus, the word "large," on 9 of the 14 occasions in which it was presented in a series of 77 words. The synonym used as a test of generalization, the word "big," was presented once just prior to the last presentation of the conditioned stimulus. Galvanic skin responses were also recorded during the conditioning procedure. In the control group the unconditioned stimuli were likewise presented 9 times but each time after an irrelevant word. After conditioning the subjects completed a pleasant-unpleasant semantic differential scale to determine how they felt about 6 words, including the two crucial to the experiment, "large" and "big." Galvanic skin response difference scores between the GSR for the critical stimulus words and for neutral words were computed for the experimental and con-

trol groups. The major findings of the study were:

1) The GSR difference score for "large" in the experimental group exceeded that of the control group, according to "t" test analysis at the .01 level but no significant differences were found between groups for "big."

2) Difference scores on the semantic differential showed that the experimental and control groups differed at the .0005 level of significance for "large" with "large" being judged much more unpleasant in the experimental group - a finding not obtained to a significant degree for the stimulus word "big" used as a synonym.

3) The correlation between individual GSR difference scores for the word "large" and evaluative meaning difference scores was .39, which was significant at the .05 level, thus indicating a tendency for subjects with more extreme conditioned GSR scores to the word "large" to attribute to that word more intense evaluative meaning.

The authors concluded that their results "support the theory that word meaning consists of responses which are classically conditioned to a word through systematically pairing it with certain aspects of the environment."

#### Sentence Order and Comprehension

Darnell (40) tested the hypothesis that successive degrees of removal from a "because" order in a sentence will reduce accuracy of prediction about the missing parts of a passage. Twenty college undergraduate subjects were assigned to each of seven groups which read a 15-sentence passage for which seven different word-order constructions varying in degree of disorganization were used. Identical sentences were used in the seven constructions and comprehension was tested by the cloze procedure after 10 minutes allowed for reading the passage. It was found that comprehension as measured by cloze procedure and subjected to analysis of variance produced differences significant at the .05 level. A correlation of .75, significant beyond the .05 level, was also found between predicted ranks of difficulty and obtained ranks of difficulty based on mean cloze scores. The writer interpreted these findings as indicating that the amount of loss of clarity becomes greater as the degree of disorganization in sentence order becomes greater.

#### Directional Perception of Words

Harcum and Finkel (67) experimentally tested the hypothesis that "the accuracy of tachistoscopic perception for words printed in the normal orientation will be superior for the words presented to the right of fixation, but perceptual accuracy for words in re-

versed orientation will be superior for the words to the left of fixation." The verbal and written reactions of 20 subjects were secured to stimuli consisting of eight-letter English words presented at an exposure interval of .15 seconds. One set of 40 stimulus words appeared in the correct left-right orientation while a second set of words were printed with a reversed left-right orientation. Half of each set appeared to the left or the right of the fixation point, respectively. The results were in the predicted direction, the letters of normally printed words being perceived more accurately to the right of fixation, but the letters of reversed words being more accurately perceived to the left of fixation.

### Perceptual-Cognitive Functioning in Reading

Walters and Doan (178) compared the performance of advanced, average, and retarded readers on a series of perceptual, perceptual-motor, and cognitive tasks. The subjects were 54 boys from grades seven and eight in two suburban schools in a Canadian city. Tests of learning capacity and paragraph comprehension were administered. The raw scores for each test were transformed into z scores which were used to define comparable discrepancy scores between reading level and intelligence for the advanced and retarded readers. All subjects were within the 90 to 120 IQ range and had no special auditory, visual, or behavior problems. The boys at one school were placed in a rewarded group which had the incentive of one of a number of prizes for good performance, while the boys in the second school comprised an unrewarded group. Subjects were given the Steer-Beatty Closure-Threshold Test, a multiple-choice test designed to measure latency in reaction time through the use of apparatus described in a previous 1961 study, the Gibson and Gibson test of perceptual differentiation, and a symbolic learning task in which the association of colored lights mounted on a multiple-choice box with that box in which a nebish was hidden was to be learned. No significant differences were found among groups in perceptual closure but in perceptual differentiation an analysis of variance indicated that rewarded subjects performed better than nonrewarded subjects at the .05 level of significance. A similar analysis of mean trials for the symbolic learning task indicated differences among groups significant at the .005 level, retarded readers doing more poorly than either of the other groups, while the nonrewarded group was poorer as a whole than the rewarded group at the .05 level of significance. The effect of reward appeared to be inconsistent, although on most tasks it improved performance of advanced and retarded readers who, as a group, were slower in their reaction times and relatively weak in perceptual discrimination and symbolic learning. The authors concluded that retarded readers "appear to have difficulty in decision making and in association a symbol with an object, i.e., difficulties at a cognitive level, as well as perceptual handicaps. In addition, they may lack the motivation to perform at maximum efficiency." In a second study, Walters and Kosowski (179) used similar techniques

for categorizing 72 boys between 11 to 15.8 years of age and 90 to 126 IQ, and for testing the effects of rewarded versus unrewarded groups in symbolic learning tasks. The multiple-choice box was again used to present a visual association task, using colored lights, and an auditory association task, in which characteristic tones for each box were substituted for lights. Subjects were given both visual and auditory tasks until they completed eight successive correct trials. Reaction time was recorded automatically. In an analysis of variance on the trials-to-criterion measure, groups were found to differ at the .05 level of significance, while a "t" test analysis revealed that retarded readers performed significantly more poorly at the .01 level. A tasks-by-order interaction was significant at the .001 level, apparently due to transfer effects from the visual to auditory tasks. No significant main effects by reading levels were found, although a significant interaction at the .05 level was found for groups by conditions on the auditory task. In general, retarded readers did less well under nonrewarded conditions than did advanced and average readers. But under rewarded conditions, the retarded readers did as well as other reading groups in the auditory task. An analysis of median reaction times showed a group's x order effect significant at the .001 level which revealed that retarded readers responded much more slowly when the auditory task was given first. While children in general responded more slowly to the auditory task than to the visual task, retarded readers were still significantly slower than their comparison groups. The authors concluded that retarded readers have difficulty with symbolic learning, that their speed of learning in a complex task is likely to vary with practice and motivation level, and that the retarded reader may suffer from a deficit in attention in learning tasks.

#### Perception and Oral Reading

Poulton (131) sought to objectively determine the best size of window to use with films for increasing rate of oral reading. A typewriter carriage was used to hold a page of double spaced typing which could be exposed through a window in a disc which rotated above the carriage. The window could be made to move smoothly across the page at one of several speeds. For the reading of prose, the window width varied from 3 letter spaces to 79 letter spaces. The oral responses of subjects were recorded by means of a tape recorder. Three types of material were used: prose from *The Time Machine*; scrambled prose in which the same material was randomized with punctuation marks and capitalization omitted; and random letters consisting of lines of 10 letters each with intervals of 6 blank spaces between letters. Twelve different subjects, ranging in age from 18 to 31, were used in each of four experiments. Each experiment was preceded by a practice period. Two of the experiments were devoted to the effective window size upon oral reading speed and errors in relation to different types of reading material, one was devoted to

practice effects and window size, and one to eye movement frequency and duration. Among the more general findings, it was noted that:

1) Average rate of oral reading was highest for continuous prose, next highest for random letters, and slowest for scrambled prose.

2) An analysis of reading errors indicated that the largest window opening, 79 letter spaces, produces error differences significant at the .01 level for each of the three kinds of materials, although rather similar increases in the number of errors were found for the three kinds of material as the size of the window was reduced.

3) The error analysis also suggested that oral reading accuracy was determined primarily by the time for which each letter could be seen whether the time resulted from a small window moving relatively slowly or from a larger window moving more rapidly.

4) For 7 practice periods given within a week's time, only the use of a window of 3 letter spaces produced reliable evidence of continued improvement between practice periods 5 and 7.

5) Eye movements averaged 3.8 fixations per second with no obvious differences being observed in eye movement patterns as a function of different sizes of windows used in the experiment.

#### Research in Readability

Mills and Richardson (114) examined the accuracy of grade level listings by publishers of 200 basic readers and other texts recommended for use in grades one through three and an unspecified number of books recommended for use in grades four through eight. The primary materials were graded by remedial clinicians according to the Spache formula while the Dale-Chall formula was used for books at upper grade levels. Using these formulas as criteria, it was found that only about one-half of the primary materials were appropriately labeled, while the results for grades four through eight books were comparable to those found in the study of elementary texts. A further evaluation of 20 of the books that varied from the publishers recommended placement indicated that 80 percent were above the grade level recommended and 20 percent below, with a variance of from one to four school years from the publishers' recommended listing. Questionnaires addressed to a very small sample of publishers reported no satisfactory evidence that standardized readability formulas were used. The authors concluded that a more stable base for estimating readability to reduce the variance in consistency in publishers' estimates of readability of their materials is indicated. The same readability formulas were used by Arnsdorf (7) in a study of 25 books designed for use in the primary and intermediate grade levels in four basal social studies series. One hundred

samples were drawn for analysis randomly from each third of each text. The general finding was that all but 3 of the 25 books had readability levels in line with the publishers' recommended sequence when estimates were based upon the entire text, but 12 of the texts were found to progress in difficulty from the first third through the last third of the text material. The readability of occupational materials designed for high school use was also investigated by Ruth (151) in a study of the SRA *Occupations File*. Five or more samples were selected from each of 85 SRA Occupational Briefs and 35 other items included in the 1959 Career Information Kit Supplement. The Farr-Jenkins-Patterson simplification of the 1948 Flesch reading ease index was applied to these materials. The reading ease grade levels were found to range from grade nine to sixteen plus, with a mean of 14.7, a level judged by the author to be too high for incidental reading use by most high school students. It was noted that while the materials used a simple vocabulary, readability was lowered through the presence of over-long sentences.

Empirical studies of the readability of textbooks in industrial arts and in physics were likewise reported. Miller (113) compared the readability of five general shop textbooks as determined by the Dale-Chall and Flesch formulas with the reading abilities of 411 ninth grade, general shop students on the silent reading comprehension section of the Iowa Tests of Basic Skills. While a composite readability rating showed that these texts ranged from grade levels 9.25 to 10.0, with a median grade level of 9.5, individual texts varied widely in readability, from 7 grade levels in one text to 11 grade levels in another text according to different samples within each text. Since 70 percent of the students were found to be reading below the ninth grade level, substantial portions of each text were found to be above the students' level of reading ability. Marshall (110) used the Flesch Reading Ease Formula to compute the readability of seven most commonly used textbooks in physics courses in New York state, exclusive of New York City. He then selected an original passage on basic electricity from a widely used textbook with a low reading ease score (thirteenth grade level) and prepared a rewritten version of the same material to raise the reading ease score to approximately the eighth to ninth grade level, principally by shortening the average sentence length to about half of that of the original. One hundred forty-four physics students and matched for reading ability and physics aptitude were subdivided into two groups, each to read one of the passages. A 31-item multiple-choice test was used to measure comprehension on the passages. An analysis of variance revealed no significant differences in comprehension scores by readability levels, but differences in scores between reading levels and between physics ability levels were significant at the .05 level. The author concluded that the use of the Flesch Reading Ease Formula for judging the readability of high school physics textbooks was "unjustified."

Brief studies on technical aspects of readability likewise appeared. Evidence was reported by Martin and Lee (111) that 10-page samples rather than 50-page samples produced no significant differences in the Dale-Chall readability formula estimates for five high school biology textbooks. In a second study, Danielson and Bryan (39) reported on the design and results of a new computer-based readability formula. Certain difficulties in programming the Farr-Jenkins-Paterson revision of the Flesch Reading Ease Formula were described, but it was found that the new formula was about equal to the revised Flesch formula in predictive power and operated twice as fast.

### Hygiene of Reading

Coleman and Kim (34) investigated the effect of five styles of typography upon reading speed and comprehension in a series of eight experiments among 267 undergraduate college students. In four of the experiments in which subjects read long passages of about 1500 words preceded by practice passages of about 200 words, no significant differences for reading rate and comprehension on the passages were found for three variations of spaced style in comparison with conventional style, for three variations of vertical style under timed conditions, for the same experiment under untimed conditions, and for two types of phrasing in short and long units in comparison to conventional style. However, under tachistoscopic presentation conditions in which subjects were scored for the number of correct words reproduced regardless of order, it was found by analysis of variance that vertical, spaced, and square span arrangements were read significantly more accurately beyond the .01 level than were materials presented in the conventional order. The authors suggested the possible advantages of the new typographical arrangements would need to be accompanied by specific training to employ them effectively in continuous reading.

### THE PHYSIOLOGY OF READING

#### Reading and Neurological Defects

Kucera and others (91) conducted a clinical study of 81 boys and 10 girls ranging in age from 7 to 13 years to analyze the symptoms and etiology of dyslexia. Four types of dyslexia were described: mild encephalopathic, hereditary, hereditary-encephalopathic, and neurotic. The hypothetical nature of these categories was recognized and the need for intensive physiological research stressed in order to define the nature of these physiological disturbances more precisely. In another study, Hickey (72) addressed a questionnaire to the teachers of 60 cerebral-palsied children aged from 4-1/2 to 16 years. Teachers reported that only 19 of the 60 pupils were fluent readers and noted that multiple learning difficulties and some delay in learning to read was characteristic of many of the pupils. Kinsbourne and Warrington



(87) investigated perceptual errors made by 6 right-handed persons with reading disability and with acquired right hemisphere lesions. In perceiving tachistoscopically exposed words and letter combinations, the subjects made paralexical errors frequently and predominantly ones limited to the beginning of the word. The errors included the substitution of one or two letters to the left of the letter group presented, seeing words for which the exposed letters formed only the end, and seeing words when nonmeaningful letter combinations formed the ends. In a second study, Kinsbourne and Warrington (86) examined a syndrome of cerebral cortical disorder known as finger agnosia in 13 backward readers and writers aged, with one exception, from 8 to 14 years. Finger agnosia is characterized by difficulty in naming the fingers and perceiving a right and left discrimination. Six subjects whose scores on the nonverbal section of the WISC exceeded that on the verbal by at least 20 points were compared with 7 subjects whose verbal performance exceeded nonverbal performance to the same degree. Children with high nonverbal performance scores did relatively poorly in reading and spelling achievement but had no difficulty in construction tasks nor on tests of finger differentiation. On the other hand, children with high verbal performance did relatively well in reading and spelling achievement but all had difficulty in construction tasks and all failed tests of finger differentiation. A high incidence of left-handedness and mixed laterality was also reported for the subjects.

The relationship of lateral dominance and handedness in reading achievement was likewise the object of two recent studies in the United States. Balow (11) administered the Harris Tests of Lateral Dominance to 302 first grade children during the first week of school and later obtained reading scores on the Gates Reading Readiness Test and the Gates Primary Reading Tests. It was found that only 15 of these children showed a definite left-hand preference but that a much higher proportion showed a mixed-hand preference than reported by A.J. Harris for 7-year old children. Analysis of variance revealed no significant relationships or interactions among various types and degrees of hand-eye dominance or between dominance and knowledge of right and left. The author concluded that lateral dominance screening will not help teachers detect children likely to have difficulty in learning to read. Groff (64) compared the reading achievement scores of 540 left-handed children with those of a total group of 6226 fourth, fifth, and sixth grade children. Children who wrote with their left hand were classified as left handed. Twelve comparisons were made by grade, sex, and for two school districts. Significant differences were found in only 2 of the 12 comparisons, one of these indicating that left-handed girls were better than left-handed boys at the .05 level of significance in word meaning at grade four. Both of these studies support the general trend of previous findings on the relationship between dominance and handedness to reading achievement for unselected populations as being a tenuous one.

Flescher (54), in an experimental study of 150 fourth grade children selected according to defined laterality characteristics, examined the relationship between the type of laterality and oral reading rate and accuracy for materials presented as mirror images, as inverted mirror images, and as inverted images. The Gray Standardized Oral Reading Check Tests were used as the stimulus material. The Harris Tests of Lateral Dominance were used to identify an experimental group of 50 children with preference for the left eye and the right hand. Two control groups of 50 children each were formed of unilateral groups of right-eyed, right-handed children and left-eyed, left-handed children. Two hypotheses were examined: 1) that children with mixed dominance in the experimental group would obtain higher mean scores in oral reading than the control groups, and 2) that the inverted presentation of material would yield the highest mean scores in oral reading. Analysis of variance of the data yielded no significant effects between groups nor was the inverted stimulus condition the most easily perceived. The author concluded, however, that the superiority of inverted reading over combinations of inverted and mirror reading demonstrate the importance of directional factors in word perception. No sex differences were found between the equal number of boys and girls used in this study.

#### Visual-Motor Capacities and Reading

Leton (95) analyzed the results of electro-oculograms and selected tests of perceptual functioning given to 21 children of intermediate grade school age on the basis of case history data and teacher judgment. Seven remedial readers were identified as having perceptual difficulty, 6 remedial readers as having emotional disturbances, while 8 subjects were selected from regular classes as a control group. Among the findings it was reported that differences in reading and spelling on the Wide-Range Achievement Test between the control and the two disability groups were significant; that there were no significant differences in mean scores among the groups on the Bender Motor-Gestalt Test, the Benton Revised Visual Retention Test, and the Graham-Kendall Memory-for-Designs Test; and that electro-oculogram rankings for reading were significant at the .01 percent level among groups. A blind analysis of electro-oculogram tracings during reading permitted accurate identification of 19 out of 21 cases.

#### Mode of Reading in the Blind

A comprehensive status study has been issued by the United States Department of Health, Education, and Welfare (174) on the mode of reading, braille and/or print, in relation to the degree of vision in blind children. The study involved 14,125 legally blind children in grades kindergarten through twelve in five states. Among the findings, it was noted that: 1) only 24 percent of the children were reported as totally blind, while about 60 percent of the students reportedly have sufficient residual vision to engage

in many school tasks; 2) as visual acuity decreases, the use of print likewise tends to decrease and the use of braille increases; 3) a much higher proportion of children with some residual vision in local schools read print than do comparable students in residential schools for the blind; 4) the highest percentage of children reading both print and braille is found in grade seven. The bulletin includes a valuable discussion of the implications of these findings with respect to such questions as the reliability of the visual examination procedures by which the children are classified, the need for adequate diagnosis at the near point as well as the far point, psychological problems of adjustment to reading braille, the extent to which the classification of degree of visual acuity thereby defines a homogeneous group, and the need for examination of differences in mode of reading practices between school systems and residential schools for children of equivalent levels of visual acuity. The bulletin should be consulted for other specific findings.

A study comparing the effectiveness of reading and listening in learning the content of an extended passage by 70 blind students was conducted by Nolan (118). Subjects were drawn from grades six through ten of a school for the blind and were braille readers. Experimental groups were formed comprising three braille reading groups, three listening groups, and a control group. A multiple-choice test was used to measure learning effectiveness. It was found that both experimental groups performed significantly better on the test than the control group, but that analysis of the experimental means adjusted for intelligence showed no significant differences between the listening and reading groups. The need for further research on the relative efficiency of these two modes of learning was stressed by the author.

### Reading Epilepsy

Two additional clinical descriptions of primary reading epilepsy were added to the literature by Norbury and Loeffler (119). They describe the symptoms and attempted treatment of this condition and discuss the possible mechanisms involved.

## THE TEACHING OF READING

### Status of Reading Instruction

#### Cross-Sectional Comparisons

Preston (133) compared the reading comprehension and speed, including sex differences, of 1054 fourth and sixth grade pupils from Wiesbaden, Germany, with 1338 American pupils in and near Philadelphia. All subjects took two tests, the Frankfurter Test and the comprehension subtest of the Gates Reading Survey in appropriately translated versions. Rate was measured on the Gates comprehension subtest by determining which paragraph pupils were reading after working for 10 minutes. Somewhat higher correlations

between scores on the two tests were found for American pupils than for German pupils. In reading comprehension, the mean scores of American pupils were higher than those of German pupils in all but one of the four comparison subgroups, the German sixth grade boys being significantly higher on both tests of comprehension at the .05 level. Similarly significant differences were found for American fourth grade girls on both tests and for sixth grade girls on the Gates comprehension subtest. An adjusted sample to equate differences in the proportion of children according to type of school significantly favored the performance of the American pupils. In reading speed as measured in this study, all differences were found to be significant at the .05 level in favor of the American pupils. Sex differences were found in both grades and upon all tasks favoring American girls over American boys. For German subjects the reverse was true except for fourth grade reading speed scores. The writer concluded that this study yielded no support for the unqualified statement that German children read better than American children or for the presumption that sex differences are unique to United States pupils. It was also noted that the superiority of American pupils tended to be less at the sixth grade level than at the fourth, and that sex and speed differences may be related to differences in cultural emphasis in the two countries. The problem of translation, it would appear, may also affect the results of studies of this type.

#### Foreign Language Instruction and Reading

Johnson, Flores, and Ellison (76) investigated the effect of foreign language instruction upon basic learning skills for an experimental group of 90 fourth grade children who received 20 minutes of instruction daily in Spanish and for a control group similar with respect to age, intelligence, sex, and achievement factors. Mean achievement gain scores were computed from administrations of the Iowa Every-Pupil Test of Basic Skills upon entrance to fourth grade and later upon entrance into fifth grade. A "t" test analysis of differences in mean gain scores for the two groups on subtests of vocabulary, reading comprehension, language skills, arithmetic, and work-study skills revealed significant differences only for the latter test, at the .004 level in favor of the control group. The authors concluded that the added amount of time devoted to foreign language instruction in elementary school programs did not reduce average pupil gain in basic learning skills on standard achievement tests.

#### Elementary Reading Achievement

Ramsey (135) conducted a questionnaire study of the reading status of children on standardized reading achievement tests at the fourth and eighth grade level in 135 out of 209 Kentucky school districts. Scores were obtained for 29,921 fourth grade pupils and 32,101 eighth grade pupils upon the California Achievement

Test, the Metropolitan Achievement Test, and the Stanford Achievement Test. All scores were converted to California Achievement Test equivalents and fall and spring means were examined. Kentucky fourth grade children were found to be reading up to the national norm, but at eighth grade level they were found to be reading significantly below the national norm at a level not reported. Bauernfeind and Blumenfeld (14) used scores on the SPA High-School Placement Test to investigate differences in reading and other achievement areas of a random sample of 1000 eighth grade pupils attending Catholic schools and a sample of 1000 eighth grade students attending public schools, the samples being matched on the basis of reasoning ability, sex, and geographic location. The original study was fully replicated except for a modification of the sample to provide more adequate representativeness for the matching factors. The results of the original study indicated that Catholic school pupils had a mean grade equivalent score of approximately 1.0 years higher than public school pupils on reading and arithmetic, the differences exceeding the .01 level of confidence. A similar differential was found in the replication of the study, including differences in the language arts area which was added to the second study. The authors concluded that, "It is important to note that these broad findings would not necessarily apply to any given local group of parochial-school and public-school children. But, on a national basis, circa 1960, Catholic-school eighth-grade groups showed significantly higher levels of achievement in three curriculum areas than did public-school eighth-grade groups."

#### Reading Instructional Time

Grekke (21) conducted a questionnaire study of the time spent in basal reading and other reading activities in grades one through eight in relation to the amount of time recommended by reading authorities. A sample of over 1000 schools was drawn from 8 geographic areas throughout the United States and the amount of time reported for reading compared with the recommendations of 60 or more reading authorities. A "t" test analysis of differences in the average number of minutes per week by grades indicated that significantly more time at the .05 level of confidence was actually spent in basal reading instruction in grades one and three than recommended by reading authorities, the general trend being to spend more time in the primary grades than in grades seven and eight and less time in the intermediate grades. On the other hand, schools reported spending in every grade less time on other reading activities than authorities recommended to degrees ranging from the .05 to the .01 level of significance. It was further found that differences in time allotments were greater among various states than among schools within states at each grade level, that the amount of time spent in basal reading was greatest in early grades and least in later grades with the reverse being true for time spent in other reading activities, and that slightly more than half of the total reading time utilized

for reading was allotted to basal reading instruction. The author recommended that to conform with the recommendations of reading authorities, schools should decrease the weekly time spent in basal reading in the primary grades in favor of more time for other reading activities, that more time should be provided for both basal and other reading activities in the intermediate grades, and that more time for other reading activities should be provided in grades seven and eight.

### Supervision of High School Reading

Simmons (160) analyzed the results of a questionnaire received from 127 of 152 high schools in five midwest states to determine supervisory policies and practices in high school reading instruction. Responses were largely from middle sized and larger schools. In general, it was found that a large proportion of schools felt that each teacher must assume responsibility for instruction in reading in his own area, that the responsibility of the English Department for administering the reading program was advocated about twice as frequently as other agencies, and that supervisors responsible for secondary reading instruction had very little training, the most frequent response being "no formal training." The writer stresses the need for greater attention to reading instruction in high schools and commented that the English teacher, to whom the responsibility for leadership in reading is most often delegated, may be the poorest prepared.

### The Teacher and Reading

#### Proficiency in Reading Instruction

Groff (63) secured self-estimates of the teaching ability of 645 student teachers with respect to their relative strength and weakness in teaching various elementary school subjects, including reading. Of the 11 elementary subjects considered, reading was ranked first as the subject which they felt best prepared to teach. Ramsey (136) administered an informal test of word recognition skills to 236 students in elementary education programs in five midwestern colleges before students enrolled in their first reading methods course. It was found that in the spelling of unfamiliar syllables, the students preparing to teach were relatively strong in the identification of initial and final consonants but weaker in the correct identification of medial vowels. The writer concluded that more attention should be paid to determining the correct pronunciation of vowels in teacher training programs. Burnett (22) examined another aspect of teacher proficiency, the diagnostic proficiency of teachers of reading as related to their training and experience. The performance of 75 undergraduate elementary education students, 93 experienced elementary teachers, and 19 reading specialists were compared with respect to their diagnosis and recommendations for treatment for 2 children representing typical reading problems and for whom case study material was

presented. The diagnostic proficiency of the reading specialist was judged significantly better at the .01 level than that of experienced teachers, who in turn were significantly better than inexperienced students at the .05 level. Other data are reported with respect to test reliability and other factors affecting the performance of these groups.

## Developmental Reading Instruction

### Early Reading Instruction

Durkin (48) raised the question of the appropriateness of an earlier start in reading for certain children as a result of a comparison at the end of third grade of the reading achievement of 25 children who could read when they started first grade with a control of 201 children of similar intellectual ability but who could not read upon entrance to first grade. The IQ's of the experimental group ranged from 91 to 161 IQ, with a median of 114.8 IQ, while those for the control group ranged from 70 to 191 IQ, with a median of 110.2 IQ. In the analysis, intergroup comparisons were made for children with IQ's of 120 or less and for those of 121 IQ or higher. After coefficients of correlation between intelligence and reading achievement were computed from the control group data, a regression equation was formulated to predict the reading scores for early readers and a comparison of predicted scores with actual reading scores made. A correlation of .61 was found between intelligence and reading achievement for 129 control subjects with IQ's below 120, but for the brighter control group the correlation was very low, .17. The actual reading achievement scores for the earlier readers were greater than predicted, most noticeably in the range of 91 to 110 IQ. The author concluded that reading tests are inadequate for establishing the upper limits of achievement for brighter third grade children and that children of relatively lower intelligence levels, as defined in this study, benefit especially from an early start in reading. It was also suggested that kindergarten teachers should feel obligated to give certain children help with reading, namely those exhibiting obvious readiness for reading. Fowler (55) reported an investigation of the extent to which a two-year-old child, the experimenter's daughter with a measured IQ of over 170, learned to read during a 9-month period, together with observations on the methods used and possible personality or intellectual disturbances. Training sessions were held 5 days a week, varying in length from 5 to 10 minutes to slightly over an hour during the latter months. Occasional brief supplementary instruction was given. The writer describes the methods used as emphasizing play technique and a highly flexible, trial-and-error approach modelled after the "look-and-say" method. A variety of reading achievement, intellectual, and psychological tests were employed during the study. The experimenter reported a high degree of success in the learning of 250 words presented in isolation and in sentences as measured at different points in the training program. Many signs

were noted of improvement in the quality of perceptual learning in such aspects as ease, spontaneity, and quickness of learning; enthusiasm over new words; ability to make finer discriminations; and the emergence of a definite achievement motivation. In spite of fluctuations, progressive improvement in reading was noted until the final month and one-half when motivation and performance in reading declined seriously and a number of generalized signs of anxiety appeared.

#### Readiness Factors in Beginning Reading

Hall (66) reported the results of two studies having to do with the relationship of entrance age to first grade and to school retention and achievement. In the first study, it was found that 801 of approximately 12,800 elementary school pupils had been retained, almost three times as many boys being retained as girls. Of those retained, 77.9 percent of the boys and 80 percent of the girls were underage at the time of entrance to first grade. In the second study, a random selection was made of 607 third grade pupils and 556 sixth grade pupils, representing slightly more underage than overage pupils in each group. When the performance of these pupils was analyzed on the SRA Achievement Tests, under-age children, especially boys, were found to be at a distinct disadvantage in achievement in comparison with overage boys and girls. Balow (12) studied the role of sex differences in first grade reading in a population of 151 boys and 151 girls in 13 first grade classrooms randomly selected from 32 classrooms in a suburban area in Minnesota. Pupils were given the Gates Reading Readiness Test early in the school year and later were given the Lorge-Thorndike Intelligence Test and the Gates Primary Reading Tests. The girls' performance upon the reading readiness test was significantly higher than that of the boys at .01 level, while a higher level of significance, .001, was found for the girls in achievement on the Gates Primary Reading Test administered later. An analysis of variance on mean scores on paragraph reading for pupils classified by sex, for three levels of intelligence, and for three levels of readiness showed only readiness to be significant at the .01 level in favor of the high readiness group. Other analyses indicated that the ability of the girls to see similarities and differences in words accounted for their higher reading achievement. The author thus concluded that girls not only come to school better prepared than boys for formal reading instruction but that these differences account for their significantly higher achievement in first grade. Brazziel and Terrell (20) reported that a guidance approach to registration and school induction and an intensified teacher-parent planning approach in the creation of reading and number readiness overcame to a considerable extent the effects of a culturally disadvantaged group of first grade Negro children. The 26 children in the experimental group, and 66 children in a control group drawn from three other first grade sections, were given the Metropolitan Readiness Test at the end



of a 6 weeks' readiness period, at which point the experimental group scored significantly above the control group at the .01 level. Roche (146) examined the question as to whether a reading readiness period between kindergarten and formal reading was essential for some children by comparing the subsequent reading achievement of 83 children who were continued in readiness activities as long as teachers felt it necessary with that of a control group of 103 pupils who entered first grade reading activities immediately after kindergarten. The experimental group was comprised of children whose mental, social, or emotional age was less than 6.6 years upon entrance to first grade. Special programs were also provided for the very slow and immature. The major finding of the study was that children in the experimental group showed superior achievement in reading when measured 4 years later by the Iowa Basic Reading Tests, 52.8 percent of the experimental group scoring at or above grade level as compared to 34.3 percent of the control group.

#### Primary Reading Methods

McNeil and Keislar (106) used programmed instructional materials to investigate the value of using oral responses in beginning reading among 182 kindergarten children, half of whom made oral responses and half of whom did not, to instructional materials presented in 17 daily lessons through the use of small-group study techniques. The pupils, whose average IQ was 107, were taught 40 words during the training program and were given a silent reading post test consisting of 51 multiple-choice items designed to measure word and sentence comprehension. For matched pairs of instructional groups, the mean score for those in the oral group was higher at the .01 level of significance. In each of the 13 pairs of groups involved, the mean of the oral group was higher. The authors concluded that "The experiment gives no support for the belief that oral responding in learning to read has unfavorable effects...The act of vocalization during instruction is an aid to the beginning reader in what for him is already a difficult reading situation. Without such vocalization, his performance would be worse."

Recent studies have likewise appeared in various aspects of the teaching of phonics. Olsen (122) investigated the relationship between success in first grade reading and the early teaching of sounds and their names and other aspects of phonics to 1170 children in the Boston area who had a mean IQ of 110. The pupils were first tested in 1956 on their knowledge of sounds, auditory and visual discrimination of words, and their learning rate for words, while 5 months later they were tested for phonics knowledge, for their ability to apply phonics to solve new words, and for success on an oral reading test. Rather substantial correlations were found between the phonics skills measured and reading achievement in the later testing. These findings led the author to suggest that success in first grade reading is closely

related to the early teaching of sounds and their names as well as to other aspects of phonics, and that requiring a child to develop a 75 word sight vocabulary before word analysis skills are developed is unjustified. Sabaroff (152) reported a comparative study of gains in reading achievement by 54 second grade pupils grouped by three levels of ability and having received instruction in either systematic phonics, functional phonics, or independent pleasure reading. The experimental design which was subjected to analysis of variance, incorporated three modes of treatment and three levels of reading ability. Formal phonics lessons were presented to the systematic group, phonics help when needed was provided in the functional group, while the teacher told children words with which they were having difficulty in reading materials of their own choice in the independent pleasure reading group. The Dolch list, the Gates Advanced Primary Reading Test and test I and II of the McKee Inventory of Phonetic Skills were administered to determine pupil-gain scores. The most significant differences found, at the .01 level of significance, were those for ability groups and not for methods used, although the gain in phonetic elements by the experimental group was significantly better than that by the control group at the .05 level. Tensuan and Davis (171) reported a comparison of a phonic method with a "combination" method for teaching reading to 1147 Philippine children during their first and second years in school. Subjects were drawn from 10 elementary schools in different sections of a Philippine city, 658 pupils representing the phonic group and 489 the combination group. In the phonic approach, pupils were first taught the sound of letters and diphthongs and next to identify sounds and words and to blend sounds. In the combination approach, interest in word knowledge was first aroused and whole words associated with their meanings, after which letters and diphthongs were associated with the sounds and words that the pupil was already reading by sight. Reading materials were the same for the two groups except for the phonic drill cards used by the phonic group and the reading readiness exercises used in the combination methods. Appropriate tests of mental ability and achievement were administered, the latter at the end of grade two, and the mean achievement scores adjusted to certain identifiable differences in the two groups. No significant differences were found between the groups on a test of paragraph comprehension nor in social studies and language usage, although differences in arithmetic favored the combination group at the .05 level of significance.

Further comparative studies of the New Castle reading method and conventional approaches to reading instruction in Canada were reported. In a study by Cruickshank and Flowers (37) involving 732 experimental pupils in grades one through four in one city and 1881 control pupils in the same grades in two other cities, no significant differences were found at any of the four grade levels between mean scores on the Dominion Achievement Test in Silent Reading according to "t" test analysis when the .01 level of significance was used as the criterion. The higher mean score of the

two control cities was used in the comparisons. While it was found that the experimental group scored highest on all achievement tests, it was concluded that due to lack of experimental control, the superiority of the experimental approach was not necessarily established over existing reading approaches. A second study (140) described the comparative effectiveness of the same methods for a small group of children comprising 11 matched pairs of children in grade one. Close correspondence in chronological age, reading readiness test scores, and IQ were used in the matching. On paragraph reading in the Dominion Achievement Test in Silent Reading, 8 of the 11 experimental subjects had higher scores than their matched controls but the difference was not significant at a .05 level. These results were interpreted as not warranting a definite conclusion.

### Reading in the Content Fields

Witt (183) reported gains significant at the .01 level in reading achievement on the Iowa Silent Reading Test, on performance on the STEP social studies test and in the understanding of 10 specific social studies concepts as the result of a reading emphasis in two social studies classes involving 58 seventh grade students. The gains in achievement were particularly increased when the teaching method during the second semester of the experiment was focused upon the development of 10 selected social studies concepts.

### Grouping for Reading

Several studies examined the effects of homogeneous and other related types of grouping. Balow (10) reported that the homogeneous groupings of 94 fifth grade students into four groups on the basis of total scores on the Iowa Silent Reading Test, did not produce homogeneity in their performance upon the subtests of the same test; and likewise that no significant differences in reading achievement were found for an unspecified number of sixth grade students under homogeneous and heterogeneous grouping during the school year. Balow and Ruddeii (13) likewise concluded from an experiment designed to test the relative effects of homogeneous cluster and heterogeneous grouping at the sixth grade level that homogeneous grouping according to reading achievement did not produce gross scores in reading achievement on the Metropolitan Achievement Test significantly different from cluster or heterogeneous grouping. Similar results failing to support the superiority of homogeneous over heterogeneous grouping were reported by Koontz (89) for 5 fourth grade classes homogeneously grouped and 2 classes heterogeneously grouped. An analysis of variance revealed that the heterogeneous group was significantly higher in reading achievement at the .01 level.

The effects of multi-graded versus single-graded school organization on the achievement of children at the third and fifth

grade levels was studied by Finley and Thompson (52) by an analysis of differences in scores on the California Achievement Tests for 104 paired children at the third grade level and 108 paired children at the fifth grade level. No significant differences were found in the paired groups at either level in reading achievement nor in other achievement areas except arithmetic. On the other hand, Carbone (26) found significant differences in all areas of achievement on the Iowa Basic Skills Test, including reading, in a systematic random selection of 122 nongraded pupils and 122 graded pupils from fourth, fifth, and sixth grade classes and from upper, middle, and lower socioeconomic levels. An analysis of covariance was used to control effects of intelligence. The results of a mental health test also administered showed no significant difference in four out of five mental health factors except in social participation in which graded pupils scored significantly higher at the .01 level than the nongraded pupils. A semantic differential test including 25 polar word pairs designed to describe characteristics of teachers produced significant differences on nine-word pairs which indicated that nongraded pupils scored their teachers more favorably than graded pupils. No evidence was found from a questionnaire designed to explore the instructional practices of teachers to show that changes in organizational structure likewise produced major changes in the instructional practices of teachers. The author noted that the evidence provided in this study was in sharp disagreement with most of the literature, but observed that it was not realistic to expect improvement in academic achievement and personal adjustment in pupils merely on the basis of a change or organizational structure. It was also noted that changes in organizational structure alone do not necessarily produce appropriate adaptations in the instructional practices of teachers.

No significant differences in reading achievement on the California Reading Test between individualized reading and conventional groups were found by Wilson and Harrison (182) for an unspecified number of sixth grade students of similar intellectual ability according to test gains between fall and spring testing periods. Healy (70) likewise reported no significant differences by analysis of variance of scores on the Weekly Reader test for three types of instructional grouping involving 100 fifth grade students, one group of which followed an individualized reading plan, but did report differences in attitudes toward reading based upon a questionnaire and teacher observations. A much higher number of children liked the individualized grouping plan than did like the other instructional plans. Since it was also noted that a substantial number of children in the individualized group made exceptional achievement in the 7 months preceding the final testing, the author concluded that "A combination of small group instruction, reading partners, and individualized instruction appeared to be promising." The effects of interclass grouping for reading instruction versus grouping within the classroom were examined by Kierstead (85) for students in grades three

through eight in a Vermont school district. In the interclass grouping, all reading classes were scheduled throughout the school at the same time and students of like reading ability were grouped for reading instructions. Gains over an 8-month period on the Iowa Test of Basic Skills were obtained as well as evaluations by students of the type of grouping in grades seven and eight. When groups were equated for intelligence, no significant differences were found in gains in reading achievement between the two groups. While students in seventh and eighth grade reported that they felt comfortable academically as a result of being separated by levels of reading ability, the slower group reported they did not feel comfortable socially. On the other hand, a study reported by Green and Riley (61) indicated some differences in reading achievement favoring schools using the Joplin Plan of interclass reading instruction. Experimental and control subjects were matched by grade, school, sex, IQ, and parental occupation, after which a random sample of 30 matched pairs was drawn for each grade in each school. Mean reading gains from the Stanford Achievement Test from September to May were found by "t" test analysis to favor the experimental group at either the .05 or .01 level of significance except for grade five in one school under conditions in which initial scores were either controlled or uncontrolled. It was also reported that analysis of variance of fourth grade gains indicated that gains by schools were significant, but that method by school interaction was negligible.

#### Reading and Acceleration

Mayne (112) studied the effects of the acceleration of two superior children through second grade, who had been moved directly to second grade from an enriched kindergarten experience. The boy and girl studied had WISC IQ's of 139 and 140, respectively. The investigator used monthly teacher and parental interviews, sociograms, and the Metropolitan Achievement Test, Primary III Battery, to evaluate pupil performance. No undesirable effects with respect to tension, emotional and social adjustment, or academic development were noted. Rusch and Clark (149) conducted a comparative study of achievement in reading and other academic areas using an experimental group of 30 able pupils from the fourth grade and three types of control groups to determine whether or not the experimental group would be ready for ninth grade work following 3 academic years and 4 summer sessions of school work. The experimental group ranged from 111 to 137 in IQ and had achievement scores ranging from 5.8 to 8.6 in grade level. Test results in academic achievement were secured at each of seven successive grade levels, three through nine. In comparison with one control group matched for age, intelligence, and achievement, and a second control group matched in intelligence but 1 year older and 1 year above in achievement level at the beginning of the experiment, the experimental subjects were found to achieve as well as the control subjects in reading, spelling, and arithmetic at the end of the ninth grade. Further, the Detroit Adjustment In-

ventory and an informal sociometric study did not indicate any negative results in adjustment for the experimental group. The author concluded that "the experimental group was ready for ninth grade - as ready academically as a comparable group a year older, a group that attended school for 4 academic years after grade four."

Klausmeier (88) conducted a follow-up study of 50 boys and 50 girls near the end of fifth grade to determine the effects of accelerating bright older pupils from the second to the fourth grade after a 5-week summer session. The performance of the accelerated group was compared with that of two groups of nonaccelerated pupils of superior ability above and below the median age, respectively, of normally progressing fifth graders, and two groups of nonaccelerated pupils of average ability above and below median age, respectively, for fifth grade. Nine types of data were gathered with respect to a wide variety of intellectual and nonintellectual characteristics and the scores subjected to analysis of variance. On the scores of the Metropolitan Achievement Test, the accelerated group was not found to be significantly different from the nonaccelerated superior groups except in word knowledge and in total language scores on which the older unaccelerated, superior group was significantly higher. The accelerated group was likewise significantly higher in achievement than pupils in the unaccelerated, average groups except in language study skills for which no significant differences were found between the experimental group and the nonaccelerated, older, average group. It was also found that on ten tests of creative thinking ability, the accelerated group was not significantly different from the other comparison groups. The author concluded that the usual objections to acceleration were shown to be invalid.

#### Reading Workbooks

Docter (46) published specific data to support findings reported in a previous article in 1962 entitled "Reading Workbooks: Boon or Busy Work?". The reading achievement of 144 third grade students who used a reading workbook for 4 weeks was compared with a group of 147 pupils who engaged in various reading enrichment activities as reported by Sartain (153). Analyses of gains on five reading tests subjected to analysis of variance and covariance showed that the use of workbooks by less capable readers produced significantly greater knowledge of the reading vocabulary in the unit under study than did the practice of not using workbooks. No significant differences were found for methods of word recognition, paragraph reading comprehension, individual word analysis, or phonetic knowledge.

#### Analyses of Reading Instructional Materials

The vocabularies of early materials for instruction in reading were studied in several investigations. Stone and Bartschi (167)

developed a composite basic word list, grouped by half-year intervals for the primary grades, of words common to five basal reading series, and the Dolch and Fry word list. Similarly, Fitzgerald (53), proposed a list of 644 words described as "an intergrating basic communication vocabulary" based upon the 500 commonest words of Horn's kindergarten list of the spoken vocabulary of young children before entering the first grade and the Gates list of 500 words for primary reading. The frequency of these words was also checked in five other compilations of children's vocabularies. Denslow (42) examined the vocabulary, sentence length, and reading difficulty as measured by the Spache formula of 8 first grade science books. A considerable range in difficulty was noted for each of these characteristics within and between books. Carterette and Jones (29) examined redundancy in reading texts at grade levels one, two, three, and five and simple texts intended for adult use by quantifying the letter redundancy of the text through the application of information theory to the sequential constraints among the letters. Letter redundancy of each of the five books was calculated by a modification of Newman and Waugh's method, and contingency tables were constructed to show the number of times that a given symbol was followed at any specified interval by every possible symbol in order to determine degree of sequential restraint. The authors reported that "Information in single letters is about the same for all texts. Redundancy decreases with increasing grade in a regular way, while mean word length increased. A third reader has about the same redundancy as a simple adult text. The constraints in a first grade reader are considerable, whereas those in a fifth grade reader approach those in average adult texts."

An analysis was made by Clymer (33) of the teacher's manuals of four basal reading series to determine what phonic generalizations are taught and to determine the usefulness of 45 of these generalizations. Great variation in the grade level at which the generalizations were introduced, in degree of emphasis, and in phrasing were noted. A word list was then prepared composed of words introduced in the four basic series plus words from the Gates Primary Vocabulary. The selected generalizations were then checked against the word list to determine those words to which the generalization applied and those which were exceptions to the generalization. A percentage of utility was computed for each generalization by dividing the number of words pronounced according to the generalization by the total number of words to which the generalization could be expected to apply. The two criteria established by the investigator to determine degree of application were that the list should contain a minimum of 20 words to which a generalization might apply and that the percent of utility should be at least 75 percent. According to these criteria, only 18 of the 45 generalizations were found to be useful. The author thus concluded that many of the phonic generalizations taught are of limited value, but noted that the study did not answer the questions of which phonic generalizations

primary children can apply in working out the pronunciation of unknown words. In addition, it would appear that the defined percent of utility is a matter of judgment and that other considerations concerning the linguistic adequacy of a given phonic generalization were not examined, nor the full possible range of its application to reading other than in basal series recognized.

#### Children's Word Recognition Techniques

Robinson (144) investigated the relative effectiveness of various techniques for the identification of unfamiliar words met in reading by 61 fourth grade students who failed to pronounce correctly two-thirds of the words on a sight word test. Five forms of a test passage in which 22 words chosen from those familiar to 50 percent or more pupils in grade six, according to the Dale-Eichholz study, were used as criterion variables. The test passages were differentiated as follows: in Form One, blank spaces were substituted for test words; in Form Two, configurations of the 22 words were used; in Form Three, word configurations plus beginning elements were given; in Form Four, both beginning and final elements were used; and in Form Five, the full word was exposed. Subjects were asked to work their way through each of the forms, beginning with Form One, and the number of correct responses per form were totaled and their means and standard deviations calculated. A number of correct responses for each of the 22 words was also tabulated and the percentage of words correct in each form computed. On the whole the subjects experienced very little success on any of the forms, only about one-fourth of the subjects being able to identify 50 percent or more of the words even when viewed in context. The author concluded that no word identification technique was used very successfully by this group of subjects, but felt that at this level pupils should have met with a greater degree of success.

#### Reading Improvement and Remediation

##### Special Reading Programs

Jones and Van Why (79) conducted an experimental study of the effect of tachistoscopic training on reading rate and comprehension, using experimental and control groups of 66 fourth grade and 62 fifth grade pupils over a 3-month period. While significant changes in performance upon pre- and postadministrations of the Iowa Silent Reading Test were noted when the experimental and control groups were divided into subgroups according to achievement level, no differential changes in reading rate or comprehension could be attributed to the experimental treatment. Rasmussen and Dunne (138) made a comparison over a 5-year period of 59 students who started in the seventh grade in a corrective junior high school reading program with the academic progress of a similar



group of 20 students who began at the same school in the year previous to the establishment of the corrective program. It was noted that while placement in the corrective reading class did not result in significantly greater improvement in reading skills, the students in the corrective class had a much lower dropout rate, appeared to receive more need satisfaction, and had a lower rate of school retardation than the controlled subjects at the .05 level of significance. Plessas and Ladley (129) concluded from a study of the effect of corrective reading instruction upon the spelling ability of 73 retarded readers in grades three through eleven that a corrective reading program does not necessarily insure growth in spelling. The correlations between reading and spelling growth and between reading growth and word discrimination, were so low as to suggest the need for greater attention to direct spelling instruction.

The effect of a short, intensive precollege developmental reading program upon the measured IQ of three groups of students was reported briefly by McCord (97). He administered alternate forms of the California Capacity Questionnaire to sections of 16 and 13 students, respectively, before and after a 5-week training program. He also administered the same form of the California Short Form Test of Mental Maturity before and after training to a group of 22 students. Average increases by groups of 14, 9, and 8 IQ points were noted and the implications of these findings discussed. Chansky (30) reported rank-order correlations among IQ, reading improvement, and age for 41 children with a median age of 11 who were enrolled in a remedial reading class. Test data were secured from alternate forms of the Gates Reading Survey at the beginning and end of the academic year, while the California Short Form Test of Mental Maturity was given at the beginning of the school year. Chansky found little evidence, when age was partialled out, of a relationship between intelligence and reading improvement. However, when IQ was held constant, a rank-order correlation of  $-.35$  suggested an inverse relationship between age and improvement in reading.

The effect of intensive vocabulary training was reported by Jackson and Disney (75) in a comparative study of reading growth on the Cooperative English Reading Comprehension Test for 45 twelfth grade students randomly assigned to experimental and control groups over a 27-week period. A "t" test analysis indicated group differences in vocabulary growth favoring the experimental group at the .05 level, but no significant group differences in level of comprehension or in reading speed. Allman (3) likewise reported substantial gains as a result of direct vocabulary instruction for 124 college students in a program in which students submitted weekly lists of all unfamiliar words encountered in reading with evidence of his ability to use the word in a sentence. The vocabulary section of the Diagnostic Reading Tests was used for measurement of vocabulary growth.

At the college level, Kammann (81) made a correlation analysis of aptitude, reading, and study habits, and of gain in reading ability for 352 freshmen students completing the reading improvement program at the University of Cincinnati. Scores were taken from the survey of study habits and attitudes, the Scholastic Aptitude Test or the American College Test, and the survey section of the Diagnostic Reading Tests, the latter of which was administered at the beginning and end of the reading program. Appropriate subtests of these measures were used to compute the relationships studied, with findings suggesting four general trends: 1) study habits were unrelated to aptitude, reading, or reading improvement; 2) students high in aptitude were initially high in reading level and did not improve in reading level; 3) none of the variables appeared to be related to improvement in reading rate; and 4) improvement in one reading skill did not contribute appreciably to improvement in any other reading skill. Cheris and Austin (31) used experimental and control groups of 18 college students each to investigate whether speech students trained in silent reading speed and comprehension would improve in oral reading speed and accuracy, and to discover the relationship between ability to read rapidly and accurately in a silent reading situation and in audience eye contact time during oral reading. The experimental group showed an increase in the combined speed-accuracy score in silent reading significantly greater beyond the .01 level than that for the control group, and likewise improved in speed of oral reading, in a reduction of the number of mistakes made, and in their combined speed-accuracy for reading scores whereas the control group improved only in speed. No relationship was found between rapid silent reading and the total amount of audience eye contact during oral reading. Mains and Collins (107) in an evaluation of the effect of one semester of remedial reading instruction of college freshmen in a junior college, reported that attrition rate decreased, that there was some improvement in grade point averages, but that gains in reading were variable. The course was taught in a challenging way to emphasize critical thinking in reading with much classroom discussion and debate about the reading material. The authors stated that "It seems reasonable to conclude that in some instances remarkable gains in reading skill can be achieved through even one semester of training. If such progress can occur with some students, there is hope that with advancements in teaching skills and attitudinal approaches it can occur with others and perhaps even with most students"

#### Remediation of Severe Reading Disability

In connection with a fuller discussion of the Augmented Roman Alphabet and its applications to the teaching of reading, Downing (47) reported a pilot study of the effect of the Augmented Roman Alphabet for remedying previous reading failures. The two experimental groups consisted of 7 students each, one group having a

mean IQ of 99 and the other of 83, all of whom had demonstrated that they were unable to read more than three words on the Schonell Graded Word Reading Test. Three control groups, two for the high IQ group and one for the low IQ group, were matched with the respective experimental groups on intelligence, attainment levels, and social environment. After 16 hours of instruction, which was alike except for differences in the orthography of the books used, subjects were retested on the Burt-Vernon scale previously administered in the appropriate form of orthography. The experimental group then changed to materials in traditional print and were retested after different periods of remedial teaching. After 16, 20, and 40 hours of remedial teaching the experimental pupils read a substantially larger number of words correctly than did the control subjects. The authors concluded that "Both A.R. groups maintained their advantage over the control groups even after their transfer from A.R. to T.O. (traditional orthography) material which suggests the aim of providing a first stage alphabet and spelling from which an easy transfer from reading skill can be made to traditional spelling has been fulfilled - at least in this pilot experiment."

Ofman and Shaevitz (121) conducted an experimental study of 30 full-time male students enrolled in the University of California at Los Angeles Clinic School to explore the effect of tactual-kinesthetic variables. The subjects, who were randomly assigned to one of the three experimental conditions, had a mean age of 13.5 and were reported not to differ significantly in age, IQ, reading ability, or length of training at the school. The three treatment groups were: Group A, eye tracing, in which subjects traced the word presented to them by visually following a moving point of light as it followed the outline of a syllable; Group B, finger contact tracing, in which subjects placed a finger on a slide on which was written a word and were asked to press down and trace the word with the finger, pronouncing it as the experimenter had done; and Group C, simple reading, in which subjects merely read the word after the experimenter had pronounced it. Ten nonsense syllables of low associative value, inked upon the slides in cursive writing, were the stimulus words used. The list of syllables was gone over three times by each subject. After the third exposure, the subject was tested by asking him to write the word as the experimenter pronounced it. In each treatment condition, the time for each segment of the procedure was equal as were method of presentation and number of exposures. An analysis of variance revealed a treatment effect significant at the .05 level while "t" test analysis showed that both groups A and B were significantly higher in mean performance than group C at the .05 level.

Reading Techniques  
for the Handicapped

Davy (41) reported favorable effects of a 2-year reading program,

using Woolman's Progressive-Choice method with 13 educable mentally retarded children at the Emmorton Special School, Maryland. Retention of words learned over a 3 month's summer recess at the end of the first and second years was sufficiently great as to lead the author to suggest that this approach to teaching of reading "may be more efficient and effective in teaching mentally retarded children than methods commonly used."

Talmadge, Davids, and Laufer (169) studied the comparative effects on a kinesthetic approach versus conventional reading approaches of matched groups of 12 subjects, each subject having been diagnosed as a brain damaged, emotionally disturbed, and disabled reader. The training program was carried on for approximately 3 months and improvement on the California Achievement Test in Reading Vocabulary and Comprehension reported. While no tests of statistical significance were applied, the general findings suggested that the kinesthetic procedure was most beneficial for children with the types of brain damage represented in the study. Pollack (130) examined the effect of sleep learning on a 17-year-old brain injured boy who began with a sight vocabulary of 40 to 50 words. Two lists of 23-letter words of equal difficulty were used, the experimental list being presented to the subject while he slept. Somewhat better performance on the experimentally presented list was found on successive testings leading the author to conclude that the learning of auditory material does occur during partial sleep.

Illovsky (74) reported an experimental study of the influence of group hypnosis upon reading ability for five experimental and control socially maladjusted subjects in the boy's unit in Central Islip State Hospital during a 6-month period. Oral reading achievement was measured on the Gray Oral Reading Paragraphs. Some evidence favoring the hypnotized group in oral reading improvement was reported, it also being noted that the effects of suggestion apparently continued in some boys but not in all after the suggestions had ceased. Birch and Stuckless (16) reported the effect of a programmed presentation of written language on the learning and retention of 52 deaf children and 47 control subjects. Five classes of words were presented and paired with appropriate illustrations for presentation in each frame of the program. The experiment continued for a 6-month period after which a postexperimental language test was administered. In general, no significant differences were revealed by a "t" test analysis at the .05 level between the groups in learning or retention, although the programmed instruction was more efficient in time and was favorably received by the participating teachers. Candland and Conklyn (23) reported briefly that a refinement of the "oddity problem" was successful as a technique for teaching reading among four children who were congenital deaf mutes.

## Follow-up Clinic Clients

Robinson and Smith (145) conducted a follow-up investigation of the academic accomplishments and/or occupational status, reading habits, and parental satisfaction with reading clinic services for 44 clients 10 years after they first came to the University of Chicago Reading Clinic. The sample represented almost 50 percent of the clients who came to the reading clinic for the first time in 1948 and received help. The data were gathered by personal interviews, phone interviews, and written questionnaires. In general, evidence of favorable subsequent progress was found, indicating that students who are able but retarded in reading could be rehabilitated educationally so as to fulfill their occupational ambitions. Evidence was also secured which suggested that if the problems of such students can be corrected before their handicap has become too great or too persistent, they may become avid readers. The study should be consulted for further particulars.

## Clinic Training for Remedial Reading Teachers

Robeck (142) made a comparative study of the effect of reading laboratory experience on the relative academic achievement in the remedial reading theory course for a total for 140 students over a 4-year period. The comparison involved 102 university students concurrently enrolled in reading laboratory courses and 38 students not so enrolled. Among the results of the study it was found that the concurrently enrolled laboratory students made significantly greater gains at the .001 level over those not so enrolled in their relative performance from midterm to final examination; that the laboratory students in the highest and lowest one-third on verbal scholastic aptitude tests made more significant gains at the .001 level than did their counterparts in the nonlaboratory course; and that students enrolled for two units of laboratory experience showed relative gains significant at the .001 level over a random sample of students enrolled for only one unit of laboratory experience. Some evidence was also found that the clinic type of laboratory program offered on campus was more helpful with respect to the course than that offered in off-campus programs.

## Reading Diagnosis

### Characteristics of Poor Reading

Purcell (134) gathered data over a 6-year period for 827 students in 91 different reading improvement classes in which students were asked to rank in the order of importance the three poor reading habits which characterized them and also add others in order of importance from a list of 12 categories of poor reading symptoms. The most frequently mentioned poor reading habits were word-by-

word reading, vocalizing, back tracking, and daydreaming. Relatively high correlations were found for the rank ordering of the 12 symptoms of poor reading by groups representing different achievement, ability, and grade levels. Woodbury (186) compared the frequency of underachievement by pupils whose performance on a reading achievement test and a scholastic aptitude test were calculated by the traditional age-ratio procedure and by a differential index technique, using 134 fourth grade pupils from seven schools in a New England community as subjects. The measuring instruments were the Pintner General Ability Tests, Verbal Series, and the Paragraph Meaning subtest of the Stanford Achievement Battery, Intermediate Form. A comparison of mental ages and reading ages for these pupils revealed 56 students with reading ages more than one year below their mental ages who might be classified as underachieving readers. A differential index was next computed by equating the two distributions of test scores for the same population and adjusting the distribution for regression, thus effecting a linear transformation. A differential index representing a -1 standard error of estimate was used as the cutting point to determine underachievement. Its application to the same distribution identified only 18 pupils as underachieving readers. The author felt that this procedure was more precise but likewise suggested that a more appropriate cutting point might be one and one-half times the standard error of estimate. Robeck (143) investigated the types of errors in oral reading, in intellectual functioning and potential, and in background factors for 20 reading clinic children whose major difficulty was lack of word attack skill. Nineteen boys and 1 girl with CA's from 6-11 to 12-1 years, with a range of 98 to 136 IQ's and grade placement from second through seventh grades constituted the sample. Among the findings it was noted that fluency errors accounted for about half of the total number of poor reading errors; that significant strengths on the WISC were in comprehension, similarities, vocabulary, picture completion, and block design; that significant weaknesses on the WISC were in information, arithmetic, digit span, and coding, all beyond the .001 level; and that such factors as minimum entrance age, poor auditory memory, and poor visual memory were prominent characteristics of these cases.

#### Intellectual and Social Factors in Reading Disability

Paterra (126) analyzed WISC scattergrams of 33 retarded readers in grades one through nine to distinguish any similarities among their abilities and disabilities. The sample represented IQ's in the average, superior, and very superior range. The author made a number of recommendations for remedial treatment based upon such findings as great variability in Similarities scores, relatively high Picture Completion and Comprehension scores except among younger children with large discrepancies in their verbal and performance IQ, consistently low Vocabulary scores, and higher variability among groups classified as "verbal" than among those clas-

sified as "performance" of these retarded readers. Alwitt (4) conducted an experimental study of the rate of decay of memory traces for visually presented digits under four different conditions, using an experimental group of 19 children in the Albany Study Center for Learning Disabilities and a control group of 60 public school boys in grades one through six. Twenty-four cards were prepared upon which eight digits were typewritten, each card containing two rows of four digits each, which were presented by the Tachitron. Four conditions, in which subjects were encouraged to guess, were presented in the same order to all subjects: 1) four cards, to report all eight digits in any order, 2) eight cards, to report digits of only one row, 3) eight cards, to report only one row, and 4) the same as condition 1. In conditions 2 and 3 response cues were delayed. Cards were scored by the number of items reproduced in their correct position and a mean digit span computed for each condition, calculated as the proportion of correct letters within a condition multiplied by the number of digits requested. No significant difference was found in digit spans between the reading disability group and the control group as a function of the experimental condition, while the finding of no significant difference between the mean digit span for conditions 1 and 4 suggested that the effects of practice and familiarity were likewise insignificant. Although the control group showed a higher mean digit span significant at the .05 level than the disability group in the two conditions in which the response cues were delayed, the author concluded that the data suggested that immediate memory traces of reading disability cases do not decay at a faster rate than do those of normal readers. Krippner (90) after examining 4 children who exhibited extreme sociopathic tendencies, summarized his findings as follows:

"[These boys had] a lower WISC Verbal IQ than Performance IQ with particularly poor accuracy on the Digit Span, Coding, and Mazes subtests. In addition, such Mental Health Analysis components as positive outlooks and goals were below average. Reversals of words and letters marked the reading process as did poor comprehension, a slow rate, and an ambivalent or negative attitude.

"All four boys were deprived of adequate paternal affection and discipline during their early years. It is suggested that the teacher and the school often become targets for the sociopath's resentment. Remedial reading, as a result, is most effective when it is combined with psychotherapy."

#### Appraisal of Reading

##### Analyses of Reading Tests

Leton (94) made a factor analysis of readiness tests in relation to the composite mental abilities and subabilities required for successful reading, using scores from 236 first grade pupils from nine classrooms. The Metropolitan Reading Readiness Test, and

the Rutgers Drawing Test were the instruments used. Two factors were identified in the analysis, verbal comprehension, and visual-motor capacity. The author noted that "The number readiness factor which is presumed in the Numbers subtest of the Metropolitan failed to appear as a distinct factor but was subsumed under the second factor in this study," and recommend further research to isolate this factor. Sheppard and Campbell (159) evaluated the discriminative power of the California Achievement Test, Reading Vocabulary, in relation to the test norms, using a total 2906 pupils in grades four, five, and six in the Hicksville, New York school district. Difficulty indices were computed for each item on the test at each grade level and a frequency distribution of item difficulty made for each grade. Chi-square analysis revealed that the distribution of item difficulty was significantly dissimilar at the .001 level to that upon which the test norms were apparently based, the discrepancy being particularly apparent in scores for the fourth grade which approximated a bimodal distribution. The authors concluded that this test did not effectively discriminate the vocabulary knowledge of this sample of students.

The "norm-equivalents" of five different achievement test were examined by Taylor and Crandall (170) who compared the rank ordering of mean test scores for five different achievement tests, using five groups of children comparable in distribution of ability and sex at each of the fifth and eighth grade levels. The ordering of test means from highest to lowest was found to be 1) California Achievement Test, 2) SRA Achievement Test, 3) Iowa Tests of Basic Skills, 4) Stanford Achievement Tests, and 5) the Metropolitan Achievement Tests. The frequency of highest and lowest mean achievement scores in reading for 12 matched groups of fifth and eighth-grade children was found to be, in order, the CAT, then the SRA and ITBS, and then the SAT and MAT for highest mean scores, and almost the reverse for lowest mean scores - the MAT, then the SRA and ITBS, the SAT, and the CAT. For the entire test batteries, the SRA was found to have the highest sex differences, whereas the CAT and the MAT were relatively free of differences in the sex factor. Graham (60) reported a correlation analysis of normal and differential marking of the Mill Hill Definitions Tests and the WISC vocabulary and four other tests, using scores of 100 English boys age 13 to 13.11. The other tests involved in the comparison were the Terman-Merrill and the Watts vocabulary tests, the Otis Quick-Scoring Verbal Intelligence Test, and the Ravens Progressive Matrices. The differential scheme of marking used on the WISC vocabulary test, which differentiates between good, poor, and incorrect definitions, produced substantially higher correlations between the criterion Mill Hill Definition Tests and the other measuring instruments, leading the author to advocate its greater use in vocabulary scales involving definitions. Rankin (137) used the SA-S Senior Scales to examine various aspects of reliability and validity of the cloze test, a cooperative test of reading comprehension, and the Diagnostic Reading Test: Survey Section, as a function of introversion-extroversion. Three



separate studies were conducted using different groups of high school and college students for each study. In general, the studies indicated a relationship between introversion-extroversion and reading test reliability and validity such that the greater the degree of extroversion, the smaller the reliability and validity of the test appeared to be. The author thus concluded that greater confidence can be placed in the predictability of reading test scores for introverts than for extroverts. The latter observation was somewhat modified for the cloze test because of inflation of scores on a speeded task.

### Prediction of Reading Success

Mann and Alvard (109) found that the Spiral Aftereffect Test was a useful predictor of success in reading for 75 first grade subjects who were having adjustment and achievement difficulties in school. By comparing children with perfect scores on the Spiral Aftereffect Test with those who failed, under conditions in which subjects were matched for sex and chronological age, a successful group on the experimental test achieved significantly higher scores on the Metropolitan Tests of Reading Readiness and Reading Achievement at the .05 level, thus indicating some diagnostic and predictive validity for the test. Vacchione (175) reported that mean IQ's on the Van Alstyne Picture Vocabulary Test were significantly higher at the .05 level than on the Stanford-Binet and likewise showed a higher standard deviation in testing 41 children with an average CA of 5-1/2 years. The author concluded that the Van Alstyne Test was not an entirely adequate substitute for the Stanford-Binet in predicting readiness of preschool children for first grade.

A further study of the effectiveness of the group Bender Gestalt in screening for reading readiness was reported by Smith and Keogh (162) for 221 kindergarten children in relation to their reading achievement one year later. The Lee-Clark Reading Readiness and Reading Achievement Tests were used as the validating instruments. A significant correlation at the .01 level was obtained between the Bender-Gestalt total score and the measures of reading readiness and reading achievement. It was thus judged to be an effective and useful instrument for predicting the readiness level of these children. On the other hand, Dobson and Hopkins (45) reported from an assessment of predictive validity and reliability of the Lee-Clark Reading Readiness Tests in which teachers' ranking of reading ability and scores from the Wide Range Achievement Tests were used to judge the reading performance of 326 pupils in grades one through four, that the validity coefficients were moderate to low, decreasing generally with each successive grade. The authors noted that "There was little lasting general variance by the fourth grade, only about ten percent. This shows that score difference on the readiness test at the beginning of Grade One means little in terms of lasting individual differences." It was also found that reliability coefficients reported in the

test manual were significantly higher at the .05 level than those obtained in the study, a finding which led to the recommendation that the diagnostic profiles of the tests should be ignored because of the low reliability of the subtests.

At the intermediate grade level, Keller and Rowley (83) investigated the relationships among intelligence, anxiety, and school achievement, and the use of a statistical combination of intelligence and anxiety in the predication of scholastic performance, including reading, for 292 children in grades four, five, and six in the public schools of Knoxville, Iowa. The Children's Manifest Anxiety Scale, the Otis Quick-Scoring Mental Ability Test, and the Metropolitan Achievement Tests were used as measuring instruments. In general, the generally negative correlations between anxiety and intelligence and between anxiety and school achievement led the authors to conclude that the use of manifest anxiety as a predictor variable did not appear useful for upper elementary school children. On the other hand, Bobbe and others (18) concluded from a correlation analysis of scores on the Elementary Battery of the California Achievement Test, including reading, and the California Mental Maturity Test, that the correlations, were sufficiently substantial as to question the usefulness of administering such achievement tests. In the authors' opinion, the "Results indicate that intelligence test scores are as valuable in predicting performance as the performance on the previous year's achievement test." The correlations upon which this statement is based range from .43 to .78 for test scores on 130 subjects in grades four and five. The same tests were used by Anderson (6) to investigate the prediction of reading and language achievement from subscores on the California Achievement Tests among 112 fourth grade children from six classes in three different Los Angeles area schools. School grades in reading and language were used as the criterion variables. It was found that all subtests were significant predictor variables, with the exception of the Arithmetic Fundamentals subtest, while the Reading Vocabulary and Reading Comprehension subtests were the best predictors. The author noted that "a comparison of the multiple correlations with the zero order correlations indicates that reading comprehension alone predicts the two grade distributions quite well, and it seems doubtful that the remaining predictors provide enough material assistance for their addition in the prediction of Reading and Language at the fourth grade level."

In a study of 31 seventh grade students who had been retained one year previously in elementary school with 31 randomly selected, nonretained students at the seventh grade level, Kamii and Weikart (80) examined the kinds of pupil grades, scores on achievement tests, and performance on a group intelligence test made by these two groups. Significantly lower performance was reported for the retained group with respect to grades in academic subjects, achievement levels in reading and arithmetic, and lower

IQ's although more than half of the retained pupils had at least average IQ's as measured by the California Test of Mental Maturity. The authors concluded that the reason that the retained group received low marks was attributable neither to low intelligence nor to poor basic skills, such as reading, thus questioning the predictive usefulness of these instruments. Schneyer (155) investigated certain academic, personality, and social factors which might distinguish students who made progress in a college reading improvement course from those who failed to do so, using a population of 71 students completing the program at the University of Pennsylvania Reading Clinic during the 1958-59 academic year. Groups of high, average, and low improving students were formed and given a battery of reading and study skills tests, personality inventories, and the SAT in addition to a personal interview in connection with the 7-week improvement program. In general none of the instruments employed was able to discriminate among students in these groups at a level high enough to provide prediction of progress on an individual basis.

#### Development of Reading Tests

Traxler (173) made a preliminary report on the construction of two 50-word vocabulary tests suitable for use with senior high school students and college freshmen. An initial pool of 210 words was chosen at random from the thousands 10 through 20 of the Thorndike-Lorge list, and items based upon these words were then tested in the tenth and twelfth grades of a New York high school whose students had a mean IQ of 110. Item analyses were then run to identify two forms of a shorter test which was administered to students in two other New York high schools with mean IQ's of 115 and 120, respectively. It was reported that the reliability coefficients of the forms were high, all being above .90, and that the discrimination values of the tests were higher for grade twelve than for grade ten. Relatively high correlations were obtained between the experimental tests and the Cooperative English Test of Vocabulary and scores on the American Council Psychological Examination. The preliminary data indicated that the test was sufficiently reliable for use with individuals. Braam (19) described the development and results of an instrument for measuring flexibility in reading, administered to 71 college-bound senior high-school boys and girls enrolled in Syracuse University's Sagamore Reading Camp. Two flexibility tests were devised, each test consisting of five selections ranging in length from 750 to 900 words and representing five different kinds of material. The two selections for each of the five different materials were taken from a common source. Readability of the selections was measured by the Dale-Chall formula. Purpose for reading was held constant: "Read as quickly as you can and still understand the general content of this selection." Time was recorded by the reader and comprehension checked through 15 true-false questions on each selection. The test was administered at the beginning and end of a 6-week summer developmental reading

program. Comparison of the pre- and posttest results showed a pronounced increase in variation in reading speed by type of selection as well as increases in both gross and effective reading rates. There appeared to be little correlation between posttest reading rates and the difficulty of each of the five selections, leading the author to conclude that there may be a greater relation between familiarity and speed than between difficulty and speed.

#### Reading Test Norms for the Deaf

Wrightstone, Aronow, and Moskowitz (188) reported the development of reading test norms for deaf children based upon 5307 pupils from 73 special classes for the deaf. Two types of norms, percentile ranks and standard reading ratings, were developed for the Elementary Reading Test, Test II: Reading, of the Metropolitan Achievement Tests to a widely distributed sample constituting over half of all the deaf pupils in the United States who were receiving instruction in special schools for classes. Differences in average raw scores were found in the study for children grouped by age according to degree of hearing loss. Correlations for 5224 children for whom decibel losses were reported were found to vary from  $-.17$  to  $+.01$  for the various ages. When grouped by extent of hearing loss, differences in the average raw scores of pupils were found with the least handicapped children obtaining the highest average in each case. The authors concluded that "a single set of norms irrespective of children's degree of hearing loss would be impractical."

#### CONCLUDING STATEMENT

Vigorous research effort is noticeable in the current summary, especially in the sociology, psychology, and teaching of reading. Active areas of research endeavor include the attitudinal effects of reading, perceptual and cognitive factors in reading, various aspects of developmental reading instruction, and analyses of testing instruments and their use in the measurement and diagnosis of reading effectiveness. The previously noted trend toward more sophisticated and appropriate research designs continues to be apparent and strengthens by their presence, the body of investigations relating to reading.

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