A STUDY OF THE READABILITY OF DRUG EDUCATION MATERIALS IN GRADES FIVE THROUGH TWELVE

A DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN HEALTH EDUCATION IN THE GRADUATE SCHOOL OF THE TEXAS WOMAN'S UNIVERSITY

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To Marilyn Gail

for whom the task was undertaken

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CHAPTER I

INTRODUCTION

The basic premise underlying the development of a program in drug education is effectively stated by Levy:

> We are a drug using society. A large segment of our population looks to drugs to alleviate a host of physiological, psychological and social discomforts. Young and old alike are inundated with commercial sophisms eulogizing drug products. Within this persuasive millieu, drug abuse is spawned. Education, to be effective, must first recognize the complex historical, social and psychological setting as a powerful stimulus to the use and abuse of drugs.[1]

Furthermore, this statement serves to support the concept, as stated by Mikeal,[2] that drug abuse education is unmistakably linked to health education. In a presentation to the Council on Drugs of the American School Health Association he utilized the tri-dimensional conceptual definition of health education, to state the inherent relationship between drug education and health education. The definition states in part that health is ". . . the interdependence among an

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[1]Marvin R. Levy, "Background Considerations for Drug Programs," Resource Book for Drug Abuse Education (National Clearinghouse for Mental Health Information, U. S. Department of Health Education and Welfare, October, 1969), p. 3.

[2]Robert Mikeal, "A Positive Approach to Drug Education," Journal of School Health (October, 1970), p. 450.

individual's physical well being, his mental and emotional reactions and the social complex in which he exists."[1]

These statements and others with similar inferences have served to influence the current changes in the health education curriculum. The current problem of drug abuse has caused concern among persons in every walk of life and has helped focus on new implications and directions for health education in the schools. Emphasis in combatting drug abuse was formerly centered around tough laws, tough penalties and tough policemen. With the emergence of greater social concern the emphasis has shifted from law enforcement to education. To this Fort states:

> The major approach to both drug abuse and the broader drug use must be one of education, prevention and attacking the sociocultural roots.[2]

He is supported in his remarks by Opaskar of the American School Health Association who states:

> The widespread and unprecedented use of chemicals for non-medical purposes has thrust upon educators the necessity of considering drugs as an essential separate component of elementary and secondary school instruction.[3]

With reference to the schools, Levy[4] asserts that the school program for students must begin early as concepts, attitudes

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[1] Ibid., p. 451.

[2] Joel Fort, The Pleasure Seekers (New York: Bobbs and Merrill, 1969), p. 230.

[3] American School Health Association and Pharmaceutical Manufacturers Association, Teaching About Drugs (Kent, Ohio, 1970), Foreword, Carl Opaskar.

[4] Levy, Resource Book, p. 3.

and behavior are developing during the elementary years and the school cannot ignore this learning opportunity.

In an effort to implement drug education into the school program, the Sixty-first session of the Texas Legislature passed House Bill 467 requiring that units on drug education be incorporated into the school curriculum for every child in grades five through twelve. An extension of the requirements downward into the primary grades and kindergarten has been suggested by the Texas Education Agency.[1] To this, questions have been raised with reference to who should teach, and with what will they teach?

The tools of teaching are many and varied and the teacher should use a variety of functional methods to aid in the reinforcement of subject content. The Texas Education Agency states "Technique and method of presentation are more important than subject matter content."[2] The challenge of drug education implies a necessary change of teaching behavior, that of maximum active involvement of the student in the learning process with the teacher as the facilitator.[3] Among the recommended methods for teaching about drugs is the laboratory method, which involves group dynamics and problem solving, as well as resource persons and the use of supplementary materials.

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[1]Texas Education Agency, Tentative Draft of Teachers Handbook on Drug Education (November, 1970), Introduction.

[2]Ibid., p. 9.

[3]Ibid., p. 3.

Statement of the Problem

The proposed investigation is a study of the readability of supplementary materials available in drug education programs to the public school districts in Texas. The study was conducted during the academic year 1970-71, at the Texas Woman's University. Upon the basis of the findings, conclusions were drawn with respect to the assessment of grade levels of the materials as measured by the Dale-Chall Formula for Readability.[1]

Rationale for the Study

The use and abuse of drugs in American youth is increasing. Fort states that youth are showing extensive interest in and use of marijauna as well as other drugs, such as LSD and heroin.[2] In another report made by primary teachers in Marian County, California, it was cited that dangerous drug use was the principle reason for twenty-five percent of the arrest of children under fifteen and accounts for sixteen percent of those eighteen and older.[3]

It is inevitable that since our youth spend much of their time in schools and since the school has the central

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[1]Edgar Dale and Jeanne Chall, "A Formula for Predicting Readability," Educational Research Bulletin, XXVII (January 21 and February 17, 1948), p. 11-20 and 37-54.

[2]Fort, Pleasure Seekers, p. 210.

[3]"Program Recommendations for Elementary Teachers," Resource Book for Drug Abuse Education, (National Clearinghouse for Mental Health Information, U. S. Department of Health, Education and Welfare, October, 1969), p. 18.

role of educating the individual, it takes a leadership role in drug education. Former Attorney General Ramsey Clark, in an interview with the United Press International has stated:

> Our clearest duty is education. That's the essential part of any drug program. . . .Truth and education are more important to crime control in narcotics than policemen.[1]

The investigator is focusing attention on one of the tools used by the classroom teacher in the educational process. Educational tools are chosen with an understanding of both their value and limitations, and must be a part of the diagnostic skill of the teacher.[2] The tool chosen for consideration is the use of supplementary reading materials.

According to Lerret, reading is considered a most important tool in gaining useful information. She states:

> Perhaps no other school subject has been more significant in reflecting the development of the religious, economic, social, political and educational progress of the nation. The history of reading shows glimpses of advancing psychologies, changing philosophies and the ever increasing attempts to apply science to education. It reveals historical trends, contemporary problems and changing educational programs.[3]

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[1]Interview, UPI, "Clark Sees Education as Best Drug Stopper," Dallas Morning News, Dallas, Texas, Sunday, November 29, 1970, p. 6AA.

[2]SOPHE, Research Committee, "Review of Research Related to Health Education Practice," Health Education Monograph, 1963, p. 65.

[3]Elva Lerret, "An Evaluation of Texas State Adopted Basal and Supplementary Readers" (unpublished Master's thesis, Texas Woman's University, August, 1950), p. 10.

Many teachers rely on outside reading assignments as the source of new information. Others make substantial use of the many free or inexpensive pamphlets furnished by various voluntary, professional and governmental health related agencies. Rarely do these agencies offer guidelines in the use of these materials or do they make recommendations for the appropriate level of instruction. The American Cancer Society[1] is one of the few organizations to recommend the use of materials at certain levels. Even in this case none of the materials have been designated on the basis of readability. There appears, therefore, to be little guidance in the organization and compilation of this literature in a logical manner for education. Often the dissemination of this material to the classroom teacher is carried out without giving consideration to the appropriate grade level. Many pamphlets are indiscriminately used and thus do not serve as a corollary to the lessons. The assessment of readability levels is frequently left to the discretion of the teacher, who, for the most part, relies on her intuition rather than objectively defining this level. The investigator found support for this statement in a communique from the office of the Texas Education Agency. It stated in part:

> We have made no attempt to assign a grade level to materials. That type of assignment is

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[1]American Cancer Society, Texas Division, Public Education Handbook, Schools and Colleges, 1969.

> impossible in the light of the varying levels of sophistication of the students.[1]

The selection of reading material which is interesting and readable is of prime importance to their effective usage within the classroom. Pena[2] points out the importance of considering the background and ability of the students in determining material to be read. Consideration must be given to interest and motivation, as Spache asserts, "children's interests are the most important single influence upon their attitude toward reading."[3] However reading disability is real and no amount of motivation or interest can overcome this handicap by itself.[4] Thus the readability of the choice of supplementary materials becomes a key factor in whether or not the materials will be effective. Larrick states that:

> Numerical grade placement is the only way we have devised of comparing the reading difficulty of literature. It is more reliable than grade placement by hunch, which is all we have had for years.[5]

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[1]Marilyn Boone, Consultant, Drug Education, Texas Education Agency, Communique, January 20, 1970.

[2]Modesta Pena, "A Study of the Relationship of Students Reading Ability, Difficulty of Materials and Their Responses to Selected Passages of Literature" (unpublished Master's thesis, Texas Woman's University, August, 1953).

[3]George Spache, Good Reading for Poor Readers (Champaign, Illinois: Garrard Publishing Company, 1966), p. 1.

[4]Ibid., p. 1.

[5]Nancy Larrick, "Readability Formulas and Books for Children," Publishers Weekly (October 27, 1951), p. 1711.

For these reasons the investigator was prompted to consider the readability of pamphlets used in drug education programs by selected school districts in Texas.

Definitions and/or Explanation of Terms

For the purpose of clarification, the following definitions and/or explanation of terms have been established for use in the proposed study:

A. Drug Education - "A part of health education involving the interaction of drugs and an individual's physical well being, mental and emotional reactions, and the social complex in which he exists."[1]

B. Drug - The investigator accepts the definition by Mikeal and Smith as "Any substance except food, consumed by a living organism that exerts a differentially measurable physiological, psychological or sociological change in the structure or function of the organism from its pre-consumptive state."[2]

C. Reading - "The comprehension of written language, largely through translation of the sequences of graphic

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[1]Robert L. Mikeal and Mickey C. Smith, "A Positive Approach to Drug Education," Journal of School Health (October, 1970), p. 451.

[2]Ibid., p. 451.

signs into their oral language equivalent or into an unarticulated linguistic form underlying both oral and written language."[1]

D. Readability Level - "An indication of the difficulty of reading materials in terms of the grade level at which it might be expected to be read successfully."[2]

E. Readability - "The quality of a piece of reading matter that makes it interesting and understandable to those for whom it is written, at whatever level of educational experience."[3]

F. Supplementary Reading Material - "Reading material used for the purpose of enriching the materials of instruction."[3]

G. Pamphlet - "A short treatise or essay . . . on some subject of contemporary interest. A complete, unbound publication of generally less than eighty pages."[5]

H. Elementary Grade Level - The writer accepts grades one through six as established by the Texas Education

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[1]Doris Gunderson, ed., Interdisciplinary Committee on Reading Problems, "Reading Problems: Glossary of Terminology," Reading Research Quarterly, LV (Fall 1968-69), p. 543.

[2]Ibid., p. 543.

[3]Carter V. Good, ed., Dictionary of Education (New York: McGraw-Hill Book Co., 1959), p. 329.

[4]Ibid., p. 444.

[5]The Random House Dictionary of the English Language, Random House, Inc., New York, 1966, p. 1041.

Agency;[1] for purposes of this study grades five and six will be specified.

I. Secondary Level - The writer accepts grades seven through twelve as established by the Texas Education Agency.[2]

J. Professional Health Agency - "A group with established standards of membership, composed of persons specifically prepared in some health discipline and organized for the purpose of upgrading the quality of their contribution to public health."[3]

K. Voluntary Health Agency - "Non-official agencies, funded by contributions, subscribed membership, community projects; diversified within the scope of their services."[4] For purposes of this study, they shall have contributed literature specifically concerned with drug education.

L. Government Related Agency - "Those official health agencies, financed by taxation and authorized by state and federal legislative action to fulfill specific functions."[5]

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[1]Principles and Standards for Accrediting Elementary and Secondary Schools, Texas Education Agency, Bulletin 617, May, 1963, p. 73.

[2]Ibid., p. 21.

[3]Committee on Terminology, American Association of Health, Physical Education and Recreation, Journal of Health, Physical Education, and Recreation, Vol. 33 (November, 1962), p. 28.

[4]Jessie Helen Haag, School Health Program (New York: Holt, Rinehart and Winston, 1965), p. 163.

[5]Ibid., p. 163.

Purpose of the Study

The general purpose of the study is to assess the readability level of drug information pamphlets available to the public school districts in Texas, thereby, providing an index of graded supplementary materials for use by the teacher. The grade levels are limited to grades five through twelve as required by statutory provision of the State of Texas in House Bill 467, Crime Prevention and Misuse of Drugs and Narcotics.[1] The stated hypotheses are:

A. The literature tested will not yield a readability level corresponding to the elementary grade levels of five and six.

B. The literature tested will not yield a readability level corresponding to the secondary grade levels of seven through nine.

C. None of the literature tested will be outside the range of grades ten through twelve.

D. There will be no significant difference in the proportionate distribution of materials, within grades ten through twelve, as determined by the Test for Significant Difference Between Two Proportions.[2]

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[1] Tentative Draft of Teachers, Handbook on Drug Education Texas Education Agency, Austin, Texas, (November 1970), Introduction, p. x.

[2] James L. Bruning, Computational Handbook of Statistics (Glenview, Illinois: Scott, Foresman and Company, 1968), p. 199.

Delimitations of the Study

The proposed study is subject to the following delimitations:

A. One hundred (100) drug information pamphlets available to public school districts in Texas.

B. Materials published within the years 1965-71.

C. The availability of the literature to be tested.

D. Assessment of a readability level within the range of grades five to twelve.

E. The reliability and validity of the instrument used in the study.

The selection of the sample school districts were dependent upon these criteria:

A. The school district must be involved in the development of a drug education program.

B. The school district must be in the State of Texas and therefore, subject to the Texas Education Agency's guidelines.

C. The school district must be cooperative in supplying needed information.

Sources of Data

The data utilized in the proposed study will be from the following sources:

A. Documentary Sources

1. Books, periodicals, pamphlets and bulletins related to the proposed study.

2. Theses, dissertations and other unpublished materials related to the proposed study.
3. References and pamphlets suggested by the selected Texas School Districts.

B. Human Sources

Individuals, who by their professional status and/or experience in various aspects of the study, will serve as resource persons or experts.

Summary

The study is concerned with the assessment of the readability level of drug education materials used in selected districts in Texas. The Dale-Chall Formula will be employed to determine the level of readability of the material.

The increased abuse of drugs in our society has created a need for shifting the emphasis from punishment to education as the major attempt to affect behavioral change. The teacher will be concerned with the skillful use of teaching tools and will undoubtedly utilize supplementary materials as a corollary to the lesson. In the selection of this material the teacher must consider many variables, among them is the readability of the chosen material.

The study will be conducted within the limitations established and will be further defined as stated here. Chapter II will be concerned with a survey of related

literature. Chapter III will relate the procedures followed in the development of the study. Chapter IV will be a presentation of the findings. Chapter V will contain a summary, conclusions and recommendations.

CHAPTER II

RELATED LITERATURE

A survey of the literature revealed that the proposed investigation does not duplicate any previous study specifically related to the readability of drug pamphlets. Several studies relating to the readability of health education pamphlets furnished background information for this study. Selected literature pertaining to general readability formulae and to various materials significant to other disciplines have also been examined and are included in the review.

Several formulae have been devised to measure readability. Lorge,[1] (see Appendix A) developed a formula for estimating the difficulty of reading materials and the spoken text, based upon comprehension of reading passages. Comprehension was judged by correctness and completeness of responses to questions about the text. Therefore testing procedures at the end of the reading assignment were involved. He considers vocabulary load and sentence length as important factors in determining readability. His readability index is an estimate of the reading grade at which the average school child will be able to answer fifty-five percent of the

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[1] Irving Lorge, The Lorge Formula (New York: Bureau of Publications, Columbia University, 1966).

questions concerning detail, appreciation, import, vocabulary and concept with adequate completeness and correctness.[1] The Lorge formula is based upon a criterion derived from responses to five types of questions. It tends therefore to overestimate the difficulty of passages to be read primarily for appreciation or for general import; and to underestimate the difficulty of passages to be read for specific details or for following directions.[2]

Flesch[3] (Appendix B) employed the average sentence length to determine readability. He considered the sentence factor a good index of readability at any level because it is a fact in language theory that we read by sentences, not by words.[4] He considered the number of syllables per 100 words (morphemes) as a factor. He believed that morphemes were the rational elements in the language which were the keys to the arrangement of notions, and the arrangement of notions in turn, were the key to understanding.[5] Flesch also included in his formula a measure of the interest level. He makes tabulations of personal sentences; the combination of these

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[1] Ibid., p. 1.

[2] Lorge, Formula, p. 1.

[3] Rudolph Flesch, Marks of Readable Style (New York: Teachers College, Columbia University, 1943).

[4] Ibid., p. 18.

[5] Ibid., p. 22.

give him the human interest score.[1] His formula basically measures adult reading material.

Spache's[2] formula (Appendix C) is applicable only to materials which are appropriate to primary grade levels. The elements of sentence length and proportion of hard words were selected as most indicative of reading difficulty in primary materials. Spache stated that this selection was based on other research studies which indicated these two elements as the best predictors of readability. An analysis of 152 commonly used school textbooks served as the basis for the development of this formula. He further indicated that although estimates of reading difficulty greater than 3.9 can be found by using this formula, it is doubtful that these have any accuracy or real meaning, in view of the fact that the formula was standardized by the analysis of primary reading materials.[3]

Elley[4] (Appendix D) assessed the readability of children's reading materials using a word frequency count to rate the nouns in a given passage. In this technique passages were used which contained a minimum of twenty nouns, and are

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[1]Nancy Lerrick, "Readability Formulas and Books for Children," Publishers Weekly, 160 (October 27, 1951), p. 1710.

[2]George Spache, Good Reading for Poor Readers (Champaign, Illinois: Garrod Publishing Company, 1966).

[3]Ibid., p. 150.

[4]Warwick B. Elley, "The Assessment of Readability by Noun Frequency Counts," Reading Research Quarterly, IV (Fall 1968-Summer 1969), p. 411-427.

most useful in story type material. His rationale for the use of nouns was that, "nouns were much more sensitive to differences in difficulty of comprehension than were other parts of speech."[1] This statement was based upon an analysis of the vocabulary and grammatical structure in passages, and an examination in detail of the writing of a number of authors with a reputation of abstractness of subject matter or complexity of vocabulary.[2]

Fry's[3] formula (Appendix E) was based upon the number of syllables per 100 words and length of sentences. He used a two axis graph for locating grade levels rather than assessing a single score and this structural dimension made it dependent on an individual's understanding of the use of graphs. In discussing the construction of the graph, Fry stated:

> Grade level designations were determined by simply plotting lots of books which publishers said were third grade readers, fifth grade readers, etc. I then looked for clusters and smoothed the curve.[4]

One of the oldest formulas devised for readability is the Yoakum Readability Formula[5] (Appendix F). It was devised

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[1] Ibid., p. 416.

[2] Ibid., p. 416.

[3] Edward Fry, "Graph for Estimating Readability," The Reading Teacher, XXII (May, 1969), p. 750.

[4] Ibid., p. 750

[5] G. A. Yoakum, Basal Reading Instruction (New York: McGraw-Hill Book Co., Inc., 1955), p. 329.

by G. A. Yoakum in the 1930's for measuring the readability of textbooks and other materials. It determines the reading difficulty of any given piece of material by estimating the weight of the vocabulary used in that material. It was the result of his experience in checking completely a series of school readers and noting the manner in which words were used, according to the Thorndike Teachers' Workbook of 20,000 words. All words in these readers were scored with the serial numbers given in the Thorndike Teachers Workbook, Yoakum listed seven basic steps in using his formula. The mathematical calculations are simple arithmetic operations.

Dale-Chall[1] (Appendix G) developed a formula based upon two counts, average sentence length and percentage of unfamiliar words (words outside the Dale list of 3,000 words). The Dale list represents words that are known by at least eighty percent of the children in grade four. Dale-Chall validated their formula by testing materials in health education and social studies and comparing formula predictions with the judgments of experienced teachers and readability experts and with the actual comprehension scores of readers on passages. The formula correlated .92 with the judgments of readability experts and .90 with the reading grades of children and adults, who were able to answer at least three

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[1]Edgar Dale and Jeanne Chall, "A Formula for Predicting Readability," Educational Research Bulletin, XXVII, (January 21 and February 18, 1948), pp. 11-20 and 37-54.

questions out of four on thirty passages. The passages ranged from very easy to very difficult.[1]

Other studies have been made which indicate the range of reading abilities within different grade levels. Hunt[2] found that there is a range of five grade levels in any primary grade; five to eight in any middle or upper elementary grade and eight to twelve grade levels in any high school grade. Kottmeyer[3] found in his study a range of at least thirteen grades from four and below to thirteen and above. He employed the use of the Thaxler Silent Reading Test. Larrick[4] states that reading progress may range from second to sixth grade or even higher in grade four.

In a study by Mallinson[5] and others the authors undertook two studies approximately twelve years apart to determine the reading difficulty of science textbooks. The conclusions were basically the same for both studies. First, the reading levels of many textbooks in science are too advanced for the

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[1] Ibid., January 21, 1948, p. 18.

[2] J. T. Hunt, "What High School Teachers Should Know About Individual Differences in Reading," School Review, (October 1964), p. 417.

[3] William Kottmeyer, "Improving Reading Instruction in the St. Louis Schools," Elementary School Journal (September 1944), p. 34.

[4] Larrick, Publishers Weekly, p. 1711.

[5] George Mallinson et al., "The Reading Difficulty of Textbooks for General Science," School Review (February 1952), p. 94.

students for whom they are written. Secondly, there are significant differences between the levels of reading difficulty of the easiest and most difficult textbook in any area of science. Thirdly, in some science textbooks whose average level of reading difficulty seems satisfactory, there are passages that would be difficult for some college students. Lastly, several science textbooks contain non-technical words that could be replaced with easier synonyms.

Wiegand's[1] study was designed to compare the readability levels of the high school mathematics text, used with the observed reading performance levels of high school students, in Pittsburgh. The Dale-Chall formula was used in the assessment of the readability levels of nine math text and the standardized reading ability of students. The general conclusion was that the readability levels of the math text run higher than the reading ability level of most students.

Williams[2] conducted a study to determine the effect on sixth grade pupils comprehension when sixth grade materials were rewritten to a lower level of readability (grade three). He used the Yoakum formula, substituting simpler words for non-technical words. The sentences were rephrased and shortened to make the thoughts more clear and distinct. After testing the pupils on reading and comprehension,

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[1]Regis B. Wiegand, "Pittsburgh Looks at the Readability of Mathematics Textbooks," Journal of Reading (Dec. 1967), p. 201.

[2]David Williams, "Rewritten Science Materials and Reading Comprehension," Journal of Educational Research (January 1968), p. 204.

Williams concluded that all pupils read the simplified material with greater speed and comprehension than the grade level materials.

Keeran and Bell[1] compared the communication effectiveness of two styles of one message distributed in a large state hospital. One was a traditionally worded interdepartmental directive with a relatively low reading ease score as determined by the Flesch count. The other conveyed the same information but had a high reading ease score. Communication effectiveness was determined by comparing the accuracy with which personnel understood the message. Comprehension of the simplified version was significantly better than that of the traditionally worded directive.

McTaggart's[2] study measuring the readability of high school health text was designed to compare student comprehension of selected health passages of seventh, ninth and twelfth grade reading difficulty levels as estimated by the Flesch and Dale-Chall formulae, and to determine the effect of health knowledge on students' comprehension of selected health passages. He utilized the experimental approach, having two experimental groups and one control group. Comprehension of each group was determined by the students ability to answer questions after reading the health passages. His conclusions

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[1]C. V. Keeran and G. B. Bell, "Reading Ease as a Factor in Improved Communication Effectiveness," Journal of Psychology, 1968, p. 49-53.

[2]Aubrey McTaggart, "Measuring the Readability of High School Health Text," Journal of School Health (November, 1964), p. 434-443.

were that most texts are too difficult for the student with average reading ability, and that students who read the most difficult materials scored lowest on comprehension test. Finally, that those reading the easiest materials scored highest. Recommendations were made regarding the use of readability formulae to supplement subjective judgment. He further stated that the primary purpose of writing should be to communicate, and the principles of readability are important in all forms of communication.

Ford and Stief[1] pretested a milk pamphlet for reader comprehension. The hypothesis which preceeded this study was that nutrition education was not significantly reaching the intended audience. It was felt that one way to supplement and reinforce such programs was through the distribution of literature. The basic questions were concerned with the extent to which homemakers could acquire and retain information. The Flesch formula was used to determine the level of reading ease. The conclusions were that people can acquire and retain information from educational literature when presented within the framework of their needs.

Osborn and Sutton[2] used a rating scale to evaluate supplementary materials which are appropriate and effective

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[1]M. Ford and R. Stief, "Pretesting a Milk Pamphlet for Reader Comprehension," Journal of American Dietetics Association, XXX, 1954, p. 29-33.

[2]Barbara Osborn and Wilfred Sutton, "Evaluation of Health Education Materials," Journal of School Health (February 1964), p. 72-73.

for enhancing the learning process. Included in the rating scale was suggested criteria related to the selection of pamphlets. Among the questions studied in the criteria were: (1) are materials directed toward one specific group as teachers, pupils and parents? (2) is the reading level appropriate for the intended group? Suggestions were made that school districts have a policy for selecting health education materials and that these materials be evaluated periodically.

Ford and Hartman[1] utilized the Flesch formula to test a pamphlet intended for mothers of preschool children. The pamphlet was designed to stress the contribution of parents and others in the emotional growth and development of the child. Analysis of the data showed evidence that readers of the material were better informed on the subject matter. There was evidence that readers with an educational level of about twelve years found interest in information that was written at the sixth grade level, suggesting that there is not necessarily a loss of readership when material for general distribution is written for a level that is considerably below that of a portion of the intended audience provided that the material is related to their interest and problem.

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[1]Marie Ford and Evelyn Hartman, "Measuring Reader Comprehension of Pre-school Pamphlets," Public Health Reports, (May 1954), p. 498.

Knutson[1] suggested several factors which influence the effectiveness of movies, exhibits, posters, pamphlets and other media. Among them were: (1) comprehension (how many will understand the words, concepts and illustrations used?) (2) understanding of purpose (how many really understand the point of the message?) (3) learning and retention (how many will acquire and retain the information and attitudes essential for action?) Knutson suggests the need for objective evaluation of materials to determine their strong and weak points early enough to make changes.

The investigator concludes that sufficient evidence exists relevant to the need of readability studies to justify the present study of drug information literature. According to Williams:

> Too frequently, all children in a given classroom are expected to read, with understanding . . . regardless of individual pupil readiness for reading at the readability level of the literature in use. Adequate provision for individual differences among children, and some guarantee of a reasonable degree of pupil success with its accompanying sense of self confidence, requires among other factors, textual materials written nearer to the reading level of individual pupils. The final responsibility for providing content reading material suited to the needs of individual children rest with the schools.

In summary, Chapter II has dealt with a survey of literature related to readability. In the first half of

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[1]Andie L. Knutson, "Pretesting: A Positive Approach to Evaluation," Public Health Reports (July 1952), p. 699.

[2]David Williams, Journal of Educational Research, p. 204.

the chapter several formulae for estimating the difficulty of reading material were identified. Following this section studies significant to other disciplines as well as those related to health education were cited. These studies lend support to the need of readability studies in the use of literature for classroom purposes. Chapter III will be concerned with the procedures followed in the development of the study.

CHAPTER III

PROCEDURES

In our present culture reading is a basic tool of communication and in the field of education it is the principle vehicle for learning. Almost every teacher makes some use of printed materials for the communication of ideas necessary to his course.[1] All instructors, therefore, have the responsibility to select materials which lie within the normal range of reading ability of the students in their course.[2] The investigator has established that the readability of materials is important and preliminary to the issuance of literature if the intended audience is to benefit from this material. Several studies significant to the readability of materials have been discussed. The investigator failed, however, to find any studies directly related to drug education materials.

The present study was undertaken to determine the readability level of drug education pamphlets which are

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[1]Pooley, Robert C,, "Distribution of Responsibility for the Reading Program," in Reading In an Age of Mass Communication, ed., by William Gray (New York: Appleton-Century-Crofts, 1949), p. 95.

[2]Ibid., p. 106.

available to selected school districts in Texas. It is expected that by designating the grade level of this material the meaningfulness of drug education programs will be improved.

The methods for the collection of data in the present study were a documentary analysis of selected studies concerning readability, a survey of selected districts in Texas to determine their selection and use of supplementary literature, communication with the Texas Education Agency to identify materials which they recommend for use, and communication with various voluntary, professional and health related agencies concerned with the distribution of drug education materials (see Appendix I). The Dale-Chall formula was administered to determine the readability level of the materials collected from the sample schools.

In this chapter the investigator will describe chronologically the steps followed in the execution of the study under these headings: Preliminary procedures, selection of materials to be tested, selection of the instrument, application of the instrument, treatment of data and preparation of the final written report of the study.

Preliminary Procedures

Prior to the conduct of the study, the investigator made a thorough study of the literature related to drug education. Additional information was obtained from selected

school districts in Texas. Upon the basis of the findings, the investigator prepared a tentative outline for the study and presented it in a graduate seminar of the College of Health, Physical Education, and Recreation at the Texas Woman's University in Denton, Texas. The tentative outline was revised in accordance with the recommendations received during the Graduate Seminar. Upon final approval by members of the graduate committee the approved outline was filed as a prospectus of the study in the Office of the Dean of Graduate Studies at the Texas Woman's University in Denton, Texas.

In order to collect data for an introduction and rationale of the study, the investigator reviewed literature pertinent to the problem of the misuse of drugs in our society and the implications for education within the classroom structure. Based upon these findings the investigator established the need for such a study and from these findings built a rationale.

Selection of Materials

A total number of 100 drug education pamphlets were selected for study by the investigator. The selection of the pamphlets was based upon the following criteria.

A. That the materials were available to the sample school districts in the study.
B. That the materials were recommended by the Drug Education Division of the Texas Education Agency.

C. That the materials were consistently included in drug education packets distributed by various health related agencies.

The selection of the sample school districts were dependent upon these criteria:

A. The school district must be involved in the development of a drug education program.

B. The school district must be in the State of Texas, and therefore, subject to the Texas Education Agency's guidelines.

C. The school district must be cooperative in supplying needed information.

Prior to the application of the formula the investigator surveyed and classified the materials received from the various voluntary, governmental and professional health agencies. In collecting this material it was revealed that many of the publications were duplicated, especially those received from governmental agencies. Others were written in incomplete sentences and therefore could not be evaluated within the framework of the selected instrument. Upon elimination of the duplicated materials and the materials inappropriate to this formula, the investigator selected 100 pamphlets to be evaluated.

The sources of publication for supplementary materials and a list of the selected school districts is included in Appendix J. A sample bibliography is also included.

Selection and Description of the Instrument

The investigator established the commonly accepted criteria for test instruments validity, reliability and administrative feasibility in the selection of the instrument. According to Bean,[1] validity is defined as the extent to which a measuring instrument measures what it was intended to measure. To establish validity, it is first essential that an independent criterion be found. "By independent criterion is meant some measure other than the test of the trait which the test is intended to evaluate."[2] Wood[3] states that the necessity for human judgment at some point is inescapable and in the case of predictive validity, the decision must be made that the criterion itself is valid. Validity then, entails the questions both of whether the test is adequately serving its ultimate purpose and how accurately it is measuring.

Reliability as stated by Bean is concerned merely with whether or not results are consistent.[4] It infers that the same results will occur if the test is administered at different times under identical circumstances. Wood states that the question of reliability of the test measures may not

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[1]Kenneth L. Bean, Construction of Educational and Personnel Test (New York: McGraw-Hill Book Company, Inc., 1953), p. 160.

[2]Ibid., p. 161.

[3]Dorothy Adkins Wood, Test Construction (Columbus, Ohio: Charles E. Merrill Books, Inc., 1960), p. 18.

[4]Bean, Educational and Personnel Test, p. 161.

need to be explored separately from that of validity if the correlations between the test measures and the criterion measures is satisfactorily high.[1]

Administrative feasibility relates to the ease with which a test may be applied. According to Mathews,[2] in order for a test to be practical, it must be economical in terms of cost and time required for administration.

The validity and reliability of the Dale-Chall formula were established by the authors who conducted several experiments comparing the formula predictions with the judgments of experienced teachers, the judgments of readability experts, and the actual comprehension scores of readers on passages.[3] According to Dale-Chall,

> On fifty-five passages of health education materials, we found that our two factor formula predictions correlated .92 with the judgments of readability experts, and .90 with the reading grades of children and adults who were able to answer at least three questions out of four on thirty of these passages. They ranged from the extremely easy to the very difficult.[4]

Regarding administrative feasibility, the application of this formula requires the minimum essentials of work sheets,

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[1]Wood, Test Construction, p. 19.

[2]Donald K. Mathews, Measurement in Physical Education (Philadelphia: W. B. Saunders Company, 1963), p. 24.

[3]Dale-Chall, Educational Research (January 21, 1948), p. 18.

[4]Ibid., p. 18.

pencils, and the use of a calculator. The authors, Dale-Chall, state,

> The formula developed is a simple, two factor formula that is easy to apply. With the use of a factor of vocabulary load and a factor of sentence structure, we have a good prediction of readability.[1]

In addition, the investigator established the following criteria for the instrument to be used in this particular study.

A. The instrument should be an accepted and well established test of readability.

B. The instrument should be applicable to drug education materials.

C. The instrument should be applicable to a wide range of grade levels.

In order to determine the appropriate instrument, the investigator reviewed several tests of readability. A few of the instruments studied were similar in nature but were specific to certain grade levels and were established upon materials not significant to this study. The Dale-Chall formula was selected as being the instrument which best met the established criteria.

The Dale-Chall formula is one of the most widely used formulas for readability. It has been accepted and used by many experts, other than the authors, in the development of

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[1] Ibid., p. 19.

their studies. For example, the Dale vocabulary list has been incorporated for use by Lorge[1] and Spache[2] in the development of their formulae. It thus, satisfactorily meets the needs of the first criteria established by the investigator.

Since the Dale-Chall instrument was validated on health education materials and the range of its estimated grade levels has been established as 4.9 and below to 10.0 and above (applicable through college level), the other criteria are met.

In the formula the factor of vocabulary load is determined by considering the number of words not in the Dale list of 3,000 familiar words. The Dale list represents words that are known in reading by at least eighty percent of the children in grade four. It was constructed primarily as a list which gives a significant correlation with reading difficulty.[3]

The second factor dealing with sentence structure refers to average sentence length. This factor is determined by dividing the number of words in the sample by the number of sentences in the sample. The combination of the two with other variables in the formula gives the level of readability of materials.

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[1]Lorge, Formula, Appendix C, p. 15.

[2]Spache, Good Reading, Appendix, p. 142.

[3]Dale-Chall, Educational Research Bulletin, p. 44.

Since the Dale-Chall formula predicts grade levels within a range of one to two grades, the investigator modified the Dale correction table for purposes of this study by selecting the midpoint of each range from the formula raw score in order to specifically assign materials to one grade level. Both the Dale Correction Table and the Modified Table are shown below.

Dale Correction Table[1]

Formula Raw Score	Corrected Grade-Levels
4.9 and below	4th grade and below
5.0 to 5.9	5-6th grade
6.0 to 6.9	7-8th grade
7.0 to 7.9	9-10th grade
8.0 to 8.9	11-12th grade
9.0 to 9.9	13-15th grade (college)
10.0 and above	16-(college graduate)

Modified Table

Formula Raw Score	Corrected Grade-Levels
4.9 and below	4th grade and below
5.0 to 5.4	5th grade
5.5 to 5.9	6th grade
6.0 to 6.4	7th grade
6.5 to 6.9	8th grade
7.0 to 7.4	9th grade
7.5 to 7.9	10th grade
8.0 to 8.4	11th grade
8.5 to 8.9	12th grade
9.0 and above	College

[1]Educational Research Bulletin, p. 42.

The corrected grade levels aid in the interpretation of the scores obtained by the formula and allow for a more usable means of placing materials within the comprehension of the various grades. A given piece of material having a formula score of 5.2 should be within the comprehension of children who have fifth to sixth grade reading abilities. This formula score indicates, for adults, the highest grade they should have completed in order to read a piece of material with understanding.[1]

The formula can also be used as an aid to text simplification when a text has an undesirably high score. According to the prediction of the formula, it may be simplified by substituting more concrete, familiar words for the unfamiliar and abstract words. Sentences can also be shortened and made clearer.[2] A copy of the Dale-Chall instrument appears in Appendix G of this study.

Preparation for and Application of the Instrument

Prior to the application of the Dale-Chall formula the investigator reproduced a sufficient number of data work sheets to be used in the study. The pamphlets collected were grouped according to sources of publication in order that related analysis could later be made. Preliminary

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[1] Ibid., p. 19.

[2] Ibid., p. 20.

information about each pamphlet was then recorded on the work sheet. This information included the title, author, publisher, page numbers from which samples were selected and "clue" words to indicate the starting point and ending of each sample.

The investigator then secured permission for the use of a desk calculator, to be used in the statistics laboratory at the Texas Woman's University. After approval to use the equipment was granted the investigator proceeded to apply the formula as indicated by Dale-Chall. A copy of the work sheet is included here, for further analysis.

In order to verify the figures calculated by the investigator in the statistical analysis, a graduate assistant in the Department of Psychology was employed to re-apply the formula. Appropriate corrections were made where necessary.

The results of the statistical analysis was further verified by the investigator through the use of the Klare Table for Rapid Determination of Dale-Chall Readability Scores.[1] This table is an index of raw scores based upon the Dale score value and average sentence length. The investigator was satisfied that the analysis was correct. A copy of the Klare Table appears in Appendix H.

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[1]George Klare, "A Table for Rapid Determination of Dale-Chall Readability Scores," Educational Research Bulletin (Ohio State University, February 13, 1952), p. 43-7.

Readability Work Sheet

Dale-Chall Formula[1]

Article: _____	Page No._____	Page No._____	Page No._____
Author: _____	From_____	From_____	From_____
Publisher:_____	To_____	To_____	To_____
Date of Publication:_____			
1. Number of words in the sample.....	_____	_____	_____
2. Number of sentences in the sample.....	_____	_____	_____
3. Number of words not on Dale list.....	_____	_____	_____
4. Average sentence length..... (Divide 1 by 2)	_____	_____	_____
5. Dale score..... (Divide 3 by 1, multiply by 100)	_____	_____	_____
6. Multiply average sentence length (4).... by .0496	_____	_____	_____
7. Multiply Dale Score (5) by .1579.....	_____	_____	_____
8. Constant.....	3.6365	3.6365	3.6365
9. Formula raw score (add 6, 7, and 8).....	_____	_____	_____

Average raw score of 3 samples...._____ Analyzed by_____ Date_____

Average corrected grade-level....._____ Checked by_____ Date_____

[1] Ibid., February 18, 1943, p. 43.

Treatment of Data

In order to analyze the data the following statistical procedures were adhered to:

Grouping of Data by Grade Levels

The materials were grouped according to grade levels within the limitations previously established in Chapter I. An analysis of this grouped data revealed (1) the percentage of materials readable at the selected elementary grade levels, (2) the percentage of materials readable at the secondary grade level, (3) the percentage of materials readable at each grade level within the range of grades five to twelve.

The above information enabled the investigator to present in tabular form the readability levels of the materials according to the prevalence of each percentage, in rank order, and lastly, to determine the range and mean grade level for the material.

Grouping of Data by Sources of Publication

The investigator grouped the data by sources of publication in order to reveal the range and mean grade levels of the publications for each agency concerned. The agencies are grouped under the broad headings of voluntary agencies, professional and health related agencies. This grouping further allowed the investigator to determine the percentages of materials from each source of publication at each of the assessed grade levels.

Grouping of Proportionate Data

The actual or observed proportion of data per grade level was computed in order to determine the relationship of the distribution of data. The first step was to record and tabulate the data on which the proportion was based, in this case, readability scores. The proportion (p) is equal to the number of scores per grade level divided by the total number of scores.[1] For example, three pamphlets were scored at fifth grade level out of a total of 100 pamphlets, then:

$$p = \frac{3}{100} \text{ or } .03$$

This proportionate distribution was then used to determine the significance of difference between two proportions. This test was applied to grades 10-11-12, using all combinations of these three grades. The investigator used the Test for Significance of Difference Between Two Proportions.[2] The formula used in this test is:

$$z = \frac{p_1 - p_2}{\sqrt{\frac{P_1(1-p_1) + P_2(1-P_2)}{N_1 + N_2}}}$$

Where: P_1 = proportion of group 1 N_1 = number in group 1
P_2 = proportion of group 2 N_2 = number in group 2

The data studied was presented in tabular form in order to show this relationship.

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[1]James L. Bruning and B. L. Kintz, Computational Handbook of Statistics (Glenview, Illinois: Scott, Foresman and Company, 1968), p. 197, Section 5.1.

[2]Ibid., p. 199, Section 5.2.

Preparation of the Final Written Report

The following procedures were adhered to in writing the report of the study: (1) the presentation for approval of the corrected outline, filed as a prospectus of the proposed study in the office of the Dean of Graduate Studies at the Texas Woman's University, (2) preparation of a topical outline for each chapter, (3) development of each chapter, (4) preparation of a classified bibliography, and (5) preparation of an appendix. Each chapter was written in accordance with the topical outline, submitted to members of the dissertation committee for suggestions and corrections, and revised according to the suggestions made. A summary of the written report of the investigation was prepared along with conclusions and recommendations for further study. The classified Bibliography and Appendix were assembled.

Summary

This chapter has dealt with the procedures followed in the development of the study. The investigator undertook the present study to determine the readability level of drug education pamphlets used in selected school districts in Texas. The methods of collecting data for the study were (1) a documentary analysis of selected studies concerning readability, (2) a survey of selected districts in Texas to determine their selection and use of supplementary literature, and (3) communications with the Drug Education Division

of the Texas Education Agency to identify the material which they recommend for use in the public schools, and (4) communication with various agencies concerned with the distribution of drug education material.

The preliminary procedures involved the development of a tentative outline and the presentation of the outline in a graduate seminar, on June 11, 1971, in the College of Health, Physical Education, and Recreation. The investigator revised the tentative outline in accordance with the recommendations received during the graduate seminar. The approved revised outline was filed as a prospectus in the Office of the Dean of Graduate Studies at the Texas Woman's University, Denton, Texas.

The rationale for the study was based upon a review of literature used in drug education programs. The selection of materials was based upon established criteria as was the selection of the instrument to be used in determining the readability of the materials. The Dale-Chall formula was selected as most suitable for use in this study.

The analysis of data adhered to the following procedures: (1) grouping of data by grade levels in order to reveal percentages at each level, and to determine the range and mean grade level of the total data; (2) grouping of data by source, in order to reveal the range and mean grade levels of the publications from each source of publication;

(3) grouping of proportionate data in order to determine the relationship of the proportionate distribution of data. The Test of Significance of Difference Between Two Proportions was employed in this procedure.

The investigator followed these procedures in the preparation of the final written report: (1) the presentation for approval of the corrected outline, filed as a prospectus of the proposed study in the office of the Dean of Graduate Studies at the Texas Woman's University, (2) preparation of a topical outline for each chapter, (3) development of each chapter in accordance with the topical outline, (4) preparation of a classified bibliography and (5) preparation of an appendix.

Chapter IV will be concerned with the presentation of the findings.

CHAPTER IV

PRESENTATION OF THE FINDINGS

The major purpose of this study was to determine the grade level of supplementary reading materials in drug education, available to classroom teachers in grades five through twelve in Texas schools. The need for such a study is supported by Ekwall and Henry who state:

> Most classroom teachers have been through the frustrating experience of trying to match the right child with the right book. . . .[1]
>
> . . . . . .
>
> Most teachers do not have the time nor the experience to apply formulas to check the readability of large numbers of books.[2]

Relative to this Spache asserts:

> The selection of materials of difficulty appropriate for the reader is a recurring problem. The readability of material or degree of comprehensibility, must constantly be matched to the reading abilities of the child or adult for whom a book is apparently intended. Reading vitally affects all levels and types of education and communication.[3]

A second purpose was, therefore, an attempt to provide an index for the selection of appropriate grade level material

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[1]Eldon Ekwall and Ida B. Henry, "How to Find Books Children Can Read," The Reading Teacher, Vol. 22, No. 3 (December 1968), p. 230.

[2]Ibid., p. 232.

[3]Spache, Good Reading for Poor Readers, p. 27.

based upon readability. Since most publishers of supplementary materials do not provide such information, the teacher is left to select subjectively the materials to use.

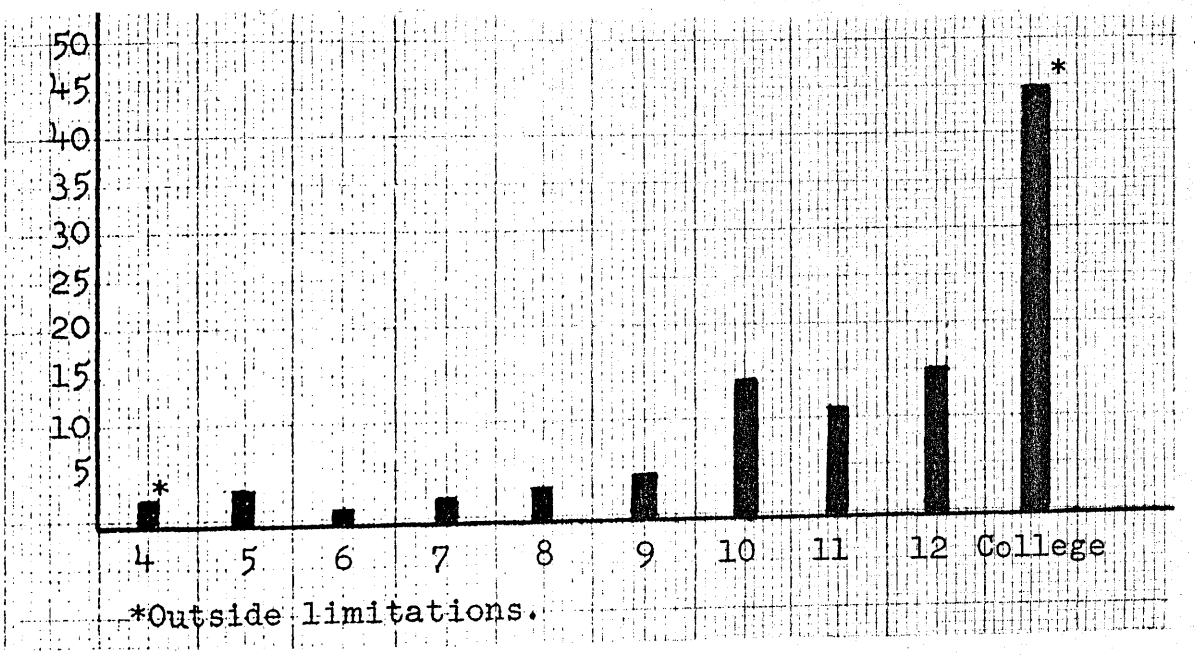
In this chapter the investigator will submit an analysis of data, interpret the findings and test the hypotheses as stated in Chapter I. A summary of the chapter will be presented. This chapter is organized in the following manner:

A. Percentage of supplementary materials by grade level from all sources.
B. Rank order of materials based upon grade level from the highest to lowest according to the raw score.
C. Percentage of supplementary material by grade level according to type of publication (grades 5-12).
D. Percentage of supplementary material by grade level according to type of publication (grades 4-college).
E. Range and means of drug education material according to source of publication.
F. Proportionate distribution of supplementary materials in grades 5-12.
G. Table of differences between proportions in grades 10-11-12.

In Table 1 there is a presentation of the supplementary material by grade level, for grades five through twelve. In addition, the percentages in grades four and at the college level are presented as a means of indicating the placement of the balance of data, outside the stated limitations.

TABLE 1

PERCENTAGE OF SUPPLEMENTARY MATERIALS
BY GRADE LEVEL FROM ALL SOURCES



As shown in Table 1, three (3) percent of the data was assessed at grade five, while grade six was assessed one (1) percent making a total of four (4) percent of data at the elementary level. Grades seven, eight and nine contained a total of nine (9) percent, revealing that most of the data, within the limitations, was assigned to grades ten, eleven and twelve, or the upper secondary level. Grade ten was assessed fourteen (14) percent, grade eleven, eleven (11) percent and grade twelve fifteen (15) percent, yielding a total of forty (40) percent data.

Slightly less than fifty (47) percent of the data analyzed was outside the limitations stated in this proposal. Grade four was assessed two (2) percent while the major

portion of forty-five (45) percent was indicated at the college level.

The application of the Dale-Chall formula enabled the writer to rank the materials, based upon grade level, from the highest to the lowest grade level, as revealed by the raw scores (Table 2). The raw score is determined by the analysis of three passages from the pamphlets according to the Dale-Chall formula. The rank order shows that the highest raw score is 15.58, assessed to a pamphlet submitted by the American Medical Association, a professional organization. This score indicates a grade level appropriate for a college graduate.

Further analysis of this table reveals that among the top one-fourth (1-25) of the data, seventy-two percent of these pamphlets (N=18) were from professional health related agencies. The voluntary civic agencies contributed twelve percent (N=3) while sixteen percent (N=4) were from governmental agencies.

The next group (21-50) of the rank order shows that the governmental agencies contributed slightly more than half (13-25) of the pamphlets while the voluntary-civic agencies and the professional agencies each contributed six. The grade levels in these two groups were for college and twelfth grade.

In the third quartile (51-75) the ranking extends from grade twelve downward through grade ten, and in the last group (76-100) the ranking extends from grade ten to grade four.

TABLE 2

RANK ORDER OF MATERIALS BASED UPON GRADE LEVEL FROM HIGHEST TO LOWEST ACCORDING TO THE RAW SCORE

	Title of Pamphlet	Type*	Raw Score	Grade	Publisher
1.	Dependence on LSD and Other Hallucinogenic Drugs	Prof.	15.58	College	American Medical Association
2.	Dependence on Barbiturates	"	11.58	"	AMA
3.	Amphetamines	"	11.29	"	AMA
4.	Medicinal Narcotics	"	11.08	"	Pharmaceutical Manufacturers Assn.
5.	Barbiturates	"	10.97	"	AMA
6	Dependence on Amphetamines and Other Stimulant Drugs	"	10.95	"	AMA
7.	Facts About Tranquilizers	"	10.85	"	Addiction Research Foundation
8.	Dependence on Cannabis	"	10.71	"	AMA
9.	Facts About LSD	"	10.66	"	Addiction Research Foundation
10.	Glue Sniffing	"	10.61	"	Univ. Texas School of Pharmacy
11.	Alcohol and Alcoholism	V-C	10.59	"	Public Affairs Comm.

*Prof. - Professional
V-C - Voluntary-Civic
Gov't. - Governmental

TABLE 2--Continued

	Title of Pamphlet	Type*	Raw Score	Grade	Publisher
12.	Facts About Amphetamines	Prof.	10.55	College	Addiction Research Foundation
13.	Marihuana and Society	"	10.38	"	AMA
14.	Ancient Drug and Modern Social Problem	"	10.27	"	Eli Lilly Company
15.	Guide of Abused Drugs	V-C	10.24	"	Texas Alcohol Narcotics Education
16.	LSD	Prof.	10.22	"	AMA
17.	Facts About Solvents	"	10.22	"	Addiction Research Foundation
18.	How Safe Are Our Drugs	"	10.21	"	Food and Drug Administration
19.	Marihuana Thing	"	10.13	"	AMA
20.	Marihuana and Other Relevant Problems	V-C	10.06	"	American Bar Assn.
21.	Recent Research On Narcotics, LSD, etc.	Gov't	10.00	"	National Institute of Mental Health
22.	Volatile Substances: Questions and Answers	"	9.98	"	National Institute of Mental Health

*Prof. - Professional
V-C - Voluntary-Civic
Gov't. - Governmental

TABLE 2--Continued

	Title of Pamphlet	Type*	Raw Score	Grade	Publisher
23.	Fact Sheet (1970)	Gov't.	9.96	College	Bureau of Narcotics
24.	LSD: The False Illusion Part II	"	9.88	"	Food and Drug Adm.
25.	The Crutch That Cripples	Prof.	9.85	"	AMA
26.	The Up and Down Drugs	Gov't.	9.81	"	NIMH
27.	Drug Abuse: Identification of Narcotics	"	9.80	"	Bureau of Narcotics
28.	The Dangers of Marihuana	"	9.57	"	" " "
29.	The Use and Misuse of Drugs	"	9.48	"	Food and Drug Adm.
30.	Fact Sheets (1968)	"	9.44	"	" " " "
31.	LSD: The False Illusion Part I	"	9.42	"	Bureau of Narcotics
32.	Sedatives	"	9.41	"	NIMH
33.	Teen Age Booby Trap	"	9.39	"	Bureau of Narcotics
34.	What About Marijuana	V-C	9.39	"	Public Affairs Comm.
35.	Nicky Cruz: Gives the Facts on Drugs	"	9.38	"	Logos Publishers for Ordeal

*Prof. - Professional
V-C - Voluntary-Civic
Gov't. - Governmental

TABLE 2--Continued

	Title of Pamphlet	Type*	Raw Score	Grade	Publisher
70.	The Narcotic Addiction Problem	V-C	8.06	11	American Social Health Assn.
71.	Alcohol: Fun or Folly	"	8.03	11	TANE
72.	Drug Abuse: The Chemical Cop-out	"	7.97	10	TANE
73.	Glue Sniffing	"	7.97	10	TANE
74.	Operation "Can-Quit"	"	7.95	10	TANE
75.	Why Not Marihuana?	"	7.88	10	TANE
76.	LSD: Questions and Answers	Gov't.	7.86	10	NIMH
77.	The Facts About Smoking and Health	"	7.86	10	Public Health Service
78.	The Roach	"	7.82	10	Texas Education Agency
79.	Narcotics: Questions and Answers	"	7.77	10	NIMH
80.	Alcohol--Servant or Master	V-C	7.77	10	TANE
81.	Why Adolescents Drink and Use Drugs	Gov't	7.70	10	NIMH

*Prof. - Professional
V-C - Voluntary-Civic
Gov't. - Governmental

TABLE 2--Continued

	Title of Pamphlet	Type*	Raw Score	Grade	Publisher
82.	Smoking and Illness	Gov't.	7.77	10	Public Health Service
83.	Drug Addicts are Getting Younger	V-C	7.56	10	American Social Health Assn.
84.	Marihuana and You	"	7.55	10	TANE
85.	Know About Drugs	Prof.	7.52	10	American Education Publication
86.	Lets Talk About Drugs	V-C	7.48	9	TANE
87.	The Smoking Habit	Gov't.	7.41	9	Texas State Dept. Health
88.	Marihuana: Questions and Answers	"	7.37	9	NIMH
89.	Lets Talk About Marihuana	V-C	7.09	9	Illinois Action on Alcohol Problems
90.	The Village Hippie	Gov't.	6.96	8	Texas State Dept. Health
91.	Cigarette Smoking: The Facts	V-C	6.87	8	Nat'l T.B. Assn.
92.	Don't Let Your Health Go Up In Smoke	Gov't.	6.77	8	Texas State Dept. Health
93.	Who Me?..Quit Smoking	V-C	6.37	7	American Cancer Society

*Prof. - Professional
V-C - Voluntary-Civic
Gov't.- Governmental

TABLE 2--Continued

	Title of Pamphlet	Type*	Raw Score	Grade	Publisher
94.	Smoke Cigarettes? Why?	V-C	6.20	7	American Cancer Society
95.	Smoking Affects Two Lives	Gov't.	5.70	6	Public Health Service
96.	The Little Smokers	"	5.32	5	Texas State Dept. Health
97.	Turning On: Two Views	V-C	5.19	5	Encounter
98.	Katy's Coloring Book	Gov't.	5.17	5	Bureau of Narcotics
99.	Caution Cartoons	"	4.81	4	Texas Education Agency
100.	Me Quit Smoking? How?	V-C	4.32	4	National T.B. Assn.

*Prof. - Professional
V-C - Voluntary-Civic
Gov't. - Governmental

The publications which fall within the limitations of this study are shown to rank from number forty-six downward to number ninety-eight. Within these limitations the largest source of material is from the voluntary-civic agencies (25) and governmental agencies (19).

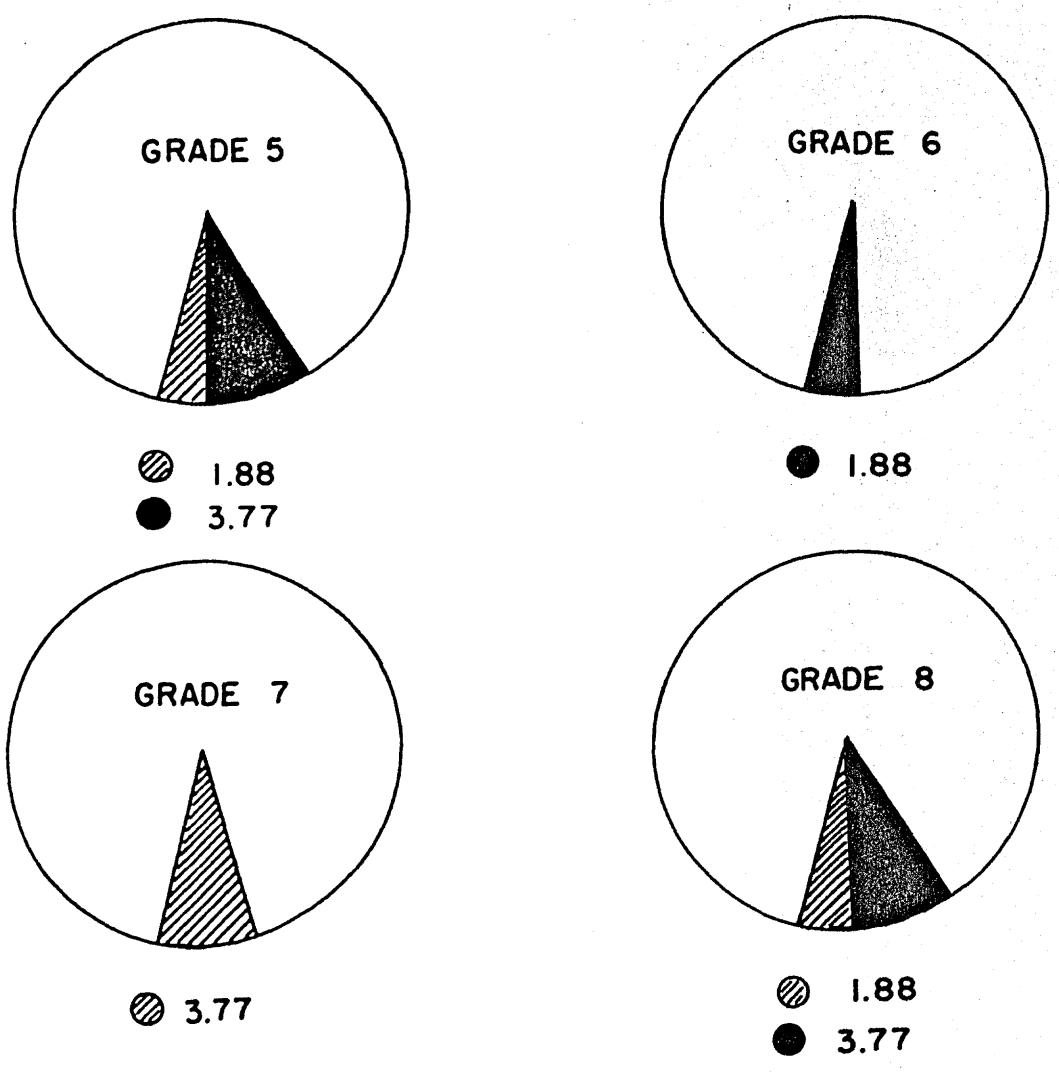
Inspection of Table 3 reveals the percentage of data by grade level according to type of publication, and limited to grades five through twelve. In the evaluation of total data, fifty-three (53) percent of the pamphlets were identified as being appropriate for grades five through twelve. This percentage was used as the basis for this analysis.

As shown, the source of contributions in grades five through nine was from voluntary-civic and governmental organizations. The initial contribution from professional agencies is revealed in grade ten. The total contributions of data, from the various sources and within the stated limitations are revealed as 45.15 percent for voluntary-civic agencies, 35.82 for governmental and 18.85 for professional agencies.

At the upper secondary level, grade ten reveals an almost equal percentage of data from both governmental and voluntary agencies, at 11.32 and 13.20 respectively. Grade eleven reveals the upward trend in the percentage of data from the professional organizations, with 7.54 percent at this level and 9.43 percent in grade twelve.

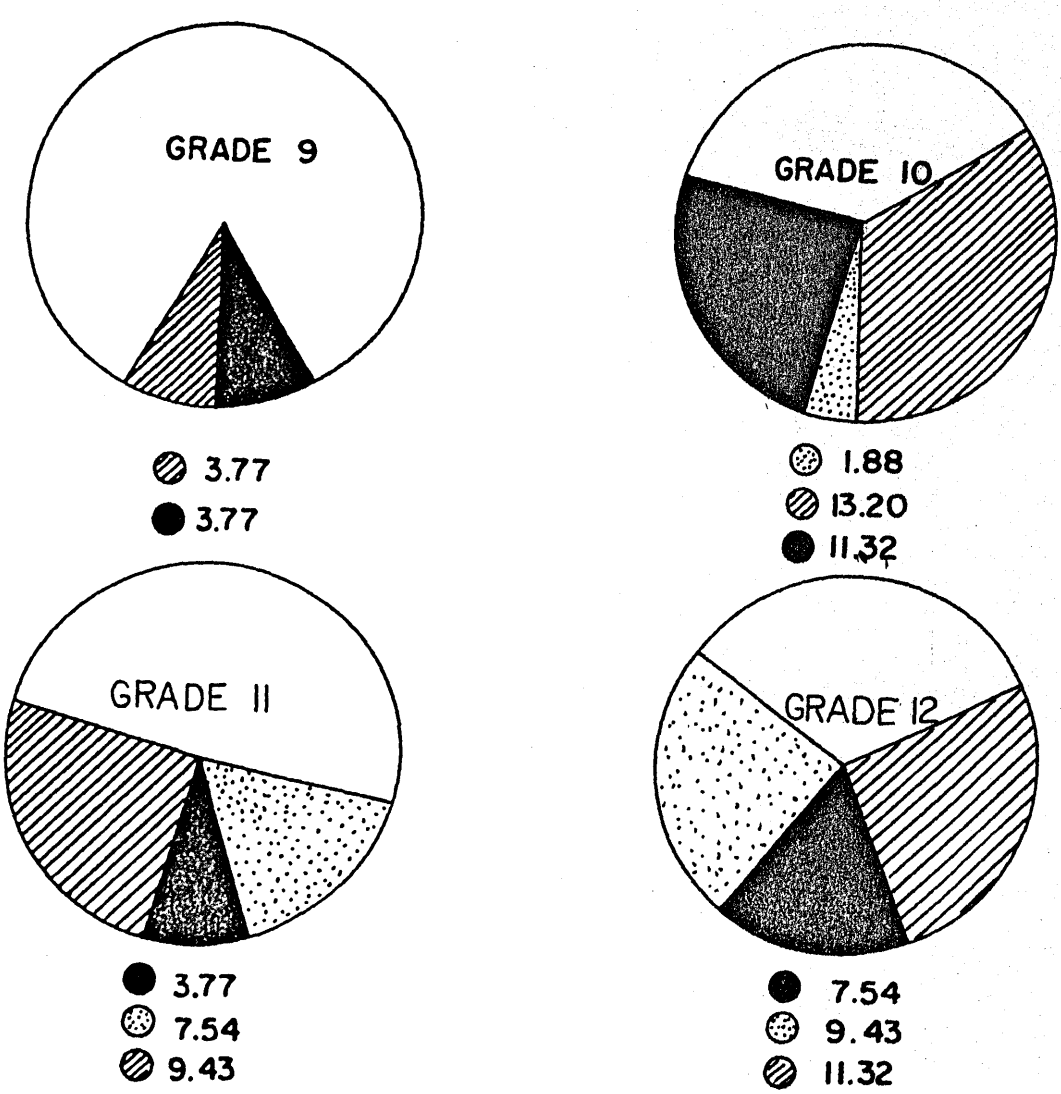
TABLE 3

PERCENTAGE* OF SUPPLEMENTARY MATERIAL BY GRADE LEVEL ACCORDING TO TYPE OF PUBLICATION (5-12)



* BASED ON 53% DATA (5-12)

TABLE 3 (con't)


GRADE 9
3.77
3.77
GRADE 10
1.88
13.20
11.32
GRADE 11
3.77
7.54
9.43
GRADE 12
7.54
9.43
11.32
VOLUNTARY
GOVERNMENTAL
PROFESSIONAL

Inspection of Table 4 reveals the percentage of data by grade level according to type of publication, including grades four through college. This table was based upon the evaluation of 100 pamphlets or 100 percent data.

As previously shown, 53 percent of this data was assessed to grade levels five through twelve. Table 3 revealed the type of publications contributing to these grades. The percentage of data revealed in this analysis, changed in proportion to the data treated.

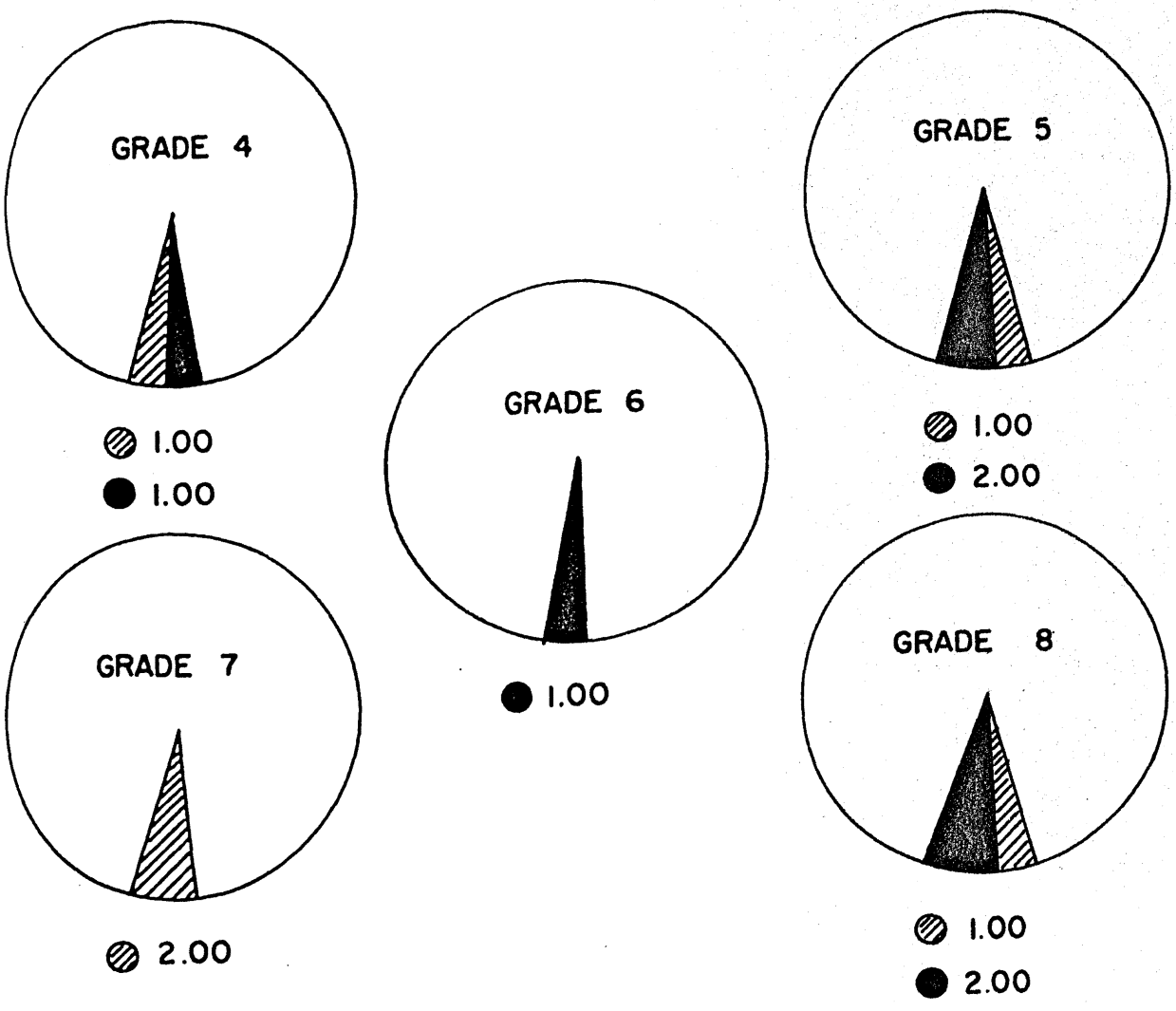
In addition, as can be seen, grade four received a total of two percent of the data, showing one percent each, from the voluntary-civic and governmental agencies. The material assessed at the college level was received from all sources. Professional organizations contributed the greater percentage of 21, followed by governmental material at 15 and voluntary-civic at 9 for a total of 45 percent.

Table 5 reveals the range and means of drug education materials, according to each source of publication, within the scope of the broad classification titles indicated. The bar graphs represent the range of materials both within the stated limitations and outside the limitations of the study. It also reveals within each range, the grades in which no material was assessed for that particular type of publication.

The range of total data is nine (13-4), thirteen is the minimum number assigned to college level grades as indicated by the Dale-Chall table. This indicates that the

TABLE 4

PERCENTAGE* OF SUPPLEMENTARY MATERIAL BY GRADE LEVEL ACCORDING TO TYPE OF PUBLICATION



* BASED ON 100% DATA

TABLE 4 (con't)

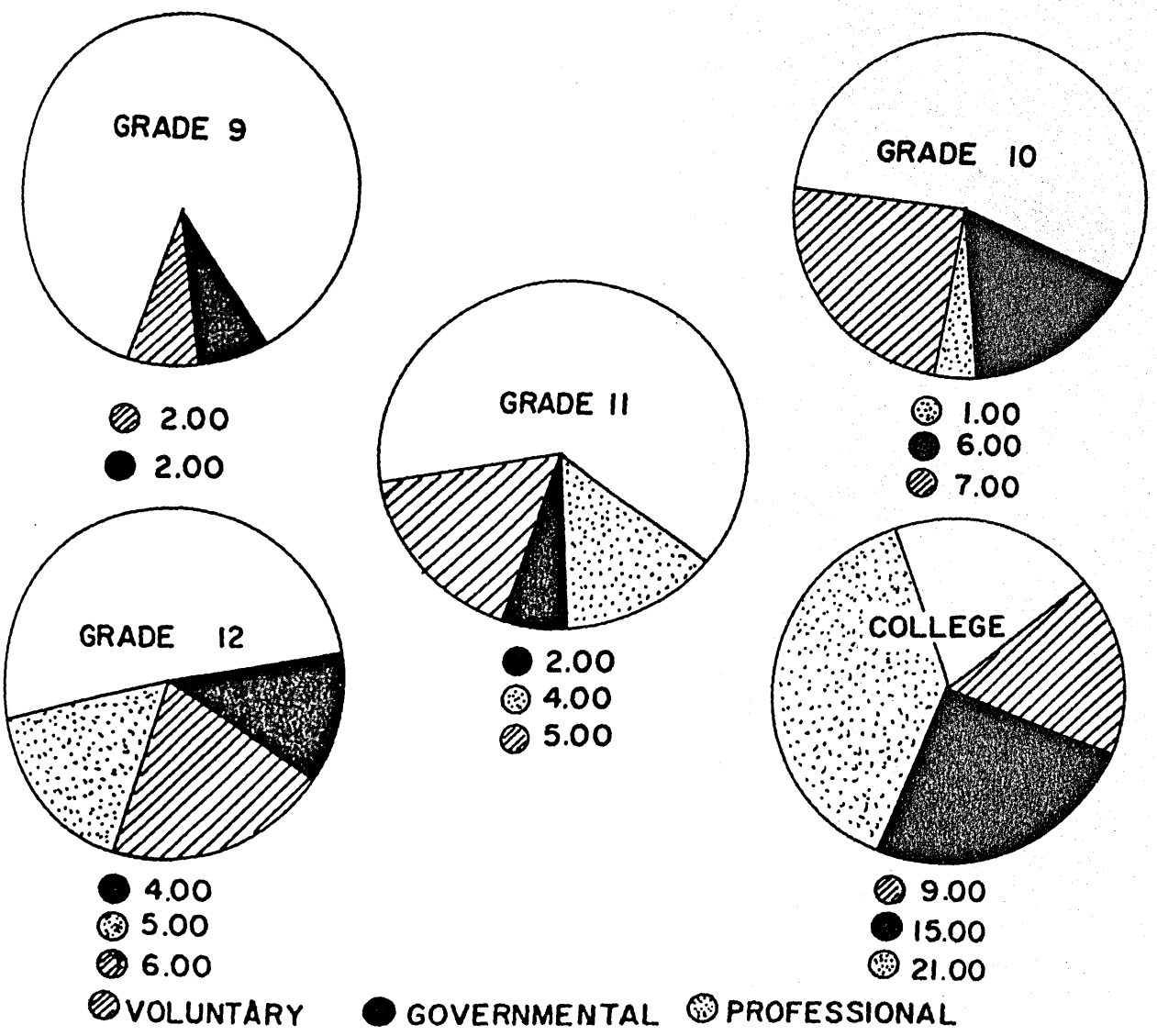

GRADE 9
2.00
2.00
GRADE 10
1.00
6.00
7.00
GRADE 11
2.00
4.00
5.00
GRADE 12
4.00
5.00
6.00
COLLEGE
9.00
15.00
21.00
VOLUNTARY
GOVERNMENTAL
PROFESSIONAL

TABLE 5

RANGE AND MEANS OF DRUG EDUCATION MATERIAL ACCORDING TO SOURCE OF PUBLICATION FOR ALL GRADES

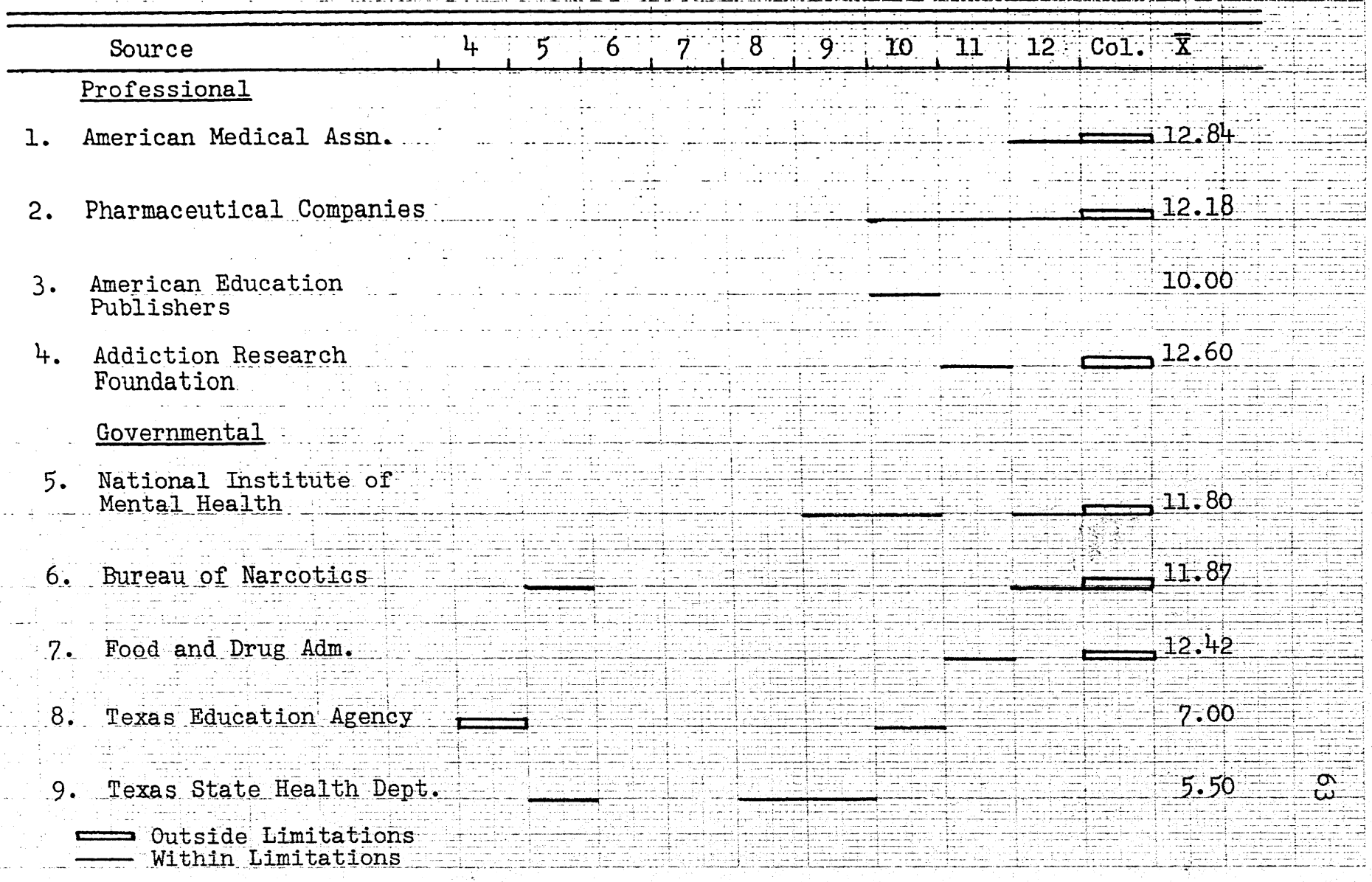


TABLE 5--Continued

Source	4	5	6	7	8	9	10	11	12	Col.	$\bar{X}$
10. Public Health Service			—				—				8.66
Voluntary-Civic											
11. Texas Alcohol Narcotics Education						—	—	—	—	▭	11.00
12. Kiwanis International								—		▭	12.00
13. American Social Health Assn.							—	—		▭	11.33
14. American Bar Assn.										▭	13.00
15. American Assn. of Sheriffs								—			11.00
16. Moody Foundation								—			11.00
17. Encounter		—									5.00
18. Ordeal (Logos)										▭	13.00

▭ Outside Limitations
— Within Limitations

TABLE 5--Continued

Source	4	5	6	7	8	9	10	11	12	Col.	$\bar{X}$
19. Public Affairs Committee											12.50
20. Blue Cross-Blue Shield											10.00
21. National Tuberculosis Assn.											8.00
22. American Cancer Society											8.66
23. Illinois Action on Alcohol Problems											9.00
											$\bar{X}$ (total data) 11.29

Outside Limitations
Within Limitations

materials were distributed over nine grade levels from grade four through the college level.

The mean score of the total data was 11.29. This indicates the average grade level of all materials studied.

Table 6 reveals the proportionate distribution of data in grades five through twelve. This proportion was determined by dividing the number of samples in each grade by the total number evaluated or, $P = \frac{n(grade)}{n(total)}$.[1] The total number was 100. As can be seen, the number of samples for each grade level is revealed in the upper row of the table. The table further reveals that the largest proportion of data was found at grade twelve while the least proportion was found in grade six.

TABLE 6

PROPORTIONATE DISTRIBUTION OF SUPPLEMENTARY MATERIALS IN GRADES FIVE THROUGH TWELVE

Grade	5	6	7	8	9	10	11	12	Total
Number	3	1	2	3	4	14	11	15	53
Propor.	.0300	.0100	.0200	.0300	.0400	.1400	.1100	.1500	.5300

Table 7 reveals the Significance of Difference Between Two Proportions as determined by the application of the formula as shown in Chapter III. A (z) of ± 1.96 is significant at the

[1]Bruning and Kintz, Statistics, p. 198

.05 level. A significant z indicates that the two proportions are significantly different.[1] As seen in the table no significant difference was found through the application of the formula, using all possible combinations of grades ten, eleven, and twelve. Grades ten, eleven, and twelve were tested based on the assumption, by the writer, that the materials would be equally distributed at the upper secondary level, as stated in Hypothesis IV.

TABLE 7

*TABLE OF DIFFERENCES BETWEEN PROPORTIONS IN GRADES TEN, ELEVEN, TWELVE

Grade	10	11	12	
Proportion	.1400	.1100	.1500	
(Z) 10 vs. 11		.3211		Not Sign.
10 vs. 12			.1082	Not Sign.
11 vs. 12			.4296	Not Sign.

*Significant Z at .05 = $\pm$ 1.96.

Test of Hypotheses

Upon the basis of the results of the data the stated hypotheses were tested:

HYPOTHESIS I: The literature tested will not yield a readability level corresponding to the elementary grade levels of five and six.

The findings indicated that the literature yielded a readability level corresponding to the selected elementary

fifth and sixth grade level. Upon the basis of these findings the writer rejects the hypothesis as stated.

HYPOTHESIS II: The literature tested will not yield a readability level corresponding to the secondary grade levels of seven through nine.

The findings reveal that the literature yielded a readability level corresponding to the stated secondary levels. Upon the basis of these findings the writer rejects the hypothesis as stated.

HYPOTHESIS III: None of the literature tested will be outside the range of grades ten through twelve.

The findings indicate that sixty percent of the literature tested was outside the range of grades ten to twelve. The writer therefore rejects the hypothesis as stated.

HYPOTHESIS IV: There will be no significant difference between the proportionate distribution of materials, within grades ten through twelve, as determined by the Test for Significant Difference Between Two Proportions.

The findings indicate no significant difference (.05) between the proportionate distribution of data within grades ten through twelve, using all possible combinations. Upon the basis of these findings the writer fails to reject the stated hypothesis.

Summary

This chapter has been concerned with the presentation and interpretation of data and the testing of hypotheses. Table 1 presented the percentage of data by grade level (five

through twelve) in graph form. It also reveals the placement of data outside the stated limitations.

Table 2 presented the data in rank order according to grade level from college downward to grade four. This table revealed that most of the literature from professional organizations was among the highest ranked according to readability. Within the limitations of grade five through twelve the largest source of materials come from voluntary-civic agencies and governmental agencies.

Table 3 revealed the percentage of data by grade level, according to type of publication, within the grades five through twelve. The establishment of these percentages were based upon the derived 53 percent of the total data. Contributions in grades five through nine were revealed as being totally from voluntary-civic and governmental agencies. The initial appearance of data from professional organizations was at grade ten.

Table 4 revealed the percentage of data by grade level according to type of publication for all data, including grades four through college. This table was based upon the evaluations of 100 pamphlets or 100 percent data. The table showed clearly that forty-seven percent of the total data lay outside the established grade limitations.

Table 5 revealed the range and means of drug education materials according to each source of publication, presented

as a bar graph. The range of total data was nine while the mean grade level was 11.29.

Table 6 showed the proportionate distribution of data in grades five through twelve. It was shown that the largest proportion was found in grade twelve while the least was found in grade six.

Table 7 revealed the significance of difference between two proportions. It revealed that there was no significant difference in the proportionate distribution of data within the grades specified.

Based upon the findings as indicated by an analysis of data the Hypotheses I, II, and III were rejected as stated. The writer failed to reject Hypothesis IV. Chapter V will be a summary of the study, and will contain recommendations and state probable values.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The present study was undertaken to determine the grade level of supplementary materials in drug education available in grades five through twelve in the public schools of Texas. The grade levels were limited by statutory provision of the Texas Legislature in House Bill 467, which requires that drug education be implemented into the public school curriculum for grades five through twelve (Appendix K).

The basic premise underlying the development of a program in drug education was effectively stated by Levy, who emphasized that "We are a drug using society. . . .A large segment of our population look to drugs to alleviate a host of physiological, psychological and social discomforts."[1] Mikeal[2] supported this concept and utilized the tri-dimensional conceptual definition of health education to state the inherent relationship between drug education and health education.

The current problem of drug abuse has caused concern among people in every walk of life, thus, focusing on new

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[1]Levy, "Background Considerations for Drug Programs," p. 3.

[2]Mikeal, "A Positive Approach to Drug Education," p. 450.

implications and directions for changes in the health education curriculum. Fort,[1] Opasker,[2] and Levy[3] along with former Attorney General Ramsey Clark[4] are among those who have emphasized the need for education in an effort to combat drug abuse.

The purpose of a drug education program in the schools is twofold: to develop strategies which effectively influence the knowledge and understanding of drugs on the part of the students and secondly to develop strategies whereby attitudes and behavioral changes may take place. To meet the first objective the teacher will necessarily be concerned with the skillful use of teaching tools and will undoubtedly utilize supplementary materials as a corollary to the lessons. In the selection of this material the teacher has many considerations, among them is the readability of the chosen material. Williams states, "The final responsibility for providing content reading material suited to the needs of individual children rest with the schools."[5]

Chapter I of the study provided an introduction to and rationale for the study. Included also was a statement

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[1]Fort, The Pleasure Seekers, p. 230.

[2]Opasker, Teaching About Drugs, Foreword.

[3]Levy, "Background Considerations for Drug Programs," p. 3.

[4]Dallas Morning News (November 29, 1970), Interview.

[5]Williams, "Rewritten Science Materials and Reading Comprehension," p. 204.

of the problem, purpose for the study, statement of hypotheses, pertinent terminology and delimitations as well as sources of data.

Chapter II presented a survey of literature which revealed that the study does not duplicate any previous study specifically related to the readability of drug pamphlets. Several studies relating to the readability of health education material and studies significant to other disciplines were examined and furnished background information for the study. Selected studies relating to general readability formulas were also included. Among those reviewed were readability formulas by Lorge,[1] Spache,[2] Flesch,[3] and Yoakum.[4] Other studies included Wiegand,[5] Williams,[6] McTaggart,[7] Osborn and Sutton.[8]

Chapter III dealt with the procedures followed in the development of the study. The methods of collecting data for

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[1]Lorge, The Lorge Formula, 1966, p. 3.

[2]Spache, Good Reading, p. 144.

[3]Flesch, Marks of Readable Style, 1943.

[4]Yoakum, Basal Reading Instruction, p. 329.

[5]Wiegand, "Pittsburgh Looks at the Readability of Mathematics Textbooks," p. 201.

[6]Williams, "Rewritten Science Materials and Reading Comprehension," p. 204.

[7]McTaggart, "Readability of High School Health Text," p. 434.

[8]Osborn and Sutton, "Evaluation of Health Education Materials," p. 72.

the study were (1) a documentary analysis of selected studies, (2) a survey of selected districts in Texas to determine their selection and use of supplementary literature, (3) communication with the Drug Education Division of the Texas Education Agency to identify the materials recommended for use in the public schools and (4) communication with various governmental, professional and voluntary-civic organizations concerned with the distribution of drug education materials.

The preliminary procedures involved the development of a tentative outline and the presentation of the outline in a graduate seminar, in the College of Health, Physical Education and Recreation. The outline was revised in accordance with the recommendations received from the graduate committee and filed as a prospectus in the Office of the Dean of Graduate Studies.

The selection of materials was based upon established criteria as was the selection of the instrument used in determining the readability of the materials. A total number of 100 drug education pamphlets were selected based upon the following criteria.

A. That the materials were available to the sample school districts in the study.
B. That the materials were recommended by the Drug Education Division of the Texas Education Agency for use in the public schools.

C. That the materials were consistently included in drug education packets distributed by various health related agencies to the public schools.

The selection of the sample school districts were dependent upon these criteria:

A. The school district must be involved in the development of a drug education program.

B. The school district must be in the State of Texas, and therefore, subject to the Texas Education Agency's guidelines.

C. The school district must be cooperative in supplying needed information.

The Dale-Chall formula was selected as most suitable for use in this study. The criteria were those generally accepted in scientific research of validity, reliability and the administrative feasibility of the instrument. In addition, for purposes of this study, the investigator established the following criteria:

A. The instrument should be an accepted and well established test of readability.

B. The instrument should be applicable to drug education materials.

C. The instrument should be applicable to a wide range of grade levels.

The analysis of data adhered to the following procedures: (1) grouping of data by grade levels in order to

reveal percentages at each level to determine the range and mean grade level of the total data; (2) grouping of data by source, in order to reveal the range and mean grade levels of the materials from each source of publication; (3) grouping of proportionate data in order to determine the relationship of the proportionate distribution of data. The Test of Significance of Difference Between Two Proportions was employed in the latter procedure.

The final procedures involved the preparation of a topical outline for each chapter, the development of each chapter in accordance with the topical outline, and the preparation of a classified bibliography and appendix. The investigator also included in Chapter III the Dale Correction Table, which revealed the formula raw scores and corrected grade levels. Since these grade levels were given in a range of one to two grades the writer presented a modified table appropriate to this study, for placement of material into specific grades.

Chapter IV was a presentation of findings. It was revealed that 53 percent of the data analyzed was within grades five through twelve and 47 percent was outside the stated limitations. Of that percentage, 45 percent was indicated as being college level material.

A rank order table from college through the fourth grade showed that most of the literature from professional organizations was among the highest ranked according to

grade level. Within the limitations of grades five through twelve the largest source of materials were from voluntary-civic agencies and governmental agencies.

According to type of publication, within the stated grade levels and based upon 53 percent of the data, it was shown that in grades five through nine, the materials were only from voluntary-civic and governmental agencies. The initial appearance of printed material from professional organizations was in the tenth grade.

The range and means of drug education materials according to each source of publication was presented. This information revealed the grade levels at which no material was assessed within the total range for that source. The range of the total data was nine while the mean grade level was 11.29.

The largest proportion of material within the stated limitations was found in grade twelve while the least was in grade six. It was shown that there was no significant difference in the proportionate distribution of data within the grades specified.

Based upon the findings, the following hypotheses were rejected as states:

HYPOTHESIS I: The literature tested will not yield a readability level corresponding to the elementary grade levels of five and six.

HYPOTHESIS II: The literature tested will not yield a readability level corresponding to the secondary grade levels of seven through nine.

HYPOTHESIS III: None of the literature tested will be outside the range of grades ten through twelve.

The writer failed to reject the following hypothesis:

HYPOTHESIS IV: There will be no significant difference in the proportionate distribution of materials, within grades ten through twelve, as determined by the Test for Significant Difference Between Two Proportions.

Conclusions and Recommendations

The conclusions drawn from this study imply a greater need for pamphlets written at the elementary and lower secondary level. Present thinking of those professionals who are developing drug education programs emphasizes the need for such programs in the elementary school. Influence on student attitudes and behavior appear to be greater at this point. In addition, from all indications of the limited success in the treatment of drug users it would seem that the best efforts would be applied in a preventive sense before experimental behavior takes place. The range of these materials should extend from kindergarten through grade twelve and be written at the appropriate level of these students. In a statement by Winick, it was indicated that:

> The major trend in drug abuse has been its steady extension to younger and younger age groups. From college and university campuses the drug scene has spread to high schools and junior high schools.

> Now there is shocked awareness that it has reached the very young indeed. In the last few years abuse of a variety of chemical substances, from glue to heroin has been growing among children of the middle years--those between ages eight to twelve and, in school terms, between the third grade and junior high school.[1]

The pamphlets tested revealed a high percentage of technical and repetitive materials, especially from the professional agencies selected as sources of supplementary material. The investigation further indicated that much of the material is not within the readability levels of the proposed drug education program grades. With almost half of the pamphlets assessed above the twelfth grade level it appears that school districts will be limited greatly in their selection of materials.

Based on the findings and conclusions as stated previously, the following recommendations are therefore suggested:

(1) health agencies of all types be concerned with the re-writing and/or the development of materials in drug education to meet the readability levels of the various grades from elementary through high school.

(2) curriculum personnel direct their efforts toward the evaluation of this material in order that the classroom teacher might have an index from which to select. In view of the fact that

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[1]Charles Winick, "Drug Addicts Getting Younger," The PTA Magazine (September, 1970), p. 6.

the format of some materials are written, using "alarmist tactics" (see Appendix L), perhaps a rating scale might be adopted.

(3) classroom teachers give consideration to the level of readability of supplementary materials in order that it will be better understood and will therefore serve as a corollary to other learning experiences.

(4) classroom teachers should be provided with drug pamphlets which correspond, in readability level, with the wide range of reading ability typically found in the classroom.

The writer further recommends

(5) that the vocabulary indices of the readability formulas be re-examined in light of the increased sophistication of contemporary students with regard to drug terminology, in order to determine what additions or specialized vocabularies might be made to supplement the present vocabulary.

Relative to this recommendation the investigator points out that Lorge[1] emphasized that of the various factors involved in the determination of readability, vocabulary load is the most important. However, Dolch[2] points out that although

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[1]Irving Lorge, "Readability Formulae: An Evaluation," Elementary English, XXVI (February, 1949), p. 91.

[2]E. W. Dolch, "The Use of Vocabulary List in Predicting Readability and in Developing Reading Materials," Elementary English, XXVI (March, 1949), p. 142-49.

many of the various studies on readability use a vocabulary list as a fundamental part of their methods, special subject matter list must be considered in some cases, as different fields of interest have different vocabularies.[1] The investigator believes that because of the highly technical terminology in drug literature, drug education may be considered as one of the aforementioned special cases.

Dale and Chall[2] emphasized that some objective evidence of the readers' familiarity with technical vocabulary is needed, and pointed out that from a previous study conducted to determine factors involved in comprehending health materials, different technical terms contributed most to the difficulty in reading comprehension.[3] Thus, the writer concludes that the recommendation relative to readability indices is a valid one.

In conclusion, the writer cautions against "the literal interpretation that some people give to the grade placement or readability index of a book."[4] As Chall states,

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[1] Ibid., p. 146.

[2] Edgar Dale and Jeanne Chall, "Familiarity of Selected Health Terms," Educational Research Bulletin (November 15, 1950), p. 197.

[3] Edgar Dale and R. W. Tyler, "A Study of the Factors Influencing the Difficulty of Reading Materials for Adults of Limited Reading Ability," Library Quarterly (July, 1934), p. 384-412.

[4] Nancy Larrick, "Readability Formulas and Books for Children," 1711.

because of the wide range in reading ability within one class any book selected for the average reading ability of the class will almost invariably be too difficult for the children at the lower end of the scale.[1] Readability indices should be interpreted solely as a useful adjunct in the evaluation of written materials.

Probable Values

The investigator anticipates that the proposed study will:

A. Contribute to the literature concerning the readability of supplementary materials.

B. Stimulate the interest of other individuals in conducting research of a similar nature.

C. Serve as a basis for the assignment of supplementary materials related to drug education.

D. Serve as the basis for the publication of articles in appropriate professional journals.

E. Stimulate interest in the preparation or rewriting of materials using grade level vocabulary.

F. Stimulate the need for upgrading readability indices.

G. Stimulate concern for the random selection and dissemination of pamphlet material.

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[1]Jeanne Chall, Readability, An Appraisal of Research and Application (Ohio State University, Columbus, Ohio, 1958), p. 96.

APPENDIXES

APPENDIX A

LORGE READABILITY FORMULA

DIRECTIONS FOR USING THE LORGE FORMULA

SELECT THE SAMPLE.

Short passages (300 words or less). When a short passage is to be appraised, it is advisable to analyze the entire passage.

Longer passages. When a longer passage is to be appraised, it is advisable to analyze samples of the material. Select a sample near the beginning, another sample near the middle, and a third sample near the end of the passage. These samples should be approximately one hundred words in length.

Number the lines of text serially, and then count the number of words per line (for about ten lines) to get an estimate of the number of words. For instance, a passage has 141 lines; ten lines chosen at random have 11, 12, 13, 13, 12, 12, 12, 12, 16, and 16 words, or an average of 13 words per line. The passage thus has approximately 1,833 words. A sample of 100 words would then be approximately eight lines in length. The three samples could be chosen in a variety of ways. They could be chosen beginning at or near line 3 through line 11, at or near line 53 through line 61; and at or near line 103 through line 111. In this way, a sample is chosen in each third of the passage.

It should be noted, moreover, that each sample should start with the beginning of a sentence, and should stop at the end of a sentence. When the samples have been located with beginning and end points, the remainder of the analysis can be made.

Books. When books are to be appraised, it would be advisable to analyze samples of the book, perhaps from 5 to 10 per cent of the book (but never less than five samples). These samples should be chosen throughout the book.

For instance, a book has 92 pages of text with an average of 195 words per page. This indicates an approximate wordage of 18,000 words. A 5 per cent sample would be 900 words; a 10 per cent sample would be 1,800 words. The 5 per cent sample would require approximately five pages; the 10 per cent sample would require approximately nine pages. Thus, every eighteenth page should be chosen for the 5 per cent sample; every tenth

page should be chosen for the 10 per cent sample. The sample might be pages 3, 21, 39, 57, and 75 in the one instance; or 4, 14, 24, 34, 44, 54, 64, 74, and 84 in the other. Here also, of course, a sample must start with the beginning of a sentence and stop at the end of a sentence.

LABEL THE WORK SHEET.

Fill out the information about title, author, edition, publisher, and date of publication (latest copyright year listed). Carefully identify the location of the sample (p. 14, line 2, The answer . . . p. 14, line 26, ever after.).

COUNT THE NUMBER OF WORDS.

Begin at the beginning of the sample and count (or number serially) each word to the end of the sample. Observe the following procedure:

A hyphenated word is counted as one word. When in doubt about uncommon hyphenations, follow Webster's Unabridged Dictionary (2nd edition); if listed in the dictionary as hyphenated, count as one word; if not listed, count as two words.

A word separated at the end of a line and continued on the next line is counted as one word.

Numbers are counted as words, e.g., in "January 3, 1950," *3* is counted as one word and interpreted as the word *three*, *1950* is counted as one word and interpreted as *nineteen-fifty*.

Compound words like place names or persons' names are counted as one word, e.g., *New York, United States, van Loon, Santa Claus, St. Nicholas.*

Contractions are counted as one word, e.g., *don't, he's, they'll, they'd*, etc., are each counted as one word.

Record the count on the Work Sheet under Basic Data, item 1 (see page 10).

COUNT THE NUMBER OF SENTENCES.

Begin at the beginning of the sample and count the number of complete sentences.

Record the count on the Work Sheet under Basic Data, item 2 (see page 10).

COUNT THE NUMBER OF PREPOSITIONAL PHRASES.

Begin at the beginning of the sample and count each prepositional phrase in the sample.

A prepositional phrase is made up of a preposition and a noun, or a preposition and a pronoun, or a preposition and a gerund, e.g., *to the house* (noun), *for him* (pronoun), *in skating* (gerund).

Some common prepositions are:

about	below	from	till
above	beneath	in	to
across	beside	inside	under
after	between	into	until
along	beyond	of	up
among	by	off	upon
at	during	on	with
before	except	onto	within
behind	for	outside	without

Less common prepositions are:

despite (the opinion), *concerning* (the idea), *notwithstanding* (the opposition).

Infinitive phrases are *not* to be counted. An infinitive phrase is made up of a preposition *(to)* and a verb, e.g., *to swim, to answer.*

A preposition followed by a clause is a conjunction, and hence is *not* counted, e.g., "*After* the storm had passed" is *not* counted.

Record the count on the Work Sheet under Basic Data, item 3 (see page 10).

COUNT THE NUMBER OF HARD WORDS.

Use the Dale List (see pages 15–20) and cross out in the sample every word on the List, regardless of its meaning.*

The count is of the number of different hard words, so that each hard word is counted only once. For instance, if in a passage *reliability* occurred three times, it still would be counted only once. Observe the following procedure:

Nouns. Separate counts are not made of plurals and possessives in *s*, plurals in *es*, or plurals in which *y* is replaced by *ies*; e.g., *boys,*

* That is, *spring*, meaning *season*, *jump*, *water*, or *steel coil*, is counted as one word.

churches, berries are counted with *boy, church, berry*. However, *knife* and *knives, goose* and *geese, man* and *men*, and the like are all counted as different words.

SPECIAL CASES: An *s* added to a word in the text, not forming a plural or possessive, forms a different word from the root form; e.g., *Robert* and *Roberts* are two different words.

Proper nouns which seem to be composed of root and derived forms are not tabulated with the root form; e.g., *Wheeling*, the proper name, is not counted with *wheel; Browning*, the proper name, is not counted with *brown*.

Nouns formed by adding *r* or *er* to the other nouns or to verbs are not counted with the original word; e.g., *own* and *owner* are two different words.

Adverbs. Separate counts are not made of adverbs formed by adding *ly;* e.g., *badly* and *sadly* are counted with *bad* and *sad*.

Adverbs formed from an adjective in *e*, as *gently* from *gentle, truly* from *true*, are counted as different words.

Adjectives. Separate counts are not made of adjectives formed by adding *n* to proper nouns; e.g., *Austrian* and *Bavarian* are counted with *Austria* and *Bavaria*.

SPECIAL CASE: An adjective formed by adding *ly* to a noun is counted as a different word from the noun; e.g., *home* and *homely* are two different words.

Comparatives and superlatives of adjectives and adverbs. Special counts are not made of comparatives and superlatives formed by adding *er* or *r* and *est* or *st*, or by changing *y* to *ier* or *iest;* e.g., *longer, prettier*, and *bravest* are counted with *long, pretty*, and *brave*.

SPECIAL CASE: This also applies to adjectives doubling the final consonant and adding *er* and *est;* e.g., *red, redder*, and *reddest* are counted as one word.

Verbs. Special counts are not made of verb forms ending in *ing* and in *s, d, ed*, or of forms changing *y* to *ies* and *ied*, or of past participles formed by adding *n;* e.g., *plays, playing*, and *played* are counted with *play*.

SPECIAL CASES: Verb forms which drop the final *e* and add *ing* are counted with the root form; e.g., *pace* and *pacing* are counted as one word.

Verb forms which double the final consonant and add *ing* or *ed* are counted as one word; e.g., *drip, dripping*, and *dripped* are counted as one word.

Past participles formed by adding *en* to a verb are counted as different from the verb; e.g., *eat* and *eaten* are two different words.

Hyphenated words. In case of uncommon hyphenated words, follow Webster's Unabridged Dictionary (2nd edition). Any hyphenated word is considered as one word if it is listed in the dictionary as a hyphenated word; otherwise it is counted as two words.

Compound names. Compound names of persons or places like *New York, United States, St. Louis, Santa Claus*, and *Van Dyke* count as single words.

Contractions. Count contractions as different words from those from which they are derived; e.g., *because* and *'cause* are two different words. *He's* is not counted with *he* or with *is*.

Both common and proper nouns. Count the proper noun as being the same word as the common; e.g., *Jack* and *jack* are the same word.

MISCELLANEOUS SPECIAL CASES: Words formed by adding *y* to a word in the list are counted as different from the root word; e.g., *squeak* and *squeaky* are different words, *German* and *Germany* are different words.

Words of different spelling listed in the dictionary as one word are counted as the same word; e.g., *honor* and *honour* are the same word, *Frankfort* and *Frankfurt* are the same word.

If a word is formed by adding two or more suffixes to a listed word, one of which when added to the listed word is counted with it, that word is different from the root word; e.g., *happen* and *happening* are the same word but *happenings* is a different word. *Excite* and *excited* are the same word, but *excitedly* is a different word.

Words formed by adding *en* are counted as different from the original word; e.g., *wool* and *woolen* are two different words, *gold* and *golden* are two different words, *bit* and *bitten* are two different words.

Record the count on the Work Sheet under Basic Data, item 4 (see page 10).

Large Formula for Estimating Difficulty of Reading Materials

WORK SHEET

R.I.= _____

Title of book or article: _____ Edition: _____

Name of author: _____

Magazine: _____ Volume and No.: _____

Publisher: _____ Date of Publication: _____

Location of sample in text: _____

Basic Data

1. Number of words in the sample _____
2. Number of sentences in the sample _____
3. Number of prepositional phrases in the sample _____
4. Number of hard words in the sample _____

Computation

				Values
For average sentence length:				
Divide Item 1 by Item 2 =	.	× .06	=	.
For ratio of prepositional phrases:				
Divide Item 3 by Item 1 =	.	× 9.55	=	.
For ratio of hard words:				
Divide Item 4 by Item 1 =	.	× 10.43	=	.
		Constant	=	1.9892
		Add the Values and the Constant		
		READABILITY INDEX	=	.

WORK SHEET (cont.)

Notes: _____

_____

_____

_____

_____

Name of Analyst _____ Date of analysis _____

Name of Computer _____ Date of computing _____

Name of Checker _____ Date of checking _____

APPENDIX B

FLESCH READABILITY FORMULA

HOW TO USE THE READABILITY FORMULA

THE statistical readability formula is a means of gauging the ease and interest with which a book, article, or story will be read. The estimate is expressed in a figure that indicates the reading-grade at which the average school child will be able to answer about three-quarters of the questions in a reading comprehension test concerning detail, appreciation, import, vocabulary, and concepts of the text, with adequate completeness and correctness. Thus a reading grade placement of 5.4 for a passage indicates material at the fifth grade, that is, within the reading comprehension of average fifth grade children. For adult readers, this grade placement may be converted into an estimate of the reader's "magazine reading level," indicating the type of magazine comparable in ease and interest of style to the tested passage. Material can then be selected with a view to magazines read or preferred by the specific audience or individual.

1. *Selecting the samples.*

Unless a whole text is analyzed, samples of a hundred words each should be chosen according to a definite scheme, e.g., every fifth paragraph or every tenth page. For an average article or story of about three thousand words, not less than three hundred words should be sampled. Longer articles or books require, of course, more samples. Each sample should start at the beginning of a paragraph.

2. *Counting the number of words.*

Count each word up to a hundred. Hyphenated words and contractions are counted as one word. Numbers and letters are

counted as words. As a rule, count all the words and other items that are separated by white space.

3. *Computing the average sentence length in words (the "sentence factor," X_S).*

Find the sentence ending nearest to the hundred-word mark, e.g., at the 94th word or at the 109th word. Count the sentences up to that point and divide the number of words by their number; if in doubt what is to be considered a sentence, follow the units of thought rather than the punctuation: sometimes sentences are marked off by colons and semi-colons instead of periods—like these.

4. *Counting the number of affixes (the "morpheme factor" X_M).*

An affix is "an addition placed at the beginning or end of a root, stem, or word, to modify its meaning (*Oxford Dictionary*). Count all the affixes within the hundred-word sample. If the text has more or less than a hundred words, compute the number of affixes per hundred words. Disregard capitalizations. Affixes may be inflectional endings, prefixes, suffixes, foreign endings.

INFLECTIONAL ENDINGS:

Verbs: -ing, -ed, -d, -t, -en, -n; e.g., doing, lived, said, meant, written, been
Adjectives and adverbs: -er, -est, -st; e.g., better, highest, first
Adverbs: -ly; e.g., slightly, only
Numbers: -ty, -th; e.g., twenty, fourth

EXCEPTIONS: Do not count -es or -s when used to form plurals, possessives, or a third person singular. Do not count -en when used to form plurals. Do not count ending -d or -t in: could, did, had, might, ought, should, stood, went, would.

LIST OF PREFIXES, WITH EXAMPLES:

a-	about, amoral, avert, achieve	ac-	accord
		ad-	admit
ab-	abhor	af-	afford
abs-	abstract	after-	afternoon

ag-	aggressive
al-	allocate, already
am-	ambiguous
amphi-	amphibian
an-	anarchist
ana-	anatomy
ant-	antagonize
ante-	antedate
anti-	antitoxin
ap-	appeal
apo-	apostasy
ar-	arrive
arch-	archbishop
archi-	architect
as-	assign
at-	attain
auto-	automobile
be-	beguile, because
bene-	benefactor
bi-	bicycle
bio-	biography
by-	bystander
cata-	catalog
cath-	catholic
circum-	circumference
cis-	cisatlantic
co-	cooperate
col-	collateral
com-	commemorate
con-	connection
contra-	contradict
cor-	correlation
counter-	counteract
de-	deduce
di-	dilemma
dia-	diagnose
dif-	different
dis-	dismiss
dys-	dysentery
e-	eliminate
ec-	eccentric
ef-	effect
em-	embargo, emperor
en-	enchant
enter-	entertain
eph-	ephemeral
epi-	epigram
equi-	equidistant
es-	escort
eu-	eulogy
ex-	exaggerate
extra-	extraordinary
for-	forget
fore-	forecast
hemi-	hemisphere
hetero-	heterogeneous
homo-	homonym
hyper-	hyperbole
hypo-	hypotenuse
i-	ignorant
il-	illiterate
in-	inactive, into
infra-	infrared
inter-	intersection
intra-	intramural
intro-	introduce
ir-	irritable
mal-	maltreat
mega-	megaphone
meta-	metamorphosis
mis-	mistake
mono-	monograph
multi-	multiform
neo-	neolithic
non-	nonchalant
ob-	obstacle
oc-	occur
of-	office, offer
off-	offset
omni-	omnipotent
on-	onslaught
op-	oppose
ortho-	orthodox
out-	outline, outlive
over-	overcome
pan-	panacea
panto-	pantomime
para-	paraphrase
pen-	penultimate
per-	percolate

peri-	periphery
poly-	polysyllable
por-	portrait
post-	postscript
pre-	precede
pro-	proceed
pseudo-	pseudonym
pur-	purpose
re-	revise
red-	redeem
retro-	retrospect
se-	secession
semi-	semicircle
sub-	subsoil
subter-	subterfuge
suc-	succeed
suf-	suffer, suffice
sug-	suggest
sum-	summons
sup-	suppose
super-	superhuman
sur-	surrender
sus-	suspender
syl-	syllogism
sym-	symbol
syn-	syntax
tele-	telephone
thorough-	thoroughfare
tra-	tradition
tran-	transcendental
trans-	transatlantic
tres-	trespass
tri-	triangle
ultra-	ultraviolet
un-	unlock, until
under-	understand
uni-	university
up-	upset
vice-	vicepresident
with-	withdraw, without

LIST OF SUFFIXES AND FOREIGN ENDINGS, WITH EXAMPLES:

(Combinations of two affixes are marked 2)

-a	area, idea, opera, data
-able	suitable
-aceous (2)	rosaceous
-acious (2)	vivacious
-acy (2)	fallacy
-ade	lemonade
-age	marriage
-ae	alumnae
-ain	certain, captain
-al	cereal, real
-an	American
-ana	Lincolniana
-ance	abundance
-ancy (2)	pregnancy
-ant	hesitant
-ar	liar
-ard	drunkard
-arian (2)	librarian
-arium (2)	aquarium
-art	braggart
-ary	commentary
-ate	activate
-ation	operation
-cide	homicide
-cle	cubicle
-cracy (2)	democracy
-crat	aristocrat
-cy	bankruptcy
-dom	freedom
-ee	employee
-eer	pioneer
eign	foreign, sovereign
-el	hotel, shovel
-en	fasten, golden (not: happen)
-ence	inference
-ency (2)	tendency
-ent	competent
er	teacher, folder
ern	northern
-ery	pottery
-es	series, mores
esce	coalesce
-escent (2)	adolescent
-ese	Chinese
-esque	Romanesque
-ess	princess
-et	pocket, violet
-ete	obsolete
-etic	energetic
-ette	cigarette
-ey	alley, money
-ferous (2)	vociferous
-fic	specific
-fication (2)	amplification
-fold	manifold
-form	uniform
-ful	beautiful
-fy	testify
-gram	monogram
-graph	phonograph
-graphy (2)	photography
-hood	childhood
-i	stimuli
-ial	facial
-ian	Bostonian
-ible	edible
-ic	basic
-ical (2)	logical
-ice	service
-ics	antics
-id	stupid
-ide	bromide
-ie	movie
-ier	soldier, financier
-ies	species
-il	civil
-ile	fragile
-im	victim, interim
-in	insulin
-ine	gasoline
-ion	division
-ique	technique
-is	crisis
-ise	treatise, merchandise
-ish	finish, English
-isk	asterisk
-ism	Fascism
-ist	egoist
-it	limit, unit
-ite	polite, unite
-ition	nutrition
-itis	arthritis
-ity	authority
-ium	solarium
-ive	creative
-ize	criticize
-kin	manikin
-le	twinkle, battle (not: little)
-less	endless
-let	booklet
-like	childlike
-ling	duckling
-logy (2)	criminology
-ly	cleanly, daily
-m	poem, phlegm
-ma	stigma, coma
-me	scheme, theme
-meal	piecemeal
-men	specimen
-ment	achievement
-meter	hexameter
-mony (2)	alimony
-most	topmost
-nd	errand, reverend
-nda	agenda, propaganda
-ness	greatness
-nomy (2)	economy
-o	ratio
-ock	hillock
-od	method, period
-oid	celluloid
-ol	phenol
-on	criterion
-one	ozone
-oon	balloon, cartoon
-or	doctor, sailor
-ory	factory
-orium (2)	auditorium
-os	chaos
-ose	verbose

-osis (2)	apotheosis	-ue	value, issue
-ous	famous	-um	forum
-phile	Anglophile	-ure	nature, future
-ry	dentistry	-us	nucleus
-scope	microscope	-ute	minute, statute
-ship	dictatorship	-verse	universe
-some	handsome	-vert	extrovert
-son	reason, prison	-ward(s)	afterward
-sophy (2)	philosophy	-ways	always
-ster	gangster	-wise	likewise
-stress	seamstress	-worthy (2)	praiseworthy
-th	warmth, wealth, faith	-x	apex, vertex
-t	draft, height	-y •	very, breezy, army, beauty, party, city, dolly
-tion	portion		
-tude	multitude		

• Count -y also when it appears as -i-; e.g., ladies, heavier, business, hurried.
• Do not count -y in any, body, every, many.

These lists of prefixes and suffixes are not exclusive. They do not contain rare affixes, like -aign in "campaign." On the other hand, do not count mechanically everything that looks like an affix but is part of the root, like -er in "matter." If in doubt, follow the etymological explanation of a good dictionary. Every affix that fits the above definition should be counted. If a word consists only of two or more of the listed affixes, one is to be considered the root, e.g., -soph- in "philosophy" or -meter in "diameter."

NOTE: Do not count affixes in proper names, like "Fanny Farmer" or "Argentine," unless the original meaning is preserved, as in "United States." One word may have several affixes, e.g., "compartmentalization" (5), "undeservedly" (4), "disenfranchisement" (4).

5. *Counting the number of personal references (the "human interest factor," X_H).*

Count all personal references in your hundred-word sample. If your text has more or less than a hundred words, compute the number of personal references per hundred words. Disregard capitalizations. Personal references are: names, personal pronouns, and certain words listed below.

NAMES:

Count all names of people or animals (first names, last names, nicknames, petnames, etc.). Count the full name with titles as one personal reference, e.g., "the Vice-President, Mr. Henry Agard Wallace."

PERSONAL PRONOUNS:

I, thou, you, he, she, we, they; me, thee, him, her, us, them; my, mine, thy, thine, your, yours, his, her, hers, our, ours, their, theirs; myself, thyself, yourself, himself, herself, ourselves, yourselves, themselves.

NOTE: they, them, their, theirs, themselves, are to be counted only if they refer to people, or to animals which appear as characters in the passage or story. Count she, her, etc., even if referring to a ship or a country.

WORDS INDICATING HUMAN BEINGS OR RELATIONSHIPS:

Aunt, baby, boy, brother, child, cousin, dad, daddy, dame, daughter, family, father, fellow, folks, friend, gentleman, girl, guy, husband, kid, lad, lady, lass, madam(e), mamma, man, miss, mister, mother, nephew, niece, pal, papa, parent, people, (not peoples), sir, sister, son, sweetheart, uncle, wife, woman; and combinations of these words with each other and with grand-, greatgrand-, step- and in-law. Count also familiar forms of these words, like "grandpa."

This list is exclusive. Do not count any other words, like "teacher" or "doctor."

EXAMPLE: "My Aunt Mary herself" contains four personal references.

6. *Averaging results.*

Compute the average of each statistical measure from all your samples.

7. *Formula.*

Insert the values for X_S, X_M and X_H in the following formula:

$$.1338\ X_S + .0645\ X_M - .0659\ X_H + 4.2498.$$

The end result gives the reading grade placement.

Placement in Class I to Class VII can be achieved directly by subtracting 5.0 from the reading grade placement by the formula, or by using the alternative formula:

$$.1338\ X_S + .0645\ X_M - .0659\ X_H - .7502.$$

In this notation, 0.0 indicates material for adult readers who are barely literate, and 7.0 corresponds to reading matter that requires considerable effort even from highly educated adults.

8. *Conversion table (to be used for adult readers).*

Class	*Reading grade placement by formula*	*Description*	*Typical magazine*	*Reading grade placement (estimated correction)*
I	5.9 and below	Very easy	(none)	5.9 and below
II	6.0 to 6.9	Easy	*True Story*	6.0 to 6.9
III	7.0 to 7.9	Fairly easy	*Liberty*	7.0 to 7.9
IV	8.0 to 8.9	Average difficulty	*Reader's Digest*	8.0 to 9.9
V	9.0 to 9.9	Fairly difficult	*Harper's Magazine*	10.0 to 12.9
VI	10.0 to 10.9	Difficult	*Yale Review*	13.0 to 16.9 (college)
VII	11.0 and above	Very difficult	*Scientific Monthly*	17.0 and above (college graduate)

APPENDIX C

SPACHE READABILITY FORMULA

How to Use the Formula

In attempting to evaluate a book apparently intended for readers of the first three grades, we have found the following steps effective:

1. Prepare a Worksheet like that given on page 126.
2. Count off approximately 100 words in the early part of the book. Begin at the beginning of a sentence and end the the count with the last word of the sentence containing the 100th word.
3. Write the number of words in the Worksheet on line 1.
4. Count the number of sentences in the sample. Write the number of sentences in the Worksheet on line 2.
5. Check the separate words in the sample against the Stone Revised Word List. Make a count of the number of words not found in this list.
6. Write the number of hard words in the Worksheet on line 3.
7. Divide the number of words in the sample by the number of sentences to find the average sentence length (line 4).
8. Divide the number of hard words by the number of words in the sample to find the per cent of hard words. Drop the decimal point. (line 5).
9. Multiply average sentence length (line 4) by .141. Write product on line 6.
10. Multiply per cent of hard words (line 5) by .086. Write product on line 7.
11. Add the figures on lines 6, 7 and the constant, .839.
12. The sum is an estimate of the grade level of difficulty of the selection.
13. Repeat steps 1-11, with samples from the middle and rear of the book. Use at least 5-10 samples depending upon the length of the book.
14. Determine the average grade placement of the book by adding the estimates and dividing by the number of samples. This is the final estimate of the grade level of difficulty of the entire book. Drop the last figure or round it off, as 2.367 = 2.4.

Rules For Applying The Formula

Some questions may arise in comparing the words in the book with the Stone Revised Word List. These rules are offered to clarify this word counting.

1. Count all letters and numbers in figures as familiar.
2. Proper nouns, or names of persons, places are counted as familiar.
3. Count regular verb forms as familiar. This includes ing, es, ed, and changes involving doubling of the final consonant, dropping the final e, changing y to i.
4. Count regular plurals and possessive endings of nouns as familiar.

APPENDIX

Plurals in s, es, ies are familiar; those, as in ox-oxen, goose-geese, are unfamiliar unless on the list.

5. Count adjectival or adverbial endings, as ily, er, est, ly as unfamiliar unless on the list.
6. Count a word as unfamiliar only once even though it appears again or with variable endings later in the sample.
7. A group of words, consisting of the repetition of a single word or exclamation, as oh, oh, oh; look, look, look, is counted as a single sentence regardless of punctuation.
8. Count hyphenated words as unfamiliar unless both parts appear in the word list.
9. Count contractions, as didn't, unfamiliar unless on the list.
10. Count hyphenated words, compound words and numbers in figures as one word.

Other Suggestions

1. Analyze each sample independently, i.e. words counted as unfamiliar in any sample are again unfamiliar in subsequent samples.
2. Count single or two-word sentences as such in determining average sentence length, as in directions and some preprimers.
3. Avoid sampling material that is not typical of continuous matter, e.g. avoid dialogue, headings, titles.
4. Avoid sampling consistently at the beginning or end of chapters since the Clymer study cited above indicates these are not typical.

Stone's Revised Word List

In the early stages of our work with the formula, we employed a word list devised by Edgar Dale.[4] This contained 769 words found in the spoken vocabulary of children as noted in the International Kindergarten Union list, and in the first 1000 of the reading vocabulary of Thorndike's *Teacher's Word Book of 10,000 Words*. Later Clarence R. Stone[5] suggested that this list should be modernized by the use of more recent word counts. He offered such a word list which involved changes in 173 words. We have adopted this list and find that estimates based upon it do not vary materially from those found in using Dale's list. We compared the estimates by either word list for 25 books ranging in reading difficulty from low first to high third grade levels. There were no consistent differences in the estimates at any particular level. Differences in the estimates of reading difficulty averaged less than two months and in no case were greater than four months. For these reasons, we believe that the Stone Revised Word List can now be used in the application of the formula.

4. Dale, Edgar, "A Comparison of Two Word Lists," *Educational Research Bulletin*, (Ohio State University) 18, December 8, 1931, 484-488.
5. Stone, Charles R., "Measuring Difficulty of Primary Reading Material: A Constructive Criticism of Spache's Measure," *Elementary School Journal*, 57, October 1956, 36-41.

CLARENCE R. STONE'S REVISION OF THE DALE LIST OF 769 EASY WORDS

a
about
across
afraid
after
afternoon
again
air
airplane
all
almost
alone
along
already
also
always
am
an
and
animal
another
answer
any
anyone
anything
apple
are
arm
around
arrow
as
ask
asleep
at
ate
away
automobile

baa
baby
back
bad
bag
bake
baker
ball
balloon
band
bang
bark
barn
barnyard
basket
bath
be
bear
beautiful
became
because
bed
bedroom
bee
been
before
began
begin
behind
being
believe
bell
belong
beside
best
better
between
big
bigger
bill
bird
birthday
bit
black
blew
blow
blue
board
boat
book
both
bottom
bow
bowl
bow-wow
box
boy
branch
bread
break
breakfast
bright
bring
brother
brought
brown
bug
build
building
bump
bunny
bus
busy
but
butter
buy
buzz
by

cabbage
cage
cake
calf
call
came
can
candy
cap
car
care
careful
carry
cat
catch
caught
cent
chair
chick
chicken
child
children
circus
Christmas
city
clap
clean
climb
close
clothes
clown
cluck
coat
cock-a-doodle-doo
cold
color
come
coming
cook
cooky (ie)
corn
corner
could
count
country
cover
cow
cried
cross
crumb
cry
cup
cut

dance
dark
day
dear
deep
deer
did
dig
dinner
dish
do
does
dog
doll
done
don't
door
down
draw
dress
drink
drive
drop
dry
duck

each
ear
early
east
eat
egg
else
elephant
end
engine
enough
even
ever
every
everything
eye

face
fall
family
far
farm
farmer
fast
fat
father
feather
feed
feel
feet
fell
felt
fence
few
field
fill
find
fine
finish
fire
first
fish
fit
five
flag
flew
floor
flower
fly
follow
food
foot
for
found
four
fox
fresh
friend
frog
from
front
fruit
full
fun
funny

game

APPENDIX

garden
gate
gave
get
girl
give
glad
go
goat
God
going
gold
gone
good
good-by
got
grandfather
grandmother
grass
gray
great
green
grew
ground
grow
guess

had
hair
hall
hand
happen
happy
hard
has
hat
have
hay
he
head
hear
heard
heavy
held
hello
help
hen
her
here
herself
hid
hide
high
hill
him
himself
his
hit
hold
hole
home
honey
hop
horn
horse
hot
house
how
hungry
hunt
hurry
hurt

I
ice
if
I'll
in
Indian
inside
into
is
it
its

jar
joke
jump
just

keep
kept
kill
kind
kitchen
kitten
knew
knock
know

lady
laid
lamb
land
large
last
late
laugh
lay
learn
leaves
left
leg
let
let's
letter
lie
light
like
line
lion
listen
little
live
log
long
look
lost
lot
loud
love
lunch

made
mail
make
man
many
march
matter
may
me
meat
meet
men
meow
met
mew
mice
might
mile
milk
milkman
mill
minute
miss
Miss
money
monkey
moo
more
morning
most
mother
mouse
mouth
move
Mr.
Mrs.
much
mud
music
must
my

nail
name
near
neck
need
nest
never
new
next
nice
night
no
noise
north
nose
not
note
nothing
now
nut

of
off
often
oh
old
on
once
one
only
open
or
orange
other
our
out
outside
over
own

paint
pan
paper
park
part
party
pat
paw
pay
peanut
peep
pennies
people
pet
pick
picnic
picture
pie
piece
pig
pink
place
plan
plant
play
please
pocket
point
policeman
pond
pony
pop
poor
post
present
press
pretty
puff
pull
push
put
puppy

quick
quiet
quite

rabbit
race
rain
rake
ran
read
ready
real
red
rest
ride
right
ring
river
road
roar
robin
rock

rode
roll
roof
room
rooster
root
rope
round
row
rub
run

said
same
sand
sang
sat
save
saw
say
school
sea
seat
see
seed
seem
seen
sell
send
sent
set
seven
shake
shall
she
shell
sheep
shine
shoe
shop
short
should
show
shut
sick
side
sign
sing
sister
sit

six
skate
skin
skip
sky
sled
sleep
sleepy
slide
slow
small
smell
smile
smoke
sniff
snow
so
soft
sold
some
something
sometime
song
soon
sound
soup
splash
spot
spring
squirrel
stand
star
start
station
stay
step
stick
still
stone
stood
stop
store
story
straight
street
string
strong
such
suit

summer
sun
sunshine
sure
surprise
swam
sweet
supper
swim
swing

table
tail
take
talk
tall
tap
teach
teacher
teeth
tell
ten
tent
than
thank
that
the
their
them
then
there
these
they
thin
thing
think
this
those
though
thought
three
threw
throw
ticket
tie
tiger
time
tired
to

today
toe
together
told
tomorrow
too
took
top
town
toy
train
tree
trick
tried
trunk
try
turkey
turn
turtle
two

uncle
under
umbrella
until
up
upon
us
use

vegetable
very
visit
voice

wagon
wait
wake
walk
want
war
warm
was
wash
watch
water
wave
way
we

wear
wee
weed
week
well
went
were
west
wet
what
wheat
wheel
when
where
which
while
white
who
why
wide
wild
will
win
wind
window
wing
winter
wish
with
without
woman
wonder
wood
woke
wolf
word
work
world
worm
would
write

yard
year
yellow
yes
you
your

zoo

GOOD READING FOR POOR READERS

Worksheet for Application of the Spache Readability Formula for Grades I-III

Article or Book_____ Date_____

Author_____ Publisher_____

	Page____ From____ To____	Page____ From____ To____	Page____ From____ To____	Page____ From____ To____
1. Number words				
2. Number sentences				
3. Number words not on Stone Revised Word List				
4. Ave. Sentence Length (Divide 1 by 2)				
5. Per cent hard words (Divide 3 by 1, multiply by 100)				
6. Multiply (4) by .141				
7. Multiply (5) by .086				
8. Constant	.839	.839	.839	.839
9. Estimated grade placement (Add, 6, 7, and 8)				

Average grade placement of_____ samples_____

Analyzed by_____

Date_____

APPENDIX D

ELLEY NOUN FREQUENCY FORMULA

Estimating readability by the noun frequency method

The following procedural steps were developed by successive trial d test methods and are in line with similar methods adopted by other searchers into readability assessment.

1] Select from each story or selection, three passages long enough to contain at least 20 different nouns. If the style varies in difficulty, it is advisable to choose the more complex passages, since these usually set the upper limit on comprehension. Otherwise, select passages at random from the beginning, middle, and end of the story.

2] Using the NZCER List, look up and record the frequency level of all the nouns in the passage. Any noun not appearing in the seven levels of the original list, or the additional eighth level (see below) is rated level nine.
e.g., animal—3, automobile—8, appointment—9.
Note:
- a] Do not count people's names. Other proper nouns (cities, countries, institutions, etc.) follow the same rules as common nouns, e.g., New Zealand—3, New Zealander—9.
- b] If a noun appears more than once in a passage, count it only once.
- c] Give plural nouns the same count as singular nouns even if the plural form is included in the NZCER List.
- d] Give gerunds the same count as the verbs they are derived from.
- e] Hyphenated words follow the normal rules.
  e.g., make-up—8, make-believe—9.
- f] Abbreviations for nouns are counted as level 9.
  e.g., UNESCO—9, Sept.—9.

3] Compute the mean frequency level, i.e., Add up the frequency level numbers and divide by the number of nouns.

4] Refer to Table 3 to determine the approximate age group for which the material is suitable for instructional purposes.

Example Selection from New Zealand School Journal

Part I, Number 1, 1967

Japanese *gardens* are among the most beautiful in the *world*. They make very attractive *use* of *rocks* and *water*, and Japanese *gardeners* twist the *branches* of *trees* into different *patterns* as they grow.

Often Eiko's *family* goes to a nearby *restaurant* for the evening *meal*. It has a very beautiful garden. Above you can see some of the *guests* looking out of the restaurant *window* at the garden.

After they have eaten, Eiko and some of her *friends* go for a walk in the garden. The rocks are carefully placed so they can stand in the *middle* of the *lake*.

Ferns grow among the rocks outside the restaurant window. Eiko's *father* is ready at the window with his *camera*. The restaurant gives a good *idea* of how Japanese *houses* are built. The *spaces* at ground *level* allow cool *air* to move under the *building*.

gardens	3	family	2	ferns	9
world	2	restaurant	9	father	1
use	2	meal	4	camera	7
rocks	3	guests	7	idea	4
water	1	window	2	houses	1
gardeners	9	friends	1	spaces	6
branches	4	walk	2	level	6
trees	1	middle	3	air	2
patterns	9	lake	2	building	2
				Total	104

Average Frequency Level $= \frac{104}{27} = 3.85$

This passage would be classified as suitable for average 8 to 9 year-old readers.

Level 8 List

accept	banner	claim	desire
accompany	baseball	closely	determine
according	beet	clothe	develop
acrobatic	beggar	colonel	devil
active	benefit	combine	devote
actual	bluff	comfort	difficulty
actually	bore	constitution	dim
advance	braid	commission	directly
affair	brand	companion	display
affect	brief	compare	dodge
agent	Britain	compel	dollar
altitude	broad	completely	doubt
American	buffalo	concern	drawer
announce	bushel	creep	economic
annual	buzz	curious	effort
appeal	calm	custom	elbow
apply	campaign	dash	element
appoint	canal	debt	engage
approach	cease	declare	errand
apricot	cell	defeat	establish
arouse	certainty	demand	evidence
assume	chamber	democratic	examine
assure	charm	deny	excite
Atlantic	check	deposit	exclaim
attempt	Christian	describe	exist
automobile	circumstances	deserve	experiment

expression
extend
faith
fallen
false
familiar
fare
fashion
fate
feature
fled
ferry
file
fleet
flesh
following
force
former
friendly
gem
generally
German
glory
glow
grant
grind
grocery
Greek
gymnasium
handsome
herald
hinge
hire
homesick
include
indicate
influence
interest
inquire
insist
instant
introduce
Italian
justify
likely
locate
loss
make-up
marriage
mention
mere (adj.)
merely
moral
mule
napkin
naturally
necessity
nevertheless
nickel
noble
noisy
nursery
observe
official
ore
original
otherwise
pace
particularly
pause
pearl
pepper
perform
personal
pickle
pledge
policy
portion
possess
possession
possibly
powerful
practical
practically
praise
preach
president
previous
prefer
presence
preserve
pride
proceed
profit
proportion
propose
quilt
radish
railroad
ranch
rattle
recite
recognize
reduce
relation
relief
remainder
remark
represent
reserve
revolution
risk
rotten
scrap
screw
secure
severe
serrated
series
sigh
similar
simply
situation
slice
society
somewhat
soul
source
Spanish
sprinkle
squeeze
stalk
starve
stitch
straighten
strap
strawberry
stretch
substance
sweater
tablet
task
territory
theory
threaten
thumb
tickled
total
trace
training
tremble
trial
trim
troop
turtle
tying
understanding
university
urge
useless
vain
vary
vast
vessel
victory
warn
worthy

Table 3 Suitable age levels for different readability ratings

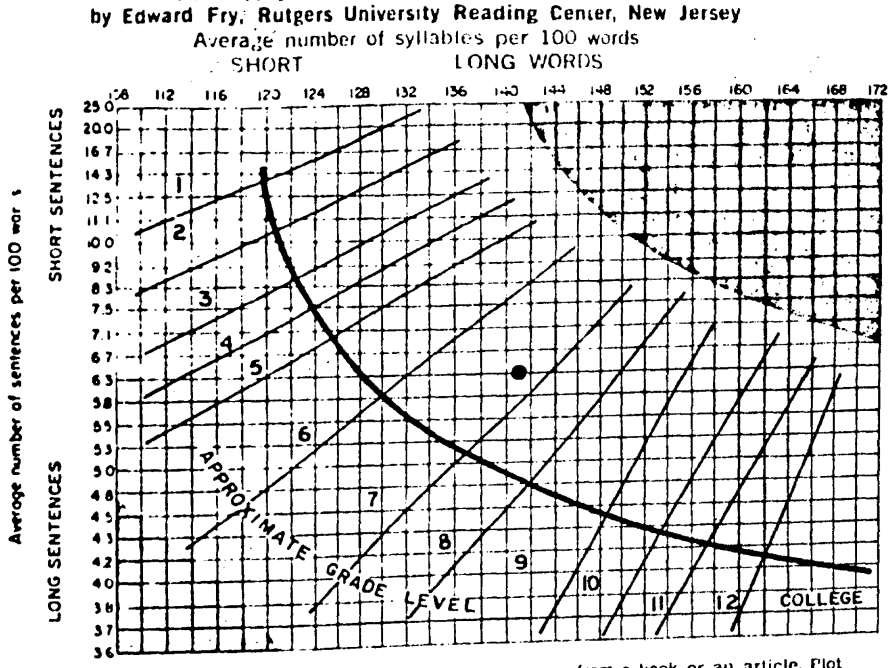
Mean noun frequency level	*Suitable age*
3.00 - 3.59	7-8 yrs.
3.60 - 4.19	8-9 yrs.
4.20 - 4.59	9-10 yrs.
4.60 - 4.99	10-11 yrs.
5.00 - 5.49	11-12 yrs.
5.50 - 5.99	12-13 yrs.
6.00 - and over	14 yrs. and over

APPENDIX E

FRY GRAPH FOR ESTIMATING READABILITY

GRAPH FOR ESTIMATING READABILITY

by Edward Fry, Rutgers University Reading Center, New Jersey



DIRECTIONS: Randomly select 3 one hundred word passages from a book or an article. Plot average number of syllables and average number of sentences per 100 words on graph to determine the grade level of the material. Choose more passages per book if great variability is observed and conclude that the book has uneven readability. Few books will fall in gray area but when they do grade level scores are invalid.

EXAMPLE:	SYLLABLES	SENTENCES
1st Hundred Words	124	6.6
2nd Hundred Words	141	5.5
3rd Hundred Words	158	6.8
AVERAGE	141	6.3

READABILITY 7th GRADE (see dot plotted on graph)

APPENDIX F

YOAKUM READABILITY FORMULA

a book is withdrawn is not proof of its readability or that the children have actually read and comprehended it.

USE OF THE FORMULA

The Yoakam formula has been used to measure the readability of school textbooks, juvenile fiction, adult fiction, adult textbooks, and magazines for children and adults. It is especially useful for evaluating instructional materials commonly used in schools from the fourth grade and above. It is useful to teachers in selecting textbooks and other materials to fit the needs of children of different levels of reading abilities. It is useful to authors and publishers in the preparation of materials for instructional purposes.

The formula is helpful to a teacher who is seeking to find suitable reference material on different levels of difficulty to be used in a unit of work. It also is useful in selecting books to be placed in a sequence of gradually increasing difficulty.

The formula is useful to textbook-selection committees who desire to select books accurately graded and not too difficult for each grade level. It can also be used to find books easy enough for the retarded reader.

The formula is of further use for research purposes in the study of the reading difficulty of various kinds of material, the accuracy of the grade placement of textbooks, and the suitability of materials for various levels of readership. It is now used quite widely in various research studies and by textbook writers and publishers for checking the reading difficulty of material in preparation for instructional use.

STEPS REQUIRED FOR USE OF THE FORMULA

The use of the Yoakam formula requires the following steps:

1. Select a book or article you wish to measure for readability.
2. Determine the size and number of the samples you wish to use.
3. Locate the samples in the book or article.
4. Scan the samples to locate all words with Thorndike serial numbers of 4 or above.
5. Add the serial numbers of the words in each sample to secure the unit index number.
6. Average the unit (or page) index numbers.
7. Look up the grade level of the book or article in the scale (Table II).

The mathematical calculations required in the use of the formula are simple arithmetic operations.

DIRECTIONS FOR SAMPLING BY PAGES

Selecting Pages to Be Sampled. According to the findings of Dr. Bertha Leifeste,[1] the best and most reliable sampling of a book consists of taking every

[1] Bertha V. Leifeste, *An Investigation of the Reliability of Sampling of Reading Material*, Ph.D. dissertation. Pittsburgh: University of Pittsburgh, 1942.

tenth page throughout. However, this method of sampling is too time-consuming for practical purposes. It is desirable to keep the sampling as small as is consistent with reliable results.

For practical purposes a sampling of ten *selected* pages, distributed at approximately equal intervals throughout the book, is reasonably reliable. Fifteen selected pages is better but increases the amount of time by one-third. A ten-page sampling will ordinarily bring one within .6 of a grade of the true measure.

The technique may be used for sampling books from fourth grade through high school and also yields apparently reliable results for general literature. It cannot be used for sampling books in mathematics or other subjects where formulas or mathematical symbols constitute a large proportion of the content but may be used to sample textual matter where the bulk of the matter consists of connected discourse.

In sampling a book, proceed as follows:

1. Make a preliminary survey of the book to get an idea of its nature and to determine the typical amount of textual matter on different pages. If a book consists entirely of full pages of textual matter without illustrations, the sampling is comparatively easy: simply take ten full pages, distributed at approximately equal distances throughout the book.
2. If a book seems extremely variable in its make-up, ten or fifteen typical pages should be selected. This selection may consist of pages with chapter headings, end pages in chapters, pages with half- or quarter-page illustrations, pages with marginal notes, or footnotes, all of which are typical of the contents of the book.
3. If a more reliable result is desired, these pages and partial pages should be so selected as to be equal to either ten or fifteen *full* pages of textual matter. Two half pages will equal one full page, etc.

Determining Size of Page

1. The average number of running words on a full page should now be computed by either counting three full pages and averaging or by estimating the size of three full pages and averaging the estimates. A method of estimating the sizes of pages is to count the number of words in five lines, average, and multiply by the number of lines on the page.
2. In sampling of ten or fifteen selected pages, the sizes of the partial pages should be determined. The partial pages should then be combined into full pages and averaged in the manner as for full pages.
3. Preface, introductions, bibliographies, and test exercises in textbooks should not be included in the samplings.

Directions for Sampling by Units. In case the investigator prefers to sample by units, the formula will measure such units with reasonable accuracy, as shown by Smith. The size of the unit should be an even number of words—100, 200, 300, or more, depending upon the size of the book to be sampled. Having determined the size of the unit, the investigator should proceed as follows:

1. Count the number of words on a selected page which equal the desired unit of 100, 200, or more words.
2. Cut a piece of paper or pasteboard equal in size to the unit chosen.
3. Using the measure, sample the book by taking 100, 200, or more words alternately from the top, middle, and bottom of ten or fifteen selected pages until the desired number of samples are secured.
4. Mark the samples in the book by making a light marginal line in pencil to indicate the beginning and end of the samples.
5. Care should be taken to choose samples that are equal in size; that is, the spacing and length of lines in the samples should be equal.

APPLYING THE FORMULA

Identifying Serial Numbers. If possible, obtain a Thorndike *Teacher's Wordbook of 20,000 Words*. Do not try to use the earlier 1921 *Teacher's Wordbook*, which contains only 10,000 words. The *Teacher's Wordbook* is arranged alphabetically and contains serial numbers for all words in the 20,000 indexed from 1, or first thousand, to 20, or twentieth thousand. It is these serial numbers that are needed in scoring books. If you cannot find a copy of this book, you may use the *Thorndike-Century Junior* (or *Senior*) *Dictionary*. The serial numbers of the Thorndike 20,000 words are found in italics after each word, such as *n* 10, *n* 5, *n* 9, etc.

If you fail to find a Thorndike *Teacher's Wordbook of 20,000 Words* or the *Thorndike-Century Junior Dictionary*, you can use instead Buckingham and Dolch's *The Combined Word List*.[8] The index numbers required are the T words listed in *The Combined Word List*. It is possible also to use the Thorndike-Lorge *Teacher's Word Book of 30,000 Words* by using the table on page 249, Part III and through its use translate the frequency numbers in the T column into serial numbers 1 to 20, as indicated in the table. This process, however, is more time-consuming, and the use of *The Combined Word List* or the Thorndike-Century dictionaries is recommended instead.

Score each sampled page of the book as follows:

1. Scan the sampled page or unit and underline in pencil each word which appears difficult; or if you prefer, list on the attached form all the scored words from the page with their serial numbers.
2. Look up all words which appear hard enough to warrant a Thorndike rating of 4 or above. You will soon realize that you underestimate the value of many words, especially adverbs, contractions, and compound words.
3. Write the serial number of each word of 4 or above over or opposite the word underlined. You will then have scored all words on the page, except those bearing a serial number of 1, 2, or 3 in the Thorndike list.
4. With practice you will soon be able to identify the words of above the fourth thousand quite easily. You will find that the words of 4 and above will constitute only a small proportion of the total running words

[8] Boston: Ginn & Company, 1936.

on a page. Ordinarily there will be from zero to twenty-five or more such words on a page, depending on the difficulty of the material.

5. Practice scoring until you feel that you are able to identify the difficult words.
6. When in doubt about a word, *look it up*.
7. Score each word only once in each sample.
8. Score all compound words which are not hyphenated by using the Thorndike serial number of that word, even though you think it seems high. If the compound word is not scored by Thorndike, score it by averaging the parts which make up the compound.
9. Score a compound word containing a hyphen by averaging the separate serial numbers of the two parts, unless the word is scored by Thorndike, in which case give it the Thorndike serial number.
10. Give all words that do not appear in the *Thorndike list* a value of 20. This does not include variants which have been scored in root words by Thorndike.
11. Do not score proper names. Investigations are under way to determine the effect of proper names on difficulty.
12. Give all variants of a root word the same serial number as the root, unless Thorndike scores the variant.
13. Do not score expletives or nonsense words, such as *O! glub*, etc.

Computing the Page or Unit Index Number. Now compute the *page or unit index number* by adding the serial numbers of all words with a serial number of 4 or above found on the sampled unit or page. Record this as the *page* or *unit index number* for the sampled page. You should then have one of these page or unit index numbers for each sampled page or unit.

Computing the Book Index Number. Now add the index numbers of the ten different pages or units and divide by ten, the number of pages.

45
20
65
80
150
35
20
45
110
90
10/660
66—Book index number

Determining the Grade Placement of the Book

1. Now determine the grade placement of the book by consulting Table II. For a 200-word page or unit, the index number 66 places the sampled book in grade 7. For a 300-word page, the book should be placed in upper grade 5.
2. In order to place the book more definitely in the upper or lower half of

each grade, the grade interval D can be divided into ten parts and the G, or grade score, can be determined by interpolation. Thus a *book index score* of 67 on a 200-word page is six-sixteenths of the distance from the bottom of grade 7, or at approximately the G score of 7.4.

3. These fractional G scores may or may not have any significance. However, it is likely that a difference of a half grade is significant.
4. These grade levels as yet are tentative, but recent data by Latimer and Smith seem to show that the scores for grades 4, 5, and 6 are approximately correct.
5. If the books are properly sampled, these scores will reveal the differences in difficulty among books as determined by the basic difficulty of the vocabulary, which is the most important general element in difficulty.
6. Since these index numbers are averages, these placements are accurate for average conditions and for children of average ability.

Table II. The Yoakam Reading Difficulty Scale

Grade	100	D	120	D	140	D	160	D	180	D	200	D	220	D	240	D
3	3	7	4	8	5	9	6	10	7	11	8	12	9	13	10	15
4	10	7	12	8	14	9	16	11	18	11	20	13	22	14	25	15
5	17	7	20	9	23	10	27	11	30	12	33	14	36	15	40	16
6	24	8	29	9	33	11	30	12	42	13	47	14	51	16	56	17
7	32	8	38	10	44	12	50	13	55	15	61	16	67	17	73	18
8	40	9	48	11	56	12	63	14	70	16	77	17	84	18	91	20
9	49	9	59	11	68	13	77	15	86	17	94	18	102	19	111	21
10	58	9	70	11	81	13	92	15	103	17	112	19	121	20	132	22
11	67	10	81	11	94	13	107	15	120	17	131	20	141	21	154	24
12	77	10	92	11	107	13	122	15	137	17	151	21	162	22	178	24
13	87	11	103	11	120	13	137	15	154	18	172	21	184	23	202	25
14	98	11	114	11	133	13	152	15	172	18	193	21	207	23	237	25

Grade	260	D	280	D	300	D	320	D	340	D	360	D	380	D	400	D
3	11	16	12	17	13	18	14	19	16	19	17	20	18	22	19	24
4	27	16	29	17	31	19	33	20	35	20	37	22	40	24	43	26
5	43	17	46	18	50	20	53	22	55	22	59	24	64	24	69	26
6	60	18	64	19	70	21	75	24	77	24	83	26	88	26	95	28
7	78	19	83	21	91	22	99	26	101	26	109	28	114	28	124	30
8	97	21	104	22	113	24	125	28	127	28	137	30	142	30	154	32
9	118	23	126	24	137	26	153	30	155	30	167	32	172	32	186	34
10	141	25	150	26	163	28	183	31	185	31	199	34	204	34	220	36
11	166	26	176	28	199	30	214	32	221	32	233	36	238	36	256	38
12	192	27	204	30	229	31	246	32	253	32	269	38	274	38	295	40
13	219	27	234	30	260	31	278	32	285	34	307	40	312	40	335	42
14	236	28	264	30	291	31	310	32	319	34	347	42	352	42	377	42

SOURCE: Statistical table prepared by Arthur D. Cleland.

Table II is read as follows: For pages of 100 running words, a book index number of 3 to 10 places the book in grade 3; 7 to 17 in grade 4, etc. The numbers 100, 120, 140, etc., indicate the size of the page or unit in number of running words. D indicates the number of points difference between grades for each page or unit size. This table was prepared by Arthur D. Cleland and is based upon the author's original data for pages of approximately 180 running words each.

A study by Swarts[9] indicates that ten units of 100 words, distributed at approximately equal intervals throughout a book, will give a reasonably accurate placement of the book for practical purposes. Swarts also found that the Yoakam formula accurately measures the readability of technical books written for adults.

TENTATIVE SCALE FOR RATING BOOKS USED IN PRIMARY GRADES

The following plan for measuring the readability of primary material does not have the evidence of reliability behind it that the plan for fourth grade and above possesses. However, it will be of interest to primary teachers and will show difference in vocabulary burden of textbooks in grades 2 and 3.

1. Use the same technique as for the intermediate grades but score all words having an index number of 2 or above.
2. The following tentative scale may be used for placing a book in its approximate grade:

Book index number	*Grade*
0–14.9	2
15–34.9	3
35–49.9	4

These scores are based on a study by Anto[10] and are on average pages found in second and third readers. They may be high. Later studies will be made to check them.

3. Additional data will be available on primary material as new studies are made to verify the scale. An attempt to develop a scale for use in the primary grades is now being made.

[9] Mary Swarts, *The Readability of Books on the Teaching of Reading*, Ph.D. dissertation. Pittsburgh: University of Pittsburgh, 1953.

[10] See bibliography at end.

2. *Forms for Use with Yoakam Readability Formula*

Form 2.

Form for Recording Samplings—Yoakam Readability Formula

Name of author(s) _____ Title _____

Date of publication _____ Type of book _____ Publisher _____ Total pages in book _____

Page sampled	Index nos.* of words	Page index number	Page sampled	Index nos. of words	Page index number

Total pages sampled _____ No. words indexed _____ Book index no. _____
No. running words per page _____ Grade assignment to book by publisher _____ + or 0
Grade placement by Yoakam scale _____ placement by grade
Name of investigator _____
Date _____

* It is helpful to make a list of the words scored with their index numbers. The list will suggest why the material is difficult.

Form 3.

Summary of Evaluations by The Yoakam Readability Formula

Type of books: _____

Rated by _____ Date _____

Author of book	Publisher	Date	Yoakam scale grade	Publisher's placement

HOW TO USE THORNDIKE-LORGE TEACHER'S WORD BOOK WITH THE YOAKAM FORMULA

The *Thorndike-Lorge Word Book of 30,000 Words* may be used with The Yoakam Readability Formula. It is necessary, however, to translate the frequency-of-occurrence numbers in the T column of the Thorndike-Lorge word list by using the table on the bottom of page 249. In column T of the word list, the frequency of occurrence of each word is indicated. These numbers are

Table III. Conversion of Frequency Numbers to Serial Numbers

Frequency of occurrences	*Serial number*
58–90	4
57	5
56	6
50–55	7
28–54	8
18–27	9
16–17	10
14–15	11
12–13	12
11	13
10	14
8–9	15
7	16
6	17
5	18
4	19
1–3	20

APPENDIX G

DALE-CHALL READABILITY FORMULA

A Formula for Predicting Readability: Instructions

By EDGAR DALE AND JEANNE S. CHALL

AN ARTICLE in the January issue of the EDUCATIONAL RESEARCH BULLETIN discussed the way in which a formula for testing the grade-level difficulty of reading materials was developed.[1] The limitations of the formula, the circumstances under which it is properly applied, and specific examples for its use were given. This article, a continuation of the one just mentioned, gives specific information concerning the technique of using the formula.

The formula is based on two counts—average sentence length and percentage of unfamiliar words (words outside the Dale list of 3000 words). Rules for selecting samples of a text to be analyzed and for computing the average sentence length and percentage of unfamiliar words are presented in this article. As each count is made, it is recorded on a work sheet[2] where detailed steps are given for arriving at the grade-level of reading difficulty. To illustrate the mechanics of using the formula, we analyzed three samples from a pamphlet, *Your Baby*.[3] The various counts and computations are given in the work sheet. The directions to guide the various steps in filling out the work sheet follow.

I. Selecting Samples:

Take approximately 100 words about every tenth page for books.[4] For articles, select about four 100-word samples per 2,000 words. Space these samples evenly. For passages of about 200 to 300 words, analyze the entire passage. Never begin or end a sample in the middle of a sentence.

II. Labeling Work Sheet:

Enter such information as title, author, publisher, date of publication, etc., regarding the sample to be appraised.

[1] Dale, Edgar, and Chall, Jeanne S. "A Formula for Predicting Readability," EDUCATIONAL RESEARCH BULLETIN, XXVII (January 21, 1948), pp. 11–20, 28.

[2] *See* page 43 of this issue. Mimeographed copies of the work sheet may be obtained from Edgar Dale, Bureau of Educational Research, Ohio State University.

[3] *See* pages 42 and 44.

[4] When a more exact grading of books is desired, 200-word samples every tenth page will probably give a more reliable measure. *See* Leifeste, Bertha V., "An Investigation of the Reliability of the Sampling of Reading Material," *Journal of Educational Research*, XXXVII (February, 1944), pp. 441–50.

III. Counting the Number of Words:
- A. Count the total number of words in the sample.
- B. Count hyphenated words and contractions as one word.
- C. Count numbers as words.
  - *10* is one word.
  - *1947* is one word.
- D. Count compound names of persons and places as one word.
  St. John, Van Buren, del Rio, Le Brun, and so on are each counted as one word.
- E. Do not count initials which are part of a name as separate words.
  John F.W.St.John is counted as two words—*John* and *F.W.St.John*.
- F. Record the number of words under No. 1 of the work sheet.

IV. Counting the Number of Sentences:
- A. Count the number of complete sentences in the sample.
- B. Record this under No. 2 of the work sheet.

V. Counting the Number of Unfamiliar Words:
Words which do not appear on the Dale list[5] are considered unfamiliar. Underline all unfamiliar words, even if they appear more than once.

In making this count, special rules are necessary for common and proper nouns, verbs, and other parts of speech. These are given in the section which follows.

A. Common Nouns:

1. Consider familiar all regular plurals and possessives of words on the list.
   boy's is familiar because *boy* is on the list (possessive).
   girls is familiar because *girl* is on the list (plural by adding *s*).
   churches is familiar because *church* is on the list (plural by adding *es*).
   armies is familiar because *army* is on the list (plural by changing *y* to *ies*).
2. Count irregular plurals as unfamiliar, even if the singular form appears on the list.
   oxen is unfamiliar, although *ox* is on the list.
   Several irregular plurals, however, are listed in the word list. When the plural appears as a separate word or is indicated by the ending in parentheses next to the word, it is considered familiar.
   goose and *geese* both appear on the list and are both considered familiar.
3. Count as unfamiliar a noun that is formed by adding *er* or *r* to a noun or verb appearing on the word list (unless this *er* or *r* form is indicated on the list).
   burner is counted as unfamiliar, although *burn* is on the list.
   owner is considered familiar because it appears on the list as follows—*own (er)*.

[5] *See* the Dale list on pages 45–54.

B. Proper Nouns:

1. Names of persons and places are considered familiar.
   Japan, Smith, and so on, are familiar, even though they do not appear on the word list.
2. Names of organizations, laws, documents, titles of books, movies, and so on generally comprise several words.

a. When determining the number of words in a sample, count all the words in the name of an organization, law, and the like. *Chicago Building Association* should be counted three words. *Declaration of Independence* should be counted three words.	*b.* For the unfamiliar word count, consider unfamiliar only words which do not appear on the Dale list, except names of persons or places. *Chicago Building Association* is counted one unfamiliar word—*Association. Building* and *Chicago* are familiar. *Declaration of Independence* is counted as two unfamiliar words—*of* is on the list.
SPECIAL RULE: When the title of an organization, law, and so on is used several times within a sample of 100 words, all the words in the title are counted, no matter how many times they are repeated.	SPECIAL RULE: When the name of an organization, law, document, and so on is used several times within a sample of 100 words, count it only twice when making the unfamiliar word count. *Security Council*, if repeated more than twice within a 100-word sample, is counted as four unfamiliar words.

3. Abbreviations:

a. In counting the words in a sample, an abbreviation is counted as one word. *Y.M.C.A.* is counted one word. *Nov.* is counted one word. *U.S.* is considered one word. *A.M.* and *P.M.* are each counted as one word.	*b.* In making the unfamiliar word count, an abbreviation is counted as one unfamiliar word only. *Y.M.C.A.* is considered one unfamiliar word. *Nov.* is considered familiar because the names of the months are on the word list. *U.S.* is considered familiar. *A.M.* and *P.M.* are each considered familiar. SPECIAL RULE: An abbreviation which is used

several times within a 100-word sample is counted as two unfamiliar words only.
C.I.O. repeated five times in a 100-word sample is counted two unfamiliar words.

C. Verbs:

1. Consider familiar the third-person, singular forms (*s* or *ies* from *y*), present-participle forms (*ing*), past-participle forms (*n*), and past-tense forms (*ed* or *ied* from *y*), when these are added to verbs appearing on the list. The same rule applies when a consonant is doubled before adding *ing* or *ed*.
asks, asking, asked are considered familiar, although only the word *ask* appears on the word list.
dropped and *dropping* are familiar because *drop* is on the list.

D. Adjectives:

1. Comparatives and superlatives of adjectives appearing on the list are considered familiar. The same rule applies if the consonant is doubled before adding *er* or *est*.
longer, prettier, and *bravest* are familiar because *long, pretty*, and *brave* are on the list.
red, redder, reddest are all familiar.
2. Adjectives formed by adding *n* to a proper noun are familiar. For example, *American, Austrian*.
3. Count as unfamiliar an adjective that is formed by adding *y* to a word that appears on the list. But consider the word familiar if *y* appears in parentheses following the word.
woolly is unfamiliar although *wool* is on the list.
sandy is familiar because it appears on the list as *sand (y)*.

E. Adverbs:

1. Consider adverbs familiar which are formed by adding *ly* to a word on the list. In most cases *ly* will be indicated following the word.
soundly is familiar because *sound* is on the list.
2. Count as unfamiliar words which add more than *ly*, like *easily*.

F. Hyphenated Words:

Count hyphenated words as unfamiliar if either word in the compound does not appear on the word list. When both appear on the list, the word is familiar.

G. Miscellaneous Special Cases:

1. Words formed by adding *en* to a word on the list (unless the *en* is listed in parentheses or the word itself appears on the list) are considered unfamiliar.
sharpen is considered unfamiliar although *sharp* is on the list.
golden is considered familiar because it appears on the list *gold (en)*.

2. Count a word unfamiliar if two or more endings are added to a word on the list.
clippings is considered unfamiliar, although *clip* is on the list.
3. Words on the list to which *-tion, -ation, -ment*, and other suffixes not previously mentioned are added are considered unfamiliar, unless the word with the ending is included on the list.
treatment is unfamiliar although *treat* is on the list.
protection is unfamiliar although *protect* is on the list.
preparation is unfamiliar although *prepare* is on the list.
4. Numbers:
Numerals like *1947, 18*, and so on, are considered familiar.

H. Record the total number of unfamiliar words under No. 3 of the work sheet.

The number of words in the sample (No. 1 on the work sheet) have now been recorded, as well as the number of sentences in the sample (No. 2) and the number of words not on the Dale list (No. 3). The next steps can be followed easily on the work sheet.

VI. Completing the Work Sheet:

1. The average sentence length (No. 4) is computed by dividing the number of words in the sample by the number of sentences in the sample.
2. The Dale score or percentage of words outside the Dale list is computed by dividing the number of words not on the Dale list by the number of words in the sample, and multiplying by 100.
3. Follow through Steps 6 and 7 on the work sheet.[6]
4. Add Nos. 6, 7, and 8 to get the formula raw score.
5. If you have more than one sample to analyze, get an average of the formula raw scores by adding all of these and dividing by the number of samples.
6. Convert the average formula raw score to a corrected grade-level according to the Correction Table given in Table I.

The corrected grade-level indicates the grade at which a book or article can be read with understanding. For example, a book with a corrected grade-level of 7–8 is one which should be within the reading ability of average children in Grades VII and VIII. For adults, the 7–8 grade-level can be compared to the last grade reached. If materials are being selected for persons who have had an average of eight grades of schooling, passages with a corrected grade-level of 7–8 should be within their ability. The corrected grade-levels corresponding to the

[6] Copies of the table of multiplications may be obtained from Edgar Dale, Bureau of Educational Research, Ohio State University.

raw scores obtained from the formula are given in Table I. These will serve to determine the grade-level of materials being appraised with the use of the Dale list.

The population reports of the Bureau of Census are a good source for determining the educational levels of large groups of adults. Statistics on the last grade reached are given in tables headed "Persons 25 Years Old by Years of School Completed," in the 1940 Population, Volume II, *Characteristics of the Population*. Part I contains the statistics for the states, cities, and counties. These are further broken down by sex, race, native and foreign born, urban and rural.

TABLE I

CORRECTION TABLE

Formula Raw Score	Corrected Grade-Levels
4.9 and below	4th grade and below
5.0 to 5.9	5–6th grade
6.0 to 6.9	7–8th grade
7.0 to 7.9	9–10th grade
8.0 to 8.9	11–12th grade
9.0 to 9.9	13–15th grade (college)
10.0 and above	16–(college graduate)

AN ILLUSTRATION of the mechanics of using the formula is given in this part of this article. The following three samples were chosen from a 15-page pamphlet, *Your Baby*, published by the National Tuberculosis Association. The words printed in italics were not found in the Dale list and are by definition unfamiliar words.

Sample 1:

A happy, useful life—that's what you want for your baby, isn't it? And because a healthy mind and body are so *necessary* to happiness and long life, you must do all you can to get your baby off to a good start. There is much you can do while he is still a baby to lay the *foundation* for good health and good health habits.

Many things *affect* your baby's health. One was the state of your own health during *pregnancy*, and the *special* care your doctor gave you before the baby was born. Other things important to your child's health are food, clothes, baths, sleep, and habit training. A baby needs a clean, happy place to live, and he must be kept from having any sickness that can be *prevented*.

Sample 2:

Diphtheria used to kill many babies. Today no child need die of *diphtheria*. It is one of the *diseases* for which we have very good *treat-*

TABLE II

A WORK SHEET USED IN FOR THE SAMPLES TAKEN FROM THE PAMPHLET "YOUR BABY"

Article: Your Baby — Page No. 2 — Page No. 7 — Page No. 12

Author: — From "A happy... — From "Diphtheria... — From "The germs...

Publisher: Nat'l TB Assoc. Date: 1945 — To ...prevented." — To...often given." — To ...or boiled."

1. Number of words in the sample	132	131	111
2. Number of sentences in the sample	7	9	6
3. Number of words not on Dale List	6	20	17
4. Average sentence length (divide 1 by 2)	19	15	19
5. Dale score (divide 3 by 1, multiply by 100)	5	15	15
6. Multiply average sentence length (4) by .0496	.9424	.7440	.9424
7. Multiply Dale score (5) by .1579	.7895	2.3685	2.3685
8. Constant	3.6365	3.6365	3.6365
9. Formula raw score (add 6, 7, and 8)	5.3684	6.7490	6.9474

Average raw score of 3 samples: 6.35 — Analyzed by: J.B.C. — Date: 1/28/48

Average corrected grade-level: 7-8 — Checked by: C.D.C. — Date: 1/28/48

ments and almost sure *prevention*. But your baby will not be safe from this *disease* unless he has been protected by *immunization*.

The way to protect your baby is simple. *Physicians usually* give *injections* of three *doses* of *toxoid*, three to four weeks apart, generally beginning when a baby is about six months old. Your doctor will tell you that your baby should have this *protection* before his first birthday.

Six months after the last *injection* of *toxoid*, the *physician* may test your baby to see if another *dose* of *toxoid* is *necessary*. Before the child enters school an extra shot of *toxoid* is often given.

Sample 3:

The *germs* that cause *tuberculosis* can enter the baby's body through his mouth or be breathed in through his nose. These *germs* come to him on *spray* or *moisture* which the person with *active tuberculosis* breathes or coughs out. *Germ-filled spray* from the mouth or nose may light on the baby's food, his dishes, his toys. The baby's hands may carry *germs* from soiled *objects* to his mouth. Kissing is one way of spreading *TB* as well as other *germs*.

Tuberculosis of the bones or *joints* or of certain organs of the body besides the *lungs* can come to the bottle-fed baby in milk which has not been *pasteurized* or boiled.

The records for these three samples are given in the work sheet reproduced here as Table II. The average raw score for the three samples was 6.35. By referring to the grade equivalent given in Table I, the correction table, the grade-level of the readability of the pamphlet, 7–8, was determined.

THE Dale list of approximately three thousand familiar words represents words that are known in reading by at least 80 per cent of the children in Grade IV. It is presented primarily as a list which gives a significant correlation with reading difficulty. It is not intended as a list of the most important words for children or adults. It includes words that are relatively unimportant and excludes some important ones. To use the list for more than an over-all statistical device which gives a good prediction of readability would be out of harmony with the purpose for which it was constructed.

The technique used for constructing the list was crude. When 80 per cent of the fourth-graders questioned indicated that they knew a word, that word was included in the list. This arbitrary cutting off at the 80–per cent point and the lack of any measure of the importance of these words make exceedingly dubious the wisdom of using individual words in appraising the

ease or difficulty of material. For purposes of computing a level of difficulty, however, the percentage of words outside this list is a very good index of the difficulty of reading materials. The terms *familiar* and *unfamiliar* describing words are therefore used here in a statistical sense.

There is, however, a real place for a list of important familiar words, graded in about four levels, for use in the preparation of materials for adults of limited reading ability. At the present time we are experimenting with such a list. It will include such words as *nation*, and so on, which tested slightly below the 80–per cent criterion on children, but are important, and for all practical purposes are probably familiar, to adults.

The three thousand words which comprise the Dale list are given in the pages which follow.

DALE LIST OF 3000 FAMILIAR WORDS

a	ah	an	armful	awhile	barrel
able	ahead	and	army	ax	base
aboard	aid	angel	arose	baa	baseball
about	aim	anger	around	babe	basement
above	air	angry	arrange	baby(ies)	basket
absent	airfield	animal	arrive(d)	back	bat
accept	airport	another	arrow	background	batch
accident	airplane	answer	art	backward(s)	bath
account	airship	ant	artist	bacon	bathe
ache(ing)	airy	any	as	bad(ly)	bathing
acorn	alarm	anybody	ash(es)	badge	bathroom
acre	alike	anyhow	aside	bag	bathtub
across	alive	anyone	ask	bake(r)	battle
act(s)	all	anything	asleep	baking	battleship
add	alley	anyway	at	bakery	bay
address	alligator	anywhere	ate	ball	be(ing)
admire	allow	apart	attack	balloon	beach
adventure	almost	apartment	attend	banana	bead
afar	alone	ape	attention	band	beam
afraid	along	apiece	August	bandage	bean
after	aloud	appear	aunt	bang	bear
afternoon	already	apple	author	banjo	beard
afterward(s)	also	April	auto	bank(er)	beast
again	always	apron	automobile	bar	beat(ing)
against	am	are	autumn	barber	beautiful
age	America	aren't	avenue	bare(ly)	beautify
aged	American	arise	awake(n)	barefoot	beauty
ago	among	arithmetic	away	bark	became
agree	amount	arm	awful(ly)	barn	because

become
becoming
bed
bedbug
bedroom
bedspread
bedtime
bee
beech
beef
beefsteak
beehive
been
beer
beet
before
beg
began
beggar
begged
begin
beginning
begun
behave
behind
believe
bell
belong
below
belt
beneath
bench
bend
bent
berry(ies)
beside(s)
best
bet
better
between
bib
bible
bicycle
bid
big(ger)
bill
billboard
bin
bind

bird
birth
birthday
biscuit
bit
bite
biting
bitter
black
blackberry
blackbird
blackboard
blackness
blacksmith
blame
blank
blanket
blast
blaze
bleed
bless
blessing
blew
blind(s)
blindfold
block
blood
bloom
blossom
blot
blow
blue
blueberry
bluebird
bluejay
blush
board
boast
boat
bob
bobwhite
body(ies)
boil(er)
bold
bone
bonnet
boo
book-
bookcase

bookkeeper
boom
boot
born
borrow
boss
both
bother
bottle
bottom
bought
bounce
bow
bowl
bow-wow
box(es)
boxcar
boxer
boy
boyhood
bracelet
brain
brake
bran
branch
brass
brave
bread
break
breakfast
breast
breath
breathe
breeze
brick
bride
bridge
bright
brightness
bring
broad
broadcast
broke(n)
brook
broom
brother
brought
brown
brush

bubble
bucket
buckle
bud
buffalo
bug
buggy
build
building
built
bulb
bull
bullet
bum
bumblebee
bump
bun
bunch
bundle
bunny
burn
burst
bury
bus
bush
bushel
business
busy
but
butcher
butt
butter
buttercup
butterfly
buttermilk
butterscotch
button
buttonhole
buy
buzz
by
bye
cab
cabbage
cabin
cabinet
cackle
cage
cake

calendar
calf
call(er)(ing)
came
camel
camp
campfire
can
canal
canary
candle
candlestick
candy
cane
cannon
cannot
canoe
can't
canyon
cap
cape
capital
captain
car
card
cardboard
care
careful
careless
carelessness
carload
carpenter
carpet
carriage
carrot
carry
cart
carve
case
cash
cashier
castle
cat
catbird
catch
catcher
caterpillar
catfish
catsup

cattle
caught
cause
cave
ceiling
cell
cellar
cent
center
cereal
certain(ly)
chain
chair
chalk
champion
chance
change
chap
charge
charm
chart
chase
chatter
cheap
cheat
check
checkers
cheek
cheer
cheese
cherry
chest
chew
chick
chicken
chief
child
childhood
children
chill(y)
chimney
chin
china
chip
chipmunk
chocolate
choice
choose
chop

chorus
chose(n)
christen
Christmas
church
churn
cigarette
circle
circus
citizen
city
clang
clap
class
classmate
classroom
claw
clay
clean(er)
clear
clerk
clever
click
cliff
climb
clip
cloak
clock
close
closet
cloth
clothes
clothing
cloud(y)
clover
clown
club
cluck
clump
coach
coal
coast
coat
cob
cobbler
cocoa
coconut
cocoon
cod

codfish
coffee
coffeepot
coin
cold
collar
college
color(ed)
colt
column
comb
come
comfort
comic
coming
company
compare
conductor
cone
connect
coo
cook(ed)
cook(ing)
cooky(ie)(s)
cool(er)
coop
copper
copy
cord
cork
corn
corner
correct
cost
cot
cottage
cotton
couch
cough
could
couldn't
count
counter
country
county
course
court
cousin
cover

cow
coward(ly)
cowboy
cozy
crab
crack
cracker
cradle
cramps
cranberry
crank(y)
crash
crawl
crazy
cream(y)
creek
creep
crept
cried
croak
crook(ed)
crop
cross(ing)
cross-eyed
crow
crowd(ed)
crown
cruel
crumb
crumble
crush
crust
cry(ies)
cub
cuff
cup
cupboard
cupful
cure
curl(y)
curtain
curve
cushion
custard
customer
cut
cute
cutting
dab

dad
daddy
devil
daily
dew
dairy
diamond
did
dam
didn't
damage
die(d)(s)
dame
difference
damp
different
dance(r)
dig
dancing
dim
dandy
dime
danger(ous)
dine
dare
ding-dong
dark(ness)
dinner
darling
dip
darn
direct
dart
direction
dash
dirt(y)
date
discover
daughter
dish
dawn
dislike
day
dismiss
daybreak
ditch
daytime
dive
dead
diver
deaf
divide
deal
do
dear
dock
death
doctor
December
does
decide
doesn't
deck
dog
deed
doll
deep
dollar
deer
dolly
defeat
done
defend
donkey
defense
don't
delight
door
den
doorbell
dentist
doorknob
depend
doorstep
deposit
dope
describe
dot
desert
double
deserve
dough
desire
dove
desk
down

downstairs
downtown
dozen
drag
drain
drank
draw(er)
draw(ing)
dream
dress
dresser
dressmaker
drew
dried
drift
drill
drink
drip
drive(n)
driver
drop
drove
drown
drowsy
drug
drum
drunk
dry
duck
due
dug
dull
dumb
dump
during
dust(y)
duty
dwarf
dwell
dwelt
dying
each
eager
eagle
ear
early
earn
earth
east(ern)

easy
eat(en)
edge
egg
eh
eight
eighteen
eighth
eighty
either
elbow
elder
eldest
electric
electricity
elephant
eleven
elf
elm
else
elsewhere
empty
end(ing)
enemy
engine
engineer
English
enjoy
enough
enter
envelope
equal
erase(r)
errand
escape
eve
even
evening
ever
every
everybody
everyday
everyone
everything
everywhere
evil
exact
except
exchange

excited
exciting
excuse
exit
expect
explain
extra
eye
eyebrow
fable
face
facing
fact
factory
fail
faint
fair
fairy
faith
fake
fall
false
family
fan
fancy
far
faraway
fare
farmer
farm(ing)
far-off
farther
fashion
fast
fasten
fat
father
fault
favor
favorite
fear
feast
feather
February
fed
feed
feel
feet
fell

fellow
felt
fence
fever
few
fib
fiddle
field
fife
fifteen
fifth
fifty
fig
fight
figure
file
fill
film
finally
find
fine
finger
finish
fire
firearm
firecracker
fireplace
fireworks
firing
first
fish
fisherman
fist
fit(s)
five
fix
flag
flake
flame
flap
flash
flashlight
flat
flea
flesh
flew
flies
flight
flip

flip-flop
float
flock
flood
floor
flop
flour
flow
flower(y)
flutter
fly
foam
fog
foggy
fold
folks
follow(ing)
fond
food
fool
foolish
foot
football
footprint
for
forehead
forest
forget
forgive
forgot(ten)
fork
form
fort
forth
fortune
forty
forward
fought
found
fountain
four
fourteen
fourth
fox
frame
free
freedom
freeze
freight

French
fresh
fret
Friday
fried
friend(ly)
friendship
frighten
frog
from
front
frost
frown
froze
fruit
fry
fudge
fuel
full(y)
fun
funny
fur
furniture
further
fuzzy
gain
gallon
gallop
game
gang
garage
garbage
garden
gas
gasoline
gate
gather
gave
gay
gear
geese
general
gentle
gentleman
gentlemen
geography
get
getting
giant

gift
gingerbread
girl
give(n)
giving
glad(ly)
glance
glass(es)
gleam
glide
glory
glove
glow
glue
go(ing)
goes
goal
goat
gobble
God(g)
godmother
gold(en)
goldfish
golf
gone
good(s)
good-by(bye)
good-looking
goodness
goody
goose
gooseberry
got
govern
government
gown
grab
gracious
grade
grain
grand
grandchild
grandchildren
granddaughter
grandfather
grandma
grandmother
grandpa
grandson

grandstand
grape(s)
grapefruit
grass
grasshopper
grateful
grave
gravel
graveyard
gravy
gray
graze
grease
great
green
greet
grew
grind
groan
grocery
ground
group
grove
grow
guard
guess
guest
guide
gulf
gum
gun
gunpowder
guy
ha
habit
had
hadn't
hail
hair
haircut
hairpin
half
hall
halt
ham
hammer
hand
handful
handkerchief

handle
handwriting
hang
happen
happily
happiness
happy
harbor
hard
hardly
hardship
hardware
hare
hark
harm
harness
harp
harvest
has
hasn't
haste(n)
hasty
hat
hatch
hatchet
hate
haul
have
haven't
having
hawk
hay
hayfield
haystack
he
head
headache
heal
health(y)
heap
hear(ing)
heard
heart
heat(er)
heaven
heavy
he'd
heel
height

held
hell
he'll
hello
helmet
help(er)
helpful
hem
hen
henhouse
her(s)
herd
here
here's
hero
herself
he's
hey
hickory
hid
hidden
hide
high
highway
hill
hillside
hilltop
hilly
him
himself
hind
hint
hip
hire
his
hiss
history
hit
hitch
hive
ho
hoe
hog
hold(er)
hole
holiday
hollow
holy
home

homely
homesick
honest
honey
honeybee
honeymoon
honk
honor
hood
hoof
hook
hoop
hop
hope(ful)
hopeless
horn
horse
horseback
horseshoe
hose
hospital
host
hot
hotel
hound
hour
house
housetop
housewife
housework
how
however
howl
hug
huge
hum
humble
hump
hundred
hung
hunger
hungry
hunk
hunt(er)
hurrah
hurried
hurry
hurt
husband

hush
hut
hymn
I
ice
icy
I'd
idea
ideal
if
ill
I'll
I'm
important
impossible
improve
in
inch(es)
income
indeed
Indian
indoors
ink
inn
insect
inside
instant
instead
insult
intend
interested
interesting
into
invite
iron
is
island
isn't
it
its
it's
itself
I've
ivory
ivy

January
jar
jaw
jay
jelly
jellyfish
jerk
jig
job
jockey
join
joke
joking
jolly
journey
joy(ful)
joyous
judge
jug
juice
juicy
July
jump
June
junior
junk
just

keen
keep
kept
kettle
key
kick
kid
kill(ed)
kind(ly)
kindness
king
kingdom
kiss
kitchen
kite
kitten
kitty
knee
kneel
knew
knife
knit

knives
knob
knock
knot
know
known
lace
lad
ladder
ladies
lady
laid
lake
lamb
lame
lamp
land
lane
language
lantern
lap
lard
large
lash
lass
last
late
laugh
laundry
law
lawn
lawyer
lay
lazy
lead
leader
leaf
leak
lean
leap
learn(ed)
least
leather
leave(ing)
led
left
leg
lemon
lemonade
lend
length
less
lesson
let
let's
letter
letting
lettuce
level
liberty
library
lice
lick
lid
lie
life
lift
light(ness)
lightning
like
likely
liking
lily
limb
lime
limp
line
linen
lion
lip
list
listen
lit
little
live(s)
lively
liver
living
lizard
load
loaf
loan
loaves
lock
locomotive
log
lone
lonely
lonesome
long
look
lookout
loop
loose
lord
lose(r)
loss
lost
lot
loud
love
lovely
lover
low
luck(y)
lumber
lump
lunch
lying
ma
machine
machinery
mad
made
magazine
magic
maid
mail
mailbox
mailman
major
make
making
male
mama
mamma
man
manager
mane
manger
many
map
maple
marble
march(M)
mare
mark
market
marriage
married
marry
mask
mast
master
mat
match
matter
mattress
may(M)
maybe
mayor
maypole
me
meadow
meal
mean(s)
meant
measure
meat
medicine
meet(ing)
melt
member
men
mend
meow
merry
mess
message
met
metal
mew
mice
middle
midnight
might(y)
mile
milk
milkman
mill
miller
million
mind
mine
miner
mint
minute
mirror
mischief
miss(M)
misspell
mistake
misty
mitt
mitten
mix
moment
Monday
money
monkey
month
moo
moon
moonlight
moose
mop
more
morning
morrow
moss
most(ly)
mother
motor
mount
mountain
mouse
mouth
move
movie
movies
moving
mow
Mr., Mrs.
much
mud
muddy
mug
mule
multiply
murder
music
must
my
myself
nail
name
nap
napkin
narrow
nasty
naughty
navy
near
nearby
nearly
neat
neck
necktie
need
needle
needn't
Negro
neighbor
neighborhood
neither
nerve
nest
net
never
nevermore
new
news
newspaper
next
nibble
nice
nickel
night
nightgown
nine
nineteen
ninety
no
nobody
nod
noise
noisy
none
noon
nor
north(ern)
nose
not
note

anything
notice
November
now
nowhere
number
nurse
nut
oak
oat
oatmeal
oats
obey
ocean
o'clock
October
odd
of
off
offer
office
officer
often
oh
oil
old
old-fashioned
on
once
one
onion
only
onward
open
or
orange
orchard
order
ore
organ
other
otherwise
ouch
ought
our(s)
ourselves
out
outdoors
outfit
outlaw
outline
outside
outward
oven
over
overalls
overcoat
overeat
overhead
overhear
overnight
overturn
owe
owing
owl
own(er)
ox
pa
pace
pack
package
pad
page
paid
pail
pain(ful)
paint(er)
painting
pair
pal
palace
pale
pan
pancake
pane
pansy
pants
papa
paper
parade
pardon
parent
park
part(ly)
partner
party
pass
passenger
past
paste
pasture
pat
patch
path
patter
pave
pavement
paw
pay
payment
pea(s)
peace(ful)
peach(es)
peak
peanut
pear
pearl
peck
peek
peel
peep
peg
pen
pencil
penny
people
pepper
peppermint
perfume
perhaps
person
pet
phone
piano
pick
pickle
picnic
picture
pie
piece
pig
pigeon
piggy
pile
pill
pillow
pin
pine
pineapple
pink
pint
pipe
pistol
pit
pitch
pitcher
pity
place
plain
plan
plane
plant
plate
platform
platter
play(er)
playground
playhouse
playmate
plaything
pleasant
please
pleasure
plenty
plow
plug
plum
pocket
pocketbook
poem
point
poison
poke
pole
police
policeman
polish
polite
pond
ponies
pony
pool
poor
pop
popcorn
popped
porch
pork
possible
post
postage
postman
pot
potato(es)
pound
pour
powder
power(ful)
praise
pray
prayer
prepare
present
pretty
price
prick
prince
princess
print
prison
prize
promise
proper
protect
proud
prove
prune
public
puddle
puff
pull
pump
pumpkin
punch
punish
pup
pupil
puppy
pure
purple
purse
push
puss
pussy
pussycat
put
putting
puzzle
quack
quart
quarter
queen
queer
question
quick(ly)
quiet
quilt
quit
quite
rabbit
race
rack
radio
radish
rag
rail
railroad
railway
rain(y)
rainbow
raise
raisin
rake
ram
ran
ranch
rang
rap
rapidly
rat
rate
rather
rattle
raw
ray
reach
read
reader
reading
ready
real
really
reap

rear
reason
rebuild
receive
recess
record
red
redbird
redbreast
refuse
reindeer
rejoice
remain
remember
remind
remove
rent
repair
repay
repeat
report
rest
return
review
reward
rib
ribbon
rice
rich
rid
riddle
ride(r)
riding
right
rim
ring
rip
ripe
rise
rising
river
road
roadside
roar
roast
rob
robber
robe
robin

rock(y)
rocket
rode
roll
roller
roof
room
rooster
root
rope
rose
rosebud
rot
rotten
rough
round
route
row
rowboat
royal
rub
rubbed
rubber
rubbish
rug
rule(r)
rumble
run
rung
runner
running
rush
rust(y)
rye
sack
sad
saddle
sadness
safe
safety
said
sail
sailboat
sailor
saint
salad
sale
salt
same

sand(y)
sandwich
sang
sank
sap
sash
sat
satin
satisfactory
Saturday
sausage
savage
save
savings
saw
say
scab
scales
scare
scarf
school
schoolboy
schoolhouse
schoolmaster
schoolroom
scorch
score
scrap
scrape
scratch
scream
screen
screw
scrub
sea
seal
seam
search
season
seat
second
secret
see(ing)
seed
seek
seem
seen
seesaw
select

self
selfish
sell
send
sense
sent
sentence
separate
September
servant
serve
service
set
setting
settle
settlement
seven
seventeen
seventh
seventy
several
sew
shade
shadow
shady
shake(r)
shaking
shall
shame
shan't
shape
share
sharp
shave
she
she'd
she'll
she's
shear(s)
shed
sheep
sheet
shelf
shell
shepherd
shine
shining
shiny
ship

shirt
shock
shoe
shoemaker
shone
shook
shoot
shop
shopping
shore
short
shot
should
shoulder
shouldn't
shout
shovel
show
shower
shut
shy
sick(ness)
side
sidewalk
sideways
sigh
sight
sign
silence
silent
silk
sill
silly
silver
simple
sin
since
sing
singer
single
sink
sip
sir
sis
sissy
sister
sit
sitting
six

sixteen
sixth
sixty
size
skate
skater
ski
skin
skip
skirt
sky
slam
slap
slate
slave
sled
sleep(y)
sleeve
sleigh
slept
slice
slid
slide
sling
slip
slipped
slipper
slippery
slit
slow(ly)
sly
smack
small
smart
smell
smile
smoke
smooth
snail
snake
snap
snapping
sneeze
snow(y)
snowball
snowflake
snuff
snug
so

soak
soap
sob
socks
sod
soda
sofa
soft
soil
sold
soldier
sole
some
somebody
somehow
someone
something
sometime(s)
somewhere
son
song
soon
sore
sorrow
sorry
sort
soul
sound
soup
sour
south(ern)
space
spade
spank
sparrow
speak(er)
spear
speech
speed
spell(ing)
spend
spent
spider
spike
spill
spin
spinach
spirit
spit

splash
spoil
spoke
spook
spoon
sport
spot
spread
spring
springtime
sprinkle
square
squash
squeak
squeeze
squirrel
stable
stack
stage
stair
stall
stamp
stand
star
stare
start
starve
state
station
stay
steak
steal
steam
steamboat
steamer
steel
steep
steeple
steer
stem
step
stepping
stick(y)
stiff
still(ness)
sting
stir
stitch
stock

stocking
stole
stone
stood
stool
stoop
stop
stopped
stopping
store
stork
stories
storm(y)
story
stove
straight
strange(r)
strap
straw
strawberry
stream
street
stretch
string
strip
stripes
strong
stuck
study
stuff
stump
stung
subject
such
suck
sudden
suffer
sugar
suit
sum
summer
sun
Sunday
sunflower
sung
sunk
sunlight
sunny
sunrise

sunset
sunshine
supper
suppose
sure(ly)
surface
surprise
swallow
swam
swamp
swan
swat
swear
sweat
sweater
sweep
sweet(ness)
sweetheart
swell
swept
swift
swim
swimming
swing
switch
sword
swore
table
tablecloth
tablespoon
tablet
tack
tag
tail
tailor
take(n)
taking
tale
talk(er)
tall
tame
tan
tank
tap
tape
tar
tardy
task
taste

taught
tax
tea
teach(er)
team
tear
tease
teaspoon
teeth
telephone
tell
temper
ten
tennis
tent
term
terrible
test
than
thank(s)
thankful
Thanks-
giving
that
that's
the
theater
thee
their
them
then
there
these
they
they'd
they'll
they're
they've
thick
thief
thimble
thin
thing
think
third
thirsty
thirteen
thirty
this

tho
thorn
those
though
thought
thousand
thread
three
threw
throat
throne
through
throw(n)
thumb
thunder
Thursday
thy
tick
ticket
tickle
tie
tiger
tight
till
time
tin
tinkle
tiny
tip
tiptoe
tire
tired
'tis
title
to
toad
toadstool
toast
tobacco
today
toe
together
toilet
told
tomato
tomorrow
ton
tone
tongue

tonight
too
took
tool
toot
tooth
toothbrush
toothpick
top
tore
torn
toss
touch
tow
toward(s)
towel
tower
town
toy
trace
track
trade
train
tramp
trap
tray
treasure
treat
tree
trick
tricycle
tried
trim
trip
trolley
trouble
truck
true
truly
trunk
trust
truth
try
tub
Tuesday
tug
tulip
tumble
tune
tunnel
turkey
turn
turtle
twelve
twenty
twice
twig
twin
two
ugly
umbrella
uncle
under
understand
underwear
undress
unfair
unfinished
unfold
unfriendly
unhappy
unhurt
uniform
United
States
unkind
unknown
unless
unpleasant
until
unwilling
up
upon
upper
upset
upside
upstairs
uptown
upward
us
use(d)
useful
valentine
valley
valuable
value
vase
vegetable
velvet
very
vessel
victory
view
village
vine
violet
visit
visitor
voice
vote
wag
wagon
waist
wait
wake(n)
walk
wall
walnut
want
war
warm
warn
was
wash(er)
washtub
wasn't
waste
watch
watchman
water
watermelon
waterproof
wave
wax
way
wayside
we
weak(ness)
weaken
wealth
weapon
wear
weary
weather
weave
web
we'd
wedding
Wednesday
wee
weed
week
we'll
weep
weigh
welcome
well
went
were
we're
west(ern)
wet
we've
whale
what
what's
wheat
wheel
when
whenever
where
which
while
whip
whipped
whirl
whisky
whisper
whistle
white
who
who'd
whole
who'll
whom
who's
whose
why
wicked
wide
wife
wiggle
wild
wildcat
will
willing
willow
win
wind(y)
windmill
window
wine
wing
wink
winner
winter
wipe
wire
wise
wish
wit
witch
with
without
woke
wolf
woman
women
won
wonder
wonderful
won't
wood(en)
woodpecker
woods
wool
woolen
word
wore
work(er)
workman
world
worm
worn
worry
worse
worst
worth
would
wouldn't
wound
wove
wrap
wrapped
wreck
wren
wring
write
writing
written
wrong
wrote
wrung
yard
yarn
year
yell
yellow
yes
yesterday
yet
yolk
yonder
you
you'd
you'll
young
younger
your(s)
you're
yourself
yourselves
youth
you've

APPENDIX H

KLARE INDEX OF RAW SCORES FOR DALE-CHALL FORMULA

TABLE I

Raw Scores of Readability for Dale-Chall Formula Determined by Dale Score Values and Sentence Length

Dale Score	Average Sentence Length—Number of Words																
	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
0	3.93	3.98	4.03	4.08	4.13	4.18	4.23	4.28	4.33	4.38	4.43	4.48	4.53	4.58	4.63	4.68	4.73
1	4.09	4.14	4.19	4.24	4.29	4.34	4.39	4.44	4.49	4.54	4.59	4.64	4.69	4.74	4.79	4.84	4.89
2	4.25	4.30	4.35	4.40	4.45	4.50	4.55	4.60	4.65	4.70	4.75	4.80	4.85	4.89	4.94	4.99	5.04
3	4.41	4.46	4.51	4.56	4.61	4.66	4.71	4.76	4.80	4.85	4.90	4.95	5.00	5.05	5.10	5.15	5.20
4	4.57	4.62	4.66	4.71	4.76	4.81	4.86	4.91	4.96	5.01	5.06	5.11	5.16	5.21	5.26	5.31	5.36
5	4.72	4.77	4.82	4.87	4.92	4.97	5.02	5.07	5.12	5.17	5.22	5.27	5.32	5.37	5.42	5.47	5.52
6	4.88	4.93	4.98	5.03	5.08	5.13	5.18	5.23	5.28	5.33	5.38	5.43	5.48	5.53	5.58	5.63	5.68
7	5.04	5.09	5.14	5.19	5.24	5.29	5.34	5.39	5.44	5.49	5.54	5.59	5.63	5.68	5.73	5.78	5.83
8	5.20	5.25	5.30	5.35	5.40	5.45	5.49	5.54	5.59	5.64	5.69	5.74	5.79	5.84	5.89	5.94	5.99
9	5.36	5.40	5.45	5.50	5.55	5.60	5.65	5.70	5.75	5.80	5.85	5.90	5.95	6.00	6.05	6.10	6.15
10	5.51	5.56	5.61	5.66	5.71	5.76	5.81	5.86	5.91	5.96	6.01	6.06	6.11	6.16	6.21	6.26	6.31
11	5.67	5.72	5.77	5.82	5.87	5.92	5.97	6.02	6.07	6.12	6.17	6.22	6.27	6.32	6.37	6.42	6.46
12	5.83	5.88	5.93	5.98	6.03	6.08	6.13	6.18	6.23	6.28	6.32	6.37	6.42	6.47	6.52	6.57	6.62
13	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.43	6.48	6.53	6.58	6.63	6.68	6.73	6.78
14	6.14	6.19	6.24	6.29	6.34	6.39	6.44	6.49	6.54	6.59	6.64	6.69	6.74	6.79	6.84	6.89	6.94
15	6.30	6.35	6.40	6.45	6.50	6.55	6.60	6.65	6.70	6.75	6.80	6.85	6.90	6.95	7.00	7.05	7.10
16	6.46	6.51	6.56	6.61	6.66	6.71	6.76	6.81	6.86	6.91	6.96	7.01	7.06	7.11	7.15	7.20	7.25
17	6.62	6.67	6.72	6.77	6.82	6.87	6.92	6.97	7.02	7.06	7.11	7.16	7.21	7.26	7.31	7.36	7.41
18	6.78	6.83	6.88	6.93	6.97	7.02	7.07	7.12	7.17	7.22	7.27	7.32	7.37	7.42	7.47	7.52	7.57
19	6.93	6.98	7.03	7.08	7.13	7.18	7.23	7.28	7.33	7.38	7.43	7.48	7.53	7.58	7.63	7.68	7.73
20	7.09	7.14	7.19	7.24	7.29	7.34	7.39	7.44	7.49	7.54	7.59	7.64	7.69	7.74	7.79	7.84	7.89
21	7.25	7.30	7.35	7.40	7.45	7.50	7.55	7.60	7.65	7.70	7.75	7.80	7.85	7.89	7.94	7.99	8.04
22	7.41	7.46	7.51	7.56	7.61	7.66	7.71	7.76	7.80	7.85	7.90	7.95	8.00	8.05	8.10	8.15	8.20
23	7.57	7.62	7.67	7.71	7.76	7.81	7.86	7.91	7.96	8.01	8.06	8.11	8.16	8.21	8.26	8.31	8.36
24	7.72	7.77	7.82	7.87	7.92	7.97	8.02	8.07	8.12	8.17	8.22	8.27	8.32	8.37	8.42	8.47	8.52
25	7.88	7.93	7.98	8.03	8.08	8.13	8.18	8.23	8.28	8.33	8.38	8.43	8.48	8.53	8.58	8.63	8.68
26	8.04	8.09	8.14	8.19	8.24	8.29	8.34	8.39	8.44	8.49	8.54	8.59	8.63	8.68	8.73	8.78	8.83
27	8.20	8.25	8.30	8.35	8.40	8.45	8.50	8.54	8.59	8.64	8.69	8.74	8.79	8.84	8.89	8.94	8.99
28	8.36	8.40	8.45	8.50	8.55	8.60	8.65	8.70	8.75	8.80	8.85	8.90	8.95	9.00	9.05	9.10	9.15
29	8.51	8.56	8.61	8.66	8.71	8.76	8.81	8.86	8.91	8.96	9.01	9.06	9.11	9.16	9.21	9.26	9.31
30	8.67	8.72	8.77	8.82	8.87	8.92	8.97	9.02	9.07	9.12	9.17	9.22	9.27	9.32	9.37	9.42	9.46
31	8.83	8.88	8.93	8.98	9.03	9.08	9.13	9.18	9.23	9.28	9.33	9.37	9.42	9.47	9.52	9.57	9.62
32	8.99	9.04	9.09	9.14	9.19	9.23	9.28	9.33	9.38	9.43	9.48	9.53	9.58	9.63	9.68	9.73	9.78
33	9.14	9.19	9.24	9.29	9.34	9.39	9.44	9.49	9.54	9.59	9.64	9.69	9.74	9.79	9.84	9.89	9.94
34	9.30	9.35	9.40	9.45	9.50	9.55	9.60	9.65	9.70	9.75	9.80	9.85	9.90	9.95	10.00	10.05	10.10
35	9.46	9.51	9.56	9.61	9.66	9.71	9.76	9.81	9.86	9.91	9.96	10.01	10.06	10.11	10.16	10.20	10.25

Dale Score	Average Sentence Length—Number of Words															
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
0	4.78	4.83	4.88	4.93	4.98	5.03	5.07	5.12	5.17	5.22	5.27	5.32	5.37	5.42	5.47	5.52
1	4.94	4.98	5.03	5.08	5.13	5.18	5.23	5.28	5.33	5.38	5.43	5.48	5.53	5.58	5.63	5.68
2	5.09	5.14	5.19	5.24	5.29	5.34	5.39	5.44	5.49	5.54	5.59	5.64	5.69	5.74	5.79	5.84
3	5.25	5.30	5.35	5.40	5.45	5.50	5.55	5.60	5.65	5.70	5.75	5.80	5.85	5.90	5.95	6.00
4	5.41	5.46	5.51	5.56	5.61	5.66	5.71	5.76	5.81	5.86	5.90	5.95	6.00	6.05	6.10	6.15
5	5.57	5.62	5.67	5.72	5.77	5.81	5.86	5.91	5.96	6.01	6.06	6.11	6.16	6.21	6.26	6.31
6	5.72	5.77	5.82	5.87	5.92	5.97	6.02	6.07	6.12	6.17	6.22	6.27	6.32	6.37	6.42	6.47
7	5.88	5.93	5.98	6.03	6.08	6.13	6.18	6.23	6.28	6.33	6.38	6.43	6.48	6.53	6.58	6.63
8	6.04	6.09	6.14	6.19	6.24	6.29	6.34	6.39	6.44	6.49	6.54	6.59	6.64	6.69	6.73	6.78
9	6.20	6.25	6.30	6.35	6.40	6.45	6.50	6.55	6.60	6.64	6.69	6.74	6.79	6.84	6.89	6.94
10	6.36	6.41	6.46	6.51	6.55	6.60	6.65	6.70	6.75	6.80	6.85	6.90	6.95	7.00	7.05	7.10
11	6.51	6.56	6.61	6.66	6.71	6.76	6.81	6.86	6.91	6.96	7.01	7.06	7.11	7.16	7.21	7.26
12	6.67	6.72	6.77	6.82	6.87	6.92	6.97	7.02	7.07	7.12	7.17	7.22	7.27	7.32	7.37	7.42
13	6.83	6.88	6.93	6.98	7.03	7.08	7.13	7.18	7.23	7.28	7.33	7.38	7.43	7.47	7.52	7.57
14	6.99	7.04	7.09	7.14	7.19	7.24	7.29	7.34	7.38	7.43	7.48	7.53	7.58	7.63	7.68	7.73
15	7.15	7.20	7.25	7.29	7.34	7.39	7.44	7.49	7.54	7.59	7.64	7.69	7.74	7.79	7.84	7.89
16	7.30	7.35	7.40	7.45	7.50	7.55	7.60	7.65	7.70	7.75	7.80	7.85	7.90	7.95	8.00	8.05
17	7.46	7.51	7.56	7.61	7.66	7.71	7.76	7.81	7.86	7.91	7.96	8.01	8.06	8.11	8.16	8.21
18	7.62	7.67	7.72	7.77	7.82	7.87	7.92	7.97	8.02	8.07	8.12	8.17	8.21	8.26	8.31	8.36
19	7.78	7.83	7.88	7.93	7.98	8.03	8.08	8.12	8.17	8.22	8.27	8.32	8.37	8.42	8.47	8.52
20	7.94	7.98	8.03	8.08	8.13	8.18	8.23	8.28	8.33	8.38	8.43	8.48	8.53	8.58	8.63	8.68
21	8.09	8.14	8.19	8.24	8.29	8.34	8.39	8.44	8.49	8.54	8.59	8.64	8.69	8.74	8.79	8.84
22	8.25	8.30	8.35	8.40	8.45	8.50	8.55	8.60	8.65	8.70	8.75	8.80	8.85	8.90	8.95	9.00
23	8.41	8.46	8.51	8.56	8.61	8.66	8.71	8.76	8.81	8.86	8.91	8.95	9.00	9.05	9.10	9.15
24	8.57	8.62	8.67	8.72	8.77	8.81	8.86	8.91	8.96	9.01	9.06	9.11	9.16	9.21	9.26	9.31
25	8.72	8.77	8.82	8.87	8.92	8.97	9.02	9.07	9.12	9.17	9.22	9.27	9.32	9.37	9.42	9.47
26	8.88	8.93	8.98	9.03	9.08	9.13	9.18	9.23	9.28	9.33	9.38	9.43	9.48	9.53	9.58	9.63
27	9.04	9.09	9.14	9.19	9.24	9.29	9.34	9.39	9.44	9.49	9.54	9.59	9.64	9.69	9.74	9.78
28	9.20	9.25	9.30	9.35	9.40	9.45	9.50	9.55	9.60	9.64	9.69	9.74	9.79	9.84	9.89	9.94
29	9.36	9.41	9.46	9.51	9.55	9.60	9.65	9.70	9.75	9.80	9.85	9.90	9.95	10.00	10.05	10.10
30	9.51	9.56	9.61	9.66	9.71	9.76	9.81	9.86	9.91	9.96	10.01	10.06	10.11	10.16	10.21	10.26
31	9.67	9.72	9.77	9.82	9.87	9.92	9.97	10.02	10.07	10.12	10.17	10.22	10.27	10.32	10.37	10.42
32	9.83	9.88	9.93	9.98	10.03	10.08	10.13	10.18	10.23	10.28	10.33	10.38	10.43	10.47	10.52	10.57
33	9.99	10.04	10.09	10.14	10.19	10.24	10.29	10.34	10.38	10.43	10.48	10.53	10.58	10.63	10.68	10.73
34	10.15	10.20	10.25	10.29	10.34	10.39	10.44	10.49	10.54	10.59	10.64	10.69	10.74	10.79	10.84	10.89
35	10.30	10.35	10.40	10.45	10.50	10.55	10.60	10.65	10.70	10.75	10.80	10.85	10.90	10.95	11.00	11.05

APPENDIX I

SAMPLE COMMUNICATIONS AND SUGGESTED BIBLIOGRAPHIES

Box 23800
TWU Station
Denton, Texas 76204
January 16, 1971

Mrs. Marilyn Boone
Drug Education Program
Texas Education Agency
Austin, Texas

Dear Mrs. Boone:

I am a graduate student at the Texas Woman's University, Denton, Texas, and am in the process of developing a research project concerning Drug Education, under the direction of Dr. Don Merki.

I am writing to request your assistance in securing resource material. It would be an invaluable aid if you could supply me with some of the free drug literature (pamphlets, flyers, or posters) which are made available to schools or suggested for use as supplementary reading materials. I am interested in materials suitable for all levels, elementary through high school. If you have assessed a grade level to any of your materials I would appreciate this information also.

Sincerely,

Emma D. Morris

(Mrs.) Emma D. Morris
Graduate Student
Texas Woman's University

Texas Education Agency

- STATE BOARD OF EDUCATION
- STATE COMMISSIONER OF EDUCATION
- STATE DEPARTMENT OF EDUCATION

201 East Eleventh Street
Austin, Texas
78701

January 20, 1971

Mrs. Emma D. Morris
Texas Womans University
Box 23800
Denton, Texas 76204

Dear Mrs. Morris:

Enclosed you will find the materials you requested in the form of literature. This by no means is a comprehensive or even a representative selection. I would suggest you contact the following services for information on drug abuse education.

- Library Loan Packets, TEXAS STATE TEACHERS ASSOCIATION, 316 West 12th Street, Austin, Texas 78701
- CLEARINGHOUSE FOR DRUG ABUSE INFORMATION (pamphlet included in materials)
- THE NATIONAL INSTITUTE FOR MENTAL HEALTH (catalog "Don't Guess About Drugs" included)

I have also included a sample teacher's manual and drug chart which school districts are using in developing their own program. Since the districts are developing their own programs, we have made no attempt to assign a grade level to materials. That type of assignment is impossible in light of the varying levels of sophistication of the students. This is all we have available in our office at the present time. Hope what we have is of some value to you.

Give my regards to Dr. Merki and wishes that his workshop in New Mexico went well and that I wish I could have been there.

Sincerely yours,

Marilynn Boone

Marilynn Boone, Consultant
Drug Education

MB:bs

Enclosure

ADDITIONAL MATERIAL AND SOURCES OF INFORMATION ON DRUG ABUSE

The following list of materials has been compiled for your information. Please contact each supplier for the cost (if any) of the quantity of material which you need.

General

Directory, National Coordinating Council on Drug Abuse Education and Information, Inc., Suite 212, 1211 Connecticut Avenue NW., Washington, D. C. 20036.

Drug Abuse Products Reference Chart, Pharmaceutical Manufacturers Association, 1155 Fifteenth Street NW., Washington, D. C. 20005.

Drug Abuse: The Chemical Cop-Out, National Association of Blue Shield Plans. Available from Blue Cross Association, 840 Lake Shore Drive, Chicago, Illinois 60611.

Drugs and the Young, National Coordinating Council on Drug Abuse Education and Information, Inc., Suite 212, 1211 Connecticut Avenue NW., Washington, D. C. 20036.

Fact Sheets, Bureau of Narcotics and Dangerous Drugs, U. S. Department of Justice, Washington, D. C. 20537.

Federal Source Book, A: Answers to the Most Frequently Asked Questions About Drug Abuse, National Clearinghouse for Drug Abuse Information, 5454 Wisconsin Avenue, Chevy Chase, Maryland 20015.

Glue Sniffing Problem, The by C. Winick and J. Goldstein, American Social Health Association, 1740 Broadway, New York, New York 10019.

Identification of Drug Abusers, Pharmaceutical Manufacturers Association, 1155 Fifteenth Street,NW., Washington, D. C. 20005.

Medicinal Narcotics: Facts on Benefits and Controls, Pharmaceutical Manufacturers Association, 1155 Fifteenth Street NW., Washington, D. C. 20005.

Time Guide to Drugs and the Young, A, The Time Education Program, Time and Life Building, Rockefeller Center, New York, New York 10020.

What About Marijuana? by Jules Saltman, Public Affairs Pamphlets, 381 Park Avenue South, New York, New York 10016.

What We Can Do About Drug Abuse by Jules Saltman, Public Affairs Pamphlets, 381 Park Avenue South, New York, New York 10016.

What You Should Know About Drugs and Narcotics by Alton Blakeslee, The Associated Press, 50 Rockefeller Plaza, New York, New York 10020.

Health Professions

Guide for the Professions, A . . . Drug Abuse Education, American Pharmaceutical Association, 2215 Constitution Avenue NW., Washington, D. C. 20037.

Deciding About Drugs, Kiwanis International, 101 East Erie Street, Chicago, Illinois 60611.

Drug Jigsaw, Kiwanis International, 101 East Erie Street, Chicago, Illinois 60611.

Glue Sniffing, American Medical Association Department of Health Education, Division of Health Service, 535 North Dearborn Street, Chicago, Illinois 60610.

LSD--Some Questions and Answers, Public Health Service Publication No. 1828, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

Marijuana--Some Questions and Answers, Public Health Service Publication No. 1829, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

Narcotics--Some Questions and Answers, Public Health Service Publication No. 1827, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

Up and Down Drugs--Amphetamines and Barbiturates, The, Public Health Service Publication No. 1830, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

The National Clearinghouse for Drug Abuse Information, in its capacity as a Federal information center, provides three basic services: publications distribution, computer services, and referrals to Federal, State, private, and other agencies. A discussion of these services follows.

Publications

The National Clearinghouse for Drug Abuse Information distributes the following publications upon specific request and in response to requests for general information about drug abuse. These publications constitute a basic packet:

1. The National Clearinghouse for Drug Abuse Information brochure.
2. A Federal Source Book: Answers to the Most Frequently Asked Questions About Drug Abuse.
3. LSD: Some Questions And Answers, PHS Publication No. 1828.
4. Marihuana: Some Questions and Answers, PHS Publication No. 1829.
5. Narcotics: Some Questions and Answers, PHS Publication No. 1827.
6. Sedatives: Some Questions and Answers, PHS Publication No. 2098.
7. Stimulants: Some Questions and Answers, PHS Publication No. 2097.
8. Selected Drug Abuse Education Films.

The following publications, although not part of the basic packet, are very popular and are usually available:

1. Directory of Narcotic Addiction Treatment Agencies in the U.S.
2. Drugs of Abuse (BNDD publication)
3. Fact Sheets (BNDD publication)
4. Suggested Drug Abuse Speech (NIMH)

The Clearinghouse occasionally has copies of the following: (Depending on print orders, number of requests, cooperation of other agencies)

1. (Is it Possible) That Someone You Care About Has Changed For No Apparent Reason (BNDD)
2. How to Plan a Drug Education Workshop for Teachers (NIMH)
3. Recent Research on Narcotics, LSD, Marihuana and Other Dangerous Drugs (NIMH)
4. Youthful Drug Use (SRS)
5. Katy's Coloring Book About Drugs and Health (BNDD)
6. Are You Just Watching. . . (BNDD)
7. Adverse Reactions to Hallucinogenic Drugs (NIMH)

General requests for educational materials are answered with an educational packet which includes the basic packet and the following:

Resource Book for Drug Abuse Education and a Curriculum Brochure

The Clearinghouse does not have copies of the following, but may refer inquirers to those publications:

1. Common Sense Lives Here (A publication developed and distributed by the National Coordinating Council on Drug Abuse Education and Information)
2. Drug Abuse Symptoms Poster (Available from BNDD and GPO)
3. Drug Abuse: The Chemical Copout (Published by the National Association of Blue Shield Plans, Available from Medical Services of D. C.)
4. Drugs on the College Campus (Available from local bookstore or library)
5. Handbook of Federal Narcotic and Dangerous Drug Laws (Available from BNDD or GPO)
6. A Community Mental Health Approach to Drug Addiction (Available from GPO)

7. A Community Program Guide: Drug Abuse Prevention (Available from BNDD and GPO)

8. Drug Abuse: Game Without Winners (From DOD or GPO)

9. Wild Hemp (marihuana): How to Control it (From GPO)

Box 23800
TWU Station
Denton, Texas 76204
November 7, 1970

Mr. Lem Nichols
Drug Education Supervisor
Garland Public Schools
Garland, Texas

Dear Mr. Nichols:

This letter is a request for your assistance in the conduct of a research problem that I am attempting. I would like to request that you provide me with samples of Drug Education literature being used by your school district for grades 5-12. A bibliography of this literature will be acceptable, if samples are impossible.

You were recommended to me by Dr. Don Merki, who will be advising me in this research. It is anticipated that the outcome of my research will be of some significance to the curriculum personnel in Texas school districts.

Your acknowledgment of this request, at your earliest convenience, will be greatly appreciated.

Sincerely,

Emma D. Morris

(Mrs.) Emma D. Morris
Graduate Student
Texas Woman's University

GARLAND PUBLIC SCHOOLS
GARLAND, TEXAS 75040

November 11, 1970

Mrs. Emma D. Morris
Box 23800
Denton ** 76201
Texas

My dear Mrs. Morris:

Thank you for your kind letter of November 7, 1970, requesting information regarding the Drug Education units taught in the Garland Public Schools.

We are well aware of the seriousness of the problem and are providing our teachers with a bibliography of sorts of material available. I am very happy to send you a copy of this list of materials and hope that you will find it useful to you in your research.

As you well know, as of this time, no official course of study has been prepared by the State Department of Education. The teachers who present a unit on Drugs, be they teachers on the elementary level, the junior high level, or the high school level, are given, more or less, freedom to work up the units as they see fit.

Please keep me posted on the progress of your research problem, and, if it is at all possible, I should like to get a copy of your findings and recommendations.

Very sincerely yours,

Lemuel S. Nichols,
Curriculum Consultant
Garland Public Schools

SUPPLEMENTAL AND REFERENCE MATERIAL

FOR THE PRESENTATION OF

A UNIT ON DRUGS AND NARCOTICS

Prepared by Lemuel S. Nichols under the direction of Mr. W. E. Peters, Assistant Superintendent of Schools, Garland, Texas.

DRUGS: USE OR ABUSE? Research from Department of Pharmacology, University of Texas Medical School, San Antonio, Texas.

DRUGS OF ABUSE: Research from Bureau of Narcotics and Dangerous Drugs, 1114 Commerce St., Dallas, Texas

MARIJUANA: Research from U. S. Department of Health, Education, and Welfare, Publication No. 1829.

DRUG ABUSE, PROBLEMS OF IDENTIFICATION: Research from Timberlawn Foundation, Inc., 2750 Grove Hill Road, Dallas, Texas

LAYMAN'S GUIDE TO T E PHARMACOLOGY, PHYSIOLOGY, PSYCHOLOGY, AND SOCIOLOGY OF L. S. D.: Research from Bureau of Narcotics and Dangerous Drugs, 1114 Commerce Street, Dallas, Texas.

NARCOTICS: Research from National Institute of Mental Health, Chevy Chase, Maryland, 20015.

DRUG ABUSE: THE EMPTY LIFE: Smith, Kline, & French Laboratories, 1500 Spring Garden Street, Philadelphia, Pa., 19101.

DRUGS AND YOU :
ALCOHOLISM : Pamphlets from Channing L. Bete Co.,
ABOUT DRUG ABUSE : Inc., 45 Federal Street, Greenfield,
THE LAW AND YOU : Mass., 01301.
TO SMOKE OR NOT TO SMOKE :

RESOURCE BOOK FOR DRUG ABUSE EDUCATION: U. S. Dept. of Public Health, Education, and Welfare, Public Health Service, Chevy Chase, Maryland, 20015.

NATIONAL INS TITUTE OF MENTAL HEALTH, 5454 Wisconsin Avenue, Chevy Chase, Maryland, 20015.

DRUG ABUSE, THE CHEMICAL COP-OUT, Blue Cross-Blue Shield of Texas, Dallas, Texas

STUDENTS AND DRUG ABUSE, U. S. Dept. of Health, Education, and Welfare, Box 1080, National Institute of Mental Health, Washington, D. C.

KIDS, L. S. D., AND POT: Bureau of Narcotics and Dangerous Drugs, U. S. Department of Justice.

DRUG ABUSE EDUCATION: Curriculum Guide for Dallas Schools, $3.00 plus tax, Auditor's Office, Dallas Independent School District, 3700 Ross Ave., Dallas, Texas

APPENDIX J

SOURCES OF SUPPLEMENTARY MATERIAL USED IN THE STUDY AND LIST OF SELECTED SCHOOL DISTRICTS

	Name of Pamphlet	Publisher
	Professional	
1.	Marihuana Thing	American Medical Association
2.	Dependence on Cannabis	"
3.	Marihuana and Society	"
4.	Dependence on LSD and Other Hallucinogenic Drugs	"
5.	Dependence on Barbiturates and Other Sedative Drugs	"
6.	Dependence on Amphetamines and Other Stimulant Drugs	"
7.	The Crutch that Cripples	"
8.	Marihuana	"
9.	LSD	"
10.	Glue Sniffing	"
11.	Barbiturates	"
12.	Amphetamines	"
13.	Marihuana: Social Benefit or Social Detriment	"
14.	Fighting Illegal Drug Traffic	Smith, Kline & French
15.	What Everyone Should Know About Drug Abuse	Channing L. Bete, Co.
16.	About Drug Abuse	"
17.	Drugs and You	"
18.	Glue Sniffing	University of Texas School of Pharmacy
19.	Medicinal Narcotics	Pharmaceutical Manufacturers Assn.

	Name of Pamphlet	Publisher
20.	A Guide for the Professions	American Pharmaceutical Assn.
21.	Know About Drugs	American Education Publications
22.	Vigilance is the Key to Drug Security	Eli Lilly, Company
23.	Drug Abuse: What One Company is Doing	Eli Lilly, Company
24.	Ancient Drug and Modern Social Problem	Eli Lilly, Company
25.	Drug Abuse: Drug Dependence	Eli Lilly, Company
26.	Facts About LSD	Addiction Research Foundation
27.	Facts About Amphetamines	Addiction Research Foundation
28.	Facts About Solvents	"
29.	Facts About Tranquilizers	"
30.	Handbook About Drugs	"
31.	Drugs--The Thief of Life	Grand Prairie School District

Governmental

32.	Recent Research on Narcotics, LSD, Marihuana and Other Dangerous Drugs	National Institute of Mental Health
33.	Answers to the Most Frequently Asked Questions About Drugs	"
34.	Volatile Substances	"
35.	Sedatives	"
36.	Why Adolescents Drink and Use Drugs	"
37.	Students and Drug Abuse	"
38.	The Up and Down Drugs	"

Name of Pamphlet	Publisher
39. LSD: Questions and Answers	National Institute of Mental Health
40. Narcotics: Questions and Answers	"
41. Marihuana: Questions and Answers	"
42. Before Your Kid Tries Drugs	"
43. The Dangers of Marihuana	Bureau of Narcotics
44. Teen Age Booby Trap	"
45. Fact Sheet (1970)	"
46. Has Anyone You Care About Changed?	"
47. LSD-25: A Factural Account	"
48. Katy's Coloring Book	"
49. Drug Abuse: Identification of Narcotics	"
50. LSD--The False Illusion Part I	"
51. LSD--The False Illusion Part II	Food and Drug Administration
52. Drug Abuse: The Empty Life	"
53. Fact Sheet (1968)	"
54. How Safe Are Our Drugs	"
55. Young Scientist Look at Drugs	"
56. The Use and Misuse of Drugs	"
57. Drugs of Abuse: Identification of Controlled Drugs	"
58. The Roach	Texas Education Agency

Name of Pamphlet	Publisher
59. Caution Cartoons	Texas Education Agency
60. The Village Hippie	Texas State Dept. of Health
61. The Little Smokers	"
62. The Smoking Habit	"
63. Don't Let Your Health Go Up In Smoke	"
64. Smoking and Illness	Public Health Service
65. The Facts About Smoking and Health	"
66. Smoking Affects Two Lives	"

Voluntary-Civic

67. Marijuana and You	Texas Alcohol Narcotics Education
68. Why Not Marijuana	"
69. LSD: Trip or Trap	"
70. Guide of Abused Drugs	"
71. Let's Talk About Drugs	"
72. Glue Sniffing: Big Trouble in a Tube	"
73. Goofballs and Pep Pills	"
74. The Truth About Drugs	"
75. Operation "Can-Quit"	"
76. Alcohol--Servant & Master	"
77. Alcohol or Highway Safety	"
78. Alcohol: Fun or Folly	"
79. Deciding About Drugs	Kiwanis International

Name of Pamphlet	Publisher
80. Drug Abuse: Identification	Kiwanis International
81. The Narcotic Addiction Problem	American Social Health Assn.
82. Drug Addicts are Getting Younger	American Social Health Assn.
83. Facts About Drugs	"
84. Drug Abuse: The Chemical Cop-Out	Blue Cross-Blue Shield
85. Marihuana and Other Relevant Problems	American Bar Assn.
86. Narcotics	American Assn. of Sheriffs
87. Mission Information	Moody Foundation
88. Turning On: Two Views	Encounter
89. Nicky Cruz: Gives the Facts	Ordeal: Logos Press
90. What We Can Do About Drug Abuse (1970)	Public Affairs Committee
91. What About Marihuana	"
92. Alcohol and Alcoholism	"
93. What We Can Do About Drug Abuse (1968)	"
94. Me Quit Smoking? How?	National Tuberculosis Assn.
95. Cigarette Smoking: The Facts	"
96. Smoking and Health	"
97. Who Me?--Quit Smoking	American Cancer Society
98. To Smoke or Not to Smoke	"
99. Smoke Cigarettes? Why?	"
100. Let's Talk About Marijuana	Illinois Action on Alcohol Problems

SURVEY OF SELECTED SCHOOL DISTRICTS USED IN THE STUDY

1. Alamo Heights Independent School District
   Mr. James Nelson, Director Health Education

2. Carrollton-Farmers Branch Independent School District
   Mr. Kenneth Bush, Assistant Superintendent

3. El Paso Independent School District
   Mr. Ted Kepple, Consultant Drug Education

4. Garland Independent School District
   Mr. Lemuel S. Nichols, Curriculum Consultant

5. Grand Prairie Independent School District
   Mr. Earl T. Keel, Curriculum Director

*6. Irving Independent School District
   Marilyn McHam, Coordinator

7. Laredo Independent School District
   Graciela C. Ramirez, Curriculum Director

*8. Richardson Independent School District
   Mr. Jerry Miller, Coordinator, Drug Education

Additional Information

9. Texas Education Agency, Austin, Texas
   Miss Marilyn Boone, Consultant, Drug Education

*10. Region 20, Educational Service Center
   Miss Linda Pringle, Consultant
   San Antonio, Texas

*Regional Service Centers, Drug Education

APPENDIX K

HOUSE BILL 467 - CRIME AND NARCOTICS EDUCATION

APPENDIX K

HOUSE BILL 467 - CRIME AND NARCOTICS EDUCATION

Article 2654-1e
House Bill No. 467

EDUCATION - CRIME AND NARCOTICS DANGERS - ADVISORY COMMISSION

Section 1. The Central Education Agency shall develop curricula and teaching materials for units of study on the dangers of crime and narcotics. The units of study shall be required for all students each academic year for grades five through twelve.

Section 2. (a) The Crime and Narcotics Advisory Commission is created. The advisory commission is composed of nine members, who shall serve for terms of two years expiring January 31 of odd-numbered years.

(b) The Governor shall appoint three members of the commission, with the following representation:

(1) a licensed physician;
(2) an official of the Department of Public Safety; and
(3) a narcotics official from the Federal Bureau of Narcotics and Dangerous Drugs.

(c) The Lieutenant Governor shall appoint three members of the commission, with the following representation:

(1) an official of a local-level law enforcement agency;
(2) a group social worker; and
(3) a public school superintendent in a city with a population of over 200,000, according to the last preceding federal census.

(d) The Speaker of the House of Representatives shall appoint three members of the commission, with the following representation:

(1) a businessman;
(2) a college student who is either a senior or a graduate student; and
(3) a juvenile judge who serves in a city with a population of over 200,000, according to the last preceding federal census.

(e) The advisory commission shall meet when the chairman deems necessary. The commission shall elect its chairman, vice chairman, and any other officers it deems necessary. The commission shall adopt rules to govern the conduct of its business.

(f) Members of the commission shall serve without compensation, but each member is entitled to reimbursement for actual and necessary

expenses incurred in performing his duties, as provided by legislative appropriation.

Section 3. (a) The advisory commission shall:

(1) advise and assist the Central Education Agency in developing curricula and teaching materials for a course on the dangers of crime and narcotics;

(2) advise and assist the Central Education Agency in designating the number of hours that the course shall be taught; and

(3) assist local citizens' groups formed to combat unlawful use of and traffic in drugs and narcotics.

(b) The commission shall develop a research program designed to measure the effectiveness of the commission's activities and shall prepare a research report annually to facilitate planning and development.

(c) The commission shall cooperate and coordinate their activities with any other state agency or legislative committee or commission that is investigating or studying drug and narcotics activity, availability, or use in Texas.

Section 4. (a) In order to keep the teachers abreast of the latest developments in the subject matter, the Central Education Agency with the cooperation of the advisory commission shall provide by regulation for annual instruction sessions.

(b) Every person assigned to teach the course in the public schools shall attend the instruction sessions as required by regulation of the Central Education Agency.

Section 5. This Act takes effect September 1, 1970.

Section 6. Emergency clause.

Effective June 10, 1969.

APPENDIX L

SAMPLE PASSAGE AND APPLICATION OF THE FORMULA

SAMPLE PASSAGES

An illustration of the mechanics of using the formula is given here. The following three samples were taken from a fourteen page pamphlet, Lets Talk About Drugs, published by TANE Press, Dallas, Texas. The underlined words are not found in the Dale list and are by definition unfamiliar words.

Sample 1

A friend of Joshua's returned from Morocco with some marijuana. This they must try. This experience they must have. At first that's all it was--an experience and an experiment. But they enjoyed the thrill they experienced.

However, as their "pot parties" gradually lost their thrill, the students graduated to cocain and heroin. Joshua became "hooked," yes, hopelessly, horribly, despairingly addicted.

In a final futile and folly-filled attempt to cure himself, he died of poisoning from alcohol and another drug he had hoped would relieve some of the horrors of his addiction.

About this same time the Oxford University newspaper reported that at least 200 of their 9,000 students were addicted to habit forming drugs.

Sample 2

Nor is this as tragic as the 18-year-old youth who ran out into the street crying: "I've killed my best friend!" something that he truly had done with a knife after the two had spent the evening sniffing glue. Nor is it as heartbreaking as the 19-year-old who was found dead with his head in a sleeping bag, several empty tubes of airplane glue mutely signaling the cause of such an untimely and unnecessary death.

Glue sniffing, or more accurately, "solvent sniffing," is at best a dangerous, grossly overrated method of obtaining a "kick". Through misinformation this has come to be known as a "safe" and easily obtainable medium by which even the most youthful teenagers may become drunk.

Sample 3

Recently however Laura sleeps soundly for only a few hours. Becoming restless, she awakens enough to roll, toss, worry and wind-up again. The following day she is drowsy on

the job. She notices some unsteadiness of her gait. Her memory and power of concentration are less sharp than they have been. She is irritable and finds it difficult to get along with her coworkers.

Another visit to her physician soon brings a complete interdiction of Laura's sedative-taking, combined with some sound advice about organizing her work at home, with more participation and help from her husband and children. More relaxation, more unwinding and less whipcracking over herself soon bring about a complete subsidence of symptoms.

Readability Work Sheet

Article: Lets Talk About Drugs	Page No. 5	Page No. 7	Page No. 9
Author: Lindsey R. Curtis	From A friend	From Nor is	From Recently
Publisher: TANE Press	To forming drugs	To become drunk	To symptoms
Date of Publication: 1970			
1. Number of words in the sample.....	117	123	116
2. Number of sentences in the sample.....	9	4	8
3. Number of words not on Dale list.....	22	21	22
4. Average sentence length..... (divide 1 by 2)	13.00	30.75	14.50
5. Dale score..... (divide 3 by 1, multiply by 100)	18.80	17.07	18.96
6. Multiply average sentence length (4)..... by .0496	.6448	1.5252	.7192
7. Multiply Dale Score (5) by .1579.....	2.9685	2.6953	2.9937
8. Constant.....	3.6365	3.6365	3.6365
9. Formula raw score (add 6, 7, and 8).....	7.2498	7.8570	7.3494 = 22.4562

Average raw score of 3 samples....7.4854 Analyzed by Emma Morris Date 6-4-71

Average corrected grade-level.....9 Checked by D'Anna Morrow Date 6-14-71

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