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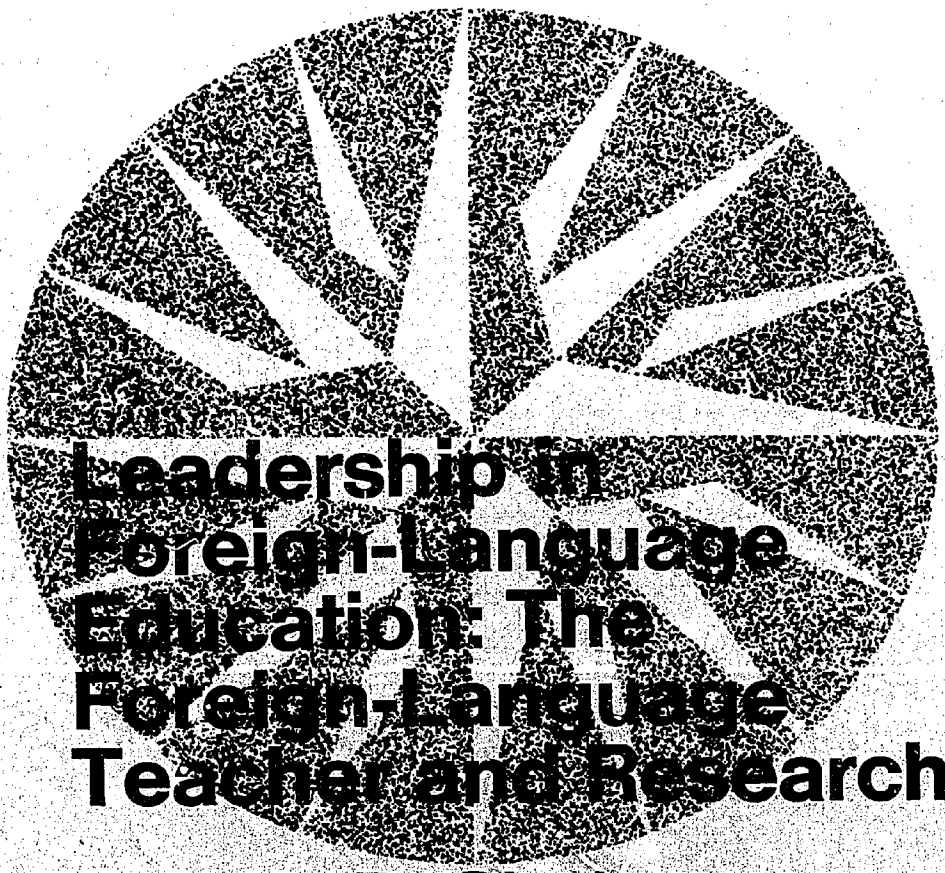
ABSTRACT

The relationship of the foreign language teacher and the researcher is explored in this report which focuses predominately on three main aspects: (1) locating research, (2) evaluating research, and (3) conducting research. An overview of the role of the teacher as potential researcher introduces the principal sections. Distinctions between overview reading and topical reading include references to specific journals, periodicals, and other sources considered to be important to language teachers. Guidelines which identify the most important criteria in evaluating typical research undertakings concentrate on demonstrating how teachers may determine the applicability and validity of research for their particular needs. Advice for the teacher conducting research stresses the need to limit the scope of the problem and the careful development of an operational plan. A bibliography is included. (RL)



Leadership in Foreign-Language Education: The Foreign-Language Teacher and Research

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I. INTRODUCTION

Why should the foreign-language teacher[1] become interested and involved in language-teaching research? Certainly, language teachers can "do without" research in the sense that even a rudimentary background in this area is virtually never a prerequisite to employment or advancement. Certainly also, the already great demand made on the teacher's time and energies—both during and after regular school hours—is a factor that must be weighed in any decision to undertake additional professional activities of an essentially elective nature.

Although it is ultimately impossible to make a fully compelling case for research involvement on the part of the foreign-language teacher, it is possible to identify certain benefits of both a personal and professional nature that could be expected to result from a modest degree of attention to research and research concerns. First, a working familiarity with the purposes, techniques, and outcomes of language-teaching research would help to moderate the highly polarized opinions about research and research workers held by many in the teaching field. At one extreme is the teacher who accords the status of pedagogical gospel to any "research finding"; at the other extreme is the teacher for whom all experimental studies are meaningless exercises carried out by "research people" far removed from classroom realities. One goal, then, of the teacher's research involvement would be to gain a more balanced view of research as a field of inquiry that exhibits both successes and failures. With this more moderate view would come the ability to judge the significance or lack of significance of a particular research study, and to assess its contribution to pedagogical theory and practice.

A second benefit, closely related to the first, would be the avoidance or minimization of the bandwagon partisanship that has typically accompanied publication of such "bombshell" research studies as the Keating report on language-laboratory use,[2] or more recently the Pennsylvania study comparing audiolingual and traditional teaching methods.[3] In these and similar instances, many of the unproductive charges and countercharges, debates and polemics stimulated by the reports might have been avoided if a greater

[1] Although for convenience the single term "teacher" will be used throughout the report, these discussions are intended also for language coordinators, supervisors, prospective language teachers, and others who are interested in foreign-language research but who have little or no formal experience in this area.

[2] Keating (1963).

[3] Smith and Berger (1968); Smith and Baranyi (1968).

proportion of teachers and other members of the profession had carefully read the reports in question and had arrived at an independent, reasoned appraisal of their shortcomings, merits, and practical significance. It is the rare research study that is all good or all bad. More typically, a given investigation has certain flaws but at the same time has something to say; and to the extent that language teachers and others in the field can learn to avoid an oversimplified, black-and-white approach to research studies, the accurate evaluation of those studies and the application of any pertinent and reliable findings to the actual business of classroom instruction will be facilitated.

A third benefit inherent in the teacher's research involvement is that he becomes aware of and has easy access to a large body of accumulated knowledge in diverse areas of foreign-language instruction. This information can be of considerable value to the teacher who wishes to try new approaches in his own classroom but who seeks assurance that these approaches have been found useful for the intended purpose through controlled experimentation.

A significant general benefit of an increased involvement of foreign-language teachers in research is the growth in status of foreign-language teaching as a well-conceived, rationally supported, and thoroughly professional endeavor. Rather than relying for research initiative on psychometricians, psychologists, and others who are, in general, only peripherally associated with foreign-language teaching, language teachers themselves must assume the major share of responsibility for initiating and carrying out research studies that are of greatest importance to them in their classroom role and, by the same token, of the greatest potential benefit to their students.

Although these and perhaps a few other tangible benefits can be cited in support of the practicing teacher's involvement in research concerns, the final and most personal justification for such an involvement must come from that indefinable motivation that interested language teachers have always had for going beyond mere job requirements into other areas of professional development and activity. The same impetus that leads a teacher to create a "cultural island" in the classroom, to obtain and make use of realia, to sponsor language clubs or to show movies, to find foreign pen pals for his students, to attend summer institutes and special training programs, to participate in language-teaching conferences and other professional meetings, must be the major impetus for his involvement in language-teaching research. While documents such as the present paper can and should suggest ways in which the teacher's investment of time and energy in the research area can be most effective, the final decision to make

such an investment must rest with the teacher and must reflect his willingness to go beyond the minimum requirements of his daily teaching role.

A Program for "Research Involvement"

A suggested program to help the teacher become more familiar with and more closely involved in research includes three major areas of activity: (1) locating research, (2) evaluating research, (3) conducting research.

"Locating research" involves as a preliminary step a certain amount of overview reading intended to provide a concise and accurate survey of the various areas in which language-teaching research has been undertaken and to outline the broad theories of language learning that have given (or that should give) direction to instructional research. In the course of this overview reading, the teacher should also attempt to identify one or more specific research areas that are of particular interest to him and that would serve as investigatory threads to be followed in a topical reading program. It is at the topical reading stage that the teacher would learn to locate published research in a given area and to make effective use of language-teaching bibliographies and other information sources.

Simultaneously with the development of skills in locating research, the teacher would gain experience in evaluating research through the critical reading of experimental studies in an area of interest. The teacher's own background knowledge of language-teaching principles and procedures, together with a familiarity with certain basic research-reading techniques, should be—with practice—largely sufficient to arrive at an accurate appraisal of the validity and usefulness to the profession of a particular piece of research.

A final, optional step would be the carrying out of a research project in some area of interest, either alone or in collaboration with other language teachers or professional staff. Although such an undertaking would certainly require considerable time and effort, the prospect of conducting a study of one's own should have strong appeal to any teacher who in the course of his earlier involvement with the research literature has become interested in the closer investigation of a particular topic or phenomenon. The possibility of conducting experimental studies in the language-teaching area is by no means closed to persons lacking formal research training. Indeed, the knowledge-about-research gained

by the teacher over the first two stages of the suggested program would go far toward providing the necessary background. This background, together with any necessary assistance from psychometricians, technicians in statistical analysis, or other such persons usually available within the school system, should bring the conduct of at least modest research projects well within the purview of the interested foreign-language teacher.

II. LOCATING RESEARCH

Overview Reading

The foreign-language teaching profession is fortunate in having available to it a number of comprehensive and well-written overviews of research undertakings that have been carried out in this field. In the Encyclopedia of Educational Research (1960), Birkmaier reviewed the research literature published between 1940 and 1960. Carroll, in a later edition of the same work (1969), summarized studies conducted up until quite recently. Other important reviews of the research literature are available.[4] Of particular importance for overview purposes is the extensive annotated bibliography of foreign-language-teaching research compiled by Nostrand that covers the years 1945-64. Useful sources discussing basic theoretical considerations in foreign-language pedagogy and related research are also available.[5]

It is not intended that the teacher carefully and exhaustively peruse all of these sources at the outset. It would be hoped, however, that by reading through these materials the teacher would get a general notion of the different areas of language pedagogy in which research has been conducted over the past twenty or thirty years, and conversely, those areas in which considerable investigatory work has yet to be done.

In addition to providing background information, an important goal of the overview reading would be to help the teacher identify one or two language-learning topics or problem areas that he would like to examine in considerably greater detail. The topic or topics selected for closer investigation could be drawn from a wide number of categories, including for example: the teaching of foreign languages to young children, the relationship between language aptitude and learning ability, the role of student motivation

[4] Birkmaier (1958); Birkmaier and Lange (1967); Carroll (1966).

[5] Carroll (1960, 1965; overviews); Charles A. Ferguson (1966; applied linguistics); Ornstein (1968; programmed instruction; Rivers (1964; psychology of language learning).

in classroom learning, programmed instructional techniques and materials, test construction theory and the development of valid and efficient language-testing instruments, optimum procedures for introducing and reinforcing vocabulary items, linguistic and pedagogical considerations involved in taking students beyond basic dialogues and pattern sentences into a freer and more active use of the language, and so forth. In all cases, the primary consideration is the degree to which the topic interests and is of potential value to the teacher.

Topical Reading

His specific research area identified, the teacher should return to the overview studies previously described to note relevant works in print. While it is not necessary or even realistically possible for the teacher to read all of the previous studies on a given topic, it is important for a balanced view of the problem area and as a background for interpreting current research in the area that the most significant prior studies be examined in some detail. Commentary by the authors of the overview articles cited will be helpful in identifying the important works in the area, and summary descriptions of individual studies in Nostrand or other annotated bibliographies should also help to differentiate "must read" studies from the more limited or peripheral investigations.

It is entirely understandable that persons with little prior experience in research and the evaluation of research studies would initially have a certain amount of difficulty in reading typical research articles or other experimental reports. Nonetheless, it is possible—with good will and reasonable perseverance, together with the knowledge of a few basic principles and techniques of "research reading"—for the novice to acquire quite rapidly the ability to read research documents with insight into their adequacy, accuracy, and overall significance. The guidelines shown in the later section on evaluating research should be of help in the initial stages, and increasing facility can be expected after the first two or three reports have been read with some degree of application.

Following or in conjunction with a reading of important previous work in a chosen research area, the teacher would want to adopt a system for identifying, on a continuing basis, current literature in the field of interest. An important initial suggestion would be for him to subscribe, if he does not already do so, to certain of the most important journals in the language-teaching field. Although it is possible in theory to read someone else's copy of a given journal, or to review periodically the school library's copy, it is usually difficult to do so in a convenient or consistent way. Further, the possibility of making marginal notes on the documents themselves or of keeping an at-home collection of earlier issues would imply a personal subscription.

There are several language journals to which one might subscribe.[6] Certainly, both Foreign Language Annals and The Modern Language Journal would be at or near the head of any list of periodicals covering research on language-teaching methodology. In addition to presenting research articles as such, Foreign Language Annals fulfills important bibliographical functions that will be described later.

In addition to these two journals, the teacher interested in foreign-language research would want to select other publications on the basis of his own language speciality or particular interests. The journals of the AAT's would of course merit early consideration (French Review, German Quarterly, Hispania, Italica, Slavic and East European Journal). Two recently established periodicals, Die Unterrichtspraxis and the NALLD (National Association of Language Laboratory Directors) Journal, report general pedagogical studies and language laboratory/audiovisual studies, respectively. Language Learning, published by the Research Club in Language Learning at the University of Michigan, contains both descriptive articles in a variety of linguistic areas and language-teaching research reports.

Other journals worthy of mention are Le Français dans le Monde, covering primarily the teaching of French, and the International Review of Applied Linguistics (IRAL), devoted to pedagogically oriented linguistic studies and to more general psycholinguistic topics. The publications of the American Educational Research Association (AERA)—which include the American Educational Research Journal, the Review of Educational Research, and a newsletter, Educational Researcher—are concerned with research in the field of education generally. However, they often report studies of relevance to foreign-language teaching. Membership in the AERA includes a subscription to these periodicals.

[6] Subscriptions to most of these journals also include membership in the corresponding professional organization—a worthwhile benefit in its own right. For subscriptions to the journals cited, contact: Foreign Language Annals: American council on the Teaching of Foreign Languages, 62 Fifth Ave., New York, N.Y. 10011; Modern Language Journal: Wallace G. Klein, Business Manager, 13149 Cannes Dr., St. Louis, Mo. 63141; French Review: F.W. Nachtmann, Executive-Secretary, American Association of Teachers of French, 59 East Armory Ave., Champaign, Ill. 61820; German Quarterly and Die Unterrichtspraxis: American Association of Teachers of German, 339 Walnut St., Philadelphia, Pa. 19106; Hispania: Eugene Savaiano, Secretary-Treasurer, American Association of Teachers of Spanish and Portuguese, Wichita State Univ., Wichita, Kan. 67208; Italica: Joseph E. Laggini, Secretary-Treasurer, American Association of Teachers of Italian, Rutgers Univ., New Brunswick, N.J. 08903; Slavic and East European Journal: Univ. of Wisconsin Press, Journals Dept., Box 1379, Madison, Wis. 53701; National Association of Language Laboratory Directors Journal: Sister Dorothy Zimmerman, Treasurer, NALLD, Mount Mary Coll., Milwaukee, Wis. 53222; Language Learning: Language Learning, 2001 North University Bldg., Univ. of Michigan, Ann Arbor, Mich. 48104; Le Français dans le Monde: European Publishers Representatives, 36 West 61st St., New York, N.Y. 10023; International Review of Applied Linguistics: Center for Curriculum Development, 401 Walnut Street, Philadelphia, Pa. 19106; Review of Educational Research, American Educational Research Journal, and Educational Researcher: Richard A. Dershimer, Executive Officer, American Educational Research Association, 1126 16th Street, N.W., Washington, D.C. 20036.

erusal of articles appearing in a limited number
ls will greatly assist the teacher to keep up with
re in a particular area. However, this activity
lemented by a monitoring system that will allow
pick up potentially interesting references from
an the journals regularly consulted. Of consider-
in this task are the facilities provided by the var-
ational Resources Information Center) Clearing-
ments in education and related disciplines, funded
e of Education. Of particular interest to the foreign
is the Clearinghouse on Languages and Linguis-
y the Modern Language Association of America.
se, usually referred to as MLA/ERIC, routinely
ie ERIC system research reports and other docu-
the teaching of all foreign languages (including
ond language), the preparation of foreign-language
ychology of language learning, presentation of the
rcultural content, psycholinguistics, theoretical and
s, and bilingualism.

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is quite inexpensive, but must be read with a spe-
ice. Hard copy is somewhat more expensive but can
read in the same way as ordinary printed matter.

the basic source of information for all ERIC-pro-
, useful lists referencing all documents in foreign-
g available through the reproduction service are
ied in Foreign Language Annals and merit con-
overview of recent publications in the language-
Although these lists do not include abstracts, they
ce numbers by which the appropriate abstract may
. The Current Index to Journals in Education (CIJE)
ily listing and semi-annual and annual cumulations
ated articles appearing in sociological, psycho-
etric, and other journals as well as those published
ucational journals. MLA/ERIC currently monitors
xty-five journals that publish articles on foreign-
- and linguistics.

ant source of bibliographical information is the
FL Annual Bibliography on the Teaching of Foreign

ublished so far appear in the December 1968, March 1969,
h 1970, October 1970, March 1971, and October 1971 issues
f each list are available from MLA/ERIC, and microfiche
ductions can be obtained from EDRS.

Languages. This bibliography, routinely published in Foreign Language Annals,[8] is based on a continuing review of almost three hundred journals, including both language-learning journals and journals primarily devoted to psychology, sociology, or other disciplines but which occasionally print articles of interest to foreign-language teachers. The Annual Bibliography has an indexing and cross-referencing system that facilitates locating references in a specific area of interest. The bibliography does not, however, contain abstracts, and it is thus necessary to refer to annotated sources such as RIE or to the original document to obtain information about the document beyond that supplied by its title and indexing in the bibliography.

A number of other bibliographical sources might be mentioned, including especially Dissertation Abstracts, covering theses and dissertations written at U.S. universities in all subject areas, and Psychological Abstracts, devoted primarily to topics in psychology and allied fields but occasionally reporting studies having application to foreign-language pedagogy.

Additional bibliographical sources will become apparent and appropriate in the course of the teacher's developing interest and background in a particular research area. It is suggested, however, that the teacher begin his literature-monitoring program on the basis of at-home subscriptions to a few carefully selected journals, supplemented by the monthly or annual perusal, as appropriate, of entries in RIE, the Lists of ERIC Documents, CIJE, and the MLA/ERIC/ACTFL Annual Bibliography.

III. EVALUATING RESEARCH

It is unfortunate that the term "research report" conjures in the mind of many teachers an arcane, cabalistic document that can be understood only by a select group of persons who have undergone intensive training in research methodology. While a formal background of this sort is never a hindrance in the accurate and comprehensive appraisal of research documents, persons with little or no prior training in research can—by making use of their own extensive knowledge of the foreign-language-teaching field and by following certain basic research-reading guidelines—determine with surprising accuracy the overall validity and usefulness to the profession of a given piece of research. The next few paragraphs describe in some detail what should be looked for in the critical reading and evaluation of a typical research report.

[8] For 1967, the Annual Bibliography was published in four successive issues of FLA, beginning in October 1967. A merged edition is available from the ERIC Document Reproduction Service. The 1968 Bibliography was published as a single work in the May 1969 issue of FLA; the 1969 Bibliography, in the May 1970 issue; and the 1970 Bibliography, in the May 1971 issue.

Is it really a research study?

Many of the articles published in language-teaching journals do not—nor do they intend to—report formal research studies. The term "research study" should be applied only to certain information-gathering activities that conform to specific and highly objectified procedural rules, and that are subject to evaluation and criticism by others on the basis of their conformance or lack of conformance to these rules. In keeping with the objective nature of the research activity itself is the high degree of detachment and succinctness with which research documents are generally prepared. A typical research report consists of a highly factual description of: (1) the research question or questions at issue (the hypotheses to be tested); (2) the nature of the experimental group (characteristics of the students or other participants in the experiment); (3) the experimental procedures used; (4) the tests administered or other measurements taken to determine the outcome of the experiment; and (5) the nature and results of any statistical or other kinds of analysis carried out. Only at the end of the report, in a conclusion or discussion section, would there be any element of personal opinion; and even here, general or subjective statements by the author would be minimal and closely tied in with the formal, objective results of the study.

Nonresearch articles take a wide variety of forms, and are properly evaluated according to such criteria as the reputation and background of the author in the area under study and the inherent logic and validity of the arguments presented. It is certainly not intended to suggest that nonresearch documents are lacking in usefulness to the profession or that they play an inconsiderable role in scholarly endeavors. Rather, the purpose of distinguishing between research and nonresearch studies is simply to emphasize that different principles of evaluation apply in the two cases.

Once it has been determined that a particular article does intend to describe a true research study, the reader is then in a position to apply to that article a number of review procedures that have been generally adopted for the evaluation of research studies and that are powerful and wide-ranging in that respect. Although it is not possible to list the many specific questions that might be asked of a given research study, it is possible to characterize the basic types of questions that would be at issue in a wide variety of research undertakings and that would form the nucleus of a reasoned and comprehensive appraisal of these undertakings.

Does the study address a significant problem in language-teaching methodology?

There is a wide difference among research projects in the number and scope of the problems or questions investigated. At one extreme is the small-scale, carefully delineated study of a single phenomenon such as the student's learning of foreign-language speech sounds under carefully controlled conditions of presentation and practice. At the other extreme are the more global studies of entire language-teaching methodologies, such as the comparison

of audiolingual and traditional methods carried out in the Pennsylvania study. Regardless of the scope of a particular study, the reader must ask himself whether genuine educational problems are being investigated—that is, whether information gathered as a result of the study would in fact have some useful application in real-life teaching situations. For those studies carried out in school settings and involving an investigation or comparison of clearly defined instructional procedures, real-life applicability is usually quite apparent. Studies of a more restricted or "laboratory" nature may of course also have obvious classroom significance, but in many cases the connection is not so readily apparent. Thus, except for investigations that are clearly addressed to "basic-research" topics, [9] the author of a report based on experimentation in a nonclassroom situation should be expected to describe in at least general terms how the results of his study might be translated into teaching practice.

Does the study take into account important prior research?

If the teacher has followed the background-reading suggestions made above, he should have some acquaintance with earlier basic studies in the area under investigation. The author's explicit mention of such studies would be expected, usually in the introductory paragraphs. While the presence of a large number of references is by no means an infallible indication of the overall quality of the report, the absence of references to previous closely-related studies would raise the possibility that the author does not have a comprehensive background in the field.

Are the important characteristics of the student participants or other experimental subjects clearly and completely described?

Such basic data as students'[10] age, sex, grade level, nature and extent of previous language training, type of school attended, and very importantly, the basis on which they were selected for the study (e.g., all the members of Miss Jones's class, every third student from a listing of the entire school grade in that language, any student who was willing to volunteer for the study, etc.) should be included. Detailed information about the students participating in the study is necessary both to evaluate the reported outcomes of the study and to judge the extent to which the findings could be extrapolated to other groups of students. The possibility of extrapolating or generalizing from the experimental group and situation to other groups and situations is one of the primary motivations for conducting research studies, and this aspect will be discussed

[9] For a discussion of important distinctions between "basic" and "applied" forms of educational research, see Carroll (1968).

[10] A technical term for an experimental participant is "subject," often abbreviated "S" in the research literature. However, since most subjects in educational experimentation are in fact students, it is appropriate to use the more familiar term here.

in greater detail in later paragraphs. The point to be made here is simply that extensive description of the status and background of the experimental participants is required if the reader is to obtain any idea of the extent to which such extrapolation is possible.

Is the experimental design sufficiently rigorous to rule out confounding factors?

Many investigations generally considered to be true research studies are pseudoresearch studies in that the experimental design does not include all of the procedural steps necessary to rule out the possibility that some factor or factors other than the experimental treatment was in fact responsible for the observed results. Barnes (1964) lists four types of "research" design commonly encountered in educational experimentation, of which only the last incorporates all of the important procedural elements: (1) "after-only" study without control group, (2) "before-after" study without control group, (3) "after-only" study with control group, (4) "before-after" study with control group. "Before" and "after" indicate the administration of appropriate tests or other evaluation instruments prior to or at the completion of the experiment. "With control group" and "without control group" denote the presence or absence of an additional group of student participants who are closely similar to the experimental group in background and prior training and who participate in all of the activities of the experimental group except for the single experimental activity or procedure being investigated.

In order to point out the differences among these various designs, let us assume that a classroom teacher has prepared a series of tape-recorded conversations and other passages in the target language that are carefully arranged in order of increasing lexical and grammatical complexity and speed of delivery. The research question is the extent to which student practice in listening to these materials in the language laboratory will increase general listening–comprehension proficiency as measured by a standardized test. In an "after-only" study without control group, the teacher would simply work with one group of students (the experimental group) and would test their listening–comprehension proficiency at only one point in time–following the experimental treatment of listening practice. Although this type of study has the advantages of speed and simplicity, it has major drawbacks that seriously limit its usefulness and validity as a true experimental procedure. In the absence of information on the students' listening–comprehension proficiency prior to the experiment, it could be suggested that the laboratory listening practice had little or no beneficial effect but rather that the end-of-experiment listening test scores reflected only the students' initial proficiency level, that is, the listening proficiency they had acquired from prior classwork or other training.

Possible influences arising from this prior study or exposure could, however, be controlled by means of a "before-after" design in which student performance would be tested both prior to and at the end of the experiment. By comparing, through appropriate statistical procedures, the test scores obtained at the end of the experiment to those obtained at the beginning, it would be possible to establish a certain direction and extent of change in listening proficiency (hopefully, positive and large) over the time period of the experiment. The results of a "before-after" study conducted with a single group could be considered a valid reflection of the merit of the experimental procedure provided that no influence other than procedure itself could reasonably be suggested to account for the "before-after" difference in student performance. Unfortunately, there are usually a large number of alternative explanations that can be proposed for the results of "before-after" studies using a single experimental group. A reader of this report might legitimately suggest that the students' listening-comprehension level was not increased as a result of the practice sessions in the laboratory but, rather, as a result of the normal classroom listening experiences that the students had over the same time period.

In order to rule out possible contamination of the observed results by these or other external factors, an additional experimental safeguard would be required: the use of a "control" group that would participate in all activities and undergo all influences of the experimental group except for the specific training procedure under investigation. In terms of the example experiment, the teacher would at the beginning of the study establish two separate groups of students: an "experimental" and a "control" group. The two groups would be set up either by matching students on the basis of years-of-instruction, class grades, and other background variables anticipated to affect their performance on the experiment or (more conveniently and probably more appropriately) by assigning the students to the two groups on a strictly random basis. The teaching situation would then be arranged so that both the experimental and control groups would have the same classroom experiences and would be treated similarly in all respects, except that the experimental group alone would receive the laboratory-listening practice.[11]

Again, an analysis of results would be made by comparing "before" and "after" scores for the experimental group, but with the important difference that corresponding "before" and "after" scores would also be available for the control group. If both the experimental and control groups showed comparable increases in

[11] So that total instructional time would remain the same for both groups, the teacher would probably arrange for the control group to carry out some unrelated activity such as reading a short story or other material during the period that the experimental group was listening to the practice tapes.

performance, it would be doubtful that the laboratory practice per se had any beneficial results. If, however, the increase in test score of the experimental group was much higher than that of the control group, a strong case could be made for attributing these gains to the laboratory-listening practice since—thanks to the original experimental design—presence or absence of the listening practice had been isolated as the only substantial difference between the two groups.

How, then, should the critical reader evaluate the results of a research study exemplifying one or another of these experimental designs? Only those experiments that operationally rule out the possibility of confounding influence by other-than-experimental factors—including both prior student knowledge and peripheral influences in the course of the experiment—should be considered true research studies in which a considerable degree of confidence could be placed. Because it is often difficult to set up a tight experimental design embodying all of the desired controls, many of the experiments reported in the language-teaching literature have been based on less than optimum designs. Studies of this type should not be dismissed out of hand but should be carefully read in an attempt to estimate the probable type, extent, and direction of nonexperimental influences that were operating in each individual case. Although studies that employ a less rigorous design cannot be considered definitive investigations, they may often be of considerable value in suggesting trends or pointing out useful areas for further experimentation.

Are the tests or other evaluation procedures appropriate for the intended purpose, and are they correctly used and interpreted?

All research studies, of whatever type, involve the collection of data on student performance through the use of some evaluation instrument or procedure. These instruments or procedures typically take such forms as the classroom observation of student behavior, the use of various questionnaires, or the administration of standardized or locally-prepared tests. In all cases, the validity and significance of the study hinge on the appropriateness of these measurement techniques and on their accurate utilization.

Of the various evaluation procedures, classroom observation is probably the most difficult to carry out in an objective manner. Researchers who make use of this technique must be very careful to adopt an observational system that minimizes subjective judgments on the part of the observer and that lends itself to reliable tabulation of the observations made. A procedure known as "interaction analysis"[12] has shown promise for objectively describing the behavior of both students and teachers in the classroom situa-

[12] For further information on this technique see Medley and Mitzel (1963), and Moskowitz (1967).

tion. However, these techniques are by no means so highly refined or well understood as are other evaluation techniques. For this reason, the reader of a research study based on classroom observation should look for, and should expect to find, a detailed description of the observational system used and the manner in which the final results were tabulated.

For research studies making use of questionnaires, a comprehensive report of evaluation procedures would include a detailed description of the questionnaire, including a number of sample items from the questionnaire or reproduction of the entire questionnaire. Since a reasonably large number of replies to a given question are needed for reliability, questionnaire results should show the number of students responding to each question, and not merely percentage figures.

Questionnaire data may be influenced by many subtle factors including the degree of student motivation in filling out the questionnaire, the format, wording, and sequencing of questions, and so forth. Payne (1951) provides excellent discussions of questionnaire design, use, and interpretation.

The administration of a test or battery of tests is the data-collection procedure used in the great majority of language-teaching research studies. In all cases, the most important question is the extent to which the content of the test corresponds to the behavior the researcher is attempting to measure. For example, let us assume that an investigator wishes to measure the accuracy of students' pronunciation of certain sounds when speaking the foreign language in a conversational situation. The testing procedure, however, involves only the student mimicry of a tape-recorded master voice. Thus, through a serious incongruity between the kind of student performance tested by the evaluative instrument (imitation of a model sound) and the performance that the investigator had intended to measure (accurate student-initiated pronunciation in an untutored situation), the results of the study with respect to the stated research goal are open to serious question.

By what means can the relatively unspecialized reader of a research study evaluate the suitability of the tests used for the purpose intended?

First, the author of the report must provide sufficient information about the tests administered. In the case of standardized, multiple-choice tests, minimal information would include the name of the test, the publisher, and the test form and level.

For standardized tests that are not multiple-choice (these would include primarily tape-recorded speaking tests and "fill-in" or "short-essay" types of writing tests), detailed information on the scoring procedures used should also be provided,

including information on any steps taken to determine scoring reliability, such as the rescoring of individual tests by the same rater or the pooled scoring of each test by a number of raters.

For many research applications, appropriate commercially distributed tests are not available, and the researcher must design his own instruments. In describing locally prepared tests, the author of a comprehensive research report should give much more information than that required for standardized tests. At a minimum, this would include: (1) identification of the corpus of materials on which the test questions are based (e.g., the vocabulary or grammar appearing in a certain textbook or textbook section; random or systematic selection of items from a frequency list or other tabulation); (2) a description of the question format (multiple-choice, fill-in-the-blank, written responses to spoken material, etc.); (3) a statement of the total number of items in the test and the amount of time allotted the student; (4) a description of the scoring procedures used, including information on any reliability checks conducted. Finally, several sample items should be presented.

Even if the author has provided a complete and accurate description of the tests used, it remains the responsibility of the reader to evaluate the appropriateness of the tests for the intended purpose. There is, unfortunately, no practical way to acquire this ability other than by becoming familiar with the nature and content of the major published foreign-language tests and by acquiring a reasonably extensive fund of information about language testing in general.

For published tests, the appropriate test catalog, sample test materials, test manual, and norms tables should be obtained from the publisher and read as basic background information. This is not a difficult undertaking, since there are relatively few published tests or test batteries in common use in foreign-language research studies. The detailed test reviews appearing in the series of Mental Measurement Yearbooks[13] should also be consulted. However, a reading of these reviews should not take the place of a close examination of the tests, their manuals, and other supporting materials.

Developing an ability to judge the appropriateness and technical merit of nonstandardized or locally prepared tests is by no means beyond the scope of the interested teacher. Useful background works in this respect include those by Lado (1964) and Valette (1967). Lado presents a theoretically oriented overview of language-testing procedures, with particular emphasis on evaluation concepts de-

[13] Buros (1965); see also earlier volumes by the same editor.

rived from contrastive linguistics. Valette outlines and discusses many different types of tests and test questions that can be developed on a local basis and gives practical suggestions on their appropriate use and interpretation. A testing work-kit developed by the Educational Testing Service[14] discusses the selection and use of standardized tests and also provides useful guidelines for local test development, scoring, and interpretation.

Is the statistical analysis appropriate to the data gathered and is it properly carried out?

Every experimental study requires some type of statistical analysis of the information obtained. The purposes of this analysis are: first, to translate the experimental data from their original raw form (e.g., entries on a classroom-observation form, questionnaire responses, individual test scores) into a more compact, more easily interpretable summary form; and second, to determine by means of specific computational tests whether the results of the experiment are statistically significant. The term "significant," as used in the statistical context, has a very precise meaning that should not be confused with ordinary or general connotations. Results of an experimental study are considered statistically significant when the experimental data are found to be of a sufficient overall magnitude (or, in comparative studies, sufficiently different from the "control" group data) that there is only a small probability that the observed results could have been obtained by chance rather than by the operation of the experimental procedure. Statistical analysis permits the probability of chance results to be determined numerically. Thus, when an investigator states that his experimental results are "significant at the .05 level," he is saying that his statistical analysis indicates that there is only a five percent probability (or less) that the results of the experiment can be attributed to the operation of chance factors. In most educational research, one of the two probability levels, .05 and .01, is adopted by the researcher as the level he will accept as "significant"; by choosing one of these levels he indicates that he is willing to accept a one-in-twenty or a one-in-a-hundred risk that the results he reports as "significant" are in fact attributable to chance.

Even if the results of a study attain statistical significance at a given level, this is by no means a guarantee that the results are significant in broader pedagogical terms. Suppose that in the laboratory-listening practice experiment previously described the experimental group was found to have "before-after" differences in scores on a fifty-item listening test that were about two points higher on the average than the control-group scores. Statistical analysis reveals that this difference is significant at the .05 level, but the question remains as to whether this relatively small average improvement in scores would justify the effort and expense required to incorporate the practice-listening materials into the class or school language program.

[14] Tests and Measurements Kit; available from the Educational Testing Service, Princeton, N.J. 08540.

Thus, the reader of a research report should—in addition to checking for statistical significance of the results—always attempt to judge whether the absolute magnitude of the reported scores or score differences would be sufficient to make a genuine "real-life case" for the experimental procedure under examination.

Although persons untrained in statistical-analysis procedures can and should acquire an appreciation of the concept of statistical significance and its application in the evaluation of research reports, it is doubtful that the self-study of statistical textbooks or other instructional materials will be of much use to the average teacher in gaining a close working knowledge of statistical procedures and their application in a given research situation. A formal course in educational or psychological statistics would probably be required for this purpose, and it is suggested that the interested teacher take such a course during the summer or through extension study.[15]

In the absence of experience gained from formal course work in statistics, the teacher would probably have to enlist the help of a qualified person within the school system to evaluate the appropriateness of a given statistical technique as used in a particular research study. This is not to suggest that every research study read by the teacher should be subjected to such a review. Rather, since any research report must pass muster in a large number of nonstatistical respects before the question of statistical accuracy becomes appropriate, a close review of statistical characteristics could be reserved for those studies that are found to incorporate successfully all of the other characteristics of a valid and meaningful study. In this connection, it should be emphasized that even the most complex and sophisticated statistical procedures cannot be considered to redeem in any way a study flawed by overall pedagogical insignificance, inappropriate selection of student participants, insufficiences of experimental design, or invalid measurement techniques.

Is the study so designed as to allow at least some generalization of the results to other student groups and educational settings, and are the stated conclusions in keeping with this level of generalization?

Consider a hypothetical research report in which the author concludes that "due to the specialized characteristics of the experimental participants and the specialized nature of the experimental procedure, it is not possible to extrapolate the results of this study to any other group of students or to any other curricular situation." We would wonder why the study was conducted in the first place, since its results are considered nontranslatable to any other students or school systems. Although this example is clearly over-

[15] For those who would like to undertake the reading of basic statistics texts on an "at-home" basis, George A. Ferguson (1966) and Edwards (1967) are recommended as standard, comprehensive treatments.

drawn, it does point up the need for the researcher to make provision–in the design and conduct of the experiment–for his results to be legimately extrapolated to some group or groups other than those involved in the study and to some pedagogical situation other than the particular context of the experiment.

In designing an experiment, it is relatively easy to incorporate at least some degree of generalizability. For example, rather than using "the brightest students" or "the students in Miss Jones's class," the experimenter might, through random selection or other means, identify an experimental group that could be considered typical of "all second-year language students in the high school." By choosing participants for the experiment on this broader and more heterogeneous basis, the researcher would operationally rule out the possibility that the obtained results would apply only to "the brightest students" or only to "Miss Jones's students" rather than to a larger and more interesting group.

Just as it is important for the researcher to provide for and to claim some useful degree of generalizability for his results, it is also important for him to avoid overgeneralizing his findings beyond the limits imposed by his experimental design. It would be inappropriate for the experimenter in the previous example to claim that his results were applicable to "second-year high school students in the United States," because he did not in fact experiment on a representative national group of students but only on a representative group of students at one high school. An appropriate summary statement for this experiment might be that the results are typical of students at the local high school, and possibly typical of students in other areas who have the same general I.Q. and socioeconomic status and who have undergone the same type of instruction at a comparable school.

Although the characteristics and basis for selection of the experimental group are usually the most important factors affecting the generalizability of results, the nature of the experimental procedure itself plays a substantial role. Small-scale experiments such as those involving the learning of certain speech sounds or lexical items cannot usually be extrapolated with confidence to dissimilar or broader contexts, although they may be highly definitive in the limited area surveyed. By the same token, results of experimental studies using self-instructional or programmed materials may be applicable only to the materials involved, unless it can be shown that their content and organization are comparable to other types of texts or materials. It should be incumbent on the author of a research report to describe the course of instruction involved in his experiment in enough detail to allow the reader to estimate whether the results are necessarily closely bound to the particular materials or procedures used, or whether they could reasonably be generalized to other texts or techniques with which they share certain common elements.

The above guidelines should help the teacher to identify the most important criteria of typical research undertakings, and to estimate the extent to which these criteria are met in particular studies. Increasing facility in applying these criteria and in evaluating other more peripheral aspects of a given study can be expected following a reasonable amount of practice.

Teachers who have "gotten into" the reading of research reports on the basis of these general guidelines may also find useful the more detailed and more technically oriented research check lists provided in Gage (1968) and Van Dalen (1958).

Useful treatments and background materials on research techniques and the evaluation of research include Festinger and Katz (1953), Travers (1969), and various articles from the Encyclopedia of Educational Research[16] and the Handbook of Research on Teaching.[17]

IV. CONDUCTING RESEARCH

It would be highly unrealistic to suggest that each and every classroom teacher should at some point in his career conduct a formal research study in some area of foreign-language instruction. It is not, however, unreasonable to expect that some teachers who have devoted considerable time and energy to locating and reading about the research activities of others would become interested in the prospect of carrying out research studies of their own.

The amount of work and personal application involved in conducting a useful experiment on some aspect of foreign-language teaching should not be minimized, but it should be made clear that such an undertaking is by no means beyond the capabilities and available resources of the practicing teacher.

Prior detailed study and analysis of a number of different research reports in an area of interest would be one of the most important types of preparation that could be made for carrying out experimental research. To this should be added the reading of various background sources cited in earlier sections of this report, and close attention to the broad procedural suggestions given below.

Choose a limited but significant research question.

A common tendency among beginning researchers is to choose a research question that is too complex and has too many different facets to permit adequate experimental study. Although experienced investigators often use research designs that allow them to test more than one hypothesis in a single experiment, it is much safer and less confusing for the novice researcher to identify a single,

[16] 4th ed., ed. Robert L. Ebel, et al. (New York: Macmillan, 1969).

[17] Ed. N. L. Gage (Chicago: Rand McNally, 1963).

carefully delimited student activity that he wishes to evaluate and to investigate the effects of that activity independently of all other aspects. It should also be determined at the outset that the research question can be operationally formulated in terms of student performance on a particular evaluation instrument or procedure.

Ideally, the topic would be selected on the basis of prior reading in an area of interest and would involve some area of inquiry for which suitable research information is not available. Investigation of a still unresolved problem would generally be required if the teacher were considering eventual publication of his research, and most teachers would want some assurance—through prior study of literature in the area—that they were not devoting a large amount of time and effort to a research question that had been comprehensively dealt with in earlier studies.

Arrange for the collaboration of any necessary resource persons.

Although the selection of a research problem and the development of a procedural outline for the study should be the responsibility of the language teacher as "principal investigator," it will often be desirable or necessary for him to collaborate with other persons, particularly in regard to data collection and analysis procedures. This collaboration should begin in the early stages of the project, so that the experimental design selected will permit the use of a recognized and appropriate statistical-analysis technique. It would also be highly useful for the beginning investigator to review his plans for the experiment with a person trained in research design. In many cases, an experienced researcher can suggest slight changes in the experimental plan that will make the study easier to carry out or that will permit more useful interpretation of the results.

Discussion of the intended study with other foreign-language teachers would provide a beneficial dialogue, especially on the practicality of the study and its pedagogical significance. A colleague might also agree to serve as co-worker and provide help in carrying out the experiment, administering and scoring tests, and so forth.

Write out a detailed research plan and review it carefully for conceptual and operational flaws.

Experienced researchers can often bypass the paperwork inherent in drawing up a detailed operational plan for a given study, especially if the study is to follow a common and straightforward research pattern. However, it is considered essential for the novice investigator to describe on paper and at some length all of the procedural aspects of the study, including information in the following areas: (1) a statement of the research question, cast in operational terms (in the listening practice experiment, for example, the appropriate operational hypothesis would be that the

student group undergoing language laboratory practice with the experimental tapes would show significantly greater "before-after" increases in listening comprehension test scores than would the control group); (2) a description of the way in which the experimental group or groups will be constituted (i.e., through pairing, random selection from a larger population, etc.), together with an indication of the level of generalization to other groups that can be anticipated; (3) a close description of the measuring instruments to be used and the way in which the measurements are to be made and tabulated; (4) a detailed "schedule-of-events" showing the points at which the various experimental activities are to take place; and (5) a description of the statistical-analysis procedures to be used.

A detailed plan of this type is necessary to assure the teacher that all major steps in the experiment have been considered in advance and that no significant design or procedural problems exist. The various elements of the plan should be checked against the criteria given in the preceding section, against other research guidelines such as those provided in Suydam (1968) and Van Dalen (1958), and then reviewed by any collaborating resource persons.

Carry out the experiment in accordance with the operational plan.

There is no single set of recommendations that would suitably cover the procedural aspects of all the various studies that might be carried out. However, the experiment should be conducted in such a way that no extraneous variables affect the course of the experiment or, if such influences cannot be avoided, in such a way that they affect both experimental and control groups comparably. Particularly to be guarded against is the so-called Hawthorne effect in which the teacher, by his own incautious approach to the experiment (e.g., through a show of obvious enthusiasm for the "new experimental technique"), may motivate the students to do better at the experimental task than would otherwise have been the case. Zimny (1961) describes this and other nonexperimental influences that may arise in educational or psychological research. A careful reading of this work will help to alert the teacher to various biasing factors so that he can guard against them from the outset. A good basic rule for experimental studies conducted in a school setting would be for the teacher to attempt, insofar as possible, to have the experiment go unnoticed—that is, not to alert the students to the fact that something special is happening or that there is any departure from normal course activity.

The teacher should also plan to keep a detailed written record of the experiment, especially if the study is to extend over a matter of days or weeks. Such a log would note the day or time at which each element of the experiment was introduced, the names of students present, any unusual occurrences, important observations

made by the teacher in the course of the experiment, and so forth. A careful record of this type can be of considerable help in the interpretation of experimental results and in the preparation of an experimental report.

Evaluate the statistical and practical significance of the study.

The teacher would be quite fortunate if the results of his study showed both statistical significance—as determined by an appropriate analysis procedure—and practical significance—as suggested by large increases in student test scores or substantial improvement over the performance level of a control group. Results that are statistically significant but which represent relatively small student gains are also useful in that they suggest the researcher may be on the right track in his investigations. A close reexamination of the details of such an experiment might indicate ways in which the materials could be improved or the procedure streamlined to produce more substantial increases in student performance.

Experimental studies that do not attain statistical significance are not necessarily failures. Provided that the design and conduct of the experiment are known to be correct and free of external, biasing influences, a finding of no significant difference based on a very high probability of chance success (perhaps .30 or higher) is useful in that it gives a frank indication of what is probably a "blind alley" of investigation. Such results, although less psychologically rewarding than positive ones, contribute to research knowledge by leading the investigator away from an apparently unprofitable line of inquiry toward a reorientation or reformulation that may have a greater chance of success.

Studies that barely fail to meet accepted significance levels (i.e., with chance probabilities of around .10 or .15) are often difficult to interpret. It is not possible, of course, to claim that the experimental outcome is statistically or pedagogically meaningful, but, on the other hand, the statistical results do come close enough to commonly accepted probability levels to suggest that some factors other than pure chance were operating in the experiment. Probably the best interpretative approach to a situation of this type would be to look very closely at the materials and procedures involved to judge whether any changes in the experiment could reasonably be expected to produce a considerable positive change in student performance. If, for example, the experimenter were to find on reexamination that a significant body of information had been inadvertently omitted from the student materials and that this had probably affected performance in a substantial way, the initial "almost significant" results could be considered suggestive of more substantial results that might be obtained following appropriate changes in the experimental materials. If, on the other hand, there is little indication that a restructuring of the experi-

ment would improve the results considerably, it would probably be better to discount the study at hand and to turn to some other avenue of approach.

Prepare a detailed report of the study for local information or for publication.

Except for those studies that are definitely failures in that they show serious conceptual or procedural flaws, every research undertaking should have the preparation of a detailed report as its final step. Such a report would provide the teacher and other persons in his school or school system a comprehensive record of the research activities undertaken and their results.

Studies that are felt to have been conducted with sufficient rigor and with appropriate attention to earlier studies in the area should also be submitted to a professional journal or other information source for possible publication.[18] It should be emphasized in this connection that there are no perfect experiments, and that even the most significant published research embodies minor flaws to which the researcher frankly admits and for which he attempts to estimate the direction and extent of experimental influence. Such shortcomings, if truly of a minor nature, should not rule out the possibility of having a study published, and there is every good reason to submit a comprehensive report to an appropriate publication.

Much of the necessary background work for writing a report will already have been done if the teacher has made the suggested written plan-of-attack before starting the experiment and has kept detailed notes in the course of the experiment. In preparing the report, the teacher would follow the content outline generally used for research reports, consisting (with minor variations) of: introduction, hypothesis, subjects, procedure, analysis, results, discussion, and conclusion. He would be careful to include, in an objective and succinct manner, all the information that the reader would require if he were to duplicate the experiment on his own. If all other aspects of the suggested "research involvement program" have been followed—including the critical reading of a number of typical experimental reports—the teacher should find the preparation of a comprehensive report of his own research activities a straightforward and even enjoyable undertaking.

[18] MLA/ERIC solicits reports of locally-conducted research studies and other unpublished documents of potential usefulness in foreign-language instruction. Accepted reports are catalogued in RIE and made available to the profession through the ERIC Document Reproduction Service (EDRS).

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