



Research Fundamentals in Home Economics

Third Edition

**Marjory L. Joseph
William D. Joseph**

RESEARCH FUNDAMENTALS IN HOME ECONOMICS / HUMAN ECOLOGY

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Marjory L. Joseph

California State University, Northridge

William D. Joseph

Glendale Unified Schools

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Preface

This text has been developed as a guide for upper division majors and graduate students in human ecology/home economics and related areas. It is designed to provide a basic background in research--what it is, how it is done, how it is evaluated, and how it is used. The book is divided into two sections. Part I is devoted to research fundamentals, while part II includes the tools, techniques, and statistics needed for evaluation of research data.

The discipline of home economics depends on continued research and development to maintain its place in society. Research provides new ideas, services, and products to help the family, business groups, educators, and consumers optimize the use of resources. Research helps home economists identify effective ways to furnish desirable food, clothing, and shelter, as well as to provide desirable mental, emotional, and social environments for individuals and families.

To understand, to use, and to evaluate research, the home economist must be able to understand and interpret research findings as well as to design, implement, and complete research studies. This text is designed to help students gain the knowledge necessary to:

1. Understand, interpret, and use research in home economics and related disciplines.
2. Evaluate research and literature in home economics and related fields, both quantitatively and qualitatively.
3. Plan, implement, and complete research studies that will improve individual and family life through the understanding and use of subject matter content from home economics and its related areas.

The various chapters of this book contain selected activities that may include study questions and problems. For most of the activities, answers to questions and solutions to problems are either included in chapters as part of the learning experience or in the appendix. Where appropriate, detailed solutions are included for some of the problems in order to help students understand the processes required for obtaining various statistical values.

Part I of the text includes chapters on the introduction to research, research strategies, research design, how to use supporting literature and research, data collection methods, the use of computers in research, how to prepare the research proposal, how to illustrate research reports, how to prepare the final research paper, and how the research consumer uses research findings, as well as how the research findings and reports are evaluated.

Part II concentrates on data analysis and evaluation. This part includes chapters on the types of research tools or statistics, the use of various descriptive processes, and the application of inferential statistics to various levels of measurement. This latter part includes the use of such tests as chi square, Spearman rho, Wilcoxon for ordinal data using matched pairs, Mann-Whitney U, Kruskal-Wallis, Pearson's r , Student's "t", and the analysis of variance (ANOVA).

The organization of this edition is consistent with the previous edition, the second, and represents additional refinement in content.

The appendices include the answers to most problems and questions included in the activities and those problems where answers are not provided in the chapter content. Other appendices include a review of basic mathematics used in the statistical tests, a summary of math symbols, and statistical tables used in determining significance of research findings.

Students may obtain mathematical answers that differ slightly from those supplied in the appendices or even those included within chapters. These differences may be the result of the method used for rounding figures, the decimal level to which work has been taken, and the method a calculator uses in rounding, as well as possible formulas built into the calculator or computer. However, at no time should answers differ sufficiently that significance levels will be changed from those determined for the text. It must be noted that some statistical tests described in this text are commonly included in statistical software programs for computers. However, some programs designed for computers may limit analysis to cross tab tables and the use of category averages. Such computer programs may not provide for one way chi-square and, in some cases, for certain types of ANOVA analysis. Computer programs of this type do not function for some problems in the text. It is important to determine computer program capabilities before comparing results in this text with computer results.

Further, students should be aware that problems included in this text are for demonstration purposes related to the specific statistical procedure. Interpretations are cited for demonstrations of how to interpret and analyze data. The data used as examples in this text are, for the most part, sampled from research studies and, thus, are not complete. The results and interpretations are examples used to show how to do the procedure discussed and are included solely for their merit in illustrating various research methodologies. At NO time should data be used as significant information for the specific topic, for these data do not represent complete research studies and therefore may result in conclusions not warranted by the actual study.

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Faculty have provided suggestions for content, organization, and sample problems. Their help is sincerely appreciated. Specific mention must be given to those who helped guide the production of the second edition and, therefore, are instrumental in this edition as well.

Dr. Ann R. Stasch read and reviewed the manuscript for all editions to date and has identified areas that needed increased emphasis and clarification. She provided suggestions for organization and content and helped to make the writing of the text both enjoyable and productive.

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Dr. Marjorie Kaiser provided suggestions relative to the organization and content of the second edition, which have been carried into this edition. She also provided suggestions regarding the inclusion of information concerning the computer and its use in research.

Others who have contributed to the development of the text include the many students who have suffered through research methods. Each class has provided ideas and information that have helped to make the book more interesting and viable than the previous edition. The help from these students has been immeasurable. While we wish to thank each and every person who has contributed in some special way toward the development of this book, we want to make it clear that we assume full responsibility for any errors and omissions that exist.

PART I

Research Fundamentals

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CHAPTER 1

Introduction

The understanding of research is an important aspect of education for any discipline that may be chosen for study. Research is a responsibility of many individuals in meeting the challenges of daily life. The use and evaluation of research findings are the responsibility of everyone. One of the most effective ways to learn how to use research, as well as how to evaluate the quality of research, is to learn how to do research. Thus, this text is designed to provide:

1. The fundamentals associated with the design of research projects,
2. The principles of research methodology,
3. Guidelines for the preparation of research proposals,
4. Guidelines for preparing the final research report,
5. The statistical tools used in analyzing research data that provide reliable and valid conclusions.

Researchers in the various areas of human ecology/home economics may encounter various problems. However, the problem that may confuse students the most is the fact that many different areas are housed within the discipline and each requires individual approaches to research procedures. Some areas may involve primarily natural sciences and require research methods that work well with such types of problems. Other areas involve the social sciences and need the research techniques that work for such problems. Most areas of home economics involve some research using human subjects; several areas of home economics may involve research using inanimate subjects; and some areas may use small animals for data collection. Studies using human subjects require different types of controls and research designs than studies using small animals or inanimate objects. Because of such problems, researchers may encounter a variety of problems that relate to both the research design and to the type of subject used.

In this text the terms "home economics" or "human ecology" are used to refer to majors in a variety of educational programs. Such programs may carry the name of "Home Economics," "Human Development," "Human Ecology," "Consumer Sciences," "Family Studies," or various combinations of such terms. The content of this text is intended to fit any program in which students are working with courses and areas that are designed to improve the physical and emotional life of families and their near environment.

RESEARCH AND LITERATURE

It is appropriate to distinguish between the terms literature and research. There are two (or more) ways in which this can be done. The first separates

literature from all research by identifying research as the doing and literature as the written record. However, this may cause some confusion because it tends to indicate that literature is always the report of research. This, of course, is not true as literature may be fiction or nonfiction; the research reports would be only a part of the nonfiction category.

A second way to try to distinguish literature and research is to identify how research fits into literature. All research is literature but not all literature is research. Research, as used in this text, involves the entire process of conducting and reporting objective investigations that will contribute useful information through providing solutions to problems and answers to questions. Research becomes literature only when the report is published and is available for sharing with others.

WHAT IS RESEARCH

There are many definitions of research. A few of the more important ones are cited here. McGrath (1970) described research as a process or tool that has utility only to the extent that the class of inquiry employed as the research activity is capable of adding knowledge, of stimulating progress, and of helping society and people relate more efficiently and effectively to the problems that society and people perpetuate and create.

Kerlinger (1973) defined research as a scientific study that can be systematically controlled, is empirical, and involves a critical investigation of hypothetical propositions about relations among natural phenomena. Hopkins (1980) described research as a structured inquiry that utilizes acceptable scientific methodology to solve problems and creates new knowledge. Compton and Hall (1972) provided a brief definition that indicated that research is the discovery of new facts and their interpretation. They elaborated on their definition by indicating that any research investigation must be purposeful, systematic, adapted to scientific ways of problem solving, and carried out with a real desire to know and discover the truth. Webster's dictionary defines research as the diligent inquiry or examination seeking facts or principles, an experimental investigation.

Based on this definition and the authors' personal opinions, the definition of research used in this text can be summarized as the objective and unbiased search for answers to questions or solutions to problems and the interpretation of the answers or solutions.

Research involves both the investigation of a problem and the preparation of the written report. Any written report must be factual, limited to reporting actual data and must involve an unbiased and objective interpretation of data which have been collected in a scientific manner. Research reports add information to a specific body of knowledge and they refrain from inserting personal opinions or any facts not supported by the findings.

WHY DO RESEARCH

Research is undertaken whenever there is a need to find new and/or additional information that will help explain phenomena. This may involve providing in-

formation that adds to known facts about a topic, answers a question, solves a problem, and/or provides new data about the unknown. For "home economics" and its related disciplines, research is directed toward finding, applying, and interpreting data that will help, in either a tangible or an intangible way, promote improved physical, mental, and emotional individual and family life.

This text directs its attention to studies that may be encountered in any of the following areas of study:

- Food, nutrition, and dietetics
- Child development and family relations
- Clothing and textiles
- Housing and furnishings for interiors
- Home management, equipment, and consumer sciences
- Technologies in teaching these and related areas.

The purpose of research is indicated by its definition. Research is undertaken to find valid answers to important questions or solutions to important problems. The major functions or purposes of research, therefore, include:

1. Discovering new information.
2. Expanding existing knowledge.
3. Validating past information to determine the need to change, discard, or accept existing hypotheses or theories or to develop new rationales for explaining or supporting them.
4. Investigating specific questions or problems in order to establish new information that may help support hypotheses.
5. Investigating existing phenomena in order to provide added information and insight into a situation.
6. Determining new uses of and applications for existing or new goods and services.

This list does not provide an exhaustive survey of the purposes or functions of research. It does, however, identify the most common functions. Most research done by college students will probably fit into at least one of the purposes cited above.

THE RESEARCH PROCESS

Research is a scientific process and requires the use of scientific methods. These methods may follow either an inductive or deductive reasoning process. When inductive reasoning is used, the project is designed to identify component parts that can eventually be tied together to lead to generalizations. The deductive process starts with the generalization and then seeks the specifics that make up and support the generalization. Research frequently uses a combination of these two processes.

The research process involves a variety of steps and components. The following discussion provides introductory statements concerning the steps involved. Each of these steps receives in-depth discussion and consideration in subsequent chapters.

1. IDENTIFICATION OF NEED A question, doubt, problem, barrier, or other indeterminate situation that demands some verifiable answer or solution is noted. This problem or question must be verbalized in a clear statement that puts the idea or concept into sharp focus. A clear need for the information is apparent prior to the research activity.

2. PRELIMINARY REVIEW OF LITERATURE A preliminary review of literature is undertaken to determine what has been done concerning the question or problem. It is necessary to find out if there is already a solution or response in the literature. If adequate information is located that solves the problem or answers the question, there is no reason to continue the research project. However, if information that is located is not adequate to provide sufficient answers or solutions, the preliminary review of literature can proceed and should help provide the following types of information.

a. Has the question or problem been noted previously and what information has been published about it?

b. What can existing literature do to help focus the research activities and indicate possible research procedures?

c. Does the absence of information in the literature indicate that the topic has not been investigated before, that there has not been anything published related to it, or that the concern was of insufficient importance and did not merit research prior to this?

For any portion of the review of literature it is essential that all pertinent information be carefully recorded. This includes the title of the article or book, the name(s) of the author(s), the journal title if the publication is an article, the date of publication (including year, volume number, month, and date when appropriate), the page numbers, the publisher and location, and any other information required for accurate references cited as a part of the research proposal or final report.

3. FORMATION OF PRELIMINARY HYPOTHESES Following the preliminary review of literature, a decision must be made as to the viability of continuing the investigation. If the problem or question has merit, it is helpful to discuss the topic with authority figures such as faculty advisers to obtain preliminary input relative to the value of the topic and the direction the activity could take. If the decision is to proceed with the research activity, preliminary objectives and/or hypotheses should be formulated. If objectives and/or hypotheses are not easily stated, one might wish to consider whether or not it is advisable to continue with the specific activity or reject the idea.

4. JUSTIFICATION FOR THE STUDY Before continuing with the research project, it is important to consider justifications for doing the study. While it may be sufficient to say that one wants to know the answer or solution, unless there is potential use by others, it is important to evaluate the possible value of using resources such as time, energy, and money. Thus, one should try and identify who can use the results when the study is completed. For example can the results be used by individuals in education, business, industry, human services, consumer sciences, family relations and child development agencies? Will the study add to the existing body of knowledge in the specific area involved? Will such new knowledge support ex-

isting information or provide potential change or conflict? Some of the sound reasons for doing research in the various areas identified by this text include the need to know more about:

- a. Nutritional needs of individuals and families in sickness and in health.
- b. Techniques of food preparation and preservation.
- c. Child rearing and parenting practices.
- d. Family relations.
- e. Psychological and/or physiological needs relating to clothing, housing, interior design and furnishings--the near environment.
- f. Identification, explanation, and solution of consumer needs and problems.
- g. Development of improved textile products and procedures for their selection, use, and care.
- h. Identification of knowledge regarding clothing practices, behavior, and fashion.
- i. Identification, evaluation, and use of various educational technologies.

5. DETAILED REVIEW OF LITERATURE If the topic is identified as good research, the researcher may continue the review of literature and make a detailed search to identify all possible pertinent literature. The researcher should have a reliable and systematic method for recording notes taken from all reviewed literature. It is essential to copy material that may be quoted exactly as it appears in print. Before doing the detailed review of literature, the researcher should identify an acceptable form book and study it carefully to ascertain what information will be needed for documentation of quotations and other referencing procedures.

Literature used for research studies can be classified into one of two categories, primary or secondary. Primary resources are those prepared by a writer who was involved in the activity being reported or actually saw it occur. Secondary resources are those which have been prepared by a writer using previously written materials or reports from others who did not participate in the research activity nor see events that are being reported actually occur. Primary resources should be used whenever possible. Secondary resources may be used when primary resources are not available or no longer exist.

6. STATEMENT OF HYPOTHESES OR OBJECTIVES When the problem or question has been clearly stated and the review of literature is in its final stages, the researcher formulates final research hypotheses and/or goals and objectives. The statement of the problem is polished. Both research and null hypotheses will be formulated if inferential statistics are to be used; if no inferential statistics are indicated, only research hypotheses may be needed.

7. RESEARCH DESIGN AND PROCEDURE It is probable that thought has already been given to the type of research, research design, and procedures to be used. However, at this point the procedures or methodology should be polished and should include the following:

- a. A research paradigm.
- b. A tentative outline of the procedural steps.
- c. Identification of the variables involved--the independent, the dependent, and extraneous.
- d. Methods to be used in data collection.
- e. Steps in the development of data collection instruments which will be followed by the actual development of the instruments or the identification of existing instruments that may be used. This includes such devices as questionnaires, interview schedules, observation protocol, and the use of any special laboratory equipment and procedures.
- f. Identify the equipment and supplies that must be purchased and how these are to be financed.
- g. Plan for a pilot test where data collection devices will be tested and then evaluated for effectiveness, accuracy, clarity, ease of use, reliability and validity.
- h. The statistical tools to be used and verification that they will be effective with the type and level of data collected.
- i. Record keeping forms that will lead to efficient data analysis.

Following a pilot study these steps will be reviewed, changes needed will be made, and a polished set of procedures will be prepared.

8. ETHICAL CONSIDERATIONS If human subjects are to be used in the research activity in any way, procedures must be cleared through various committees devoted to the protection of human subjects. Proposals for such activities will require whatever clearance is necessary on any specific campus or by any specific research organization.

9. DATA COLLECTION When all procedures have been approved the data are finally collected. The researcher must be certain that all data are collected uniformly, without bias, and objectively. All testing procedures should be consistent throughout the study.

10. ANALYSIS OF FINDINGS After the data have been collected, they must be organized into a format suitable for analysis and for the application of analytical tools. Both descriptive and inferential statistics may be used; in some cases neither may be involved. Data may be compared with results of other studies when appropriate.

11. FORMULATION OF CONCLUSIONS. Following analysis of the data, conclusions are stated. The conclusions should:

- a. Indicate acceptance (support), or rejection (nonsupport), of hypotheses--both null and research.
- b. Provide clear statements concerning answers to questions, solutions to the research problem, or comparisons of results with objectives or goals and/or hypotheses.
- c. Include any comments that can relate existing or previous information to the results of the study.

12. STATEMENTS OF RECOMMENDATIONS As a final part of many research activities, particularly graduate theses or dissertations, it is helpful to