SELECTED FACTORS AFFECTING SEWING MACHINE CARE AND MAINTENANCE

By

EVONNE LUCILLE MEISCHKE

Bachelor of Science in Home Economics

California State University - Chico

Chico, California

1975

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
MASTER OF SCIENCE
May, 1977

SELECTED FACTORS AFFECTING SEWING

MACHINE CARE AND MAINTENANCE

Thesis Approved:

Brovalynn Sisler
Thesis Adviser

Laurene Mateer

Nick Stinnett

Norman N. Durham
Dean of the Graduate College

ACKNOWLEDGEMENTS

The researcher would like to thank Dr. Grovalynn Sisler, thesis adviser, for her valuable guidance, personal interest and encouragement throughout the study. Appreciation is extended to Dr. Lavonne Matern and Dr. Nick Stinnett for their valuable criticism of the manuscript and encouragement in preparation of this thesis.

The researcher would also like to thank Dr. Grace Spivey and the extension home economists who gave their assistance in selecting the participants; and to the women in the selected Oklahoma extension homemaker groups for their participation in the study.

Special appreciation is extended to Jacque James and Johanna Tate for their assistance and friendship during the study.

Finally, a special gratitude is expressed to the researcher's parents for their patience, understanding, encouragement and support during the course of this graduate study.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

The home sewing boom of the late 1960's has continued to increase steadily. According to an article in Consumer's Research Magazine (Home sewing, 1975) about 50 million women in the United States sew at home. The home sewing industry exceeds $3 billion a year (A $3 billion boom, 1970), and of that, $400 million is spent annually on sewing machines in the United States alone (I made it myself, 1971). Total 1975 unit sales of sewing machines by the Singer Company alone were three million (Lynch, 1975). Another 2.5 million units were reported as sewing machine imports for domestic consumption by the U. S. Bureau of the Census (1975).

For today's seamstress the sewing machine is an invaluable tool of the trade. In 1936 there were about 280,000 new sewing machines of all makes sold in the United States, and by 1970 an estimated 2,800,000 sewing machines were sold nation-wide (The story of fashionomics, 1972). The basic sewing machine is a well engineered piece of equipment which requires little servicing "provided the user applies a little common sense along with some preventive maintenance in the care of her sewing machine" (Elliott, 1976, p. 21).

In keeping with this philosophy, most repairpersons agree that "90% of repairs can be eliminated when home sewers are taught proper machine operation and maintenance" (Class distinction, 1976, p.28).

According to an article in Better Homes and Gardens (Tips on sewing machine care, 1972) consumers can eliminate over 80% of costly service calls on their machines simply by practicing the basic maintenance techniques of cleaning and oiling. Elliott (1976) stated that many of "the service problems today lie in the fact that everyone is too busy to take the time to properly clean and adjust their machine" (p. 21). Hannan (1955) stated that care and maintenance of the sewing machine follows the pattern of care for automobiles, "almost everyone knows how to drive, but few know the mechanics" (p. 9).

The aforementioned statements suggest a logical need for those who use the sewing machine to be knowledgeable in caring for and maintaining their sewing machine. By educating consumers about the care and maintenance of their machines, the cost of professional maintenance can be reduced, and productive time can be saved which could otherwise be lost while the sewing machine was being repaired. Although some information is available on care and maintenance of sewing machines, much of it was not designed for the advanced and complicated home sewing machines on the market today. Little research, however, has been conducted on care and maintenance of sewing machines.

The purpose of the study was to examine some of the factors which may be related to home sewing machine care and maintenance. This could provide general indications as to the need for education in this area.

Objectives

The overall objective of this study was to gain information about sewing machine care and maintenance as related to sewing education, mechanical ability, and the general type of sewing machine used in home

sewing. The specific objectives of this study were:

1. To determine the maintenance performance score for each participant.
2. To investigate the relationship between maintenance performance scores and number of years and/or semesters of sewing education.
3. To determine the mechanical ability score for each participant.
4. To investigate the relationship between maintenance performance scores of the participants and their mechanical ability scores.
5. To determine the differences among maintenance performance scores according to the general type of home sewing machine used by participants.
6. To determine whether or not a need exists for instruction in sewing machine care and maintenance.

Hypotheses

1. There will be no significant correlation between mechanical ability scores and maintenance performance scores of the participants.
2. There will be no significant correlation between the number of years and/or semesters of sewing education and the maintenance performance scores of the participants.
3. There will be no significant difference in the maintenance performance scores of the participants according to the general type of sewing machine used.

Limitations

Participants in the study will be limited to women 18 years of age and older who are members of Oklahoma extension homemaker groups in selected Oklahoma counties. The study will also be limited to women who have used a home sewing machine.

Definitions

Sewing Education: Sewing or clothing construction education taught or supervised by a professional home economist in public schools, colleges or universities, 4-H clubs, and extension homemaker groups.

Maintenance Performance Score: The score resulting from a checklist of care and maintenance procedures which have an assigned point value according to the difficulty of the care and maintenance task performed.

Mechanical Ability: The ability to understand mechanical relationships and physical laws in practical situations (Cronbach, 1970, p. 14); not referring to motor or muscular behavior (Gekoski, 1964, p. 178).

Mechanical Ability Score: Mechanical ability will refer to a score resulting from the completion of the Differential Aptitude Test for Mechanical Reasoning.

Sewing Machine Care and Maintenance: Keeping the sewing machine clean, in proper sewing adjustment and running correctly as suggested by the manufacturer and instruction manual.

CHAPTER II

REVIEW OF LITERATURE

Between 50,000 and 25,000 years ago man began to wear clothes (Gurel and Beeson, 1975). For whatever purpose clothing was intended, throughout history it has been produced primarily in the home by a family member or craftsman. The development of the sewing machine in the mid-19th century not only lessened home sewing labors, but advanced the ready-to-wear apparel markets. As the ready-to-wear market grew, home sewing lessened despite improvements in the home sewing machines. Write (1964) indicated that by the late 1920's American women had put away their needles and the home sewing business almost disappeared from the scene.

Home Sewing Today

During the Depression era it was said that women sewed their own clothes because they could not afford ready-to-wear. Recent research, however, has shown that women now sew not only for economy, but to express their creative urge (Fessler, 1971; Stanforth, 1974). Other motives which lead women, and men, to sew include economy, enjoyment, better fit and better quality (Home-sewing fabrics unlimited, 1970). Smith (1976) conducted a recent British survey and concluded that women sew equally for economy and pleasure, 35% respectively, while 21% sew for individuality, 11% for better fit and only 4% for fashion.

Marketing surveys continue to report increases in the sale of products relating to the home sewing industry. Fabric, notion, pattern and sewing machine sales continue to rise above the $3 billion sales reported in Consumer Bulletin Annual (1972). Many fabric stores and sewing machine shops, in addition to their sewing products, offer sewing lessons which acquaint consumers with new fabrics and machines, as well as sewing skills. According to Cary (1973) "two-sewing-machine families are common today" (p. 17).

This emphasis on home sewing has contributed to the steady increase of the more than 50 million engaged in home sewing today. Dr. Joyce Brothers (Home sewing symptom of the 70's, 1970) stated that:

> By sewing clothes at home women are able to take matters into their own hands, quite literally; they are masters of their fashion fate, and need not accept the passive, dependent role of the ready-to-wear consumer (p. 74).

Sewing Machine Advancements

Sewing machines have been improved significantly since their invention. Modern industrial sewing machines operate at speeds up to 5,000 stitches per minute compared to early models which could make only a few stitches without adjustment. During the past century more than 45,000 patents have been issued relating to sewing machines (Hannan, 1955).

Although the sewing machine is largely of American origin, stemming from the inventions made between 1845 and 1854, the earliest sewing machine was invented in 1790 by Thomas Saint, a London cabinet maker (Gilbert, 1970). Many early inventors influenced the development of the sewing machine, but none as greatly as Elias Howe and Isaac M. Singer (The invention that automated needlework, 1973). Their

continued improvements and marketing skills soon made sewing machines a desirable home appliance. By the end of the 19th century, annual production of sewing machines increased to 20,000,000 by some 200 companies in America alone (Gilbert, 1970).

The early sewing machines of the 1900's were simple straight stitch machines with either a lock or chain stitch formation. These machines were made of hardened steel and were very durable. Few mechanics were available at this time; however, the machines were accompanied by an instruction booklet which explained use and care (Lowrie, 1947, p. 8). Cleaning, oiling and tension adjustments were the basic maintenance procedures needed.

Not until after World War II did the sewing machine advance significantly from these early models. In 1952 the first zigzag machine was introduced (McKee, 1953). These machines not only sewed a straight forward and reverse stitch, but one that would go from side to side (zigzag). Decorative stitches were made by variations in the length and width of the zigzag. Although this was a new mechanism, it did not change the basic maintenance techniques. Refinements in the bobbin case and hook helped to quiet the noise of the machine and made cleaning and oiling much easier.

In the following years more decorative stitches were added utilizing either built-in gears or manual snap-in cams. These presented a care problem with regard to the oiling of a new mechanism and adjustment to the proper thread tension. The addition of an automatic buttonhole attachment built into the machine was one more feature that required maintenance. The more sophisticated the machine became the more precise was the care and maintenance needed in order not to damage

the intricate mechanisms.

As knit fabrics became popular in the late 1960's, a new mechanism was added to some machines which made two stitches forward and one stitch in reverse. Given the name "stretch stitches", this new mechanism produced a multi-lock stitch which allowed the fabric to be stretched without breaking the stitches (Sewing machines and supplies, 1973, p. 90). With the addition of these advanced mechanisms a well trained repairperson was needed for major sewing machine adjustments. The amount of cleaning required remained approximately the same, but the added mechanisms required more detailed oiling.

In 1973, permanently oiled machines were being produced. This not only simplified machine maintenance, but offered some safeguard against owner neglect, unnecessary wear, binding and expensive repair (Viking, 1975). The free, or open, arm which allowed for tubular sewing, became available for home sewing in the early 1950's (McKee, 1953). These were not widely marketed until 1975 and today, all major manufacturers offer this free arm construction.

The self-winding bobbins patented by the Singer Company in the early 1960's created additional maintenance problems. Not only was the bobbin adjustment complicated, it was difficult to clean and oil. Today, this self-winding bobbin is permanently adjusted to the right tension at the factory, thus lessening the necessity for consumer adjustment.

Some of the more expensive machines on the market today have a rotary hook that is freely suspended between a driver and the shuttle cover. This means that such a machine does not have a shuttle race in which the thread can lock and jam the mechanism (Viking, 1975). This

"self-cleaning" action rejects loose threads automatically, thus lessening consumer maintenance.

In June 1975, the Singer Company patented the world's first electronic home sewing machine (Lynch, 1975). This "computerized" machine has been permanently oiled, has factory set bobbin tension and push button stitch balancing. The only maintenance required for this machine was cleaning the lint from the needle and bobbin case areas and oiling the hook.

A new ultrasonic sewing machine has been developed that works by fusing material together through frictional heat (Jones, 1974). Parallel seams are made on polyester, nylon, and blends made from these two fibers, using no needle, no thread, and no bobbin (About sonic sewing, 1973). At a cost of $2500, it is used only commercially where qualified repairpersons maintain the machine.

Sewing Machine Maintenance Education

The growth of the home sewing industry during the 1960's was stimulated by education. Fessler (1971) stated "without education, there would probably be no home sewing" (p. 12).

In contemporary high school, college and university curricula, clothing construction courses are still in evidence (Reid, 1973). According to Johnson (1960) clothing construction courses in education are offered not only for personal use, but for the preparation of teachers in all levels of education or for careers in a related field (p. 753). Therefore it would seem that regardless of whether the student's interest is vocational, professional or recreational, the sewing student would need to learn the use and maintenance of sewing

equipment as well as sewing techniques.

In a recent article (Maintenance aids sewing problems, 1976), A. J. Turn, regional school and education manager for the Singer Company in Dallas, explained that three out of five service calls received by the Singer Company from schools involved problems that could have been corrected by the teacher or prevented by the students if a better knowledge of sewing machine maintenance had been acquired (p. 15). Turn expressed the importance of teaching sewing machine maintenance and explained that two filmstrips published by the Singer Company on this subject were available to home economics instructors.

As far back as 1924, the importance of an "oiling lesson" was advocated by the Singer Company as "most valuable for students, as it will enable them to give their machines at home proper care and to keep school machines in perfect running order" (Machine sewing, 1924, p. 21). Rush (1973) expressed the need for a regular sewing machine maintenance program by the consumer and suggested that it could be learned by consulting the machine's instruction booklet or a sewing book.

Every sewing machine instruction booklet contains care and maintenance information and it would seem that consumers would practice their own maintenance program for their specific machine. Elliott, however, (1976) stated that many of "the service problems today lie in the fact that everyone is too busy to take the time to properly clean and adjust their machine" (p. 21). He also found discrepancies among existing information sources on sewing machine care because machines differ in models and manufacturers.

There seems to be no standardization of care and maintenance

procedures, although all available sources refer consumers to the machine's manual. One author (Hall, 1947) suggested that "the sewing machine be given a drink of oil quite often" (p. 11). Another author (Roxane, 1972) of a sewing instruction book agreed that the consumer should follow the instruction manual and added that the machine needs "care and feeding (yes, oil)" (p. 5). Still another author (Talbot, 1955) compared the sewing machine to the family automobile and its need for "an oil change once a month" (p. 34). Mrs. Debby Strickland, owner of a local fabric and sewing machine store, stated machines should be cleaned and oiled after every four to six hours of sewing time (Atchinson, 1976). In Forecast For Home Economics, Young (1976) suggested maintenance be performed according to the machine's manual.

It would seem that sewing machine care and maintenance would be a vital component of the sewing units taught in the classroom. Repairpersons agree that 90% of the repairs can be eliminated when individuals are taught proper machine care and maintenance (Class distinction, 1976).

Sewing Machine Care in Curricula

Evans (1973) reported that courses in the clothing and textiles curriculum should be "practical and oriented toward problem-solving" (p. 86). Practical sewing machine maintenance is not an area of problem-solving upon which general agreement is found. Just as sewing machine care and maintenance procedures have no standardized form, home economics educators have no uniform method of incorporating sewing machine care and maintenance into the curriculum.

According to the Oklahoma Department of Education resource guide

(1969) the use and care of sewing equipment is an objective to be taught in beginning high school clothing courses. In contrast, a Kentucky curriculum guide (Jefferson County Public Schools, 1973) referred only to "constructing the garment and setting up goals for good management of time and energy" (p. 18). No objective concerning the use or care of sewing equipment was mentioned.

Public junior and senior high school home economics sewing course objectives do not reflect the importance of sewing machine care and maintenance. However, state and federal vocational training programs for sewing occupations list care and maintenance of sewing equipment as a major objective. The federal vocational training program for a "clothing maintenance specialist" has a standard course objective to teach care and maintenance of the sewing machine (U.S. Department of Health, Education, and Welfare, 1964). State vocational training programs also provide instruction on sewing machine maintenance in training clothing maintenance specialists, or clothing assistants, for garment alteration vocations. Texas vocational training objectives in this area read:

> Proper use and care of the equipment with which the clothing assistant works is necessary to keep equipment in good working condition. It is, therefore, essential that the clothing assistant learn how to use and care for sewing machines properly so as to be able to work efficiently and avoid accidents or damage to the equipment (Home Economics Instructional Materials Center, 1969, p. A-95).

A study of on-the-job training for industrial sewing machine operators revealed the importance of sewing machine maintenance skills to the manufacturers who used such employees. Bates (1974) studied objectives for the training of industrial sewing machine operators and made suggestions for topics to be included in the operators on-the-job

training program. Care and maintenance of the sewing machines was not listed as an objective in the Bates training program. The view of manufacturers with regard to important skills required for industrial sewing machine operators was reported in the same study. Bates (1974) reported that the majority of the participants, local manufacturers who offered on-the-job industrial sewing machine training, ranked machine maintenance skills highest of performance requirements (p. 55).

Some college and university clothing departments have developed tests that when satisfactorily completed will allow qualified beginning clothing construction students to enter a higher level course. As such tests are not available for public inspection, the degree of sewing machine use and care knowledge being tested is not known. One author (Roxane, 1972) considered this information essential because learning to sew involves an understanding of how the sewing machine operates and how to maintain it properly.

Tests are also used to predict success in the clothing construction courses. Epps (1972) developed such a pretest, however, knowledge of care and maintenance of the sewing machine was not a tested concept.

Evidence shows that sewing machine maintenance has been an objective in many sewing instruction programs, both in schools and industry. Sewing machine care and maintenance, however, is not a standard objective in sewing instruction and evidence has suggested that there is a lack of such instruction.

Research in Sewing Machine Care

Little research is available on care and maintenance of the

sewing machine. The nature of manufacturing causes many business surveys and reports to be kept strictly confidential. Most available research is derived from private consumer studies and education.

As a part of an educational research project on sewing machine selection, McKee (1953) found that only 30% of her sample cleaned, oiled, and adjusted their sewing machines. In an educational study which dealt with sewing practices related to individual sewing centers, Lidolph (1969) reported that out of 202 sewing machines in use by her sample only 137 cleaning brushes were owned. No mention was made of how many, or how often, these brushes were used for cleaning.

Honest repair service is important to the consumer and an important aspect of sewing machine maintenance. In a recent consumer survey (Sewing machine repairs, 1975) 75% of a 275,000 sample indicated that their machines have never needed a repairman. No machine was over 10 years old. The survey also indicated that the older the machine or the more it had been used, the more likely it would require repairs. This sample rated repair service available at an average level of consumer satisfaction (Sewing machine repairs, 1975).

Sewing machine dealers usually believe competent service is a must for conducting the best business, and many businesses fail from lack of a qualified man to service the machines (Olson, 1976). One sewing machine dealer found increased customer confidence in purchasing from them because the shop could service what they sold (Moyer, 1976).

No research was available on the effects a type of sewing machine might have on the care and maintenance of the sewing machine by the consumer. A study by Wheeler (1973) did show that moderate income families had more frequent access to a sewing machine than low income

families and, therefore, had more knowledge of the sewing machine. Results of this study indicated that the type of machine owned had little or no relation to the number of garments constructed.

Evidence has shown that sewing machine dealers and repairpersons believe consumers could practice basic maintenance techniques on their sewing machines, therefore saving repair costs and lost sewing time while the sewing machine was in a shop for maintenance. Because little or no research is available on factors which affect the degree to which consumers maintain their sewing machines, there is no evidence of consumers' willingness to accept self maintenance responsibilities. Research points to the fact that less than half of the participants in one study maintained their own machines (McKee, 1953). The type of sewing machine used was found to have little or no relation to the amount of sewing, however, new types of advanced and complicated sewing machines could affect consumers' maintenance knowledge.

Mechanical Ability

According to Gekoski (1964) mechanical ability is an intellectual, symbolic function, not a physically manipulative behavior. The measurement of mechanical ability is helpful for prediction of job success in mechanical fields. Theoretically a person who scores high in mechanical ability tends to learn readily the principles of operation and repair of complex devices (Cronbach, 1970).

No degree of mechanical reasoning or ability has been established for competent learning and retention of sewing machine maintenance techniques, however many studies have researched the effect of mechanical ability or reasoning on selected psychomotor tasks through

established mechanical tests. Martin (1972) found that students with high mechanical ability performed significantly better than did students with low mechanical ability with regard to the learning and retention of selected mechanical tasks.

Although no specific researcher has studied mechanical ability and its relationship to sewing machine maintenance performance, it would seem that those with higher mechanical ability would perform maintenance tasks with a higher degree of competence than those with low mechanical ability. Mechanical ability of the students, therefore, would likely affect the learning and retention of sewing machine care and maintenance procedures.

Summary

Home sewing is increasing and more people want sewing instruction. Since the sewing machine is most often involved in the sewing construction process, it is important to understand the care and maintenance, as well as the operation of the sewing machine.

Many new advancements have lessened the amount of maintenance required for the sewing machine, although as sewing machines become more sophisticated only a highly trained repairperson can repair the machine. Simple cleaning and oiling is all that some of the newer machines require.

Although every sewing machine instruction booklet contains information on the care and maintenance of the machine, there are discrepancies which confuse the consumer. All curriculum guides do not reflect the importance of sewing machine care and maintenance. Although educational information regarding sewing machine care and

maintenance is available from some companies related to the sewing machine industry it, too, is not standardized. This lack of standardization seems unavoidable due to the number of different sewing machine manufacturers and models available on today's consumer market. Because of the individual sewing machine differences it seems likely that care and maintenance techniques would also be somewhat specific to each sewing machine. General sewing machine care and maintenance instruction, therefore, would be difficult.

The availability of sewing machine care and maintenance information and education may affect consumer care habits. The type of sewing machine owned, consumer knowledge of machine operations and mechanical ability may also affect maintenance habits.

CHAPTER III

METHOD AND PROCEDURE

The study was conducted to gain information about sewing machine care and maintenance as related to sewing education, mechanical ability, and the general type of machine used in home sewing. A review of literature revealed no studies in this specific area.

Participants in the Study

Participants in the study were 140 women 18 years of age and above who had used a sewing machine and were members of selected Oklahoma extension homemaker groups during October and November, 1976. Oklahoma extension homemaker groups were selected because they are representative of nearly every socio-economic group and educational level. Since sewing education is included in the program of these groups, they might also benefit from educational information resulting from this study. An attempt was made to include rural, urban and suburban areas in Oklahoma.

The selection of the sample was made with the cooperation of Dr. Grace Spivey, Associate Dean of Home Economics for Oklahoma Cooperative Extension Service. Each of five district home economists was contacted by Dr. Spivey. The district home economists identified county groups willing to participate in the study. The researcher then contacted county home economists in those counties and arranged a

time for the study to be conducted. A list of counties in which the study was conducted may be found in Appendix A, p. 49.

Instruments

A questionnaire developed by the researcher was used to determine (1) type of sewing machine used, (2) number of years and/or semesters of sewing education, (3) maintenance performance score, and (4) future instruction in machine care and maintenance desired by the participants. (See Appendix B, p. 51.) The Differential Aptitude Test (DAT) for Mechanical Reasoning (Bennett, Seashore and Wesman, 1972) was administered with the questionnaire to determine a mechanical ability score for each participant.

The maintenance performance score for each participant was determined from responses to question three of the questionnaire. Each participant checked the procedures she had performed. A predetermined value had been assigned to each procedure, with a value of one for a simple procedure to five for the most difficult procedures. Values of two, three, and four were assigned to care and maintenance procedures of intermediate difficulty. These values were determined by averaging the values assigned each procedure by two faculty members and two graduate students in the Department of Clothing, Textiles and Merchandising at Oklahoma State University, and by two accredited sewing machine repairpersons. The assigned values for determining the maintenance performance score are listed in Appendix C, p. 54.

The Differential Aptitude Test (DAT) for Mechanical Reasoning, published by the Psychological Corporation (Bennett et al., 1972) has a reliability coefficient of approximately .85. There is a 30 minute

time limit for completion of the DAT for Mechanical Reasoning.

Both the questionnaire and the DAT for Mechanical Reasoning were pretested by six women who were members of Payne County extension homemaker groups. These women were expected to be similar to those selected for participation in the study. Payne County was chosen since it was not among those counties selected for the study. The approximate time required to administer the instruments was determined and the questionnaire was revised where clarification was necessary.

Collection of Data

Data were collected from the selected extension homemaker groups between October 20 and November 18, 1976. Specific times for conducting the study were prearranged between the participating county home economist and the researcher. The members of participating extension homemaker groups were notified of the time and place for the meeting by the county home economist. The researcher attended the meetings and conducted the study.

The instruments were explained to the participants by the researcher before they were administered. The instruments were numbered to organize the data and no name was required so that anonymity was achieved. The DAT for Mechanical Reasoning was given first since it was a timed instrument. The questionnaire, attached to the test answer sheet, was completed after the DAT test booklet had been collected by the researcher. After the participants had completed the instruments, the researcher presented them with an information sheet on sewing machine care and maintenance (Appendix D, p. 56). This was done as a token of appreciation for their cooperation in the study. After

completion of the study the findings were released to the group that had participated.

Analysis of Data

Portions of data were analyzed by the Pearson product moment correlation formula to discover whether a significant correlation existed between maintenance performance scores of the participants and mechanical ability scores, and between maintenance performance scores and the amount of sewing education. The differences between the maintenance performance scores of the participants according to the general type of sewing machine used was determined by the analysis of variance. Remaining data were compiled into frequency counts and percentages.

The Pearson product moment coefficient of correlation was employed to ascertain the significance of the relationship between mechanical ability scores and maintenance performance scores of the participants. Mechanical ability scores were derived from the DAT for Mechanical Reasoning. The checklist of sewing machine care and maintenance procedures, question three of the questionnaire, produced the maintenance performance score for each participant. Maintenance performance scores were also correlated with the number of years and/or semesters of sewing education of participants. The Pearson product moment correlation formula was employed to determine whether a significant relationship existed. The number of years and/or semesters of sewing education for each participant, determined from question two of the questionnaire, was represented by a total of time units, years and/or semesters, in which the participant had received sewing instruction.

Question one of the questionnaire contained the three basic categories of sewing machines which the participants used to classify their machines. An analysis of variance was employed to determine whether significant difference existed in maintenance performance scores of participants according to the general type of sewing machine used.

The remaining data from the questionnaire were compiled into frequency counts and percentages and results are discussed in Chapter IV. Participants were asked to list individual sewing machine mechanical problems and these are also discussed in Chapter IV.

Summary

The purpose of the study was to examine consumer practices of sewing machine care and maintenance. The variables considered were maintenance performance scores, type of sewing machine, amount of sewing education, and mechanical ability of the participant. Participants in the study were 140 women 18 years of age and older who had used a sewing machine and who were members of selected Oklahoma extension homemaker groups. Data were analyzed by frequency counts and percentages, the Pearson product moment coefficient of correlation, and an analysis of variance.

CHAPTER IV

FINDINGS AND ANALYSIS

The DAT for Mechanical Reasoning and a questionnaire developed by the researcher were employed to obtain information about sewing machine care and maintenance. Data were collected during meetings of selected Oklahoma extension homemaker groups from members who were 18 years or older and had used a sewing machine. The findings and analysis of the data collected are presented in this chapter.

Discussion of Questionnaire Results

The variables considered in the study were mechanical ability scores, maintenance performance scores, number of years and/or semesters of sewing education and the type of sewing machine used in home sewing. (Individual scores and years and semesters of sewing education are presented in Appendix E, p. 58.)

The means and the range of scores for mechanical ability, maintenance performance and number of years and/or semesters of sewing education of the participants are presented in Table I. Mechanical ability scores were drawn from the DAT for Mechanical Reasoning completed by the participants. Scores for the participants ranged from 20-64 out of a possible total score of 70 points. The mean was 43.94, or 62.77 percent of the total possible score. Maintenance performance scores were

tabulated from the checklist on the questionnaire and scores ranged from 1-67 out of a possible score of 80. The mean was 29.77 (37.21%).

TABLE I

MEANS AND RANGE OF MECHANICAL ABILITY SCORES, MAINTENANCE PERFORMANCE SCORES AND NUMBER OF YEARS AND/OR SEMESTERS OF SEWING EDUCATION OF THE PARTICIPANTS (N=140)

Variable	$\bar{X}$	Range
Mechanical ability scores	43.94	20-64
Maintenance performance scores	29.77	1-67
Sewing education (years and/or semesters)	11.99	1-54

The numbers of years and/or semesters of sewing education ranged from 1-54 with a mean of 11.99 and a median of seven. For the purpose of this study sewing education was defined as sewing or clothing construction education taught or supervised by a professional home economist in public schools, colleges, universities, 4-H clubs, and extension homemaker groups. Years were used in describing the amount of sewing education in junior high school, senior high school, 4-H clubs, and extension homemaker groups. Semesters were used to describe college or university sewing education. In a year of junior or senior high school half the academic year (approximately four months) is most

often clothing related, and the remainder of the school year is in other interdisciplinary home economics areas. Extension homemaker groups and 4-H clubs are most often year round programs, but offer sewing education at only selected meetings throughout the year. Individual groups may have a greater, or lesser, concentration of sewing education, depending on leadership and objectives for the current year.

Participants indicated the number of years and/or semesters of sewing education they received in the following areas: junior high school, senior high school, college or university, 4-H clubs, and extension homemaker groups. These amounts were totaled and the Pearson product moment coefficient of correlation was applied to determine whether a significant correlation existed between amount of sewing education and maintenance performance scores of the participants.

The distribution of participants in ranges of years and/or semesters of sewing education is presented in Table II. Approximately 60 percent (60.71%) had from one to nine years or semesters of sewing education. Fifteen percent indicated 10 to 18 years or semesters of sewing education. Only one participant (0.72%) had between 46 and 54 years or semesters, inclusive.

The years and/or semesters of sewing education as related to educational sources are presented in Table III. Extension homemaker groups were listed as the greatest source of sewing education (68.99%). This was most likely due to the membership of all participants in extension homemaker groups. Participants indicated the number of years or semesters of instruction they had received in each of the five categories. It is assumed that the reason for the wide range of years of extension homemaker group sewing education is because the participants

TABLE II

DISTRIBUTION OF YEARS AND/OR SEMESTERS
OF SEWING EDUCATION
(N=140)

Years and/or Semesters of Sewing Education	Number	Percent
1-9	85	60.71
10-18	21	15.00
19-27	12	8.57
28-36	11	7.86
37-45	10	7.14
46-54	1	.72
	140	100.00

TABLE III

NUMBER OF YEARS AND/OR SEMESTERS OF SEWING
EDUCATION ACCORDING TO EDUCATIONAL SOURCE

Source of Sewing Education	N[a]	Total Number of Years and/or Semesters	Average Number of Years and/or Semesters
Junior high school	38	60	1.58
Senior high school	77	175	2.27
College or university	25	112	4.48
4-H clubs	34	174	5.12
Extension homemaker groups	140	1159	8.28

[a]Participants responded to more than one category.

indicated the number of years they had been members of this organization, even though they did not receive this many full years of sewing instruction. Individual data is found in Appendix E, p. 58.

The types of sewing machines used in the home were separated into three classifications: straight stitch only, simple zigzag, and decorative stitch (built-in or replaceable cams). The numbers of women owning each type of sewing machine are presented in Table IV. More than half (60.0%) of the participants owned decorative stitch machines. Slightly more than one-fifth (21.4%) owned straight stitch machines while the remaining 18.6 percent owned simple zigzag machines. Those participants owning more than one household sewing machine were asked to base their answers on the machine they used most often.

TABLE IV

TYPES OF SEWING MACHINES OWNED BY PARTICIPANTS
(N=140)

Classification	Number	Percent
Straight stitch	30	21.4
Simple zigzag	26	18.6
Decorative stitch	84	60.0
	140	100.0

Care and Maintenance Performance

The participants were asked to indicate which care and maintenance procedures they had performed on their home sewing machine. The findings were used to determine the maintenance performance score for each participant.

Table V illustrates the number of participants performing each of the selected procedures. All participants (100%) had changed a needle on their sewing machine. At least 60 percent of the participants had also performed the following: cleaned bobbin case, cleaned feed dogs, adjusted top thread tension, oiled bobbin case and hook, cleaned inside face plate, oiled inside top of head, changed light bulb, kept the machine dust free, adjusted bobbin tension, oiled underneath head, balanced the tensions, oiled inside face plate, cleaned underneath head, lubricated gears, and cleaned inside top of sewing machine head.

Approximately one-half (45.0%) of the participants had replaced the sewing machine throat plate. Only about one-fourth of the participants had performed the following: replaced worn belt, adjusted belt tension, or replaced a worn cord. Less than one-eighth of the participants had performed the procedures which had been assigned values of greatest difficulty: replaced the take-up spring, replaced tension springs, replaced tension discs, replaced worn hook, repaired the motor, or replaced the gears.

Care and Maintenance Instruction

The participants were asked to check the training sources with regard to sewing machine care and maintenance procedures, as shown

TABLE V

SEWING MACHINE MAINTENANCE PROCEDURES
PERFORMED BY THE PARTICIPANTS
(N=140)

Procedure	Assigned Value[a]	Number	Percent[b]
Change needle	1	140	100.00
Clean bobbin case	1	129	92.14
Clean feed dogs	1	116	82.86
Adjust top thread tension	3	113	80.71
Oil bobbin case and hook	2	113	80.71
Clean inside face plate	2	111	79.29
Oil inside top of head	2	108	77.14
Change light bulb	1	107	76.43
Keep machine dust free	1	106	75.71
Adjust bobbin tension	3	105	75.00
Oil underneath head	3	104	74.29
Balance tensions	4	102	72.86
Oil inside face plate	2	100	71.43
Clean underneath head	3	98	70.00
Lubricate gears	4	89	63.57
Clean inside top of head	2	86	61.43
Replace throat plate	2	63	45.00
Replace worn belt	2	37	26.43
Adjust belt tension	3	33	23.57
Replace worn cord	3	31	22.14
Replace take-up spring	5	18	12.86
Replace tension springs	5	18	12.86
Replace tension discs	5	14	10.00
Replace worn hook	5	7	5.00
Repair motor	5	4	2.86
Replace gears	5	2	1.43
Retime	5	0	0.00

[a]Assigned values for determining the maintenance performance score with one for the simplest and five for the most difficult procedures.

[b]Percent given represents the percentage of total participants performing each procedure.

in Table VI. The majority of participants (92.86%) listed the instruction booklet that accompanies new machines as a source of sewing machine maintenance instruction. Approximately one-third (34.29%) of the participants indicated knowledge of maintenance procedures was learned through extension homemaker group programs. Nearly one-third (32.86%) of the participants had been instructed in sewing machine maintenance by salespersons or dealers. Only one-fifth (20.71%) of the participants listed home economics courses in school as a sewing machine care and maintenance learning source. Other sources were listed by 10 percent or fewer. (See Table VI.)

TABLE VI

SOURCES OF INSTRUCTION ON SEWING MACHINE CARE AND MAINTENANCE PROCEDURES (N=140)

Source	Number[a]	Percent[b]
Instruction booklet with machine	130	92.86
Extension homemakers group program	48	34.29
Salesperson or dealer	46	32.86
Home economics course in school	29	20.71
4-H Club	16	11.43
Other sewing course		
Singer	14	10.00
Private	3	2.14
Bernina	2	1.43
Stretch and Sew	2	1.43
Other method		
Friends	4	2.86

[a]Participants were allowed to select more than one response.

[b]Percent given represents the percentage of total participants performing each procedure.

The number of sewing machine instruction booklets owned by the participants appears in Table VII. Ninety-five percent of the participants indicated they still owned an instruction booklet for their machine. Only five percent of the participants indicated that they had no instruction booklet.

TABLE VII

SEWING MACHINE INSTRUCTION BOOKLETS
OWNED BY PARTICIPANTS
(N=140)

Instruction Booklet	Number	Percent
Do you have a sewing machine instruction booklet?		
Yes	133	95.0
No	7	5.0
	140	100.0

Participants were asked whether they preferred to engage a repairperson to perform the routine care and maintenance of their machine or to perform these procedures themselves. The routine care and maintenance method preferred by participants is presented in Table VIII. Almost three-fourths (72.86%) of the participants indicated that they preferred to perform routine maintenance themselves while the remaining one-fourth (27.14%) preferred to have a repairperson perform these tasks.

TABLE VIII

METHOD PREFERRED BY PARTICIPANTS FOR ROUTINE CARE AND MAINTENANCE OF THEIR SEWING MACHINES (N=140)

Method	Number	Percent
Self maintenance of sewing machine	102	72.86
Maintenance by repairperson of sewing machine	38	27.14
	140	100.00

The data presented in Table VIII indicated an interest in performing routine sewing machine maintenance themselves. Participants were also questioned about preferred methods of sewing machine maintenance instruction. (See Table IX.) The largest proportion of women (80.00%) selected extension homemaker group programs as a means of sewing machine maintenance instruction. This large percentage is attributed to the membership of the participants in Oklahoma extension homemaker groups. One-third of the participants (35.71%) preferred having a sewing machine company representative give maintenance instruction at a local store, while only 11.43 percent preferred a college or university course. The cost of such a course could be a factor as well as the distant location of institutions of higher education. Only 2.86 percent indicated that no instruction in sewing machine care and maintenance need be offered.

TABLE IX

SEWING MACHINE CARE AND MAINTENANCE INSTRUCTION PREFERRED BY PARTICIPANTS (N=140)

Type	Number[a]	Percent[b]
Extension homemaker group program	112	80.00
Factory representative at store	50	35.71
Adult education course	41	29.29
College or university course	16	11.43
Other		
Booklets	3	2.14
None	4	2.86

[a]Participants were allowed to select more than one response.

[b]Percent given represents the percentage of total participants.

The likeliness of participants to attend courses or workshops on sewing machine care and maintenance is presented in Table X. The majority of those questioned (94.29%) indicated they, or some member of their family, would likely attend an instructional session in sewing machine care and maintenance. Only 5.71 percent responded negatively to this question.

Problems in Repair and Maintenance

In order to make future sewing machine care and maintenance instruction relevant to the consumer it was necessary to discover the mechanical problems encountered frequently by the participants. These problems are presented in Table XI. The two problems listed most often were tension maladjustment (43.28%) and skipped stitches (19.40%).

TABLE X

LIKELINESS TO PARTICIPATE IN SEWING MACHINE CARE AND MAINTENANCE INSTRUCTION (N=140)

Participants	Number	Percent
If the type instruction you checked in question 9 were available would you or some member of your family likely attend?		
Yes	132	94.29
No	8	5.71
	140	100.00

TABLE XI

FREQUENT SEWING MACHINE MECHANICAL PROBLEMS

Mechanical Problem	Number[a]	Percent[b]
Tension maladjustment	58	43.28
Skipped stitches	26	19.40
Not enough power to sew thick fabrics	12	8.97
Jammed bobbins	11	8.21
Out of time	10	7.46
Continual breaking threads	10	7.46
Buttonhole mechanisms malfunction	7	5.22
	124	100.00

[a]Not every participant responded to this question. Those responding were allowed to list one or more problems.

[b]Percent given represents the percentage of the total responses by participants.

Participants were questioned about the problems they had encountered in obtaining sewing machine repair service. The findings are presented in Table XII. Sixty percent of the participants indicated that they had no problems, while the remaining 40 percent indicated the opposite.

TABLE XII

PROBLEMS IN OBTAINING REPAIR SERVICE
(N=140)

Repair Service Problems	Number	Percent
Have you ever had problems getting repair service for your sewing machine?		
Yes	56	40.00
No	84	60.00
	140	100.00

Examination of Hypotheses

The overall objective of the study was to gain information about sewing machine care and maintenance as related to sewing education, mechanical ability, and general type of machine used in home sewing. Three hypotheses were formulated to analyze these variables which are discussed below.

Hypothesis I

There will be no significant correlation between mechanical ability scores and maintenance performance scores of participants. The Pearson product moment coefficient of correlation was utilized in determining whether there was a significant correlation. A Pearson r value of .18 was obtained which indicated a correlation significant at the .03 level. This finding suggested that mechanical ability was related to the performance of sewing machine maintenance tasks (Table XIII).

TABLE XIII

CORRELATION OF MAINTENANCE PERFORMANCE SCORES WITH MECHANICAL ABILITY SCORES

Description	Pearson r Value Maintenance Performance Scores	Level of Significance
Mechanical ability scores	.18	.03

This finding may be due to the premise that those with high mechanical ability perform significantly better than those with low mechanical ability on the learning and retention of selected mechanical tasks (Martin, 1972).

Hypothesis II

There will be no significant correlation between the number of years and/or semesters of sewing education and the maintenance performance scores of the participants. When this hypothesis was subjected to the Pearson product moment correlation formula, a significant correlation was found between the number of years and/or semesters of sewing education and the maintenance performance scores of the participants. The Pearson r value of .28 indicates a significant correlation between the two variables at the .001 level (Table XIV).

TABLE XIV

CORRELATION OF MAINTENANCE PERFORMANCE SCORES WITH YEARS AND/OR SEMESTERS OF SEWING EDUCATION

Description	Pearson r Value Maintenance Performance Scores	Level of Significance
Years and/or semesters of sewing education	.28	.001

Fessler (1971) stated "without education, there would probably be no home sewing" (p. 12). It would then follow that the student would need to learn the use and maintenance of sewing equipment as well as sewing techniques.

Hypothesis III

There will be no significant difference in maintenance performance scores of the participants according to general type of sewing machine used. A one-way classification analysis of variance was applied in order to determine whether there was a significant difference in maintenance performance scores according to general type of sewing machine used. The results are presented in Table XV. The F value of 7.65 is an indication that the difference was significant at the .001 level. Those respondents who indicated that they used a decorative stitch sewing machine received the highest mean maintenance performance score, while those who indicated that they used a simple zigzag machine received the lowest mean maintenance performance score. Straight stitch machines ranked intermediately. Perhaps the continued use and care of a less complicated mechanism caused the mean score for the straight stitch sewing machine to be greater than that for simple zigzag machines. The utilization of the straight stitch machine as well as the age of the machine and the quality of maintenance during use are suggested factors affecting these findings.

TABLE XV

DIFFERENCES IN MAINTENANCE PERFORMANCE SCORES
ACCORDING TO TYPE OF SEWING MACHINE
(N=140)

Description	N	$\overline{X}$	F	Level of Significance
Type of Sewing Machine				
1. Straight stitch	30	27.37		
2. Simple zigzag	26	22.00	7.65	.001
3. Decorative stitch	84	33.04		

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of the study was to gain information about sewing machine care and maintenance as related to sewing education, mechanical ability, and general type of machine used in home sewing. Data were collected at selected Oklahoma homemaker extension group meetings during October and November, 1976, from 140 women 18 years of age and older who had used a sewing machine. Data were tabulated and analyzed using percentages. Correlations were determined by the Pearson product moment coefficient of correlation, and the one-way classification analysis of variance was employed to ascertain the significance of specified differences.

Findings from this study indicated that mechanical ability, type of sewing machine owned and number of years and semesters of sewing education were factors affecting the performance of care and maintenance procedures by the participants. There was a significant correlation between mechanical ability scores and maintenance performance scores, and between number of years and/or semesters of sewing education of the participants and their maintenance performance scores. Sixty percent of the participants owned decorative stitch sewing machines and they obtained the highest mean maintenance performance

score. The remaining participants were almost evenly divided between ownership of simple zigzag and straight stitch machines, but those with straight stitch machines obtained a higher maintenance performance score than did those using a simple zigzag machine.

All of the participants had performed one or more of the care and maintenance procedures. All participants had changed a needle on their machine which was rated as one of the simplest procedures. Approximately 60 percent of the participants had performed basic care and maintenance procedures which were suggested in most of the sewing machine instruction booklets. Those procedures rated as the most difficult were performed by the smallest numbers of participants. None of the participants had retimed a machine.

More than 90 percent of the participants had learned sewing machine maintenance from the instruction booklet which accompanied their machine and 95 percent indicated that they still owned an instruction booklet. Approximately one-third of the participants received maintenance instruction from extension homemaker group programs. One-third of the participants also indicated that maintenance procedures were learned from sewing machine dealers or salespersons. Only twenty percent of the participants learned maintenance procedures from home economics sewing courses in school, while 15 percent had received this information through private and commercial sewing courses.

Approximately three-fourths of those sampled preferred performing routine care and maintenance of their own sewing machines. The remainder preferred having a qualified repairperson perform these tasks. Forty percent of the participants had experienced problems in obtaining repair or maintenance service for their sewing machine. The majority,

60 percent, had no difficulty in obtaining repair service.

When asked to list those mechanical problems which frequently occurred with their sewing machines, more than 40 percent indicated tension maladjustment. Almost one-fifth of the participants had experienced problems with frequently skipped stitches. Another seven percent reported that their machine frequently needed retiming which is often indicated by skipped stitches. Other reported problems were jammed bobbins, continually breaking threads, buttonhole mechanism malfunctions and not enough machine power to sew thick fabrics.

An attempt was made to determine whether or not a need for sewing machine care and maintenance instruction existed. The majority (94.29%) of participants indicated that they or some member of their family would attend if such instruction were offered. The majority of the participants indicated extension homemaker group programs as a preferred source of instruction for sewing machine care and maintenance. More than one-third indicated an interest in instruction in the form of a presentation from a factory representative in a sewing machine or fabric store. Nearly one-third also indicated an adult education course as a desirable source of instruction. Only 11 percent preferred a college or university course on sewing machine maintenance.

Conclusions

The following conclusions can be drawn from this study:

1. There was a significant correlation between mechanical ability scores of the participants and their sewing machine maintenance performance scores.

2. A significant correlation was found between the number of years and/or semesters of sewing education of the participants and their sewing machine maintenance performance scores.

3. A significant difference was found to exist among maintenance performance scores of participants according to the general type of sewing machine used.

4. The majority of the participants had learned sewing machine care and maintenance from the instruction booklet accompanying each new machine, and indicated that they still owned the instruction booklet.

5. The majority of the participants preferred to perform their own routine sewing machine care and maintenance.

6. The majority indicated a likeliness to participate in some form of instruction in sewing machine care and maintenance.

Implications

Findings from the study indicated that at least three factors are related to sewing machine care and maintenance: mechanical ability, sewing education and the general type of home sewing machine used. Results also indicated that the majority of participants had a desire to perform their own routine sewing machine care and maintenance and indicated a willingness to participate in some form of this instruction. Educators in sewing construction courses or programs can utilize such information for planning course objectives. Since the majority of those sampled were willing to participate in sewing machine maintenance instruction, educators may want to include such information in sewing courses. The need for more standardized and readily available

maintenance information should be made known to sewing machine manufacturers in order to improve consumer relations.

Recommendations

Recommendations for further research include the following:

1. Determine whether or not a need exists for sewing machine care and maintenance instruction in other areas of the country.

2. Investigate the availability of instructional materials in sewing machine care and maintenance and identify additional ways of informing those who sew.

3. Investigate other variables which might affect the care and maintenance practices of sewing machine owners such as cost of machine, participant's age or participant's available time.

4. Investigate specific service and repair problems, and mechanical problems with sewing machines identified by sewing machine owners.

5. Investigate the purchasing habits of consumers in regard to sewing machines.

SELECTED BIBLIOGRAPHY

A $3 billion boom in home sewing. Business Week, 1970 (Oct.), 56-57.

About sonic sewing. Machine Design, 1973, 45 (16), 6.

Atchinson, L. Home-sewed garments as good as equipment. Stillwater News-Press, 1976 (Aug. 12), 15.

Bates, G. Manpower needs, performance requirements, and training practices for industrial sewing machine operators as reported by a selected group of apparel manufacturers. Unpublished master's thesis, University of Oklahoma, 1974.

Bennett, G.K., Seashore, H.G., and Wesman, A.G. Differential Aptitude Test for Mechanical Reasoning. New York: Psychological Corporation, 1972.

Cary, J.R. Sewing machines: the new wonder workers. Parents Magazine, 1973, 48 (4), 16-17.

Class distinction. Homesewing Trade News, 1976, 16 (9), 28.

Cronbach, L.J. Essentials of Psychological Testing. (3rd ed.) New York: Harper and Row, 1970.

Elliott, T.R. Create a sewing machine image. Homesewing Trade News, 1976, 16 (7), 18-21.

Epps, H.H. Development of a pretest to predict success in the basic clothing construction course at Winthrop College. Unpublished master's thesis, Winthrop College, 1972.

Evans, C.R. Textiles and clothing program evaluation with recommendations for curriculum development and guidance. Unpublished master's thesis, Ohio State University, 1973.

Fessler, B. Education's role in home sewing industry. What's New in Home Economics?, 1971, 35 (4), 11-13.

Gekoski, N. Psychological Testing. Springfield, Illinois: Charles C. Thomas, 1964.

Gilbert, K.R. Sewing Machines. London: Her Majesty's Stationery, 1970.

Gurel, L.M., and Beeson, M.S. (Eds.) Dimensions of Dress and Adornment. Dubuque, Iowa: Kendall/Hunt, 1975.

Hall, H. Home Sewing Course. (3rd ed.) St. Louis: Sye Sewing Institute, 1947.

Hannan, W.M. The Mechanics of Sewing. New York: Frederick Kogos, 1955.

Home Economics Instructional Materials Center. Clothing Assistant. Lubbock, Texas: Texas Tech University, September 1969.

Home sewing. Consumer's Research Magazine, 1975, 49, 54-57.

Home sewing symptom of the 70's. American Fabrics, 1972, 96 (Winter), 74-75.

I made it myself. Forbes, 1971, 107 (8), 43-44.

Jefferson County Public Schools. Junior High Home Economics. Jefferson, Kentucky, 1973.

Johnson, D. A new direction in clothing construction. Journal of Home Economics, 1960, 52 (9), 750-756.

Jones, S.V. Ultrasonic sewing machine needs no thread, needle. Science Digest, 1974, 75 (1), 73.

Lidolph, T.B. An investigation of homemaker sewing practices, characteristics, and storage space recommendations for planning individual sewing centers. Unpublished master's thesis, University of Nebraska, 1969.

Lowrie, D. The Standard Book of Sewing. Garden City, N.Y.: Halcyon House, 1947.

Lynch, R.J. (Ed.) Singer News. New York: Singer Company, 1975.

Maintenance aids sewing problems. Stillwater News-Press, 1976 (Aug. 12), 15.

Martin, G.E. An Experimental Study Comparing the Relative Effectiveness of a Distributed Versus a Massed Practice Session on the Learning and Retention of a Selected Psychomotor Task. (Doctoral dissertation, University of Maryland) College Park, Maryland: University Microfilms, 1972, No. T3051.

McKee, M.P. A study of the selection, use and care of sewing machines in a selected area. Unpublished master's thesis, Oklahoma State University, 1953.

Moyer, F. Why Albright's outlook is bright. Homesewing Trade News, 1976, 16 (7), 19-20.

Oklahoma Department of Education. Homemaking Education Resource Materials for Clothing and Grooming. Oklahoma City: Oklahoma State Printing Office, 1969.

Olson, S. Sewing machines belong in fabric shops. Homesewing Trade News, 1976, 16 (9), 26-27.

Reid, E. A comparison of 8mm filmloop demonstration and teacher demonstration in teaching clothing construction techniques. Unpublished master's thesis, Michigan State University, 1973.

Roxane. The Secret of Couture Sewing. New York: McGraw-Hill, 1972.

Rush, A.F. Sewing machines: choosing and using the one for you. McCall's, 1973, 100 (5), 28.

Sewing machines and supplies. Consumer Bulletin Annual. Washington, New Jersey: Consumers' Research, Inc., 1973.

Sewing machine repairs. The 1975 Buying Guide--Consumer Reports, 1974, 39 (12), 80-81.

Sewing machines, sewing supplies. Consumer Bulletin Annual. Washington, New Jersey: Consumers' Research, Inc., 1972.

Smith, I.G. Why do women sew? Homesewing Trade News, 1976, 16 (10), 26.

Stanforth, N.F. Socio-economic factors, sewing experiences, and creativity level of women enrolled in a selected sewing class. Unpublished master's thesis, Oklahoma State University, 1974.

Talbot, C. The Complete Book of Sewing. New York: The Greystone Press, 1955.

The invention that automated needlework. The Art of Sewing: The Classic Techniques. New York: Time-Life Books, 1973.

The Story of Fashionomics. New York: Singer Company, 1972.

Tips on sewing machine care. Better Homes and Gardens, 1972, 50 (11), 160.

U.S. Bureau of the Census. U.S. Imports/Consumption and General, SIC-Based Products by World Areas. (Report No. FT210) Washington, D.C.: U.S. Government Printing Office, 1975.

U.S. Department of Health, Education, and Welfare, Office of Education. Clothing Maintenance Specialist: A Suggested Training Program. Washington, D.C.: U.S. Government Printing Office, 1964.

Viking. How Viking Uses Technical Skill to Make Sewing Simpler. (Promotional No. 10-43-323-27) Husqvarna, Sweden: Falths Varnamo, 1975.

Wheeler, J.A. Relationship between home sewing practices, perceived sewing competence, sex-role concept and selected demographic factors. Unpublished master's thesis, Oregon State University, 1973.

Wright, S. Now the sew-it-yourself boom. The New York Times Magazine, 1964 (March 8), 16-18.

Young, M. Sewing with new knits. Forecast for Home Economics, 1976, 21 (6), F-51-F-68.

APPENDIX A

PARTICIPANTS

PARTICIPANTS

Extension homemaker groups from the following counties participated in the study.

County	County Home Economist
Garfield (Enid)*	Mary Lou Swander
Garvin (Pauls Valley)*	Evelyn Brooks
Jackson (Altus)*	Ida Fay Mitchell
Johnston (Tishomingo)*	Rilla McCullough
Murray (Sulphur)*	Janice Curtis
Tulsa (Tulsa, Broken Arrow)*	Donna Cadwalader

*City in which the study was conducted.

APPENDIX B

QUESTIONNAIRE

SEWING MACHINE MAINTENANCE QUESTIONNAIRE

Your assistance in this research project is greatly appreciated. No name is required and your answers will be kept completely confidential.

Please answer the following questions by checking the appropriate answer or by filling in the space provided.

1. Check (✓) your type of home sewing machine:

_____straight stitch only
_____simple zigzag
_____decorative stitch (replaceable cam or built-in)

2. Fill in the approximate number of years or semesters of sewing education you have had in the following areas:

Junior high school_____years
Senior high school_____years
College or university_____semesters
4-H clubs_____years
Extension homemaker groups_____years

3. Check (✓) each of the following care and maintenance procedures you have performed on your home sewing machine:

_____change needle
_____balance tensions
_____adjust bobbin tension
_____adjust top thread tension
_____clean bobbin case
_____oil bobbin case and hook
_____clean inside face plate
_____oil inside face plate
_____clean inside top of head
_____oil inside top of head
_____clean underneath head
_____clean feed dogs
_____oil underneath head
NO keep machine dust free
_____replace worn cord
_____lubricate gears
NO change light bulb
_____adjust belt tension
_____replace throat plate
_____replace take-up spring
_____replace tension discs
_____replace tension springs
_____replace worn hook
_____retime
_____replace worn belt
_____repair motor
_____replace gears

4. Check (✓) the ways from which you learned about sewing machine care and maintenance:

_____instruction booklet with machine
_____salesperson or dealer
_____home economics course in school
_____4-H club
_____Extension homemaker group program
_____sewing course; specify _____
_____other; specify _____

5. What are the most frequent mechanical problems with your sewing machine?

6. Have you ever had problems getting repair service for your sewing machine?

_____yes _____no

7. Do you have a sewing machine instruction booklet?

_____yes _____no

8. How would you like routine care and maintenance of your machine to be handled?

_____you maintain your own machine
_____a qualified repairperson maintains your machine
_____other; specify _____

9. Check (✓) the following ways you would like sewing machine care and maintenance instruction to be offered:

_____Extension homemaker group program
_____factory representative at sewing machine shop
_____adult education course
_____college or university course
_____other; specify _____
_____none

10. If the type instruction you checked in question 9 were available would you or some member of your family likely attend?

_____yes _____no

Thank you for your time and cooperation. These results will be made available to your organization.

APPENDIX C

ASSIGNED VALUES FOR DETERMINING THE MAINTENANCE PERFORMANCE SCORE

ASSIGNED VALUES FOR DETERMINING THE MAINTENANCE PERFORMANCE SCORE

Maintenance Technique	Value
Change needle	1
Clean bobbin case	1
Clean feed dogs	1
Keep machine dust free	1
Change light bulb	1
Oil bobbin case and hook	2
Clean inside face plate	2
Oil inside face plate	2
Clean inside top of head	2
Oil inside top of head	2
Replace throat plate	2
Replace worn belt	2
Adjust top thread tension	3
Adjust bobbin tension	3
Clean underneath head	3
Oil underneath head	3
Replace worn cord	3
Adjust belt tension	3
Balance tensions	4
Lubricate gears	4
Replace take-up spring	5
Replace tension discs	5
Replace tension springs	5
Replace worn hook	5
Repair motor	5
Replace gears	5
Retime	5
Total possible score	80

APPENDIX D

INFORMATION SHEET ON SEWING MACHINE CARE AND MAINTENANCE

INFORMATION SHEET ON SEWING MACHINE CARE AND MAINTENANCE

You've heard "an ounce (gram in metric) of prevention is worth a pound (kilogram) of cure". Well it certainly is true for sewing machines! Your machine will serve you best if you take a few moments to keep it clean and oiled.

How often you will need to clean the machine depends on how often you use it. A good rule to follow is to clean your machine after every garment you sew, or four to six hours of sewing. A smooth running machine makes the best stitch!

The best way to maintain your sewing machine is to follow the instruction manual that comes with every machine. If you have lost yours, write the manufacturer or see if your local dealer can order a new one.

A bit of advice--disconnect your machine from the electrical source before you attempt to clean it!

Here's your basic tool kit:
- small nylon brush
- sewing machine oil and lubricant
- screwdrivers--tension and regular
- tweezers
- cleaning cloth
- and, of course, your instruction manual!

Remove lint from exposed parts with a brush and soft cloth. Be sure to clean the tension discs, presser bar, and needle bar. The take-up lever and thread guides need just as much attention. Take out the bobbin and brush the bobbin case free of lint--remove bobbin case if there is a lot of lint. Open the face plate and clean behind it with a brush. Remove the needle plate and, using a brush, clean the hook and feed dogs. Clean the machine surface with mild soap and water, especially after oiling.

After cleaning, apply only sewing machine oil at points indicated in your manual. Some of the newer machines are permanently oiled so be sure you read before you oil. About every six months (sooner if you sew a great deal), remove top and bottom covers and clean, oil, and lubricate the entire machine (moving parts, that is!).

Change needles after every garment. Be sure you are using the right size needle for your fabric. Ball points are best for knits, sharps for wovens and wedge needles for leather or vinyl. Use only high quality thread for a better stitch and cleaner machine!

Be sure your machine and bobbin are properly threaded. Adjust stitch length, pressure, and thread tension to suit your fabric. Use your instruction manual for a guide to tension adjustments.

A clean machine is a dream machine--hopefully!!

HAPPY SEWING

APPENDIX E

INDIVIDUAL SCORES ON DAT FOR MECHANICAL REASONING, MAINTENANCE PERFORMANCE SCORES, TYPE OF SEWING MACHINE AND NUMBER OF YEARS AND/OR SEMESTERS OF SEWING EDUCATION

INDIVIDUAL SCORES OF DAT FOR MECHANICAL REASONING, MAINTENANCE PERFORMANCE SCORES, TYPE OF SEWING MACHINE AND NUMBER OF YEARS AND/OR SEMESTERS OF SEWING EDUCATION

Participant	Mechanical Reasoning Score	Maintenance Performance Score	Semesters and Years of Sewing Education	Type Sewing Machine
1	33	32	11	3
2	37	8	5	1
3	28	18	6	2
4	45	37	14	3
5	49	42	1	3
6	41	67	28	3
7	37	16	5	2
8	36	33	22	3
9	54	37	7	3
10	51	47	43	2
11	43	22	35	3
12	59	37	8	1
13	54	30	3	3
14	31	49	38	3
15	20	33	20	3
16	48	36	15	3
17	61	3	4	1
18	56	18	6	3
19	38	23	3	3
20	50	32	2	3
21	64	36	8	3
22	45	30	4	3
23	31	67	7	3
24	41	18	10	3
25	50	16	4	3
26	57	1	1	1
27	63	37	1	3
28	31	32	1	3
29	47	21	1	3
30	40	49	41	2
31	37	27	2	3
32	55	36	43	3
33	59	60	9	3
34	53	45	36	3
35	60	16	2	3
36	47	16	6	3
37	35	41	1	1
38	54	34	1	3
39	50	35	29	3
40	30	20	8	2
41	50	33	11	2
42	54	20	3	2
43	48	24	1	3
44	52	40	1	1
45	47	37	6	3

Participant	Mechanical Reasoning Score	Maintenance Performance Score	Semesters and Years of Sewing Education	Type Sewing Machine
46	52	23	4	2
47	50	32	23	3
48	28	60	3	3
49	55	42	4	3
50	42	21	7	2
51	24	1	2	2
52	41	32	40	1
53	46	18	1	1
54	27	35	14	3
55	56	42	1	3
56	49	31	29	3
57	35	33	22	3
58	53	37	1	3
59	50	26	18	1
60	37	18	14	2
61	37	10	14	3
62	54	47	8	1
63	48	35	1	2
64	53	33	22	3
65	41	16	1	3
66	57	46	28	3
67	45	32	14	1
68	28	35	40	2
69	51	34	37	3
70	51	39	1	3
71	50	20	4	3
72	57	39	1	1
73	47	24	8	3
74	41	45	6	3
75	42	26	2	3
76	48	18	3	2
77	46	37	25	1
78	57	43	3	3
79	56	53	6	3
80	41	4	5	2
81	59	42	20	1
82	53	53	4	3
83	21	26	1	1
84	38	39	33	3
85	48	37	5	3
86	36	35	7	1
87	44	15	1	3
88	59	28	3	1
89	42	30	28	1
90	38	12	13	3
91	23	20	1	2
92	40	2	9	1
93	51	29	17	3
94	22	50	22	3
95	56	17	1	3

Participant	Mechanical Reasoning Score	Maintenance Performance Score	Semesters and Years of Sewing Education	Type Sewing Machine
96	28	24	1	3
97	46	30	22	3
98	44	57	23	3
99	27	30	3	3
100	64	38	31	1
101	43	25	6	1
102	45	5	1	2
103	51	33	5	3
104	41	29	43	1
105	39	8	10	1
106	41	29	43	3
107	38	10	8	2
108	42	28	1	3
109	51	25	4	2
110	49	40	13	3
111	21	8	4	3
112	22	21	10	2
113	45	31	9	3
114	47	52	12	3
115	46	34	15	3
116	46	27	10	3
117	36	15	8	3
118	41	17	2	2
119	28	31	6	1
120	53	40	54	3
121	45	33	9	2
122	32	48	2	3
123	43	30	23	3
124	43	9	36	3
125	46	50	42	3
126	21	23	6	1
127	33	30	9	3
128	51	55	15	1
129	54	11	7	3
130	36	10	8	3
131	58	40	4	3
132	50	33	10	1
133	25	11	30	2
134	35	10	2	1
135	33	22	6	2
136	45	38	21	3
137	52	14	12	1
138	45	16	1	2
139	25	31	2	1
140	50	34	1	2

VITA

Evonne Lucille Meischke

Candidate for the Degree of

Master of Science

Thesis: SELECTED FACTORS AFFECTING SEWING MACHINE CARE AND MAINTENANCE

Major Field: Clothing, Textiles and Merchandising

Biographical:

Personal Data: Born in Yreka, California, August 17, 1953, the daughter of Mr. and Mrs. Fred W. Meischke.

Education: Graduated from James Marshall High School, West Sacramento, California, in June 1971; received the Bachelor of Science degree in Home Economics from California State University, Chico, in May 1975; completed requirements for the Master of Science degree at Oklahoma State University in May, 1977.

Professional Experience: Part time Assistant Manager for Janie's Sewing Center, Stillwater, Oklahoma, 1975-1976; graduate teaching assistant in the Clothing, Textiles and Merchandising Department, Oklahoma State University, August 1975-December 1976.

Professional Organizations: Omicron Nu, American Home Economics Association, California Home Economics Association, American Business Women's Association.