

OPINIONS OF SISTERS OF ST. JOSEPH CONCERNING  
FIBERS AND FABRICS USED FOR HABITS

by 149

SISTER MARGUERITE CECILE SCHRECK

B. S., Marymount College, 1953

---

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Clothing, Textiles,  
and Interior Design

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

1967

Approved by:

*Dorice A. Hawes*

Major Professor

LD  
2668  
R4  
1964  
5391  
C.2

#### ACKNOWLEDGMENTS

Sincere appreciation is expressed to Dr. Donice Hawes, Acting Head of Clothing and Textiles and Interior Design, for her patient guidance and encouragement as major adviser; to Miss Esther Cormany for her assistance and interest; to Dr. Jessie Warden, Dr. Ivalee McCord, and Dr. Marjorie Stith for their helpful suggestions while serving on the writer's committee; and to the Sisters of St. Joseph of Concordia, Kansas, and all the Sisters who helped to make this study possible.

## TABLE OF CONTENTS

CHAPTER	PAGE
I. THE PROBLEM AND DEFINITIONS OF TERMS USED .....	1
The Problem .....	1
Purposes of the Study .....	1
Definitions of Terms Used .....	2
II. INTRODUCTION .....	3
Justification of the Study .....	3
Objectives of the Study .....	7
III. METHOD OF PROCEDURE .....	8
IV. FINDINGS AND CONCLUSIONS .....	10
Purchasing Practices of Congregations .....	10
Constituency of Groups of Sisters Trying Fabrics	
for Black Habits .....	11
Identification of Trial Fabrics and Conditions	
of Use .....	13
Satisfaction with Fabrics .....	19
V. REVIEW OF THE LITERATURE .....	22
History and Purposes of Blending .....	22
Findings of Laboratory Tests .....	23
Findings of Wear Tests .....	28
VI. SUMMARY AND RECOMMENDATIONS .....	39
Summary .....	39
Recommendations .....	43

SELECTED BIBLIOGRAPHY .....	44
APPENDICES .....	48
Appendix A - Cover Letter .....	49
Appendix B - Questionnaire .....	50

## LIST OF TABLES

TABLE	PAGE
I. Number of Fabrics Tried by Participating Congregations According to Fiber Content .....	14
II. Comparison of Ratings of the Twelve Top-ranking Fabrics .....	17
III. Comparison of Ratings of Five Fabrics Reported by Eight Different Congregations .....	21

## CHAPTER I

### THE PROBLEM AND DEFINITIONS OF TERMS USED

#### The Problem

In recent years several studies have been made concerning the religious garb of women. Most of these studies have dealt with the design of the garb and attitudes toward its modification. Recognition of the many facets of clothing and textiles has increased and the need to investigate the progress of each aspect with its implications for society has been noted. Aesthetics of clothing, concepts relating to fashion, socio-psychological value of dress, and the myriad aspects of textiles have been defined for further study.

No studies concerning fabrics used for religious habits were reviewed. However, it was learned through conversations with Sisters from various congregations that an attempt to find a fabric satisfactory to replace the traditional all-wool serge had been initiated in some congregations. Certain members within these congregations chose fabrics which they expected to be suitable for habits, then garments made from these fabrics were worn for a trial period. During the trial period, wearers noted desirable and undesirable qualities of the fabrics.

#### Purposes of the Study

Drawing together the information accumulated as a result of these investigations seemed a worthwhile project as findings based

upon the use of fabrics for a trial period had not been formally organized or related. The major purposes of the present exploratory study were: (1) to unify information obtained from the use of various fabrics on a trial basis and (2) to identify fibers and fabric qualities preferred by Sisters.

#### Definitions of Terms Used

Congregation. Throughout the report the term "congregation" indicates a group of religious women who are joined by common goals and rules under the jurisdiction of one common generalate or governing body. The members may vary considerably in number and may reside in numerous different houses or institutions.

Habit. In this study, the term "habit" refers to the distinctive dress worn by members of Catholic religious congregations of women. The term does not include the head covering or material surrounding the face.

Sister. This is a title used to designate the members of a congregation of Catholic religious women, devoted to spiritual and charitable work who live together in a community house and are bound by vows.

## CHAPTER II

### INTRODUCTION

#### Justification of the Study

According to the January 1967 Textile Organon (10), the total fiber consumption in the United States during 1965 was over eight billion pounds. A substantial portion of this textile consumption can feasibly be attributed to use by various congregations of religious women throughout the nation. In 1965 there were nearly 180,000 members of Catholic Sisterhoods in the United States including almost 20,000 Sisters of St. Joseph. The preferences of this portion of the total consumer population has bearing on the textile industry.

Clothing has proved to be an effective device in delineating roles of individuals. In the last decade, and particularly in the last half decade, the role of religious women in America has been changing rapidly. Consequently, the role-defining aspect of the religious habit has been identified as an area needing to be changed to correspond with the altered role. Prior to the publication of The Nun in the World by Leon Joseph Cardinal Suenens (33) in 1962, the role of active religious congregations had included almost the same activities it had for centuries. Among these activities were teaching, nursing, and staffing institutions for orphans, the aged, physically and mentally handicapped and social misfits. Increasing demands of a complex society



and the circulation of Suenens' book gave increased impetus to the trend of Sisters' entering other spheres of service.

Besides identifying roles of an individual, clothing serves many other functions. Some of these functions were enumerated by the Clothing and Textiles Seminar held in 1966 at Manhattan, Kansas (30). Clothing helps to satisfy basic human and social needs, provides protection, serves as a means of self-expression, status, and group identification. Innovations and modifications in dress reflect conditions in the socio-cultural milieu. Cultural, political, social, and religious mores influence clothing behavior. In all these realms clothing functions as a means of communication.

These facts are true of clothing worn by persons in general and, to a certain extent, they are also true of religious habits. Shifts in socio-cultural patterns in America along with the changes in the role of religious women have effected and promise to effect many habit modifications. Work among under-privileged families in slum areas, lecturing positions in adult education groups and various social service activities are being initiated by active congregations. As a result there is an increase in Sisters' contacts with many persons of different races and different religious beliefs, and the value of the traditional habit in the varied circumstances of their modern life has been brought into question.

In analyzing the results of a study ascertaining attitudes of lay personnel and Sisters toward the traditional religious habit, Miller (22) concluded:

Answers indicated a tension between practicality on one side and religious symbolism on the other. . . . in America, distinctive dress is usually taken as a kind of uniform. A uniform is identified with an occupation and efficiency in that occupation. Therefore, American sisters are also asking: "Should our dress be a sign of what we are, or is it to be a sign of the kind of work we do and our efficiency in our kind of work?"

Even before the Sisters' role began to change noticeably, there was a subtle movement toward altering the habits. Teufel (34) made a survey in which Sisters were questioned about their attitudes toward the official dress of the congregations. Seventy-two out of one hundred participants replied to the question: "Do you consider your habit practical?" Of these respondents, forty-one said no; nineteen, yes; and twelve had no comment. Points of agreement which these Sisters indicated would increase the functionality of the habit were less yardage, and a habit easy to make and easy to repair so that time could be more profitably employed in other activities.

Nelson (25) found that of the 296 communities of religious women contacted, 110 had already made some change in habit by 1957. Synthetic fabrics were being used, skirt and waist were detachable, hemlines had been shortened and less fabric was being used. The major reasons for these changes according to Nelson were easier care, economy of time and money, hygienic reasons, and the Pope's recommendations.

Recent Papal recommendations have provided a powerful yet unobtrusive incentive for modification of a garb that has remained relatively the same for many centuries. In 1952 Pope Pius XII (29), recognizing the varying conditions under which Sisters work, issued the following directive:

With regard to the religious habit, choose one that expresses your interior lack of affectation, simplicity and religious modesty. The religious habit should always express the consecration to Christ; that is desired by all. In other respects the habit should be appropriate and in keeping with the demands of hygiene. . . . to sum up: in things that are not essential make the adaptations counselled by reason and well ordered charity.

"The Decree for Religious" issued by Pope Paul VI and the members of Vatican II (28) reiterated the thought that adaptation of the religious habit to modern needs is desirable:

Since they are signs of a consecrated life, religious habits should be simple and modest, at once poor and becoming. They should meet the requirements of health and be suited to the circumstances of time and place as well as to the services required by those who wear them. Habits of men and women which do not correspond to those norms are to be changed.

Nelson's (25) study revealed that numerous changes had been made in religious habits with participants anticipating many more changes in the near future. Change of fabric was mentioned specifically.

Because the habit is the official dress or uniform worn daily by Sisters, certain basic qualities such as durability, ease of washing and drying, wrinkle resistance, and pleasing appearance are highly desirable. Then, too, since the lives of the Sisters are dedicated to the service of humanity, economy in the purchase and care of fabrics as implied in several sources, would enable Sisters to expend more time and effort in humanitarian endeavor.

### Objectives of the Study

Objectives of this study were: (1) to obtain, by means of a questionnaire, opinions concerning fibers and fabrics used for habits from Sisters using them, (2) to review relevant literature pertaining to the experimentation with preferred fabrics, and (3) to make findings of the isolated groups available to all congregations that participated in the study.

## CHAPTER III

### METHOD OF PROCEDURE

A preliminary questionnaire designed to obtain information which had been accumulated by various congregations concerning fabrics for habits was developed by the investigator and sent to five congregations of Sisters in various parts of the United States. A cover letter mailed with the questionnaire stated the purpose of the questionnaire and requested comments and suggestions for its improvement. A stamped, self-addressed envelope for use in returning the completed questionnaire was also enclosed. Responses to this questionnaire indicated the need for revision of the instrument for clarity and conciseness. A revised form of the questionnaire was sent to six congregations different from the five to which the original questionnaire had been sent. Responses to this questionnaire resulted in further refinement of the instrument used in the present study.

During the summer of 1966, the final questionnaire was sent to thirty-five Congregations of Sisters of St. Joseph located in all parts of the United States. The instrument used for data collection consisted of a number of short answer and open-end questions with space provided for further comments. A copy of the cover letter is found in Appendix A, and a copy of the questionnaire is found in Appendix B. Questions asked related to: (1) purchasing practices of congregations, (2) constituency of groups of Sisters trying fabrics

for black habits, (3) identification of trial fabrics, and (4) satisfaction with fabrics.

None of the preliminary questionnaires were sent to Sisters of St. Joseph. Congregations receiving preliminary questionnaires were not among those participating in the final study.

The combined membership of the Congregations of the Sisters of St. Joseph is approximately 20,000. A consensus of opinion from those who tried fabrics within each of these congregations was sought by contacting the chairman or co-ordinator of each group. Opinions concerning habit fabrics were not sought from each member. Sisters of St. Joseph were selected for several reasons: it was believed members used black all-wool serge for their habits; wide dispersion of the congregation throughout the country was believed to indicate the influence of climate on the acceptability of a fabric; and finally the investigator is a member of that affiliation.

Responses received were tabulated and percentages were calculated. The analysis of responses of eighteen congregations to questionnaires mailed to thirty-five Congregations of Sisters of St. Joseph prompted the investigator to include an extensive review of literature related to fabrics the Sisters had considered satisfactory during the trial period of fabric use.

## CHAPTER IV

### FINDINGS AND CONCLUSIONS

Responses were received from twenty (57 per cent) of the thirty-five Congregations of Sisters of St. Joseph to whom questionnaires were sent. Letters from two of these congregations indicated that the congregation did not qualify for participation in the study. Findings and conclusions of the study were based upon the responses of the eighteen congregations returning usable questionnaires.

#### Purchasing Practices of Congregations

Buying practices of congregations were not uniform. Some congregations had a central source of supply for habit fabric, but many did not. In the eighteen congregations which supplied data, nine (50 per cent) did not purchase all black habit fabric from one source. Two congregations (11.1 per cent) indicated all black habit fabric was purchased from one source. Seven congregations (38.8 per cent) of the eighteen did not respond to this question.

Responses to the question: "Approximately how many yards of black fabric for habits was purchased by your Congregation in 1964?" indicated a very general estimate of the total yardage purchased. Fourteen (77.7 per cent) did not answer, but the four that did, revealed a combined purchase of approximately 7,835 yards of black fabric for use in habits. Purchase of black fabric other than all-wool serge surpassed that of all-wool serge in 1964 according to the replies. Eight

responses indicated about 3,797 yards of all-wool serge had been purchased compared to about 6,708 yards of fabric other than all-wool serge purchased during the same time. The response of one congregation indicated that no all-wool serge had been purchased during 1964, and another respondent stated "more Dacron" had been purchased during that year. These facts coincided with the statement in a letter from Edward S. Jamieson (16) and prompted the conclusion that fabric choice for habits is shifting from all-wool serge to synthetic and blended fabrics.

Seventeen suppliers of black fabric for habits were patronized by ten responding congregations. The two suppliers sharing equal popularity were Jamieson of Chicago and T. M. McEvoy, Incorporated, New Rochelle, New York. The comparatively small number of suppliers and the number of times the two leading suppliers were mentioned indicated a concentrated source of supply for black habit fabric in the participating congregations.

#### Constituency of Groups of Sisters Trying Fabrics for Black Habits

There had been a widespread use of fabrics other than all-wool serge for habits among the congregations contacted. This was especially true among students and teachers in the 25-44 age range. Questions relating to the constituency of the groups of Sisters trying fabrics other than all-wool serge showed that the number of participants varied greatly from congregation to congregation. The number of Sisters who used



fabrics on a trial basis ranged from fifteen in one of the four congregations having a control group to 1,000 Sisters. Seven congregations were unable to give the definite number of Sisters who had worn habits made from different fabrics during a trial period. Reported age ranges of Sisters who tried different fabrics indicated that almost all ages were represented, but in the six specific responses, a clustering appeared in the 25-34 and 35-44 age groups. There were 139 Sisters who were in the 25-34 age group and 124 who were in the 35-44 age group. Various work positions were represented by Sisters trying fabric other than all-wool serge. According to the eight responses, 1,147 were classroom teachers and 295 were students.

The majority of congregations had no co-ordinator for the Sisters trying various habit fabrics. Sixteen responses indicated that five congregations had a co-ordinator, but eleven did not. Four of the five co-ordinators mentioned had the Master's degree. The fifth co-ordinator was an experienced seamstress.

The number of individual Sisters who tried several different fabrics appeared to be negligible. In fourteen congregations the number of Sisters trying different new fabrics was unknown. The four responses given in numbers indicated a total of 231 Sisters had tried one new fabric, fifty-four had tried two fabrics, and one had tried three fabrics.

### Identification of Trial Fabrics and Conditions of Use

Fibers and fabrics developed in recent years had been utilized by the participants. Respondents from thirteen (72.2 per cent) congregations indicated that the trial use of a fabric other than all-wool serge had begun in 1960 or earlier; one (5.5 per cent) marked that their use had begun in 1961; two (11.1 per cent) in 1962. Two congregations (11.1 per cent) indicated they had adopted a fabric different from all-wool serge in 1966. This was done without a previous trial period.

The influence of fabric manufacturers in the selection of fabrics for trial use seemed to indicate that suppliers were eager to meet the demands of their clientele. For economic reasons, it would seem fabric manufacturers believed religious congregations were a large enough portion of their clientele to be worthy of consideration.

In reply to the question: "How were fabrics selected?" fifty-two specific answers were given. In twenty-two instances fabric manufacturers recommended selection of the specific fabric. In seventeen instances "other" unspecified means were used. The recommendation of another congregation influenced the selection of six fabrics. Four fabrics were selected after preliminary investigation by an individual member, and three selections were simply the individual's preference.

At least thirty-four different fabrics were tried, but it was impossible to ascertain the exact number because some congregations did not give tradenames of the fabrics which were tried. This

prevented the identification of fiber and fabric duplications among congregations. Some congregations tried several different single-fiber fabrics and some tried several different proportions of the same fiber blend. The number of participating congregations trying different fabrics is presented in Table I.

Nine performance qualities were specified on the questionnaire as the criteria for determining acceptability of fabrics tried. These qualities were colorfastness, shrinkage resistance, wrinkle resistance, pilling resistance, pleasing weight, little or no pressing, spot and stain resistance, ease in sewing, and durability. Thirty-one fabrics were rated by at least one respondent on degree of satisfaction afforded by all nine performance qualities.

There were five fabrics that at least one respondent found "very satisfactory" in all respects. These fabrics were: 55 per cent Dacron polyester/45 per cent wool Bengal Lancer 60; 55 per cent Dacron polyester/45 per cent wool Whirlaway 60; 55 per cent Dacron polyester/40 per cent acetate/ 5 per cent mohair; and 45 per cent Dacron polyester/55 per cent wool Elite, and 55 per cent Dacron polyester/45 per cent rayon. Fabrics that were less than "very satisfactory" in only one performance quality were: 55 per cent Dacron polyester/45 per cent rayon; 55 per cent Dacron polyester/45 per cent rayon Airlite; and 55 per cent Dacron polyester/45 per cent wool Breezeweight. Four fabrics were rated "very satisfactory" on all but two qualities. The fiber content of these fabrics were as follows: 50 per cent Dacron polyester/

TABLE I  
NUMBER OF FABRICS TRIED BY PARTICIPATING  
CONGREGATIONS ACCORDING TO  
FIBER CONTENT

Fiber content	Number of fabrics tried by participating congregations
Dacron polyester/rayon	18
Dacron polyester/wool	13
Orlon acrylic/wool	3
Dacron polyester/cotton	2
Wool/nylon	2
Dacron polyester/Orlon acrylic	1
Wool/rayon	1
Orlon acrylic/rayon	1
Dacron polyester/acetate/mohair	1
Acetate/rayon	1
Dacron polyester	1
Cotton	1

50 per cent Orlon acrylic; 85 per cent wool/15 per cent nylon; 55 per cent Dacron polyester/45 per cent wool; and 55 per cent Dacron polyester/45 per cent viscose rayon. A comparison of the top-ranking twelve fabrics appears in Table II.

Of the twelve fabrics rated "very satisfactory" on all qualities but two or less, five were polyester/wool blends, four were polyester/rayon blends, one was a wool/nylon blend, one was acrylic/polyester blend, and one was polyester/acetate/mohair blend. Among the five that were "very satisfactory" in all respects, three were polyester/wool blends, one was polyester/rayon blend, and one was polyester/acetate/mohair blend. Among the four congregations that had agreed on the fabric most satisfactory of all fabrics tried, four fabrics were polyester/wool blends and two were polyester/rayon blends. It was concluded that fabrics made from polyester/wool blends were the most acceptable for use as habit fabric. Fabrics made from polyester/rayon blend were also very acceptable.

The over-all ratings reported by responding congregations indicated the qualities which were most frequently rated "not satisfactory" were weight, colorfastness, wrinkle resistance, pilling resistance, and ease in sewing. However, none of these qualities proved unsatisfactory in more than four instances. All fabrics tried by all respondents were rated "very satisfactory" in durability.

Thirteen fabrics constructed from a Dacron polyester/wool blend were rated for satisfaction on nine qualities. Only one instance of dissatisfaction was cited and that concerned pilling resistance.

TABLE II

## COMPARISON OF RATINGS OF THE TWELVE TOP-RANKING FABRICS

Fiber content	Tradename	Performance qualities <sup>a</sup>										
		Colorfastness	Shrinkage	Wrinkle resistance	Pilling resistance	Pleasing resistance	Weight	Little or no pressing	Spot and stain resistant	Ease in sewing	Durability	
55% Dacron polyester/45% wool	Bengal	V	V	V	V	V	V	V	V	V	V	V
55% Dacron polyester/45% wool	Whirlaway	V	V	V	V	V	V	V	V	V	V	V
55% wool/45% Dacron polyester	Elite	V	V	V	V	V	V	V	V	V	V	V
55% Dacron polyester/45% rayon	none given	V	V	V	V	V	V	V	V	V	V	V
55% Dacron polyester/40% acetate/5% mohair	none given	V	V	V	V	V	V	V	V	V	V	V
55% Dacron polyester/45% rayon	AirLite	V	V	V	V	M	V	V	V	V	V	V
55% Dacron polyester/45% wool	Breezeweight	V	V	V	V	V	M	V	V	V	V	V
55% Dacron polyester/45% rayon	none given	V	V	V	V	V	M	V	V	V	V	V
55% Dacron polyester/45% wool	Panama	V	M	V	V	M	V	V	V	V	V	V
55% Dacron polyester/45% viscose rayon	Dacpan	V	V	M	O	V	V	V	V	V	V	V
85% wool/15% nylon	none given	V	M	V	V	M	V	V	V	V	V	V
50% Dacron polyester/50% Orlon acrylic	Tropical	V	V	V	V	N	M	V	V	V	V	V

<sup>a</sup> V means very satisfactory; M means moderately satisfactory; N means not satisfactory; and O means no rating was given.

Dacron polyester/wool blends were rated "very satisfactory" on colorfastness, shrinkage resistance, ease in sewing, and durability in twelve out of thirteen times. On wrinkle resistance, pilling resistance, and pleasing weight, these fabrics were rated "very satisfactory" nine out of thirteen times, and they were rated "very satisfactory" eight out of thirteen times on little or no pressing and spot and stain resistance. Nine Dacron polyester/rayon blends were rated by reporting congregations. There were three qualities in which dissatisfaction was noted, namely, colorfastness, spot and stain resistance, and ease in sewing.

It was interesting to compare ratings given by users of the same fabric. One responding congregation rated Airlite "very satisfactory" on all performance qualities except pleasing weight on which it was rated "moderately satisfactory." The other congregation rating Airlite considered it "very satisfactory" on all qualities except colorfastness, and pleasing weight on which it was rated "moderately satisfactory." The respondent for the second congregation did not rate the spot and stain resistance of Airlite. Bengal was rated by one congregation as being "very satisfactory" in all respects, but another congregation found it only "moderately satisfactory" in requiring little or no pressing. The two congregations rating Kosker Dac agreed that it was "very satisfactory" on pilling resistance, pleasing weight, ease in sewing, and durability, but there was disagreement in other areas. There was slightly less disagreement between the two respondents who rated Dacrest, but more disagreement among the three congregations that rated

Dacpan as indicated on Table III. It would seem feasible to conduct a more controlled wear test on these fabrics to ascertain degree of satisfaction afforded by all qualities.

The response to the question: "How long was each trial fabric worn?" revealed a misinterpretation of the question. Respondents interpreted it to mean the duration of time the fabric was considered satisfactory enough to warrant continuation of its use without trying other fabrics to replace it. Panama cloth was listed by one congregation as proving satisfactory for twenty years. Another congregation reported that they found synthetics were satisfactory for the last ten years. The question was intended to determine how long trial fabrics were used in an attempt to ascertain the merits of each. Two fabrics were used for four years; nine fabrics were used for three years, six fabrics were used for two years, and four fabrics had been used for less than two years.

#### Satisfaction with Fabrics

Seven (38.8 per cent) respondents out of the eighteen answered the question: "Was there a trial fabric that your Sisters agreed was most satisfactory?" Four answered yes; three answered no. Among the four answering yes, six fabrics were listed. These were No. 10405, 55 per cent Dacron polyester/45 per cent viscose rayon; Kosker Dac, 55 per cent Dacron polyester/45 per cent viscose rayon; Oasis 45 per cent wool/55 per cent Dacron polyester; Breezeweight, 55 per cent Dacron polyester/45 per cent wool; Bengaline, 70 per cent Dacron polyester/30 per cent



TABLE III

COMPARISON OF RATINGS OF FIVE FABRICS  
REPORTED BY EIGHT DIFFERENT CONGREGATIONS

Congregation <sup>a</sup>	Tradename	Rating of performance qualities <sup>b</sup>								
		Colorfastness	Shrinkage resistance	Wrinkle resistance	Pilling resistance	Pleasant weight	Little or no pressing	Spot and stain resistance	Ease in sewing	Durability
1	Airlite 55% Dacron/45% rayon	V	V	V	V	M	V	V	V	V
2		M	V	V	V	M	V	V	V	V
3	Bengal 55% Dacron/45% wool	V	V	V	V	V	V	V	V	V
4		V	V	V	V	V	M	V	V	V
2	Kosker Dac 55% Dacron/ 45% viscose	M	M	V	V	V	V	M	V	V
5		M	V	M	V	V	M	O	V	V
1	Dacrest 55% Dacron/45% rayon	M	V	V	V	M	V	O	V	V
5		M	V	M	V	V	V	M	V	V
6	Dacpan 55% Dacron/ 45% viscose	V	V	M	O	V	V	V	V	V
7		O	O	M	V	V	V	N	M	V
8		N	M	M	M	M	M	M	N	V

<sup>a</sup> Each number, one through eight, represents a specific congregation.

<sup>b</sup> V means very satisfactory; M means moderately satisfactory; N means not satisfactory; O means no rating was given.

wool; and Bengal, 55 per cent Dacron polyester/45 per cent wool. Although fabric No. 10405, a Dacron polyester/viscose rayon blend, was named by two congregations as the "most satisfactory" fabric, neither congregation rated it on individual performance qualities.

Eleven respondents did not report the number of times the "most satisfactory fabric" had been washed when it was ranked as most satisfactory. Five respondents reported the fabric had been washed ten or more times before it was rated. Three reported fabric had been washed five or more times, and two checked both the five and ten times indication.

When asked how the serviceability of the "most satisfactory fabric" compared with the serviceability of the traditional all-wool serge, eight (44.4 per cent) responded. Four reported wool was less serviceable; one held that wool was more serviceable, and one thought there was no difference in serviceability. Two congregations thought their trial of fabrics was too recent to compare the serviceability of the new fabric with all-wool serge.

## CHAPTER V

### REVIEW OF LITERATURE

Much has been written concerning consumer satisfaction with clothing. Tests on the performance of fabrics have been made and published even before the product reached the mass population. Wear tests have been made and the findings compared with findings in laboratory tests to determine areas for improvement.

#### History and Purposes of Blending

Combination fabrics in which yarns made from different fibers are woven together have been utilized since ancient times. In the Winter 1961-1962 issue of American Fabrics (1), it was stated that ". . . fabrics incorporating a linen or cotton warp and a filling of silk were manufactured as early as 150 B. C." The practice continued through medieval times, and in the 15th and 16th centuries, linsey-woolsey cloths of coarse inferior wool, woven on flax warp were in vogue as inexpensive decorative fabrics.

Blends, the mixture of two or more fibers in either warp or weft, are of more recent origin. Extensive experimentation with many fibers in the formation of blends resulted from the development of man-made fibers because the engineered length and other controlled properties facilitated experimentation. Studies of the performance of these blends were pertinent to this study.

Although the use of synthetics is increasing rapidly, leaders in the textile world predict that wool and cotton, the natural fibers, though playing a smaller role in the future of mankind, will nevertheless remain endowed with specific virtue. Cizancourt and Segal (8) stated, ". . . they [natural fibers] will always have for men a spiritual and emotional appeal which can never be duplicated by science." It is in the union of natural with man-made fibers that the textile industries will find both their economic and their social justification in supplying the needs of a rapidly expanding population and a rising standard of living among underdeveloped nations of the earth.

Fibers have been blended for several reasons. Sometimes the purpose is to extend a limited fiber, and sometimes it is to maintain a low cost while retaining the maximum of good qualities of each constituent. Sherwood (32) held that blending facilitated spinning, weaving and dyeing operations.

#### Findings of Laboratory Tests

Moncrieff (23) noted that one of the advantages that might be expected from uniting synthetic to natural fiber was an increase in tenacity; in many blends this was found, but the increase was often not what might be expected from first principles but varied from blend to blend. He cited a specific example:

Mixtures of two fibers sometimes have a lower breaking strength than either fiber has individually. Thus a blended yarn of 75 per cent viscose rayon and 25 per cent Dacron has a lower breaking load than has viscose rayon.

Ponting (27) noted that there were two crucial points in blending; choice of fibers and percentages of each were vitally important.

After a number of experiments he stated:

It is advisable to blend no more than two fibers together, and . . . percentages in the nature of 50 per cent of each will give the best results. There may be occasions when 5 or 10 per cent of a fiber may be added to obtain additional strength.

Wool has relatively poor resistance to abrasion, but if a little nylon or Dacron is blended with it, the abrasion resistance is enormously increased. Nylon has the greatest effect; Dacron has a little less, and Orlon gives only a slight increase in abrasion resistance, according to Moncrieff (23). Dowlen (9) found that "replacing one fourth the wool by nylon produced a yarn almost twice as strong as those from all wool." The blending of nylon with wool will not prevent wool from shrinking or felting nor will it protect it from moths. It does, however, reduce shrinking and felting. One of the defects associated with the blend of nylon and wool was the tendency to pill which was much greater than it was with all wool. Another defect was the slight change in color after washing noted by North Central Research Committee (3).

Lapedes (21) reported that, after adopting a Dacron/cotton blend for summer uniforms, the United States Air Force disclosed the results of research begun in 1953 on wool/synthetic blends. Serge construction had been used and blends of wool with nylon, polyester, acrylic, viscose, and modacrylic were tested. Eighty-five per cent wool/15 per cent synthetic showed unsatisfactory breaking strength. A blend of 70 per cent wool/30 per cent synthetic in each case was more satisfactory than 100

per cent wool. A three-fiber blend, 70 per cent wool/20 per cent viscose/10 per cent nylon was finally selected because it was superior to wool in wind resistance and flex abrasion. It was equal to wool in compressibility, crease retention, and breaking strength. It was inferior to wool in flex stiffness and crease recovery. No blue fabric acceptable to the Air Force was obtained, however, so the blend of 70 per cent wool/20 per cent viscose/10 per cent nylon was not adopted for Air Force uniforms.

Moncrieff (23) found that Dacron blended with wool had appreciably more dimensional stability to changes of relative humidity. Dacron polyester/wool blends pressed and retained their creases very well, but there were some defects. Dacron/wool blends had a tendency to pill and were prone to pick up dirt along the folds and creases. Another disadvantage noted was the ease with which cigarette ashes burned holes in it. However, blends of Dacron with rayon staple, acetate staple or wool were much more satisfactory in this respect than 100 per cent Dacron polyester.

The prime attributes of acrylics, favorable fabric aesthetics and styling versatility, were utilized in blends. When Orlon acrylic Type 42 was blended with wool, a natural lift resulted according to Moncrieff (23). Blends of 50 per cent Orlon acrylic/50 per cent wool were sold as men's suitings.

Durability, wrinkle-resistance, and easy-care properties, the outstanding features of polyester, were retained in blends with natural fibers. In 1964, America's Textile Reporter (12) announced that a new

blend based on 65 per cent Dacron polyester/35 per cent cotton construction was being developed with the accepted characteristics of Dacron polyester and cotton but with the look of worsted for year-round effects and weights. An eight ounce washable version for men's spring suits was announced that same year.

Moncrieff (23) made further discoveries about Dacron polyester blends. When Dacron was blended with cellulose acetate staple, there was from the beginning an increase in strength. Small additions of Dacron polyester decreased the strength of viscose rayon, and only large proportions of the strong fiber increased the strength of viscose rayon. A 50 per cent viscose rayon/50 per cent Dacron polyester was as strong as 100 per cent viscose rayon while a 25 per cent viscose rayon/75 per cent Dacron polyester blend had a much higher strength.

The North Central Regional Committee of Textiles and Clothing (3) conducted a laboratory evaluation of wool and wool-like skirt fabrics and published their findings in 1965. One of the purposes of the study was to determine laundering and drycleaning effects on the physical characteristics of skirt fabrics. Twelve samples of fabrics were tested including 100 per cent wool, wool/nylon, wool/acrylic, wool/polyester, spun rayon, rayon/acetate, and rayon/acrylic.

Since laundering and drycleaning influence the criteria that were ranked highly desirable for skirts in a previous consumer preference study which will be discussed later, fabrics were analyzed after

0, 1, 3, 6, and 10 treatments. The following were some of the findings of the committee's research (3):

Visual observation after laundering showed only slight changes in color except for wool-nylon blends which developed a pink cast. Most fabrics were blends of white and dark fibers; therefore, if fabrics became more compact, they darkened. Slight fuzzing or pilling was noticed in some fabrics especially 100 per cent wool, wool-nylon, rayon, rayon-acetate, and rayon-acrylic. Some fabrics changed in "hand"; 100 per cent wool and wool-nylon became harsh and rayon-acetate and rayon-acrylic softened.

Some dimensional changes were also noted by members of the investigating committee. Tumbler action washing caused greater shrinkage than did agitator action. In either method there was more shrinkage in the warp. The addition of 15 per cent nylon reduced shrinkage. Wool/nylon blend treated for washability was more dimensionally stable than un-treated fabric of the same blend. In general, wool/synthetic blends were more dimensionally stable than all-wool fabrics.

Fabrics were also tested by the committee for tear resistance. Tear resistance was highest in one rayon sample before laundering. The lowest tear values recorded were in one sample of wool/polyester. With all-wool and wool/nylon blends tear resistance improved with each tumble washing. In all other fabrics, tear strengths decreased through washings.

Surface changes noted were some fuzzing in the 50 per cent rayon/50 per cent acrylic fabrics and pilling in the wool and wool blends. However in wrinkle recovery, wool and wool blends were superior to rayon fabrics, and wool maintained stiffness through cleaning



treatments better than rayon. Rayon/acrylics were as good or better than wool/acrylics and wool/polyester in wrinkle recovery.

Before new fibers were introduced to the mass market, tests like those already cited were conducted to evaluate performance and to determine acceptability of fibers and fabrics for end uses, but research to learn what happens to such textile items under normal wear and care necessarily lags behind the research to develop new textile products. Quinn (31) aptly stated, "It should be remembered that, with the introduction of every new textile material, consumers become logical test subjects." LaBarthe (19) concluded that such testing by consumers has its strong points because "the machine readings of some tests do not always agree with human experience."

#### Findings of Wear Tests

Within the last thirty years numerous studies have been made to determine consumer preferences for fibers and fabrics. In her study of service qualities of all-wool, all-rayon, and wool/rayon fabrics, Floersch (11) found that crease resistance was higher in wool and rayon mixed fabrics than in either all-wool or all-rayon after each drycleaning.

Jordan (17) found that of the 199 worn out garments analyzed, only twenty-three were listed as having been unsatisfactory by the consumer. The unsatisfactory garments included four wool; one part wool; six silk; four cotton; and six rayon.

Facts about rayon and wool fibers and the reasons they failed to meet expectations of their purchasers are pertinent to the present study.

Reasons viscose rayon proved unsatisfactory were loss of shape, loss of color, lack of wrinkle resistance, and loss of finish during laundering. The wool and part-wool garments were rated as unsatisfactory for the following reasons: stretching, thread slippage, absorption of moisture resulting in loss of neat appearance, yellowing, and fading.

In September and December of 1955 (36) a committee authorized by the United States Department of Agriculture interviewed 2,425 women and 1,751 girls to ascertain their attitudes toward wool and other fibers. Although many tangible and intangible factors influenced selection of skirts and suits, half of all the buyers said the fiber was the most important or a very important consideration. Aesthetic and practical features and the amount of experience with the fabric also influenced their preferences. Among the women, the vast majority considered wool the best for cool weather suits and skirts. Their listing of virtues of wool garments included qualities such as wears well, holds shape, doesn't wrinkle, and has warmth. Other good features mentioned were attractive appearance, cleans well and looks attractive after drycleaning. Among the few criticisms of wool were its allergenic and irritating qualities, its susceptibility to moths, lack of durability, and its being difficult to care for. Skirt owners gave a wide margin of preference to wool with wool/rayon blend their second choice.

The top-ranking advantage of wool blends was performance. Wool/rayon was praised for richness, smart appearance, and its satisfactory weight. Only a small group expressed an opinion about wool blended

with nylon, Orlon acrylic, or Dacron polyester or about Orlon acrylic or Dacron polyester alone, but the most frequently mentioned feature was ease of care.

Major advantages cited for rayon or acetate were performance, coolness, and ease of care. Half of the owners criticized rayon or acetate for suits for its difficulty to care for, wrinkling, becoming shiny, failing to keep its shape, and lacking warmth.

Another study authorized by the Department of Agriculture (37) investigated the attitudes of 1,751 girls and 368 mothers concerning fibers used in eighteen classes of apparel. Findings showed that "cotton enjoys wider usage among 14 to 17-year-old girls than any other fiber, natural or synthetic." Of the girls who favored nylon, over half spoke of its requiring little or no ironing, and quick drying qualities. Some mentioned light weight, coolness, and appearance. "Only a minority of girls felt familiar enough with rayon or Dacron to say what they liked or disliked about these fibers." Girls who preferred Dacron polyester, liked launderability, appearance, coolness, ease of washing, minimal ironing, speed in drying and wrinkle resistance. Only 3 per cent criticized Dacron polyester. In evaluating Orlon acrylic, major virtues mentioned were: launders well, doesn't scratch, and holds its shape.

Warmth was the outstanding quality of wool named by seven in ten girls. Other features praised in substantial proportions included its nice appearance, wrinkle resistance, durability, shape retention, its

ease of care and variety of fabrics. When questioned about the fibers they disliked, about half said wool was scratchy and irritating to the skin, a third of the girls had no reason for disliking wool, and one in five experienced difficulty in caring for wool.

Desirable features of rayon were listed as ease of care, appearance, style, weight, and comfort. One in ten criticized it because it lacked durability and was difficult to care for.

Teen-age girls ranked six fibers on eight features as follows: 1) those with which they had had most experience, 2) which they considered best value for money, 3) which were the longest lasting, 4) which kept its shape the best, 5) which were easiest to care for, 6) which were least likely to wrinkle, 7) which were best to wear in cold weather, and 8) which were best to wear in hot weather. Ninety-five per cent had most experience with cotton. Wool ranked highest as being long lasting and best for cold weather, and least likely to wrinkle.

When mothers evaluated the six fibers on the eight characteristics, some disagreement appeared. Nylon was listed as least likely to wrinkle by 42 per cent of the mothers, while the girls gave wool the top ranking in this category. Mothers stressed practical considerations such as durability, price, and launderability; but girls stressed weight and comfort.

Late in 1955 the United States Department of Agriculture (38) authorized the study of another facet of consumer satisfaction. A study of relative importance of fabric characteristics in the selection of women's clothing involved 2,133 homemakers in York, Pennsylvania.

These interviews revealed that style is given priority in clothing selection. Despite the importance of style admitted by respondents, fabric consideration affects their buying. They listed as highest in importance, the fabric's ability to hold shape, resist wrinkles, and retain color. It was these characteristics that the respondents felt were adequately provided for by manufacturers and need not be investigated by purchasers at the time of purchase. Appearance of weave and feel on the skin were listed as qualities most likely to be given as a choice by manufacturers and consequently somewhat influenced by the demands of the consumer.

Half of the respondents chose rayon as most pleasing in feel; nylon was ranked next. Forty-one per cent did not like the feel of wool on the skin; twenty-five did not like the feel of cotton. Another one fourth did not dislike the feel of any one sample.

During these investigations, the improvement of textile products was being evaluated by a portion of the population whose demands had been limited and static. Their satisfactions were being expressed by purchasing trends. Nelson (25), in her study of 296 communities of religious women, found that "most communities had replaced the heavy serge for their habits with a lighter weight serge or similar material." The time-saving element and hygienic factors of man-made fibers and new fibers and new finishes which lent themselves to easy care in the modern laundry were influential factors. A substantial proportion expressed the intention of modifying the habit in the near future.

Research among the general population continued. In 1958, the Marketing Research Committee of the Department of Agriculture (40)

investigated the opinions held by 2,476 mothers concerning fibers in children's clothing. Findings showed that cotton was still regarded as outstanding in many respects, but wool was considered desirable as a skirt or outer jacket. Data showed mothers had tried a great variety of materials for their daughters' skirts. "The three fabrics women liked best were all-wool (26 per cent), corduroy (25 per cent), and "other cotton" (16 per cent). Wool mixtures, such as Dacron polyester/wool, nylon/wool, and Orlon acrylic/wool, received a combined preference of 14 per cent."

The main appeal for wool was comfort, especially warmth, and fit; the main appeal for corduroy was comfort and fit. Ease of laundering was the prime appeal of "other" cottons. Appearance and style were the outstanding areas of appeal for Dacron polyester/wool blends. Included in the reason for the appeal of Dacron polyester/wool blends were washability, ability to keep creases and pleats well, and soil resistance.

Women compared three skirt materials; cotton, all-wool, and rayon/acetate on the following characteristics, namely, ease of care at home, not wrinkling, durability, and appearance after washing or cleaning. Wool received its most favorable ratings on durability, appearance and resistance to wrinkling, but showed up rather poorly on ease of care. Rayon/acetate received least favorable ratings of the three fabrics on resistance to wrinkling, durability, and appearance after cleaning. It did only a little better than wool on ease of care.

In the same study, mothers ranked the materials preferred for school blouses in the following order: cotton, first choice by a wide margin; nylon and Dacron polyester/cotton, second; and Dacron polyester, third. The features best liked about cotton were appearance and style. Ease of laundering was the feature liked best about nylon and the Dacron polyester/cotton blend. When mothers who preferred a certain fabric indicated what they disliked about that fabric, data showed cotton's noticeable bad features involved laundering; nylon's noticeable bad features involved durability; and Dacron's bad features were in the areas of appearance and style.

Mothers preferred cotton for boys' shirts with Dacron polyester/cotton the second choice. Appearance, including wrinkle resistance, was the reason given by many for preferring cotton, while ease of laundering was the reason given by most for preferring Dacron polyester/cotton. Disliked features for both fabrics were in the realm of laundering.

Materials preferred for boys' wintertime, school pants were in this order: "other cotton," corduroy, "other" wool, and Dacron/wool. Ease of laundering was the outstanding reason given for choice of "other cotton," and comfort was the outstanding reason for corduroy.

Of the mothers whose sons had worn wool blend pants, the majority ranked them fair on ease of care at home, but good in durability and wearing qualities. The majority also ranked them good in appearance after washing or cleaning and on not wrinkling. Of the mothers whose

boys had worn rayon or acetate pants, the majority ranked them fair on ease of care at home, on durability, wearing qualities, and on not wrinkling. On appearance after washing or cleaning, the majority ranked the rayon and acetate pants good.

In the spring of 1959, the Marketing Research Committee (41) interviewed 2,310 women aged eighteen to sixty-five concerning their attitudes toward cotton and other fibers in clothing. Answers indicated that cotton and nylon were the best known. From one fourth to one half the respondents did not think they were familiar enough with rayon, Dacron polyester, and Dacron/cotton to comment on them.

Comments about newer man-made fibers and the mixtures stressed wash and wear features. Nylon was marked for quick drying. Rayon was the only one of these fabrics for which a sizable number did not mention any desirable attributes.

The only fibers vigorously criticized were nylon and rayon. Nylon's bad features were enumerated as uncomfortable, excessively warm, lacking in absorbency, lacking in durability such as yellowing, snagging and pulling at the seams, and proneness to accumulate static electricity. Rayon was criticized for lacking durability and being difficult to care for. Less severe criticism such as requiring care in laundering were made about cotton and Dacron polyester/cotton. Dacron, like nylon, was criticized for weight and lack of comfort.

Consumers provided the data for the analysis made by the North Central Research Committee (2). Ninth grade girls numbering 2,422



and 491 of their mothers were interviewed to ascertain their opinions of school skirts. Findings showed that 74 per cent of the daughters and a similar percentage of the mothers preferred wool fabrics. Wool-like fabrics such as Acrilan acrylic, Orlon acrylic, Dacron polyester, and nylon were listed as acceptable. When respondents listed the top ten criteria for skirt selection, they included shape retention, durability, and retention of appearance after washing and cleaning.

About 30 per cent of the mothers reported unfortunate experiences with winter skirts. Shrinkage, sagging in the back, seam slippage, and seams pulling apart were some troubles attributed to the fabric. Some skirts also showed unusual wear at fasteners and plackets.

In 1961 a large mill brought out a 14-ounce fabric of 70 per cent polyester/30 per cent acrylic. Wear tests on this fabric showed that it had price appeal, surface appeal, warmth, and crease retention.

Another type of wear test was concluded in 1962. Lapedes (21) announced the results of field tests conducted by the Clothing Laboratory of the Air Corps. Uniforms of 100 per cent polyester, polyester/wool, and polyester/viscose were tried. In 600 wearings in hot weather, 100 per cent polyester was uncomfortable sixty-seven days; 55 per cent polyester/45 per cent wool was uncomfortable forty days, and 55 per cent polyester/45 per cent viscose was uncomfortable eighteen days. Crease recovery and crease retention of 100 per cent polyester and of 55 per cent polyester/45 per cent wool was much better than was that of 55 per cent polyester/45 per cent viscose. There was no abnormal pilling noted

on any of the uniforms. The 100 per cent polyester collected more dust and lint than the other trial fabrics. It also developed a strong cling to the body. According to Lapedes (21) two great barriers yet to be overcome in blending were obtaining satisfactory dye results and developing blends with pilling resistance.

Moncrieff (23) reported some interesting results of wear tests made using spun nylon and nylon blends:

Pilling even on the same cloth and type of garment varies with the wearer, some people show more pilling than others, usually those that are more active. Boys' trousers and girls' skirts were made from the same blend and much more pilling developed on the trousers than on the skirts.

Regarding durability, Moncrieff (23) mentioned that it had been reported that military socks made from blended yarn 75 per cent wool/25 per cent nylon staple wore five times as long as all wool.

Other studies have been made concerning consumer satisfaction with textile products. However, no study was found in which members of religious congregations expressed their preferences for fabrics. Jamieson of Chicago, the largest distributor of fabric for Sisters' habits in the United States, had drawn some conclusions from repeated purchases of certain types of habit fabrics. According to a letter from Edw. S. Jamieson (16) to the investigator:

It would be my estimate that over a period of the last five years, that 3/4 of the Sisters in the United States have changed from All Worsted fabrics to Dacron/Rayon or Dacron/Wool blends which are somewhat higher in quality. These latter fabrics have, in addition to reasonable wrinkle resistance, and durability, a nice draping feature which is desirable in habits.

Other companies specializing in Sisters' apparel apparently agreed with Jamieson in the belief that man-made and wool/man-made blends meet with the greatest satisfaction as was indicated by the number of catalog offerings of these fabrics.

Since improvement of textiles is being effected constantly, consumer satisfactions may change within a very short time. Only the latest findings can be expected to be reasonably accurate indicators of the fabric preferences for various end products.

## CHAPTER VI

### SUMMARY AND RECOMMENDATIONS

Many studies have been made on the varied aspects of clothing and textiles. Findings of the present investigation correlate with previous studies and add to the fund of information.

#### Summary

More man-made fibers are being used by a larger portion of the consumer population. One evidence of this fact is that among religious congregations responding to the questionnaire, the amount of fabric other than all-wool serge purchased during 1964 was almost twice the amount of all-wool serge purchased during the same period. This finding coincided with implication derived from comparing studies made in 1955 by the United States Department of Agriculture Marketing Research Division (36, 37, 38) with some made by the Marketing Research Division in 1958 (39) and 1959 (41). Among over four thousand respondents in the two earlier studies only a minority felt they were familiar enough with Dacron polyester and rayon to comment, but in the 1958 study (39), the respondents had used a "great variety" of fabrics, and in the 1959 study (41), only one fourth to one half of the 2,310 women contacted felt unfamiliar with rayon/Dacron polyester and Dacron polyester/cotton. Further experience with man-made fibers was indicated by the fact that in 1960 (2), 74 per cent of the respondents preferred wool

for skirts, but wool-like fabrics such as Acrilan acrylic, Orlon acrylic, Dacron polyester, and nylon were also considered acceptable.

A review of pertinent literature and responses to the questionnaire revealed that wool continues to be acceptable for many garments, but the use of blends of wool with synthetics and wool-like fabrics has increased in use. Some discrepancy appeared in the opinions concerning wool. None of the reasons for dissatisfaction with wool cited by Jordan (17) coincided with the reasons for dissatisfaction with wool in the first Agricultural Department study in 1955 (36). For instance, stretching, thread slippage, absorption of moisture, yellowing, and fading were given as reasons for dissatisfaction in 1942, but durability was mentioned as a good quality in three studies in 1955 (36, 37, 38) and later years. However, strengthening the findings of Jordan (17) were the answers of 30 per cent of the mothers who gave views about daughters' winter skirts in a study published in 1960. (2) These mothers had had unfortunate experiences with winter skirts including shrinkage, seams pulling apart, sagging at the back, and seam slippage.

It appeared there may be two possible explanations for the difference in findings in the Jordan (17) and 1955 studies (36, 37, 38). "Lack of durability" cited in the Department of Agriculture studies in 1955 may include some of the specific criticisms of wool reported by the Jordan (17) study. The other possible explanation is that the steady improvement in wool fabrics in the last twenty-five years may account for the difference in opinion about wool.

Good qualities of wool frequently mentioned in studies conducted in the years from 1942 through 1959 were attractive appearance, warmth, and wrinkle resistance. This seemed to substantiate the belief expressed by Cizancourt and Segal (8) that natural fibers have certain aesthetic qualities that cannot be substituted by science.

A commonly held criticism of wool was its need for special care. However, of the 1,751 girls and 368 mothers who gave their opinion about fibers and fabrics in the 1955 Agriculture Department study (37), seven in ten mentioned ease of care as a good quality.

Jordan (17) noted shrinkage of wool/rayon mixtures was greater than that of all-wool or all-rayon, but North Central Research Committee (3) tested skirt fabrics and found shrinkage of blends to be less than that of all wool. Laboratory testing by Moncrieff (23) also showed the ability of rayons and synthetics to decrease shrinkage of wool.

There was general agreement that blending nylon with wool improved its ease of care and greatly increased abrasion resistance and strength, but the addition of nylon also increased the tendency to pill. Laboratory tests in one study revealed a slight change of color in a wool/nylon blend when it was washed.

Dacron polyester/wool blends were praised by consumers, laboratory experimenters and suppliers. Good appearance, dimensional stability, durability, wrinkle resistance, and ability to hold creases were some of its good qualities. Among fabrics reported "very

satisfactory" in all respects in this investigation's questionnaire responses, three out of the five were Dacron polyester/wool blends.

The investigator noted that Dacron polyester/wool blends were "very satisfactory" in durability for all respondents, but the North Central Research Committee (3) reported that a wool/polyester sample had shown the lowest tear resistance of all samples tested. No reason can be given by the investigator for this difference in findings. The defect of pilling was noted in laboratory and wear tests. The problem of achieving acceptable color and uniform dye results was mentioned, but questionnaire responses in the present study showed no indication of dissatisfaction with colorfastness in the Dacron polyester/wool blends. In the Air Force wear tests, Dacron polyester/wool was considered moderately comfortable for warm weather wear. Ease of care for Dacron polyester/wool skirts was rated good by mothers interviewed about daughters' skirts, but ease of care for boys' pants of the same fiber blend was considered only fair.

Dacron polyester/rayon blends were ranked second to Dacron polyester/wool blends in acceptability for habits. Responding congregations found them slightly inferior to Dacron polyester/wool blends in wrinkle resistance, and spot and stain resistance. Air Force tests showed Dacron polyester/rayon fabric was more comfortable for warm weather wear. On the basis of these findings it appears the consumer will have to make a choice between the two blends according to the performance qualities most desired for the individual's use.

## Recommendations

Although results of the present study fulfilled the purposes for which it was undertaken, several recommendations for further investigation can be made. A formally organized wear test of habits using the twelve fabrics that were rated highest on the nine criteria of performance would refine the ratings and delineate the relative acceptability in relation to cost of fabric. Laboratory tests of all or any representative portion of the top-ranking fabrics are needed to substantiate results of the present study. A study correlating laboratory and wear tests of the six fabrics considered "most satisfactory" would seem beneficial to clarify the findings of this study, to compare with the forecast of performance qualities and purchasing trends as given by suppliers, and to verify the statement by LaBarthe (19) that "the machine readings of some tests do not always agree with human experience."



SELECTED BIBLIOGRAPHY

SELECTED BIBLIOGRAPHY

1. "A Capsule History of Blends," American Fabrics, 55:46, Winter 1961-1962.
2. Agricultural Experiment Station Bulletin 478. Adolescent Girls Skirts, Part I. Mothers' and Daughters' Opinions of School Skirts. North Central Region Publication 169. University of Minnesota, 1965.
3. Agricultural Experiment Station Bulletin 479. Adolescent Girls Skirts, Part II. Laboratory Evaluation of Skirt Fabrics. North Central Region Publication 170. University of Minnesota, 1965.
4. American Home Economics Association. Textile Handbook. Washington, D. C.: American Home Economics Association, 1964.
5. Borghetty, Hector C. "25 Years of Finishing Progress." Modern Textiles Magazine, 45:82-112, January 1964.
6. Campbell, Jerome. "Nylon's Younger Sisters: The Newer Manmade Fibers." Modern Textiles Magazine, 45:56-127, January 1964.
7. Campbell, William Giles. Form and Style in Thesis Writing. Boston: Houghton Mifflin Company, 1954.
8. Cizancourt, Charles de and William C. Segal. "Fiber Blends-- The Expanding Future of Textiles." American Fabrics, No. 55:39-45, Winter 1961-1962.
9. Dowlen, Rowena P. "Performance Characteristics of Whipcord of Wool Versus Blends of Wools with Viscose Rayon or Nylon." Textile Research Journal, 36:80-88, January 1966.
10. "End Use Consumption Changes." Textile Organon. 38:1, January 1967.
11. Floersch, Sister Mary Catherine. "Comparison of the Service Qualities of Certain All-Wool, All-Rayon, and Wools and Rayon Mixed Fabrics Before and After Dry Cleaning." Unpublished Master's thesis, Kansas State University, Manhattan, 1940.
12. "Greenwood's Murdock Blend Has Worsted Look." America's Textile Reporter, 78:39, July 1964.
13. Henke, Ted. "How It All Began." Modern Textiles Magazine, 45:23-125, January 1964.

14. Institution Supply Co. (catalog). Philadelphia: 1966.
15. Jamieson Convent Wear (catalog). Chicago: Spring 1966.
16. Jamieson, Edw. S. (Personal letter). June 1966.
17. Jordan, Mildred Naomi. "A Comparative Study of Consumer Satisfaction in Clothing Fabrics," Unpublished Master's thesis, Pennsylvania State University, University Park, 1942.
18. Keeney, Pauline E. "Recent Developments in Research on Fibers and Textiles," Journal of Home Economics, 57:789-791, December, 1965.
19. LaBarthe, Jules. Textiles: Origins to Usage. New York: Macmillan Company, 1964.
20. LaBarthe, Jules. "Your Money's Worth in Clothing and Textiles," Journal of Home Economics, 46:640-644, November, 1954.
21. Lapedes, Clarence. "What Every Mill Manufacturer Should Know About Fabrics for Uniforms." American Fabrics, No. 57:78-81, Summer, 1962.
22. Miller, Sister Mary Claudelle, S.C.L., and Mary Ellen Roach. "Religious Garb: Significant or Sentimental." Journal of Home Economics, 58:731-734, November, 1966.
23. Moncrieff, R. W. Man-made Fibers. New York: John Wiley and Sons, Inc., 1963.
24. Muckenhirn, Sister M. Charles Borromeo, C.S.C. (ed.) The Chancing Sister. Notre Dame, Indiana: Fides Publishers, Incorporated, 1965.
25. Nelson, Sister Mary Prudentia. "Trends in Sisters' Habits in the United States." Unpublished Master's thesis, Kansas State University, Manhattan, 1957.
26. Novak, Michael. "A Major Report on the New Nuns." Saturday Evening Post, July 30, 1966, 239:21-73.
27. Ponting, K. G. "Wool/Synthetic Fiber Blends." Man-made Textiles, 43:35-36, February, 1966.
28. Pope Paul VI and Fathers of Sacred Council (Vatican II). The Documents of Vatican II. New York: Guild Press, 1966.

29. Pope Pius XII. Address to the Congress of Mothers General, 44-1952-825. Review for Religious, 14:11, January, 1955.
30. "Proceedings. . . Clothing and Textiles Seminar." Manhattan, Kansas: Central Region of College Teachers of Clothing and Textiles. January, 1966. (Mimeographed.)
31. Quinn, Frances R. "Significance of Consumers' Textile Complaints." Journal of Home Economics, 52:253-55, April, 1960.
32. Sherwood, Peter W. "The Outlook for the Newer Manmade Fibers." Modern Textiles Magazine, 45:50-60, June, 1965.
33. Suenens, Leon Joseph Cardinal. The Nun in the World. Westminster, Maryland: The Newman Press, 1962.
34. Teufel, Lee, S. J. "The Religious Habit: Some Sisters' Comments." Review for Religious. 16:3-9, January, 1957.
35. The Official Catholic Directory. New York: P. J. Kenedy and Sons, 1965.
36. United States Department of Agriculture, Marketing Research Division. Teenage Girls Discuss Their Wardrobes and Their Attitudes Toward Cotton and Other Fibers. Report No. 155. Washington: Government Printing Office, 1957.
37. United States Department of Agriculture, Marketing Research Division. Women's Attitudes Toward Wool and Other Fibers: Part I--Suits, Skirts, Sweaters. Report No. 153. Washington: Government Printing Office, 1957.
38. United States Department of Agriculture, Marketing Research Division. Consumers' Concepts of Fabric. Report No. 338. Washington: 1959.
39. United States Department of Agriculture, Marketing Research Division. Mothers' Opinions of Fibers in Children's Clothing. Report No. 429. Washington: Government Printing Office, 1960.
40. United States Department of Agriculture, Marketing Research Division. Supplement to Marketing Research Report 429 Mothers' Opinions of Fibers in Children's Clothes. Washington: Government Printing Office, 1960.
41. United States Department of Agriculture, Marketing Research Division. Women's Attitudes Toward Cotton and Other Fibers in Clothing. Report No. 493. Washington: Government Printing Office, 1961.

APPENDICES

517 West First Street  
Grand Island  
Nebraska 68801

Dear Reverend Mother:

I am a member of the Sisters of St. Joseph of Concordia, Kansas, working toward a master's degree in clothing and textiles at Kansas State University, Manhattan, Kansas. In partial fulfillment of the requirements for this degree, I am writing a master's report entitled: "Opinions of Sisters of St. Joseph Concerning Fibers and Fabrics Used for Habits."

Perhaps a group of Sisters has been selected by your Congregation to try and evaluate the performance of fabrics other than all-wool serge, which they believed to be suitable for black habits. If this has been true, any information they have accumulated will be of great assistance to me. If there was no organized group, but various Sisters tried different fabrics, their findings will also be helpful.

In order to further the study and obtain facts of value to fabric manufacturers and consumers, I have formulated the enclosed questionnaire which is being sent to all Congregations of Sisters of St. Joseph throughout the United States. Please fill it out or forward it to the person who has the required information and return it to me within three weeks. I will pool this information in order to make recommendations for the use of different fibers in our habits.

When the survey is completed, you will receive a summary of the findings which I hope will be of benefit in selecting and purchasing fabric for your Sisters.

Thank you for your prompt cooperation in contributing information for this study.

Sincerely,

Sister Marguerite Cecile, C.S.J.

## QUESTIONNAIRE

50

DIRECTIONS: In sending you this questionnaire, it is hoped that your Congregation meets the following qualifications to become a respondent in this study: (1) your Congregation has traditionally used black, 100 per cent all-wool serge for the dress portion of the habit, and (2) you have had Sisters trying black fabric other than all-wool serge to determine whether another fabric is more satisfactory. Throughout the questionnaire the term, habit, designates the dress portion of the religious garb exclusive of veil and headdress.

Only a check mark is required for most answers; however, you will notice in reading through each question carefully, a few require more extensive answers.

Please return the completed questionnaire in the enclosed envelope within three weeks.

Thank you for your cooperation.

- Has your Congregation tried fabrics other than black all-wool serge for habits?  
Yes  No   
If "no," why? \_\_\_\_\_
- When did your Congregation first try fabric different from traditional all-wool serge?  

<input type="checkbox"/> 1965	<input type="checkbox"/> 1962
<input type="checkbox"/> 1964	<input type="checkbox"/> 1961
<input type="checkbox"/> 1963	<input type="checkbox"/> 1960 or earlier
- How many Sisters tried fabric different from traditional all-wool serge? \_\_\_\_\_ (number)
- Of the Sisters trying fabrics different from traditional all-wool serge, what was the number of Sisters in each of the following age ranges?  

<input type="checkbox"/> Under 25	<input type="checkbox"/> 45-54
<input type="checkbox"/> 25-34	<input type="checkbox"/> 55-64
<input type="checkbox"/> 35-44	<input type="checkbox"/> 65 or over
- Indicate the number of Sisters who tried fabric different from all-wool serge who were in each of these areas of responsibility.  

<input type="checkbox"/> Teacher (classroom)	<input type="checkbox"/> Office worker	<input type="checkbox"/> Retired
<input type="checkbox"/> Teacher (laboratory)	<input type="checkbox"/> Housekeeper	<input type="checkbox"/> Other (identify)
<input type="checkbox"/> Student	<input type="checkbox"/> Nurse	_____
- Was there a chairman or co-ordinator for the Sisters trying fabrics different from traditional all-wool serge? Yes  No   
If "yes," what was her training? (Highest degree earned or other training)  
\_\_\_\_\_
- How many Sisters tried one fabric? \_\_\_\_\_ (number), two fabrics? \_\_\_\_\_ (number), three fabrics? \_\_\_\_\_ (number), other? \_\_\_\_\_ (number tried).
- How were the trial fabrics used by the group selected? If more than one method was used, indicate the number of fabrics selected by each method.  
 Recommended by another Congregation that had used fabric.  
 Selected according to individual preference of member.  
 Selected after preliminary investigation by individual member.  
 Recommended by fabric manufacturer.  
 Other  
 What method was used? \_\_\_\_\_

9. What fabrics were tried? (Indicate percentage of each fiber, fabric name, and degree of satisfaction with each quality. Use "V" for very satisfactory, "M" for moderately satisfactory, and "N" for not satisfactory.)

Fiber content, if known	Fabric name as purchased	Color fastness	Shrinkage resistance	Wrinkle resistance	Fading resistance	Little wrinkling	Spot and stain resistance	Easy in washing	Durability	Other (name)
Example: 55% Dacron polyester/45% viscose rayon	Dacron									

10. How long was each trial fabric worn? (Write the names of the fabrics in the blanks beside the number of years they were worn.)

4 years \_\_\_\_\_  
3 years \_\_\_\_\_  
2 years \_\_\_\_\_  
Less than 2 years \_\_\_\_\_  
Comments: \_\_\_\_\_

11. Was there a trial fabric that your Sisters agreed was most satisfactory? Yes No  
If "yes," what is the fabric name and fiber content? \_\_\_\_\_  
Where was "most satisfactory fabric" purchased? (Give name and address.) \_\_\_\_\_

12. How many times had "most satisfactory fabric" been washed when it was ranked as the most satisfactory?

\_\_\_\_\_ Not washed  
\_\_\_\_\_ Less than 5 times  
\_\_\_\_\_ 5 or more times  
\_\_\_\_\_ 10 or more times



13. How did serviceability of the "most satisfactory fabric" compare with the serviceability of the traditional all-wool serge?
- All-wool serge was more serviceable than "most satisfactory fabric."  
 All-wool serge was less serviceable than "most satisfactory fabric."  
 No difference between serviceability of all-wool serge and "most satisfactory fabric."  
 Trial period too recent to compare all-wool serge with "most satisfactory fabric."
14. Approximately how many yards (not bolts) of black fabric for habits was purchased by \_\_\_\_\_ congregation in 1964? \_\_\_\_\_  
 Of \_\_\_\_\_ yardage how many yards were all-wool serge? \_\_\_\_\_  
 How many yards were fabric other than all-wool serge? \_\_\_\_\_
15. \_\_\_\_\_ all fabric for black habits purchased from one source? Yes \_\_\_ No \_\_\_
16. What are the names and addresses of the source or sources of black habit fabric or fabrics?
- 
- 

If any of your Sisters have had an unusual experience with black habit fabric, please write a detailed description of the experience and the name and exact fiber content of the fabric in the space below.

OPINIONS OF SISTERS OF ST. JOSEPH CONCERNING  
FIBERS AND FABRICS USED FOR HABITS

by

SISTER MARGUERITE CECILE SCHRECK

B. S., Marymount College, 1953

---

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Clothing, Textiles,  
and Interior Design

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

1967

The investigator learned through conversations with Sisters from various congregations that certain members within these congregations had chosen fabrics which they expected to be suitable as substitutes for all-wool serge for habits, then garments made from these fabrics were worn for a trial period to determine their acceptability. Collecting information accumulated by these groups seemed a worthwhile project.

Major purposes of the present study were (1) to unify information obtained from use of fabrics on trial basis and (2) to identify fibers and fabrics preferred by Sisters. Objectives were (1) to obtain, by means of a questionnaire, opinions concerning fabrics used for habits by Sisters using them, (2) to review relevant literature pertaining to experimentation with preferred fabrics, and (3) to make findings of isolated groups available to all participating congregations.

A questionnaire to obtain information from Sisters who had tried different fabrics was sent to thirty-five Congregations of Sisters of St. Joseph located throughout the United States. Questions dealt with purchasing practices of congregations, constituency of groups trying fabrics, identification of fibers and fabrics used for habits, and satisfaction with fabrics.

Purchasing practices varied among the congregations. Few had control groups, but many Sisters had tried fabric other than all-wool serge since 1960. Most Sisters trying different fabrics were students or teachers in the 25-44 age range. Among thirty-four fabrics tried, Dacron polyester/wool blends were most satisfactory; Dacron polyester/rayon blends ranked second. The tendency to pill was the only defect

in polyester/wool blends. All fabrics tried were satisfactory in durability.

A review of market research, Air Force tests, and experiment station reports revealed that favorable impressions of such fabrics as Dacron, nylon, and blends of these with natural fibers tended to be promoted by the amount of experience respondents had with the fabric and the progressive, actual improvement in fabrics. Since textiles are being improved constantly, consumer satisfaction may change within a short time. Only the latest findings can be reasonably accurate indicators of fabric preferences.