

FITTING PROBLEMS ENCOUNTERED BY COLLEGE  
WOMEN WHO USE COMMERCIAL PANTS  
PATTERNS

By

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1977

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  
July, 1978

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## ACKNOWLEDGMENTS

The writer wishes to express sincere appreciation to her major adviser, Dr. Grovalynn Sisler, for her assistance and advice during the period of study and research. Gratitude is also extended to other committee members, Dr. Laverne Matern and Dr. Margaret Callsen, for their contributions to the preparation of this thesis.

Appreciation is also extended to the faculty members of the Clothing, Textiles and Merchandising and Home Economics Education Departments who graciously allowed the writer to administer the questionnaire to their classes. Thanks are also due to all of the students who participated in the study.

The writer expresses a special thanks to her parents, Mr. and Mrs. Elmer Kirk, for their continual encouragement, understanding, and support during the entire course of graduate study.

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## CHAPTER I

### INTRODUCTION

The changing role of women and a more relaxed home atmosphere have initiated the desire for more comfortable and functional clothing, such as pants for women. Hutton (1974, p. 1) stated, "Because of their comfort, versatility, and fashion rightness, pants have become an important part of almost every woman's wardrobe." The commercial pattern companies have adapted to the wardrobe change with the production of pants patterns for women. Although the ready-to-wear industry has many varieties of pants on the market, many women are constructing pants at home. Bane (1973) stated that the women of the seventies are sewing more to cut the cost of ready-to-wear apparel, to make use of increased leisure time, to use creativity for garments that are not available in ready-to-wear, and to provide more variety in their wardrobes.

Pants constructed at home can be attractive; however, fit is often a problem. Margolis (1969) stated that many women believe that the right size pants pattern will automatically fit, disregarding the fact that the standard measurements given by the pattern companies are the average measurements of many women. The measurements of most women



vary from the standard measurements established by the pattern companies; seldom does one have the exact measurements as those of the pattern. Since the measurements of every woman do not exactly match those established by the pattern companies, many women have fitting problems with commercial pants patterns.

The reported research concerning the fit of pants has been limited. Babcock (1970) recommended that pants patterns and the fitting problems encountered be examined. Disney (1961) indicated the need for a study to determine the uniformity of pants patterns produced by the commercial pattern companies. Observation of pants fitting problems and recommendations from previous studies justified the need for the research.

The results were expected to aid women in the selection of pants patterns that can be fitted to the individual. The results could also assist home sewers, teachers, extension home economists, and other clothing construction educators in becoming more aware of common fitting problems encountered by those who use commercial pants patterns.

### Purpose and Objectives

The purpose of the study was to determine common fitting problems encountered by college women who use commercial pants patterns. Specific objectives for the study were:

1. To identify the fitting problems college women encounter with pants constructed from a commercial pattern.
2. To determine the specified measurements for 50 college women who use misses size 12 commercial pants pattern.
3. To compare the measurements of the participants with the commercial pants pattern measurements for a size 12 pattern and a three-size pattern.
4. To determine the percentage of participants whose measurements fall within the range of a selected three-size pants pattern.

#### Limitations

Limitations for the study were:

1. The study was limited to the measurements of 50 college women between 18 and 22 years of age at Oklahoma State University who used size 12 commercial pants patterns.
2. The selected pattern was McCall's Three-Size Series pants pattern, Number 5408, Combination C (sizes 10, 12, and 14).
3. The measurements studied were limited to waist circumference, hip circumference, hip depth, crotch, and finished length of pants.

## Definition of Terms

The following are definitions of the terms used in the study:

Alteration--A change in the shape of the pattern for adjustment to the individual's measurements (Minott, 1969).

Commercial Pattern--"Any pattern made by a pattern company and sold over the store counter" (Minott, 1969, p. 169).

Crotch Depth--Distance from the waistline to the seat level.

Ease--The difference between the body measurement and the pattern measurement to allow for comfort and mobility in the garment.

Finished Length--Distance from the side waistline over the hip to the desired length (Mansfield and Lucas, 1974).

Hip--The fullest part of the body between the crotch and the waistline (McMurtry, 1976).

Hip Depth--The distance from the waistline to the fullest part of the derriere (Minott, 1969).

Misses Size Pattern--A pattern designed for the average, well-proportioned, and well-developed woman who stands five feet five inches to five feet six inches without shoes (Mansfield and Lucas, 1974).

Waistline--The smallest part of the body at the natural bend between the bust and hips.

## CHAPTER II

### REVIEW OF THE LITERATURE

Many women who sew with commercial pants patterns have fitting problems which require alterations. The commercial pattern companies have made pants patterns available for many sizes and figure types to accommodate the various bodies of women. Reported research concerning the fit of pants is minimal; however, there are a number of sources that deal with pattern alterations and the fit of garments. For the purpose of the study, three major areas were discussed in the review of the literature: pattern selection, fit of commercial patterns, and related studies.

#### Pattern Selection

The selection of a pattern that fits the body is the basic element in achieving a proper fit. Mansfield and Lucas (1974, p. 40) stated, "Today's home sewer should have little trouble finding a well-fitting pattern." The commercial pattern companies have made an effort to produce patterns of several figure types and sizes in an attempt to fit the average size woman.

Bane (1973) reported that representatives from four major pattern companies, Simplicity, McCall's, Butterick,

and Vogue, met prior to January, 1968 as the Measurement Standard Committee for the Pattern Fashion Industry. The purpose of the meeting was to establish a set of standard measurements to be used universally throughout the commercial pattern industry. Prior to the meeting, the measurements determined by the Bureau of Standards were used. The established standard measurements were meant to aid the consumer by creating universal sizes and by establishing a closer relationship between pattern sizes and ready-to-wear sizes. Bane (1973) stated that:

Each company has a dress form in one size of each figure grouping (size 10 or 12 is used for the misses figure), and that dress form is made to the specifications of the measurement standards of the Pattern Fashion Industry (p. 34).

Babcock (1970) indicated that though the pattern companies abided by standard measurements, the interpretation of comfort and style ease varied from company to company, and that pattern companies designed their patterns for specified individual body types.

Perry (1971) indicated that patterns should be selected according to the figure type, body measurements, and fashion. The pattern should first be selected according to the figure type of the individual. An honest assessment of the figure should be made prior to the selection of a pattern. Mansfield and Lucas (1974) indicated that due to the standard sizing established in 1968, a multitude of sizes in a variety of figure types are available.

The authors indicated that the figure types available are young junior teen, junior petite, junior, miss petite, misses, half-size, and women's. The body proportions determine the figure type. Erwin and Kinchen (1974) stressed that age had nothing to do with figure typing. Mansfield and Lucas (1974) reported that a short woman should select a young junior teen, junior petite, or miss petite pattern, and a fuller woman should use the junior or half-size pattern. The average size woman would generally use a misses pattern. The larger-than-average woman would use the women's pattern.

After determining the figure type, the size should be considered. Bane (1973) indicated that the consumer should purchase the pattern according to the measurements given on the pattern envelope. The person must, therefore, determine the body measurements prior to selecting a pattern. Bane (1973) also suggested that the pattern be selected according to the part of the body that was the most difficult to fit. A few authors indicated that the pants pattern should be purchased according to the waist circumference unless a great difference existed in the waist and hip proportion; however, other authors disagreed. Mansfield and Lucas (1974) and Minott (1974) advised that the pants pattern be purchased according to the hip circumference, since the waistline was more easily altered. According to the Simplicity Sewing Book (1975) patterns should be purchased

by horizontal measurements such as bust, waist, and hip circumferences. The commercial pattern companies give five measurements for use in the selection of dress patterns: bust, waist, hip, back waist length, and finished length. For pants, three measurements are given: waist, hip, and finished length. Erwin and Kinchen (1974) suggested that the consumer select the pattern according to the figure type and to the measurements that most nearly resemble the given pattern measurements.

Margolis (1969) indicated that one cannot necessarily choose a pattern the same size as that of a garment purchased in ready-to-wear. A pattern size is anything a particular manufacturer and his staff decide it is from their experience; however, the consumer can be assured that a certain degree of uniformity exists between the sizing of patterns different companies produce.

Fashion and design features are also important in the selection process. Perry (1972) indicated that fashion influences the fit of garments. Lippman and Erskine (1977) indicated that the figure should be considered in determining the type clothing that was suitable for the body. Consideration of design features in commercial patterns must be included in the selection of a pattern to suit the individual.

#### Fit of Commercial Patterns

Hooten (1960) stated that well-fitted clothing can

be used to enhance or hide body curves. Mansfield and Lucas (1974) stated:

Any garment must be judged by its appearance on the wearer, and nothing is more important to its total effect than the way it fits. . . . Dissatisfaction with a garment can more often be traced to a fault in fitting than in construction (p. 44).

Perry (1972) stated that proper fit of pants will not only look good, but will feel good. Bane (1973) reported that the pattern sizes were established to represent average body measurements. Even though the measurements have been standardized, the body of every woman is not; therefore, patterns must be altered to fit the individual.

Bray (1962) indicated that accurate measurements of the body are essential to obtain proper fit; however, a certain degree of inaccuracy is inevitable. Minott (1974) suggested that someone else take the measurements since it is difficult for the person to take his or her own measurements precisely. Lippman and Erskine (1977) and Minott (1974) agreed that measurements should be taken while the person wears the undergarments and shoes normally worn with that type garment. Mansfield and Lucas (1974) stated that measurements taken over regular clothing would alter the fit. Brooks (1941) indicated that foundation garments influenced the hip region; therefore, foundation garments that were normally worn with pants should be worn during the measuring process. Lippman and Erskine (1977) indicated that the appropriate undergarments and shoes should be



worn throughout the entire measuring process to insure accuracy of all measurements.

Although the only measurements given on the pants pattern envelope are waist circumference, hip circumference, and finished length, other areas must also be fitted to the body. Mansfield and Lucas (1974) indicated that a knowledge of the crotch depth was essential for fitting pants. According to Minott (1974), the equipment for measuring the body must be stable and reliable to insure accuracy. Lippman and Erskine (1977) indicated that horizontal measurements should be taken snugly against the body, keeping the tape measure straight and taut.

In addition to the body measurements, a certain amount of ease is required. Erwin and Kinchen (1974, p. 216) defined ease as "the difference between body measurements and the measurements of a garment at a given point as provided by the designer." Pattern measurements are consistent within the commercial pattern industry; however, the difference in fit is due to the ease allowed by different companies. Bane (1973) indicated that the commercial pattern companies determined the pattern outline by three factors: the standard body measurements, fitting ease, and style fullness. Erwin and Kinchen (1974) agreed with Bane; however, in addition to the previously mentioned factors, it was suggested that the ease allowance was determined with the garment purpose and fabric in mind. Faioli

(1977) reported that ease can be any amount desired. A fitted garment requires less ease allowance than a garment such as a coat, which will be worn over another garment. Each of the pattern companies may have different ease allowances.

The amount of ease allowed also differs for different areas of the body. According to the Simplicity Sewing Book (1975, p. 167), "No garment fits as snugly as the tape measure; there is some ease added in every pattern to insure wearing comfort." Erwin and Kinchen (1974) indicated a need for one inch ease for the waist measurement, two inches for the hips, and three-fourths inch for the crotch depth when fitting pants. Warch (1975) indicated different amounts of ease. She suggested one-half inch to one inch ease for the waistline, two to three inches for the hip circumference, and one and one half to three inches for the hem allowance.

Bane (1973) indicated that the commercial pattern companies add ease in varying amounts due to three factors. First, the companies make the patterns according to the general consensus of the public who purchases patterns. Size and type of the wearer and the desired appearance of the garment were the other factors considered. As Babcock (1970) indicated, the ease allowance is the factor which influences the fit obtained from patterns made by different companies.

Erwin and Kinchen (1974) identified five factors which symbolize a well-fitted garment.

1. Grain. The lengthwise threads of the fabric should lie perpendicular to the floor and the crosswise threads should lie parallel to the floor.

2. Set. The garment should lie smoothly against the body free of undesirable wrinkles.

3. Line. The silhouette seamline should follow the body lines naturally.

4. Balance. The garment should appear symmetrical from one side of the body to another.

5. Ease. The garment should fit the body neither too loosely nor too tightly.

Minott (1974, p. 89) listed four related factors that indicated well-fitted pants. First, the pants should rest easily against the body from the waistline to the crotch. Second, the side seams should divide the body in half becomingly and naturally. Third, no tension, strains, wrinkles, sags, bunching, gaping, or excessive tightness or fullness should distract from the pants. Fourth, the person wearing the pants should be comfortable whether walking, standing, sitting, or bending.

Kefgen and Touchie-Specht (1971, p. 335) stated, "Proper fit will make a garment look as though it were created just for the person." Alterations to the pattern may solve the problem; however, Palmer and Pletsch (1976) indicated that pants constructed from a perfectly fitted

pants pattern may not fit due to a cutting error, differences in the type fabric, weight fluctuation, or poor posture.

Palmer and Pletsch (1976) indicated that wrinkles point to the fitting problem. Minott (1974) indicated that the correction of one fitting problem may solve another.

Fitting problems with pants were identified as:

1. Horizontal wrinkles across the front and back (Palmer and Pletsch, 1976; Mansfield and Lucas, 1974; and Minott, 1974).
2. "Smiles" in front or back (Palmer and Pletsch, 1976).
3. Excessive fullness across the front and/or back (Palmer and Pletsch, 1976 and Minott, 1974).
4. Tightness across the abdomen (Palmer and Pletsch, 1976 and Mansfield and Lucas, 1974).
5. Tightness in the thigh area (Mansfield and Lucas, 1974 and Minott, 1974).
6. Crotch length too short or too long (Palmer and Pletsch, 1976).
7. Hip circumference too small (Palmer and Pletsch, 1976; Mansfield and Lucas, 1974; and Minott, 1974).

Palmer and Pletsch (1976) and Minott (1974) indicated that uneven hips caused fitting problems. Palmer and Pletsch (1976), Mansfield and Lucas (1974), and Minott (1974) indicated that swayback also caused fitting problems.

### Related Studies

Several studies have been conducted during the past two decades to examine the patterns produced by the different commercial companies. Most of the research studies have been limited to basic fit dress patterns produced by the major pattern companies.

Disney (1961) compared the size and shape of the basic dress pattern produced by the different companies to aid the consumer in pattern selection. The researcher indicated that the study would perhaps eliminate the need for some alterations. It was concluded that the garment ease differed for each company, due to the interpretation of fit. Hooten (1960) also studied the four major pattern companies (Simplicity, McCall's Butterick, and Vogue) and Advance patterns to determine the pattern that best suited the different figure types. The findings indicated that Simplicity, McCall's and Advance patterns were designed for the average proportioned figure, while Vogue and Butterick were designed for the slimmer figure. A similar study by Babcock (1970) was conducted following the standardization of measurements in 1968. The purpose was to study the basic dress pattern to determine differences that might exist among the major pattern companies. She concluded that Simplicity patterns were designed for the medium to large framed woman with a fuller chest and average hips and waist. McCall's patterns were better

suited to the shorter woman with a medium body frame, fuller chest, and average waist and hips. Butterick and Vogue pattern measurements were identical and were suited for the slender, average to tall woman with a small body frame. The waist and hips were also smaller than average. Karns (1978) reported that home economics teachers in Cedar Rapids, Iowa, conducted a study in July, 1977, concerning pattern fit. The study indicated that no consistency in ease allowance existed in patterns from different companies. Of the three patterns studied, she concluded that Butterick patterns were shorter in length, McCall's patterns were tighter in the waist and hip area, and Simplicity patterns were larger through the hip and waist area.

Ewen (1967) studied the fitting problems encountered by Yoruba women when using commercial patterns. The findings indicated that the average size of the Yoruba women was different from the average size of the American women for whom the standard sizes were established. The Yoruba women needed many alterations in the commercial patterns.

Carr (1974) developed a set of 35mm slides to visualize fitting problems encountered in clothing construction. The slides were used in classes to illustrate fitting problems and the fit of corrected garments.

Bowlby (1973) conducted a comparative study of two systems of pattern alteration and two systems of drafting

to determine whether or not a significant difference was obtained by the different methods of fitting the figure. The findings indicated that there was a difference in the fit of the finished garments according to the method used.

### Summary

The major commercial pattern companies have made an attempt to produce patterns that a variety of women can use. Although the pattern measurements have been standardized to fit the average size woman, many women are not standard size. Alterations are usually necessary for these women to obtain a well-fitted garment constructed from a commercial pattern. An awareness of fitting problems and of the standard measurements of commercial patterns could assist women in obtaining a properly fitted garment.

## CHAPTER III

### METHOD AND PROCEDURE

The purpose of the study was to determine common fitting problems encountered by college women who use commercial pants patterns. The study was conducted in two phases. Phase I included the distribution of a questionnaire concerning the fit of commercial pants patterns to selected college women. Phase II included measuring a selected group of college women and comparing the measurements with those of a selected pattern. The body measurements were used to determine the percentage of participants who would be able to use the selected three-size pattern without further alteration. Common fitting problems were determined from questionnaire responses and from the variation between body measurements and pattern measurements.

#### Selection of Participants

The researcher administered a questionnaire (Appendix A) to 189 college women. The purposes of the questionnaire were to determine fitting problems with commercial pants patterns and to identify 50 women for the measuring procedure (Phase II). The 50 women were selected on the basis of those who were between 18 and 22 years of age,



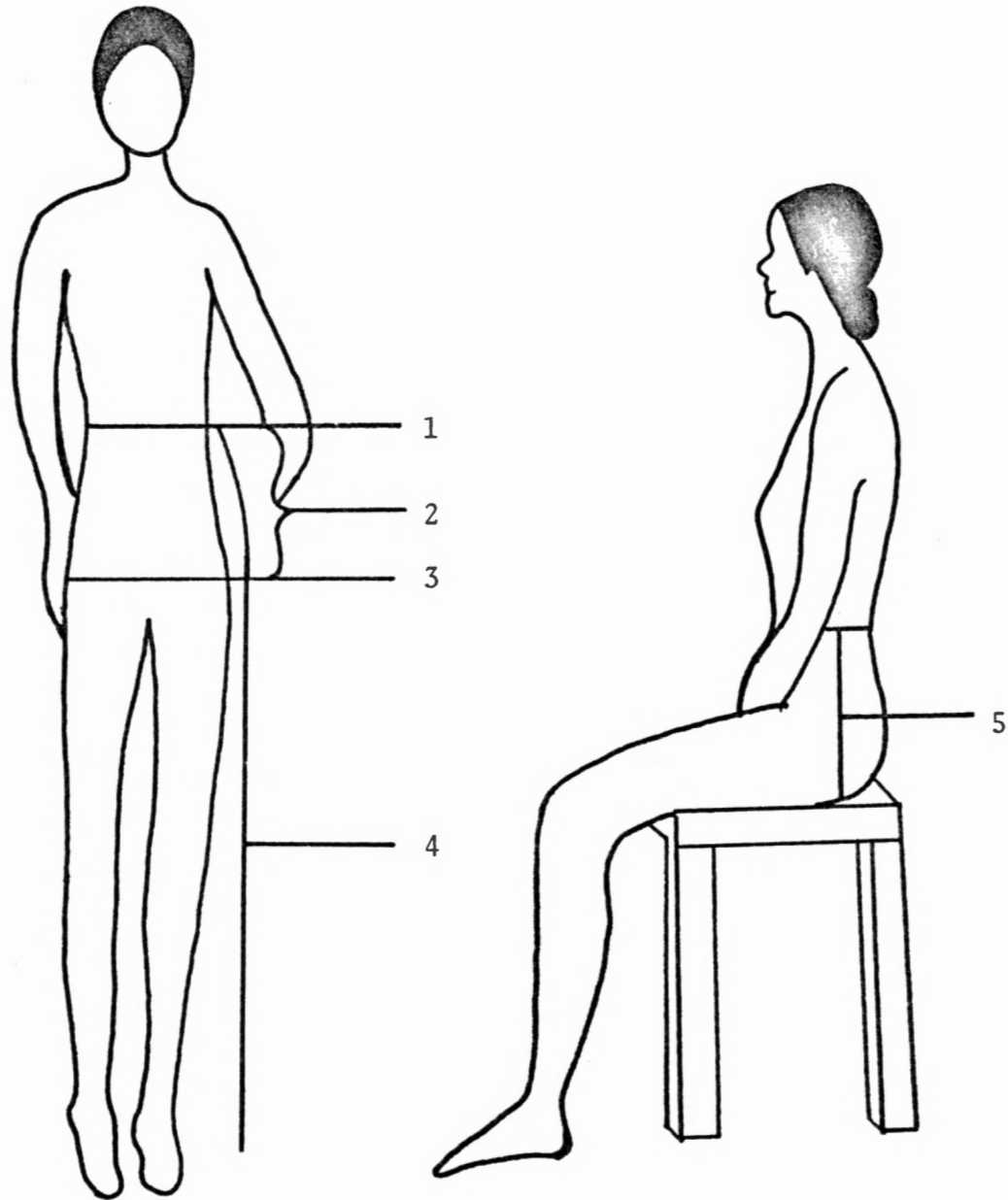
indicated some or all pants were made by themselves or someone else, used misses size 12 patterns, and were willing to be measured.

Size 12 was selected because previous research indicated it was the most popular commercial pattern size. Margolis (1969) indicated that many women wear size 12. Bowlby (1973) indicated that size 12 was the most popular size purchased by women in classes at the University of Idaho and by seamstresses of the area. Faculty members of the Clothing, Textiles and Merchandising department at Oklahoma State University verified that misses size 12 was the most popular size selected by students in clothing construction classes.

#### Measurements of Participants

Selected body measurements of 50 college women were taken. Figure 1 illustrates the areas measured. All body measurements were taken and recorded by the researcher in order to insure accuracy. The Body Measurement Chart for Pants (Appendix B) was used to record the measurements of each participant. A plastic-coated, one-half inch wide measuring tape was used for all measurements except the crotch depth measurements. A hard ruler was used for measuring crotch depth.

Each participant was measured while wearing the undergarments and shoes normally worn with pants, in order to



1. Waist circumference
2. Hip depth
3. Hip circumference
4. Finished length (desired length  
as indicated by the partici-  
pant being measured)
5. Crotch depth

Figure 1. Location of Measurements

insure accuracy of measurements. A string was tied around the waist of each participant and used as a guide for vertical measurements and for measuring the waist circumference. Vertical measurements were taken on both sides of the body.

The areas measured were described as follows:

Waist circumference--Distance around the body at the waistline (McMurtry, 1976).

Hip circumference (at nine inches below the waistline)--Horizontal measurement of the hips nine inches below the waistline.

Hip circumference--Horizontal measurement taken at the fullest part of the body between the waist and crotch (McMurtry, 1976).

Hip depth--Vertical measurement taken from the side waistline to the fullest area of the hips (Minott, 1974).

Crotch depth--Vertical measurement taken while the participant is seated on a level surface; measurement taken with a hard ruler from the waistline to the seat level (Erwin and Kinchen, 1974).

Finished length--Vertical measurement from the side waistline to the desired length (Mansfield and Lucas, 1974). Each participant indicated the preferred length and the length measurement was made to that point.

#### Description of Commercial Pattern

McCall's Three-Size Series pants pattern, Combination

C, Number 5408 was used in the study. Combination C included misses sizes 10, 12, and 14. McMurtry (1976) stated that the trio of sizes benefits the woman whose measurements indicated a combination of two or three sizes.

McCall's three-sized pattern was selected since it had been designed for use by women who encounter fitting problems.

The pattern design had a button waistband, a front zipper closing, and no darts. The measurements given on the envelope for pattern selection were waist circumference, hip circumference, and the finished length; however, the crotch depth measurement is necessary in order to fit pants.

The pants front, back, and waistband pieces were used to determine pattern measurements. The pattern pieces were pressed and mounted on tagboard prior for measuring to insure accuracy of the measurements and to retain the stability of the pattern. Since seam allowances were not shown on the pattern pieces, five-eighths inch seam allowances were marked in black at the center front, center back, and waistband. The five-eighths inch seam allowances for the waist and side seams and the hip and crotch depth were marked with individual colors to identify each size. Size 10 was marked with turquoise, size 12 with red, and size 14 with green.

The measurements were taken with a one-half inch, plastic-coated measuring tape. All measurements were recorded on the Pattern Measurement Chart for Pants (Appendix

C) in inches. The location of measurements is illustrated in Figure 2. Location for the pattern measurements was determined in the following manner:

Waistband measurement--Measurement of the waistband from center front to center front.

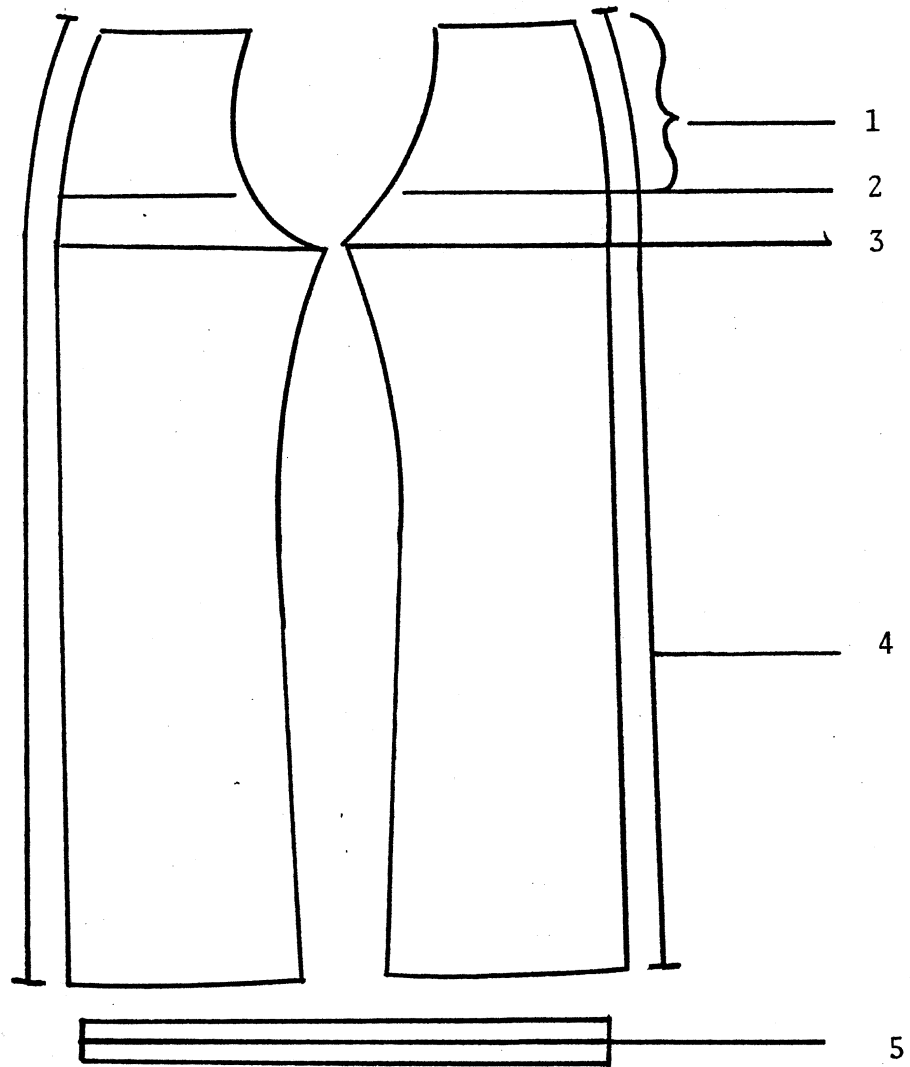
Hip circumference--Horizontal measurement of the front and back pattern pieces nine inches below the waistline.

Crotch depth--Vertical measurement extending from a horizontal crotch depth line to the waistline of the front and back pattern pieces.

Finished length--Measurement taken along the side seam from the waistline to the bottom hemmed edge (Mansfield and Lucas, 1974).

#### Use of Findings

The measurements of the participants were compared with those given for a misses size 12 and with those within the range of the three-size pattern to determine the percentage of participants who could use either pattern without alteration. A frequency distribution of measurements was used to indicate the percentage of participants whose measurements were within the identified ranges (.5 inch above to .5 inch below the given measurement) for the size 12 and for the three-size pattern. A mean, mode, median, and range were determined for each area measured.



1. Hip depth
2. Hip circumference
3. Crotch depth line
4. Finished length
5. Waist circumference

Figure 2. Pattern Measurements

Common fitting problems were determined on the basis of written responses of those who completed the questionnaire. Additional problems were suggested from a review of the location of the problem and the amount of deviation of body measurement from the pattern measurement.

## CHAPTER IV

### ANALYSIS OF THE DATA

The purpose of the study was to determine fitting problems of college women who use commercial pants patterns and to compare the body measurements of 50 selected college women with the measurements of a three-size pants pattern. Selection of those to be measured was based on age, pattern size, indication that some or all pants were made from a commercial pattern, and willingness to be measured.

#### Results of Phase I

The questionnaire was administered to 189 college women in Clothing, Textiles and Merchandising and Home Economics Education classes, a sorority house, and to friends of other participants. Originally, the researcher had anticipated that 100 questionnaires would need to be distributed in order to select the 50 participants needed for Phase II; however, 189 were required in order to identify 50 persons who qualified for all of the selection criteria. All completed questionnaires were used in Phase I.



### Background Information

Data used in the selection of participants for Phase II are indicated in Table I. Of the 189 completing the questionnaire, 180 (95.2%) were between 18 and 22 years of age. One hundred fifty-three (81.0%) indicated that pants were made by themselves or by someone else frequently (38.1%) or sometimes (42.9%). The two most popular sizes indicated were misses sizes 10 and 12. Seventy (37.0%) of the respondents indicated that they used size 12 and 51 (27.0%) used size 10.

Not all women completing the questionnaire were willing to participate in Phase II of the study; however, 116 (61.4%) agreed to be measured. Fifty-three of the 116 used size 12 patterns; however, three were disqualified because one was 23 years of age or older, one had recently had a baby and felt her body was not of normal size and shape, and one indicated that she never made pants. The 67 (35.4%) who indicated they were not willing to be measured said they were embarrassed to be measured in undergarments, they preferred to keep their measurements a secret, or they did not have time.

### Fitting Problems with Pants Patterns

The fitting problems indicated by the 189 respondents to the questionnaire are presented in Table II. A large majority of the respondents, 179 (94.7%) indicated that

TABLE I  
BACKGROUND INFORMATION  
(N=189)

Description	N	Percent
What is your age?		
18-22	180	95.2
23 and older	9	4.8
Total	189	100.0
Do you make or does someone else make pants for you?		
Frequently	72	38.1
Sometimes	81	42.9
Never	36	19.0
Total	189	100.0
What is your commercial pants pattern size?		
8	23	12.2
10	51	27.0
12	70	37.0
14	22	11.6
16	12	6.3
Other	8	4.1
No Response	3	1.6
Total	189	99.8 <sup>a</sup>
Would you be willing to be measured (in your undergarments) as a part of a study concerning the fit of pants?		
Yes	116	61.4
No	67	35.4
No Response	6	3.2
Total	189	100.0

<sup>a</sup>Total does not equal 100.0% due to rounding.

TABLE II  
FITTING PROBLEMS OF TOTAL PARTICIPANTS  
(N=189)

Description	N	Percent
Do you have problems fitting pants?		
Frequently	67	35.4
Sometimes	112	59.3
Never	7	3.7
No Response	3	1.6
Total	<u>189</u>	<u>100.0</u>
Do you purchase different sizes in patterns made by different companies?		
Yes	41	21.7
No	137	72.5
No Response	11	5.8
Total	<u>189</u>	<u>100.0</u>
Fitting Problems:		
Waist		
Too Tight	38	20.1
Too Large	87	46.0
No Response <sup>a</sup>	64	33.9
Total	<u>189</u>	<u>100.0</u>
Hips		
Too Tight	60	31.7
Too Large	24	12.7
No Response <sup>a</sup>	105	55.6
Total	<u>189</u>	<u>100.0</u>
Crotch Depth		
Too Short	38	20.1
Too Long	52	27.5
No Response <sup>a</sup>	99	52.4
Total	<u>189</u>	<u>100.0</u>

TABLE II (Continued)

Description	N	Percent
Finished Length		
Too Short	61	32.3
Too Long	54	28.6
No Response	74	39.2
Total	189	100.1 <sup>b</sup>

<sup>a</sup>It was assumed that those who did not respond had no fitting problems.

<sup>b</sup>Total does not equal 100.0% due to rounding.

they had problems fitting pants sometimes (59.3%) or frequently (35.4%). Only seven (3.7%) indicated that they never had difficulty with the fit of pants.

Only 41 (21.7%) of the respondents indicated that different sizes were used in patterns made by different companies. Various reasons were given for this; however, there was lack of consistency in the reasoning.

The women responded to fitting problems in the following specified areas of the commercial pants pattern: waist circumference, hip circumference, crotch length, and finished length. It was assumed that no response indicated no problem with fit in that area. Eighty-seven (46.0%) indicated that the waist of pants patterns was too large, while only 38 (20.1%) indicated that the waist was too tight.

One hundred five (55.6%) respondents made no indication of fitting problems in the hip area; however, 60 (31.7%) indicated that pants patterns were too tight. Twenty-four respondents (12.7%) indicated that the pattern was too large in the hip area.

Fifty-two (27.5%) respondents indicated that the crotch length was too long, while 38 (20.1%) found the crotch length was too short. Approximately one-half (52.4%) made no indication of a fitting problem in the area. Approximately one-third (32.3%) of the respondents found the finished length of the pattern to be too short and fifty-four (28.6%) indicated that the pattern was too long.

The women were asked to make additional comments concerning fitting problems with pants. Many responses were given; however, three problems were mentioned by more than one participant. Seven commented that the pattern waistline was too large in proportion to the hip allowance. Three indicated that the front of their pants always wrinkled. Two women indicated a need for a pants pattern that was proportioned for tall persons.

### Results of Phase II

Fifty women were selected from the questionnaire responses on the basis that they were between 18 and 22 years of age, used a misses size 12 pants pattern, indicated

that some or all pants were made from a commercial pant pattern, and were willing to be measured as part of the study. The researcher measured the women at specified areas of the body and recorded the information. The selected three-size pattern was measured for the waist circumference, hip depth, hip circumference, crotch depth, and finished length. The measurements of the participants were compared to the measurements of the misses size 12 and to the three-size pattern to determine fitting problems.

#### Measurement of Pattern

The selected pattern, McCall's Three-Size Series pants pattern, Number 5408, combination C (sizes 10, 12, and 14) was measured to determine the ease allowance at the waist circumference, hip circumference, and crotch depth and the hem allowance for the finished length. It was assumed that each of the participants needed the ease and hem allowance given on the pattern. The measurements of the pattern are presented in Table III.

The waist measurement given on the pattern for size 10 was 25.0 inches; size 12, 26.5 inches; and size 14, 28.0 inches. When the pattern waistband was measured, the waistband for size 10 was 26.0 inches, size 12 was 27.5 inches, and size 14 was 29.0 inches; therefore, one inch ease had been allowed.

TABLE III  
 MEASUREMENTS OF McCALL'S THREE-SIZE  
 SERIES PATTERN COMBINATION C -  
 SIZES 10, 12, AND 14

Description	Measurement of Pattern (in inches)	Given Pattern Measurements (in inches)	Ease
<b>Waist</b>			
Size 10	26.0	25.0	1.0
Size 12	27.5	26.5	1.0
Size 14	29.0	28.0	1.0
<b>Hip (at nine inches)<sup>a</sup></b>			
Size 10	37.5	34.5	3.0
Size 12	39.0	36.0	3.0
Size 14	41.0	38.0	3.0
<b>Finished Length</b>			
Size 10	44.5	42.3	2.2
Size 12	44.8	42.5	2.3
Size 14	45.0	42.8	2.2

<sup>a</sup>The hip circumference was taken nine inches below the waistline because Erwin and Kinchen (1974, p. 122) indicated nine inches for the hip depth of all misses sized patterns.

The hip circumference was measured at nine inches below the waistline for each of the three sizes. The actual measurement for size 10 was 37.5 inches; size 12, 39.0 inches; and size 14, 41.0 inches. The pattern company allowed three inches ease for the hip area. The hip area was measured at various points to determine whether the

measurement at nine inches below the waistline was the fullest area. The measurements indicated that this was the fullest area of the hips. The hip depth was marked on the pattern at nine inches below the waistline, as was suggested by Erwin and Kinchen (1974, p. 122).

The crotch depth was measured for each of the three pattern sizes, since a crotch depth measurement is not given on the pattern. Two authors indicated a need of  $\frac{3}{4}$  (.8) inch ease allowance for the crotch depth; thus,  $\frac{3}{4}$  (.8) inch was subtracted from the actual measurement of the pattern to determine the crotch depth for which the pattern was designed. After  $\frac{3}{4}$  (.8) inch ease allowance was subtracted, the crotch depth for size 10 was 9.7 inches; size 12, 10.0 inches; and size 14, 10.2 inches.

The finished length measurement (as given by the pattern company) for size 10 was 42.3 inches; size 12, 42.5 inches; and size 14, 42.8 inches. When the pattern was measured, size 10 was 44.5 inches, size 12 was 44.8 inches, and size 14 was 45.0 inches. The hem allowance for each size was approximately 2.3 inches.

#### Measurement of Participants

The 50 selected participants were measured around the waistline, nine inches below the waistline for the hip circumference, around the hips at the fullest area (if there was an area at some point which was fuller than the measurement taken at nine inches below the waistline), and



vertically for the hip depth, crotch depth, and finished length. The measurements were taken on the right and left sides of the body. Of the 50 women, 38 (76.0%) had measurements that differed in at least one area (hip depth, crotch depth, or finished length) on the right and left sides of the body, but the difference was less than one inch. Therefore, the two measurements were averaged, and the average measurement was used as the measurement for that area. A range, median, mode, and mean were determined for each area measured. The results are presented in Table IV.

Comparison with Size 12 Measurements. The range of the waist circumference measurements was 23.5 to 30.0 inches (see Table IV). The span between the smallest and largest measurement was, therefore, 6.5 inches. The most frequently occurring waist circumference (mode) and the median measurement were 27.0 inches. The mean varied slightly from the mode and median at 26.6 inches. The pattern company indicated 26.5 inches for the waist circumference; therefore, the mean was only .1 inch more than the given measurement.

The range of the hip circumference at nine inches below the waistline was 35.5 inches to 42.5 inches, which indicated a difference of 7.0 inches. The most common measurement was 39.5 inches, and the median (38.5 inches) varied one inch. The mean (38.6 inches) was only .1 inch

TABLE IV

A COMPARISON OF THE RANGE, MODE, MEDIAN, AND  
MEAN MEASUREMENTS<sup>a</sup> OF THE PARTICIPANTS  
AND THE GIVEN MISSES SIZE 12  
PATTERN MEASUREMENTS

Description	Range	Mode	Median	Mean	Given Pat- tern Mea- surement	Difference in Mean & Pattern
Waist	23.5-30.0	27.0	27.0	26.6	26.5	0.1
Hip circumference at nine inches <sup>b</sup>	35.5-42.5	39.5	38.5	38.6	36.0	2.6
Hip circumference at fullest area <sup>c</sup>	35.5-42.5	39.5	39.0	38.0	36.0 <sup>d</sup>	2.8
Hip depth <sup>e</sup>	7.0-11.0	9.0	9.0	9.0	9.0	0.0
Crotch depth <sup>f</sup>	9.0-12.3	11.3	11.0	10.4	10.0	.4
Finished length	40.0-47.3	44.0	43.4	42.6	42.5	.1

<sup>a</sup>All measurements were taken and recorded in inches to the nearest one-tenth inch.

<sup>b</sup>The hip circumference was measured at nine inches below the waistline.

<sup>c</sup>The hip circumference was measured at the fullest area in addition to nine inches below the waistline.

<sup>d</sup>The fullest area of the hip (on the pattern) was at nine inches below the waistline.

<sup>e</sup>The hip depth was determined by averaging the right and left hip depth measurements.

<sup>f</sup>The crotch depth was determined by averaging the right and left crotch depth measurements.

larger than the median, but it was 2.6 inches larger than the 36.0 inch hip circumference indicated by the pattern company.

The range of the hip circumference at the fullest area was also 35.5 inches to 42.5 inches, the same as the range of measurements at nine inches below the waistline. The most frequent measurement was 39.5 inches, while the median was 39.0 inches. The mean (38.8 inches) indicated that the average measurement was 2.8 inches larger than the pattern measurement (36.0 inches).

The hip depth ranged from 7.0 inches to 11.0 inches, indicating a variance of 4.0 inches between the persons with the shortest and longest hip depth. It should be noted that the mean, median, and mode were all 9.0 inches.

The crotch depth measurements ranged from 9.0 inches to 12.3 inches. The mode was 11.3 inches, and the median was slightly smaller at 11.0 inches. The mean was 10.4 inches which was .4 inch longer than the pattern crotch depth (10.0 inches). The given measurement was determined by subtracting .8 inch (as suggested by previous researchers) from the actual pattern measurement for the size 12 pattern.

The finished length range was 40.0 inches to 47.3 inches, which indicated 7.3 inches difference in the preferred length among the participants. The mode was 44.0 inches, and the median was 43.4 inches. The mean (42.6 inches) was only .1 inch longer than the given 42.5 inches.

Comparison with Three-Size Measurements. A comparison of the measurements of the participants with the ranges of the three-size pattern (sizes 10, 12, and 14) is presented in Table V. The range of the waist circumferences of the participants (23.5 inches to 30.0 inches) indicated that some measurements fell below and some above the range of the pattern (25.0 inches to 28.0 inches). It should be noted that the mean (26.6 inches) was within the pattern measurement range.

The hip circumference range of the participants at nine inches below the waistline and also at the fullest area of the hips was 35.5 to 42.5 inches, while the pattern range was 34.5 inches to 38.0 inches. The measurements of the participants at both hip circumference levels exceeded the pattern range. The mean (38.6 inches) measurement at nine inches below the waistline and at the fullest area of the hips (38.8 inches) both exceeded the upper limit of the range. No measurement was below the lower limit of the range.

The hip depth range of the participants was 7.0 inches to 11.0 inches. Researchers, mentioned previously, indicated nine inches as the hip depth of all misses size patterns; therefore, the hip depths of participants fell below and above the given measurement. The mean, however, was 9.0 inches.

The crotch depths of the participants fell below and above the pattern range. The crotch depths of the

TABLE V  
 A COMPARISON OF THE RANGE AND MEAN MEASUREMENTS OF THE PARTICIPANTS  
 WITHIN THE RANGE OF THE  
 THREE-SIZE PATTERN

Description	Participant Measurement Range <sup>a</sup>	Mean Measurement <sup>a</sup>	Pattern Measurement Range <sup>a</sup>
Waist	23.5-30.0	26.6	25.0-28.0
Hip circumference at nine inches <sup>b</sup>	35.5-42.5	38.6	34.5-38.0
Hip circumference at fullest area <sup>c</sup>	35.5-42.5	38.8	34.5-38.0
Hip depth <sup>e</sup>	7.9-11.0	9.0	9.0
Crotch depth <sup>f</sup>	9.0-12.3	10.4	9.7-10.3
Finished length	40.0-47.3	42.6	42.3-42.8

<sup>a</sup>All measurements were taken and recorded in inches to the nearest one tenth inch.

<sup>b</sup>The hip circumference was measured at nine inches below the waistline.

<sup>c</sup>The hip circumference was measured at the fullest area in addition to nine inches below the waistline.

<sup>d</sup>The fullest area of the hip (on the pattern) was nine inches below the waistline.

<sup>e</sup>The hip depth was determined by averaging the right and left hip depth measurements.

<sup>f</sup>The crotch depth was determined by averaging the right and left hip depth measurements.

participants were 9.0 inches to 12.3 inches, while the range of the selected pattern was 9.7 inches to 10.3 inches. It should be noted that the mean (10.4 inches) was slightly beyond the pattern range, also.

The finished length range of the participants was 40.0 inches to 47.3 inches, which indicated a large difference of 7.3 inches. The range of the three size pattern was only 42.3 inches to 42.8 inches, which provided for very little variance in the finished length. The mean (42.6 inches) measurement of the participants was within the range of the pattern.

Measurements Within Size 12 Range. The measurements of the participants were compared to the misses size 12 pattern to determine those that could use the pattern without alteration. An acceptance range of .5 inch below to .5 inch above the given pattern measurement was established. Participants with measurements that fell within the range could probably use the misses size 12 pattern without alteration. Table VI represents the percentage of participants whose measurements were within, below, and above the acceptance range.

The given waist measurement for size 12 was 26.5 inches; therefore, it was assumed that any person with a waist circumference between 26.0 inches and 27.0 inches could use the pattern without adjustment of the waistline. Twenty (40.0%) were within the limits for size 12; however,

TABLE VI  
 MEASUREMENTS OF PARTICIPANTS IN COMPAR-  
 ISON WITH THE MISSES SIZE 12 PATTERN  
 MEASUREMENTS  
 (N=50)

Description	Measurement <sup>a</sup> (in inches)	N	Percent
Waist	26.0-27.0	20	40.0
	Below 26.0	11	22.0
	Above 27.0	19	38.0
	Total	50	100.0
Hip circumference at nine inches <sup>b</sup>	35.5-36.5	3	6.0
	Below 35.5	0	0.0
	Above 36.5	47	94.0
	Total	50	100.0
Hip circumference at fullest area <sup>c</sup>	35.5-36.5	3	6.0
	Below 35.5	0	0.0
	Above 36.5	47	94.0
	Total	50	100.0
Hip depth	8.5-9.5	28	56.0
	Below 8.5	11	22.0
	Above 9.5	11	22.0
	Total	50	100.0
Crotch depth	9.5-10.5	16	32.0
	Below 9.5	3	6.0
	Above 10.5	31	62.0
	Total	50	100.0
Finished length	42.0-43.0	7	14.0
	Below 42.0	13	26.0
	Above 43.0	30	60.0
	Total	50	100.0

<sup>a</sup>The range included .5 inch below and .5 inch above the given pattern measurement for each area measured.

<sup>b</sup>The hip circumference was measured at nine inches below the waistline.

<sup>c</sup>The hip circumference was measured at the fullest area in addition to the measurement at nine inches below the waistline.

19 (38.0%) had waist circumferences larger than the range and 11 (22.0%) had smaller waist circumferences.

The given hip circumference at nine inches below the waistline was 36.0 inches; therefore, any person with a hip measurement between 35.5 inches and 36.5 inches could use size 12. Only three (6.0%) could use the pattern without alteration. No one had a hip circumference below 35.5 inches; however, 47 (94.0%) would need to enlarge the hip area of the pattern. It should be noted that the hip circumference at the fullest area of the size 12 pattern was the same as the previously mentioned measurement at nine inches below the waistline.

The hip depth was from 8.5 inches to 9.5 inches, and more than one-half of the participants (56.0%) could use size 12. The hip depths of 11 (22.0%) persons were shorter than 8.5 inches, and the hip depths of another 11 (22.0%) persons were longer.

The crotch depth measurement for size 12 was 10.0 inches. Sixteen (32.0%) participants had hip depths within the range of 9.5 inches to 10.5 inches. The largest percentage of participants (62.0%) would need to lengthen the crotch depth, while only three (6.0%) would need to shorten the crotch depth.

The finished length measurement for size 12 was 42.5 inches. Only seven (14.0%) were within the range of 42.0 inches to 43.0 inches. More than one-half (60.0%) of the



participants would need to lengthen the pattern to obtain the preferred finished length. Approximately one-fourth (26.0%) of the participants would need to shorten the pattern.

Measurements within Three-Size Range. The measurements of the participants were compared with those of the three-size pattern. An acceptance range was established which included a range of .5 inch below and .5 inch above the given pattern measurements for the three-size pattern. Participants with measurements within the range could probably use the three-size pattern without alteration. The comparative measurements of the participants with the pattern measurements are presented in Table VII.

The waist circumference range was from 24.5 inches to 28.5 inches. The three-size pattern would accommodate a large percent (82.0%) of the participants. Only one would need to make the waist smaller, and only eight (16.0%) would need to enlarge the waist circumference.

The acceptance range for the hip circumference for the measurements at nine inches below the waistline and for the fullest area of the hips was 34.0 inches to 38.5 inches. The three-size pattern could be used without further alterations by 26 (52.0%) of the participants. None of the participants would need to decrease the hip

TABLE VII  
 MEASUREMENTS OF PARTICIPANTS IN COMPAR-  
 ISON WITH THE THREE-SIZE PATTERN  
 MEASUREMENTS  
 (N=50)

Description	Measurement <sup>a</sup> (in inches)	N	Percent
Waist	24.5-28.5	41	82.0
	Below 24.5	1	2.0
	Above 28.5	8	16.0
	Total	<u>50</u>	<u>100.0</u>
Hip circumference at nine inches <sup>b</sup>	34.0-38.5	26	52.0
	Below 34.0	0	0.0
	Above 38.5	24	48.0
	Total	<u>50</u>	<u>100.0</u>
Hip circumference at fullest area <sup>c</sup>	34.0-38.5	26	52.0
	Below 34.0	0	0.0
	Above 38.5	24	48.0
	Total	<u>50</u>	<u>100.0</u>
Hip depth	8.5-9.5	28	56.0
	Below 8.5	11	22.0
	Above 9.5	11	22.0
	Total	<u>50</u>	<u>100.0</u>
Crotch depth	9.2-10.7	18	36.0
	Below 9.2	1	2.0
	Above 10.7	31	62.0
	Total	<u>50</u>	<u>100.0</u>
Finished length	41.8-43.3	12	24.0
	Below 41.8	12	24.0
	Above 43.3	26	52.0
	Total	<u>50</u>	<u>100.0</u>

<sup>a</sup>The range included .5 inch below and .5 inch above the given pattern measurement for each area measured.

<sup>b</sup>The hip circumference was measured at nine inches below the waistline.

<sup>c</sup>The hip circumference was measured at the fullest area in addition to the measurement at nine inches below the waistline.

circumference; however, 24 (48.0%) would need to increase the pattern hip circumference.

The hip depth range was from 8.5 inches to 9.5 inches, and the given measurements for all three sizes was 9.0 inches. Twenty-eight (56.0%) of the participants were within the size 12 hip depth range; however, 11 would need to decrease the measurement, and 11 (22.0%) would need to increase it.

The crotch depth range, which was 9.2 inches to 10.7 inches, included the measurement of 18 (36.0%) of the participants. Thirty-one (62.0%) of the participants would need to lengthen the crotch depth, while only one would need to shorten the crotch depth of the pattern.

Variance of Hip Circumference. Table VIII indicates the number of participants whose hip circumference was greater at a depth other than 9.0 inches. Two hip circumference measurements were taken: one at nine inches below the waistline and one at the fullest area of the hips. The tape measure was placed around the hips and moved up and down until the fullest area of the hips was located. The measurement at nine inches below the waist was recorded and those with hip depths that varied from 9.0 inches were recorded.

Forty (80.0%) participants had hip circumference measurements that were the same at both levels of measurement, while only 10 (20.0%) had hip circumference

TABLE VIII  
 VARIANCE OF THE HIP CIRCUMFERENCE MEASURE-  
 MENTS AT NINE INCHES AND AT THE  
 FULLEST AREA OF THE HIPS  
 (N=50)

Hip Circumference	N	Percent
Same <sup>a</sup>	40	80.0
Different <sup>b</sup>	10	20.0
Total	<u>50</u>	<u>100.0</u>
Within 8.5-9.5 <sup>c</sup>	3	6.0
Shorter than 8.5 <sup>d</sup>	1	2.0
Longer than 9.5 <sup>d</sup>	6	12.0
Total	<u>10</u>	<u>100.0</u>

<sup>a</sup>The participants who had the same hip circumference at the nine inch hip depth measurement and at the fullest area of the hips.

<sup>b</sup>The participants who had different hip circumference measurements at the nine inch hip depth measurement and at the fullest area of the hips.

<sup>c</sup>Those who had different hip circumference measurements that were still within the 8.5 inches to 9.5 inches hip depth range.

<sup>d</sup>Those who had different hip circumference measurements that were not within the 8.5 inches to 9.5 inches hip depth range.

measurements that were different. Of those who differed, three (6.0%) had the fullest hip circumference measurements within the 8.5 inches to 9.5 inches hip depth range of the three-size pattern. One person had a shorter hip depth measurement and six (6.0%) had a longer hip depth measurement.

### Discussion of Results

Fitting problems as identified on the questionnaire were compared with fitting problems identified through the measurement process. Of 189 women completing the questionnaire, 125 (66.1%) indicated a problem with fit in the waistline. Eighty-seven (46.0%) of the women indicated that the waist was too large and 38 (20.1%) indicated the waist was too small. The measurement of the women indicated that 20 (40.0%) of the participants had waist measurements within plus or minus .5 inch of the given waist measurement for the size 12 pattern (26.5 inches). Twenty-seven (38.0%) had waistlines larger than 27.0 inches and 11 (22.0%) had waistlines smaller than 26.0 inches. Forty-one (82.0%) participants had waistline measurements within the acceptance range of the three-size pattern; therefore, the three-size pattern accommodated 21 (42.0%) more participants than the size 12 pattern.

Eighty-four (44.4%) of the 189 women completing the questionnaire indicated a problem with fit in the hip area.

Sixty (31.7%) of the women indicated that the hip circumference was too small and 24 (12.7%) indicated the hip circumference was too large. The measurements of the women indicated that only three (6.0%) had measurements within the accepted measurement range for size 12; however, 47 (94.0%) had hip circumference measurements larger than 36.5 inches and no one had a hip circumference smaller than 35.5 inches. Twenty-six (52.0%) had measurements within the acceptance range of the three-size pattern; therefore, the three-size pattern would accommodate 23 (46.0%) more than the size 12 pattern.

Nearly one-half (47.6%) of the respondents indicated a problem with the crotch depth. Fifty-two (27.5%) of the women indicated the crotch depth was too long, and 38 (20.1%) indicated the crotch depth was too short. The measurements of the 50 women indicated that 16 (32.0%) of the participants had crotch depth measurements within the accepted measurement range of the size 12 pattern (10.0 inches). Thirty-one (62.0%) required a longer crotch depth than 10.5 inches and only three (6.0%) required a shorter crotch depth than 9.5 inches. The three-size pattern accommodated only two (4.0%) more persons than the size 12 pattern.

Of the 189 women completing the questionnaire, 115 (70.9%) indicated a fitting problem with the finished length. Fifty-four (28.6%) indicated the length was too long and 61 (32.3%) indicated the finished length was too

short. The measurement of the participants indicated that only seven (14.0%) required finished length measurements that were within the acceptance range of the size 12 pattern. Thirteen (26.0%) required a length shorter than 42.0 inches and 30 (60.0%) needed a length longer than 43.0 inches. Only 12 (24.0%) had finished length measurements within the acceptance range of the three-size pattern; therefore, the three-size pattern accommodated only 5 (10.0%) more than the size 12 pattern.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

The purpose of the study was to determine common fitting problems of college women who use commercial pants patterns. The measurements of a selected group of college women were compared with the measurements of a three-size pants pattern.

The researcher distributed a questionnaire to 189 college women to determine common fitting problems and to identify a group of 50 women who qualified for the measuring procedure. The women who were measured were selected on the basis of age, pattern size, indication that some or all pants were made from a commercial pattern, and willingness to be measured.

The measurements of the participants were compared to the measurements of a misses size 12 and a three-size pants pattern. The areas measured were waist circumference, hip depth, hip circumference, crotch depth, and finished length. The comparison indicated those who could use the size 12 pattern and the three-size pattern without adjustment. The results from the measuring procedure were



further compared with the responses from the questionnaire to determine common fitting problems of college women with commercial pants patterns.

### Conclusions

A large majority of the women completing the questionnaire indicated that they had fitting problems with commercial pants patterns. The results of the measurements, however, indicated that the mean measurement of each area was within .1 to .4 inch of the pattern measurement of size 12 except the hip circumference. The average measurement of the hip circumference exceeded the given measurement for the size 12 pattern slightly more than 2.5 inches. The mean hip depth was the only mean measurement that was the same as the pattern measurement (9.0 inches).

The three-size pattern would accommodate many more women than the size 12 pattern; however, the measurements of only four women were totally within the limits of the three-size pattern in all areas. In the waist and the finished length areas, the three-size pattern would accommodate approximately twice as many as the size 12 pattern. In the hip area, approximately 8.5 times as many could be accommodated by the three-size pattern; yet, the hip measurements of almost one-half of the participants were above the upper limit of the three-size pattern. In the crotch depth area, only two women, who were not within

the acceptance range of the size 12 pattern, could be accommodated by the three-size pattern.

The conclusions drawn from the measurement process indicated that some of the participants were not aware of or neglected to indicate fitting problems. More problems were identified in the hip circumference, crotch depth, and finished length areas than were noted in the responses. The measurements indicated that there was more need for enlarging the pattern (in all areas) than was indicated by the responses. The most notable difference between responses and actual measurements was in the hip area where only 44.4 percent indicated a problem, but the measurements indicated that 94.0 percent of the participants were larger than the hip measurement of the size 12 pattern. More persons would need adjustments in the hip circumference than in any other area of the pattern.

#### Recommendations

Recommendations for further study are the following:

1. Repeat the study with a different age group to determine the fitting problems with commercial pants patterns.
2. Replicate the study using similar patterns from other pattern companies to determine differences in ease allowed by the various companies.
3. Compare the fit of ready-to-wear pants and pants constructed from a commercial pattern of the same size.

4. Investigate the interpretation of proper fit for pants among women of different age groups.

5. Determine the difference in fit obtained between various methods of drafting and altering a pants pattern.

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**APPENDIXES**

**APPENDIX A**  
**QUESTIONNAIRE**

Name \_\_\_\_\_

Class \_\_\_\_\_

## QUESTIONNAIRE

What is your age? \_\_\_\_\_

Do you make your pants or does someone make pants for you?

\_\_\_\_\_ frequently \_\_\_\_\_ never \_\_\_\_\_ sometimes

Do you have problems fitting pants?

\_\_\_\_\_ frequently \_\_\_\_\_ never \_\_\_\_\_ sometimes

Please check the fitting problems you have had with pants patterns:

\_\_\_\_\_ waist too tight

\_\_\_\_\_ waist too large

\_\_\_\_\_ hips too tight

\_\_\_\_\_ hips too large

\_\_\_\_\_ crotch too short

\_\_\_\_\_ crotch too long

\_\_\_\_\_ length too short

\_\_\_\_\_ length too long

Additional comments on fitting pants:

Do you purchase different sizes in patterns made by different companies? \_\_\_\_\_ yes \_\_\_\_\_ no. If so, please indicate the size difference and the companies: \_\_\_\_\_  
\_\_\_\_\_

Would you be willing to be measured (in your undergarments) as a part of a study concerning fit of pants?

\_\_\_\_\_ yes \_\_\_\_\_ no

What is your pants pattern size? 8, 10, 12, 14, 16, 18, 20 or other. (Please indicate size if 'other') \_\_\_\_\_

Body Measurements (as given on the pattern):

Size. . . . .	6	8	10	12	14	16	18	20	
Waist . . . . .	23	24	25	26½	28	30	32	34	Inches
Hips. . . . .	32½	33½	34½	36	38	40	42	44	Inches



APPENDIX B

BODY MEASUREMENT CHART FOR PANTS

## BODY MEASUREMENT CHART FOR PANTS

Participant Number \_\_\_\_\_

Description	Measurement
Waist circumference	
Hip circumference nine inches below the waistline	
Hip circumference for the fullest area of hips	
Hip depth (right side)	
Hip depth (left side)	
Crotch depth (right side)	
Crotch depth (left side)	
Finished length (right side)	
Finished length (left side)	

**APPENDIX C**

**PATTERN MEASUREMENT CHART FOR PANTS**

## PATTERN MEASUREMENT CHART FOR PANTS

Description (Size 10)	Pattern Measurement	Given Pattern Measurement	Difference
Waist		25.0	
Hips		34.5	
Crotch depth		9.7	
Finished length		42.3	

Description (Size 12)	Pattern Measurement	Given Pattern Measurement	Difference
Waist		26.5	
Hips		36.0	
Crotch depth		10.0	
Finished length		42.5	

Description (Size 14)	Pattern Measurement	Given Pattern Measurement	Difference
Waist		28.0	
Hips		38.0	
Crotch depth		10.3	
Finished length		47.8	

VITA

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Master of Science

Thesis: FITTING PROBLEMS ENCOUNTERED BY COLLEGE  
WOMEN WHO USE COMMERCIAL PANTS PATTERNS

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