

SUGGESTED ALTERATION PROCEDURES FOR COMMERCIAL SKIRT
PATTERNS BASED ON FIGURE ANALYSIS OF TEENAGE GIRLS

by 458.9

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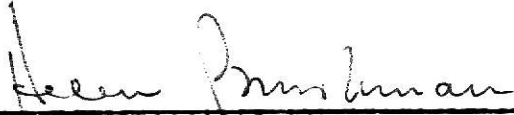
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INTRODUCTION

This study was made with teenage girls to evaluate the fit of the commercial skirt pattern. The purpose of the study was to analyze causes of poor fit so that guidance and help could be given teenage girls in the use of commercial skirt patterns.

The first part of the study was conducted with high school home economics students in Fowler and Meade, Kansas, where 127 girls were measured and their measurements analyzed. This data was tabulated with the purpose of finding:

1. the prevalence and degree of deviation from the standard differential in measurement between waistline and hipline used by pattern companies.
2. the relationship of this deviation to such factors as age, height, and weight.

The information obtained from the above study was used to determine the size range and amount and type of figure deviation to be found in this high school age group.

The second part of the study was made with fifty girls in four high schools in Fowler, Meade, Minneola, and Montezuma, Kansas, who were judged to have figures with normal differential on the basis of the first study. The skirt sizes that the girls' measurements indicated were sizes 10, 12, and 14 on the standard measurement chart used by leading pattern companies. Two muslin skirts were made in each size, one using a Simplicity basic skirt pattern and one using a basic skirt

pattern for the Bauman dress form. Each girl modeled the two skirts in her size, and a check sheet with nineteen items was used in judging the comparative fit of the skirts.

Definition of Terms Used

Differential. Differential refers to the difference between any pair of measurements of body girth taken at a different common measurement level such as bust, waist, hip. In this study the two measurements used are waistline and hipline.

Figure differential. Figure differential refers to the difference in girth between waistline and hipline (measurement over the fullest part of the hip).

Normal figure differential. Normal figure differential refers to a person with a figure differential between $10 \frac{1}{2}$ and $11 \frac{3}{8}$ inches.

Normal figure. A normal figure is one that lies within the limits of the normal differential ($10 \frac{1}{2}$ - $11 \frac{3}{8}$ inches).

Average differential. A figure with average differential is a figure that lies within the limits of the normal differential.

Dart takeup. The dart takeup (the amount of fabric taken up by the dart) is the amount by which the dart reduces the seamline in which it terminates.

REVIEW OF THE LITERATURE

Familiarity with the factors which are present in every fitting problem will enable the wearer to recognize points of a good fit. These points include ease, line, grain, set, and balance. Erwin (4) pointed out that if the grain is not true, the garment will be off balance, and drawing and pulling may result. Erwin (4) defined ease as the difference in actual body measurements as compared with garment measurements. Lines refer to the basic silhouette seamlines. The well-fitted garment will set smooth and be free of wrinkles. The author also stated that causes of poor fitting include failure to place the pattern on the grainline of the fabric. Other problems may be created from inaccurate cutting, marking, pinning, basting, stitching or pressing.

The success of any garment is judged by its appearance on the wearer as was pointed out by Gawne (5). Nothing is more important than the fit and much of the satisfaction with the finished garment depends on how well it fits.

The fit of your garment depends on the fit of your pattern which Erwin divided into these specific problems that are caused by body versus pattern proportions:

- tightness or looseness
- lines out of place
- off-grain condition
- wrinkles
- off-balance condition (4, pp. 407-408)

The author then lists five steps to follow in solving these problems:

1. Recognize evidences of
2. Determine cause of
3. Decide on remedy for
4. Correct by simplest method
5. Analyze cause and effect relationship to help you with future alterations. (4, pp. 407-408)

Brockman (2) who used the term "sloper" to mean a basic sheath skirt pattern said that the "sloper" which is made to fit around the curves of the figure by means of darts and a shaped side seamline furnishes an accurate blueprint of the body beneath. Darts are most commonly used for fitting. Darts take up excess fabric, beginning at the hipline (about 5 inches below the waistline) in front and an inch or more lower in the back for the normal figure. In the sloper where the darts are bisymmetric, the center line of the dart falls on the straight grain of the fabric. This gives the pattern a contour balance. From one to three darts may be used on each side of the figure depending on the style. The purpose of the dart is to reduce the working or finished garment width of a pattern piece to the measurement of the seamline to which it extends. Short darts are better suited to a rounded hip contour, while long darts are better, as a rule, for a sloping hip contour. The panel dart generally can be made smaller than the side dart because the body is less curved at the center front and back than it is at the sideseam area. The amount of takeup of any dart represents the amount of curvature in the area it services.

Bane (1) stated that if a figure has a larger-than-average curve at a particular point, it will require a larger-than-average dart to fit the curve; a smaller-than-average curve will require a smaller-than-

average dart. She made the point that this knowledge will be a great help in fitting, for fitting is largely a matter of adjusting the shape of a garment to the body contour.

As pointed out by Sturm, the standards of fit for a skirt should include the following guidelines:

- (1) Center lines in front and back should hang straight without swinging toward either side.
- (2) Sideseams should hang perpendicular to the floor and close to the body giving the appearance of continuing the underarm seam of the bodice and dividing the skirt evenly between front and back.
- (3) Hipline - to allow freedom of movement, the hipline should be easy. Above the hipline the skirt should lie smoothly, and below the hipline it should fall straight to the floor.
- (4) Darts in a skirt may be judged by the same general standards of fit given for the darts in a bodice. Darts should distribute the ease so the fabric lies smoothly on the figure and the grainlines fall in the correct position.
- (5) The waistband of a skirt should fit smoothly around the normal waistline of the body. It should be loose enough to be comfortable and to remain flat without wrinkling, but tight enough to hold the skirt in position on the body. (7, p. 355)

According to Warden, fitting becomes simpler when it is understood why a well-fitted garment is both comfortable and flattering to the three-dimensional figure made up of hollows, planes and bulges. Clothes must fit, be fashionable and look comfortable to flatter. If any one quality is missing, some confidence and poise is lost. An understanding of the human body and the shaping of fabric is fundamental to fitting for no fashion can flatter the figure unless garment proportions are related to the human figure. (9, pp. 25, 29)

PROCEDURE

Data on skirt analysis was collected from responses to a questionnaire, which had been designed by the writer, to obtain a sampling of teenage girls. Participating in the study were 127 girls in home economics classes in Fowler and Meade, Kansas, high schools. The girls were in grades nine through twelve and ranged in age from 13 to 19 years. Individual measurements of the girls were made by home economists. Measurements and data were obtained from recommended procedures generally outlined in clothing texts.

The following information was obtained for each of the girls used in the study:

Individual Measurement Data

- Age
- Weight
- Height
- Bust measure
- Waist measure
- Hip measure (over the fullest part of the hip)
- Distance from the waist to the fullest part of the hip
- Differential (difference between waistline-hipline measurement)

Pattern Data

- Pattern preference
- Reason for the preference
- Pattern size normally used

The data was analyzed by means of tables and graphs as shown in Appendix A.

A comparison was made between the fit of the commercial skirt pattern and the fit of the control skirt pattern for each of the 50 girls with a differential (difference in waistline-hipline measurement)

of not more than 11 1/2 inches or less than 10 inches. A pattern from the Simplicity Pattern Company was used since the data analysis showed 96 per cent of the girls preferred this make of pattern. The control pattern was made to fit a Bauman "industrial" dress form, so-called since Bauman and Wolf are the two major suppliers of dress forms for the apparel industry. Commercial pattern companies use dress forms from the same suppliers, but the dress forms are made to the specific measurements used by pattern companies which are not necessarily the same as those used by industry. Scale drawings of the two patterns were made in centimeter scale (Appendix C).

Two basic skirts were constructed of muslin in pattern sizes 10, 12, and 14. These sizes were chosen on the basis of the first study which showed that 80 per cent of the 127 girls used patterns in the 10-14 size range. The skirts were designed with four darts in the front and four in the back. The finished waistlines of the two skirts were practically identical, but the length and width of the darts differed and a comparison of the skirts in any one size showed that the control pattern had approximately one inch more ease above the hipline than the commercial pattern, as is shown in the scale drawings mentioned above.

Each of the 50 teenage girls in the study modeled the two skirts in her size. The fit of the skirts was judged by the school home economist who used a check sheet to record her judgment on the 19 items that were used in making the analysis (Appendix D).

DISCUSSION OF FINDINGS

One hundred and twenty-seven teenage girls enrolled in home economics classes in Fowler and Meade high schools were the subjects for the first part of the study. This study conducted during the spring of 1969 used an individual measurement and data sheet to secure the information for the report. The results and analysis served as a basis for the selection of the skirt patterns used in the second part of the study.

Analysis of Individual Measurement Data

Table 1 shows the distribution of the 127 girls in the study by age. Based on the total number of girls in the study, the median age was 16 years.

Table 1
Number of Teenage Girls in Each Age Group

Teenage girls	Range of ages in years						Total
	13	14	15	16	17	18-19	
Number	10	28	19	27	37	6	127
Median age	*						

Table 2 shows the number and percentage of teenage girls grouped according to figure differential (difference in waistline-hipline measurement). Fifty-six (44.1 per cent) of the students in the small differential group had a difference in their waistline-hipline measurement of

less than 10 1/2 inches. The small differential varied from 5 to 10 3/8 inches. The "average" or normal differential group included forty (31.5 per cent) girls of the total studied who had differential measurements which ranged from 10 1/2 to 11 3/8 inches. Girls in the large differential group had waistline-hipline differences greater than 11 3/8 inches. The range of differential for this group was from 11 1/2 to 14 inches. The median differential for the girls in this study was slightly below 11 inches.

Table 2

Number and Percentage of Teenage Girls in Small, Average,
and Large Waistline-Hipline Differential Groups

Differential	Number of girls	Median differential	Percentage of girls
Small (below 10 1/2 inches)	56		44.1
Average (10 1/2 to 11 3/8 inches)	40	*	31.5
Large (above 11 3/8 inches)	31		24.4
Total	127		100.0

Table 3 shows the three differential groups by age of the teenage girls. The girls in each age group were divided according to small, average, and large differential. From 57 to 60 per cent of the girls in the 13 and 14 age groups had differentials of less than 10 1/2 inches. Approximately 47 per cent of the girls, who were 15 years of age, had small differentials of less than 10 1/2 inches, and the remainder were

evenly divided between the other two categories. The girls who were age 16 divided more evenly among the differential groups with approximately 37 per cent having a small differential. The girls in the 17 age group showed a slight tendency toward a larger differential with 35 per cent in this area. Since the total number of girls in age 13 and age 18-19 groups was small, no trends in differential (difference in waistline-hipline) were found. This table shows that as age increases, the girls tended to distribute more evenly into the three differential groups: small, average, and large with tendency toward a larger differential.

The number of teenage girls studied by weight and differential is shown in Figure 1. The median weight for the girls was approximately 120 pounds. A total of forty-four (35 per cent) of the girls weighed from 116 to 124 pounds and thirty-two (25 per cent) weighed approximately 110 pounds.

The distribution by differential is shown along the left side of the graph (Fig. 1). The smallest differential was 5 inches for a girl who weighed 110 pounds, while the largest differential was 14 inches for a girl who weighed 147 pounds. The median differential was slightly under 11 inches for the girls.

The distribution of differential plotted against weight on the graph (Fig. 1) shows that in the $10 \frac{1}{2}$ to $11 \frac{3}{8}$ inch differential group, weights varied from 90 to 150 pounds. The weight of twenty-six (65 per cent) of the girls varied from 110 to 130 pounds. A circle drawn from the midpoint of distribution where the median differential

Table 3

Number and Percentage of Teenage Girls with Small, Average,
and Large Waistline-Hipline Differential by Age

Girls Age	No.	Waistline-hipline differential					
		Small (below 10 1/2 in.)		Average (10 1/2-11 3/8 in.)		Large (above 11 3/8 in.)	
		No.	per cent of age group	No.	per cent of age group	No.	per cent of age group
13	10	6	60	2	20	2	20
14	28	16	57	9	32.1	3	10.7
15	19	9	47.4	5	26.3	5	26.3
16	27	10	37	9	33	8	30
17	37	12	32.4	12	32.4	13	35.2
18-19	6	3	50	3	50	0	

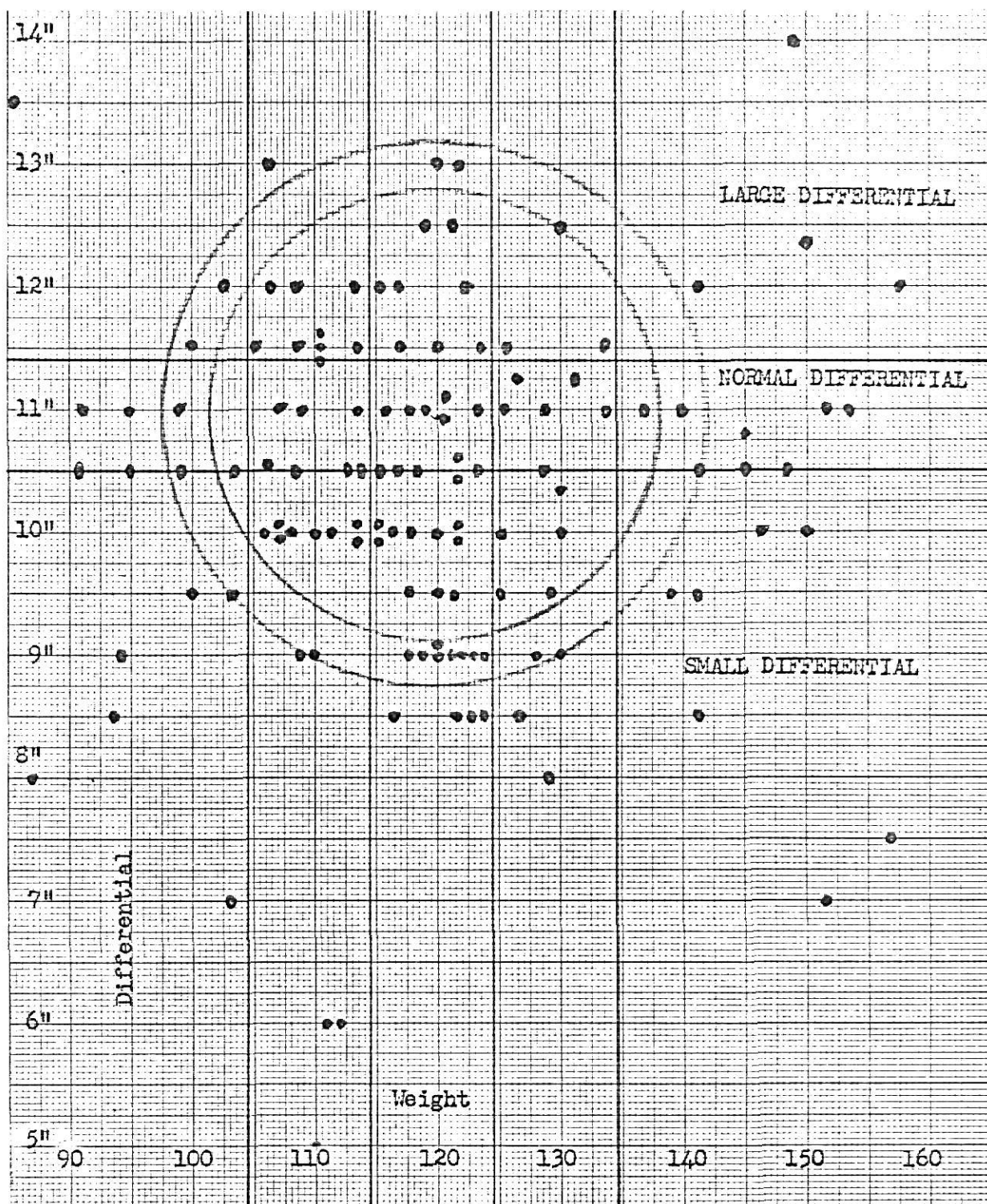


Figure 1

Relationship of Differential to Weight of the 127 Girls
in the Individual Measurement Study

(slightly under 11 inches) crosses the median weight (120 pounds) encompassed approximately 50 per cent of the girls in the study showing that the factors of weight and differential are inter-related. A second circle drawn outside of the first circle encompassed 75 per cent of the girls and showed a similar relationship.

The large differential group in the upper part of Fig. 1 shows that the weights of this group ranged from 105 to 157 pounds. The girls in this group had small waistline measures in comparison to their hipline measurements. In differential the girls in this study ranged from 11 1/2 to 14 inches.

The small differential group on the lower part of Fig. 1 included girls whose weights varied from 97 to 156 pounds. Girls in this differential group had larger waist measures in proportion to their hipline measurements with a variance in differential ranging from 5 to 10 3/8 inches.

Table 4 (a, b, and c) shows the study made with small, average, and large differential groups compared with height, weight, and age of the 127 girls. Numbers were used in the body of the tables to represent the ages of the girls in the study and in this way showed the distribution according to age.

Table 4 (a) shows that 33 of the 56 girls with small differential were 13 to 15 years of age. Of the 33 girls in this age group, 14 weighed below 115 pounds and 22 weighed less than 124 pounds. Table 4 (a) also shows a varied distribution of height from 5 to 5 feet, 8 inches. In the 16 and 17 age groups, 13 of the girls weighed from 115 to

Table 4 (a)

Height and Weight of Teenage Girls with the Small
(less than 10 1/2 in.) Differential by Ages

Height (inches)	Weight in pounds					Above 144
	Below 105	105-114	115-124	125-134	135-144	
Below 60			17,16			
60	14		14,15,16	14		
61	13		15	13,17	18	
62		14,14,17 17		15		14
63	13,13 13,14	14,14,14 15,17	14,15,17	14,17,17		
64		14	16	17	15	16
65			14,16,16 17,18	13	14	
66		15,18	15,15,16 16	14		15
67		17				
68 and up			13			17

Table 4 (b)

Height and Weight of Teenage Girls with the Average
(10 1/2-11 3/8 in.) Differential by Ages

Height (inches)	Weight in pounds					
	Below 105	105-114	115-124	125-134	135-144	Above 144
Below 60						
60	17,16					
61	14					
62	13,18	14	14,16	16		
63	17	17	16,16 17	14,14	17	15,15 16
64	15	13,14 15	16,17 17	14,17		
65				19,19		
66		16	14,15		14,17	
67		17				16
68 and up			17		17	

Table 4 (c)

Height and Weight of Teenage Girls with the Large
(above 11 3/8 in.) Differential by Ages

Height (inches)	Weight in pounds					Above 144
	Below 105	105-114	115-124	125-134	135-144	
Below 60	16					
60	14					
61		15,16				
62			14,16	17		
63		16,17,17 17,17	16	17		17
64		17	13,15 17	15,17		
65		16	13,17	14		16,17
66						
67			17			
68 and up		15,15			16	

134 pounds and were evenly distributed on the height table which showed that the weight of these girls was not an indicator of their height.

Table 4 (b) shows that ages of the girls with average differential ranged from 14 to 19 years. Twenty-one of the 64 girls who were 16 and 17 years of age were in this differential group. Ten girls, who weighed from 115 to 134 pounds, ranged in height from 5 feet, 2 inches to 5 feet, 4 inches. Of the 57 girls in ages 13 through 15, a total of 16 girls had average differentials. These girls were distributed evenly across the weight table, and they ranged in height from 5 feet, 1 inch to 5 feet, 6 inches.

Twenty-one of the 31 girls with large differential (above 11 $\frac{3}{8}$ inches) were 16 and 17 years of age, weighed 105 to 134 pounds, and varied in height from 5 feet to 5 feet, 8 inches (Table 4 (c)). Four girls in the 16 and 17 age group weighed above 135 pounds and ranged in height from 5 feet, 3 inches to 5 feet, 8 inches. Ten girls in the 13 and 15 age group had large differentials according to the table with weights that varied from 105 to 134 pounds. These tables show that differential is more closely inter-related with age and weight than with the height of the individual.

Analysis of Pattern Data

The pattern preferences for the 127 girls and reasons given for their preference were tabulated. The data sheet (Appendix A) included only the names of patterns from the four leading pattern companies.

Results showed that 122 (approximately 96 per cent) of the 127 students preferred one pattern over the other three patterns. Three

girls listed this same pattern as their second choice. No more than two students preferred any other single pattern.

One hundred and twenty-five girls responded to the questionnaire indicating reasons for their pattern preference. Forty-four per cent of the girls selected style as the reason for their preference, 25 per cent chose better fit, and 24 per cent chose availability as reasons for pattern selection (Table 5).

Table 5
Primary Reasons Given by the 127 Girls
for Their Pattern Preference

Reasons	Number showing reasons for preference	
	Number	Percentage
Style	56	44.1
Better fit	32	25.3
Availability	31	24.4
Other	6	4.7
No reply	2	1.5
Total	127	100.0

Table 6 shows that the pattern sizes varied from junior size 5 to misses size 16. Eighty-five (69 per cent) of the girls used pattern sizes 9, 10, 11 or 12. The misses pattern was used by ninety-one (72 per cent) of the girls in the study. Eight selected teen patterns, 15 chose junior miss and 13 used junior petite patterns.

Table 6
Pattern Sizes Preferred by the 127 Teenage Girls

Pattern figure	Pattern sizes by number of girls						
	5-6	7-8	9-10	11-12	13-14	15-16	Total
Misses		10	37	25	17	2	91
Junior Miss		1	8	6			15
Junior Petite	6	3	2	2			13
Teen	2	1	3	2			8
Total	8	15	50	35	17	2	127

Further study was made with 60 girls in the first group who used the following size patterns: misses, size 10; teen, size 10; junior, size 9; and junior, size 11. The students checked their pattern size and figure problems that were related to pattern adjustment. Seventeen of the 60 girls (Table 7) showed measurements with an 11 inch differential. Forty-three figure problems were checked as reasons for making pattern adjustments and alterations. Groups A and B were girls with small differential and Groups C and D comprised girls with larger-than-average differential.

Analysis of Skirt Patterns

The skirt pattern analysis was made with 50 home economics teenage girls in four high schools who were selected on the basis that they had normal figures with average differential (10 1/2 to 11 3/8 inches).

Table 7

Figure Problem and Differential (11-in.) Study of
60 Girls Who Used Misses Size 10, Teen 10,
Junior 9 or Junior 11 Patterns

Pattern size	11-inch differential	Figure problems noted by girls				
		A Small hip	B Large waist	C Small waist	D Large hip	Total
Misses 10	10	6	7	9	5	37
Junior Miss size 9, 11	3	1	7	3		14
Junior Petite size 9, 11	2		1	1		4
Teen 10	2	2			1	5
Total	17	9	15	13	6	60

The girls who modeled the skirts are shown by age (Table 8). The ages of these girls ranged from 14 to 19 years. The median age was 16 years and the study showed that 17 of the girls were in this age group. Thirty-six (72 per cent) of the girls ranged in age from 15 to 17 years.

Table 8

Age Range of the 50 Teenage Girls with 10 to 11 1/2 inch
Waistline-Hipline Differential

Girls	Range of ages by years						Total
	14	15	16	17	18	19	
Number	6	10	17	9	6	2	50
Median age	*						

Table 9 shows differential (difference in waistline-hipline measurement) and age of the 50 girls who modeled skirts. Twenty-eight (56 per cent) of the girls had average differentials with a difference in waistline-hipline measurement of 10 1/2 to 11 3/8 inches. Twenty-two (44 per cent) were no more than 1/2 inch above or below the average or normal differential of 10 1/2 to 11 3/8 inches.

Table 9
Relationship of Differential to Age
of the 50 Teenage Girls

Age of girls	Number in each differential group			Total
	Small (10-10 1/4 in.)	Average (10 1/2-11 3/8 in.)	Large (11 1/2 in.)	
14	1	3	2	6
15	4	6		10
16	4	11	2	17
17	4	3	2	9
18	1	4	1	6
19		1	1	2
Total	14	28	8	50
Percentage in each group	28	56	16	100

The sizes used in the skirt pattern study were misses sizes 10, 12 and 14 as shown in Table 10. Twenty-one (42 per cent) of the 50 girls who modeled a size 10 varied in age from 14 to 19 years.

Nineteen (38 per cent) of the girls modeled size 12 and this group ranged in age from 14 to 18 years. The ten (20 per cent) girls who modeled size 14 skirts were ages 14, 16, 18, and 19 years.

Table 10
Comparison of Age and Size Used by the 50 Teenage Girls
in the Skirt Pattern Study

Age of girls	Size of patterns (Misses)			Total
	10	12	12	
14	1	3	2	6
15	7	3		10
16	6	5	6	17
17	4	5		9
18	2	3	1	6
19	1		1	2
Total	21	19	10	50
Percentage in each size	42	38	20	100

Some fitting problems are caused by lack of symmetry in the girls figure. One hip that is higher or larger than the other results in a center seamline which does not hang true. This is a figure problem and not the fault of the pattern. If the problem was too pronounced, it would require that two different shapes of skirts be made to fit the two different sides of the figure. One side will have a different

waistline-hipline differential from the other side. In these cases the differential for each side can be determined by measuring each side from the center-front to the center-back, after a straight centerline is established for each. Table 11 shows a similarity in number of teenage girls who have figure problems that cause grainlines in the front and back to hang off balance.

Table 11

Fitting Problems Observed in Skirts Made From the Commercial and Control Skirt Pattern and Modeled by 50 Teenage Girls

Fitting problems	Skirts from	
	Commercial pattern	Control pattern
Back waistline:		
requires lowering	7	7
requires raising	8	5
Sideseam lines:		
falls backward	0	0
falls forward	11	6
Center-front grainline		
falls to the right	7	5
falls to the left	5	5
Center-back seamline		
falls to the right	9	10
falls to the left	5	4
Total number of fitting problems observed	52	42

A comparison of the fit of the two muslin skirts through the torso area was made. Girls were asked to walk, stand, and sit in the skirts to determine the necessary ease. In observations of the ease, Table 12 shows that 18 girls needed more ease when seated in the skirt made from the commercial pattern while only five lacked adequate ease in the control skirt.

In judging the skirts for good silhouette fit, 25 girls had problems with the skirt cupping in or out with the skirt from the basic commercial pattern; only 14 showed a similar problem with the skirts made from the control pattern.

The trim smooth fit was possible only when no fitting problems were present. Skirts modeled by 40 girls showed problems with wrinkles in the commercial skirt; less than half as many showed similar problems with the control skirt.

Table 12

Observations of the Ease Through the Torso Area of Skirts
Made From Commercial and Control Patterns
and Modeled by 50 Teenage Girls

Ease observed	Skirts from			
	Commercial pattern		Control pattern	
	Yes	No	Yes	No
Necessary sitting ease	32	18	45	5
Good silhouette with no cupping in or out	25	25	36	14
Trim fit without wrinkles	10	40	30	20

Table 13 shows the comparison of the dart length, location, and takeup alteration needed as observed on the 50 girls who modeled the skirts. Record of judgment of the fit showed that forty girls (80 per cent) needed to have the front dart lengthened on the commercial pattern while only sixteen (32 per cent) required some front dart adjustment on the control pattern. The girls who were short in stature often required all the darts to be 1/2 to 1 inch shorter on the skirt made from the control pattern. The number of girls who needed an adjustment in front dart takeup in the commercial pattern was thirty-eight (76 per cent) while twenty-seven (54 per cent) required attention on the back dart. Less than half as many adjustments were needed in the back and front darts of the control pattern. Dart location was satisfactory in the two skirt patterns.

Table 13

Dart Length, Location, and Takeup in Relation to the Fit
of Two Skirts for 50 Teenage Girls

Fit of skirts observed	Skirts from			
	Commercial pattern		Control pattern	
	Yes	No	Yes	No
Front darts for an easy smooth fit				
Length	10	40	34	16
Location	48	2	50	0
Takeup	12	38	32	18
Back darts for an easy smooth fit				
Length	18	32	40	10
Location	49	1	49	1
Takeup	23	27	38	12

SUMMARY OF FINDINGS

The purpose of the study was to analyze causes of poor fit so that guidance and help could be given teenage girls in improving the fit of commercial skirt patterns.

The study was divided into two parts:

1. The first part of the study was conducted with high school home economics girls in Fowler and Meade, Kansas, in which 127 teenage girls were measured and their measurements analyzed. This study also included pattern analysis which showed pattern preference, reason for a preference, and pattern size normally used. A data sheet was used to record the information.

2. The second part of the study was made with 50 teenage girls in four high schools in Fowler, Meade, Minneola, and Montezuma, Kansas, who were chosen because they had normal figures with average differential. Each girl modeled two skirts in her size, and a comparative judgment was made between the commercial skirt pattern and the industrial skirt pattern in which the fit of the commercial pattern was evaluated in relation to the teenage figure. A check sheet with 19 items was used by the school home economist in judging the comparative fit of the skirts.

The number of girls in this study was too small to draw general conclusions for all teenage girls. However, certain generalizations could be stated regarding the individual measurement data, pattern data, and skirt analysis for the girls included in this study.

The median age of these girls was 16 years with 88 per cent of the girls in this study ranging in age from 14 to 17 years. The median differential was slightly below 11 inches. Commercial pattern companies use a 10 1/2 inch differential on misses patterns through size 12, and an 11 inch differential for misses pattern sizes above 12. (Appendix B) Bauman and Wolf dress forms used in industry for ready-mades have established an 11 inch differential on all misses sizes.

Thirty-one per cent of the teenage girls had a normal differential (difference in waistline-hipline measurement) from 10 1/2 to 11 3/8 inches. Forty-four per cent of the girls had a small differential (below 10 1/2 inches) while approximately 25 per cent had a large differential (above 11 3/8 inches). Included in the small differential group were girls who had larger waistlines in proportion to their hip measures, whereas, the large differential group included girls with larger hips in proportion to their waistline measures. Alterations or adjustments of any basic (sheath) skirt pattern would undoubtedly be needed by 69 per cent of the girls in the first study who had smaller or larger than normal waistline-hipline differentials.

The results of this study showed that the factors of weight and waistline-hipline differential are inter-related, for as girls gained in weight they generally tended toward a larger waistline-hipline differential. The findings also indicated that as age increased, the girls tended to distribute more evenly among the three differential groups, with a tendency toward a larger differential.

Results of the data on pattern analysis indicated that 96 per cent of the girls preferred one pattern over three other leading

patterns. Style was selected by 44 per cent, better fit by 25 per cent, and availability by 24 per cent as reason for pattern selection. Results from the pattern data of 60 girls who used misses size 10, teen 10, and junior 9 or 11 showed that less than 30 per cent of these girls had figures with the normal waistline-hipline differential.

From the findings on the second part of the study on skirt pattern analysis which were based on a limited number of girls varying in age from 13 to 19 years, it was concluded that:

1. The fit of a basic skirt has a direct relationship to differential (difference between waistline-hipline measurement) of the individual.

2. In the basic skirt pattern used in the study sitting ease through the torso area was inadequate for comfort and body movement in a large per cent of the figures with normal waistline-hipline differential.

3. When sideseams do not hang straight so that they divide the figure evenly front and back wrinkles are apt to appear which require some pattern adjustment.

4. Results of the dart analysis showed that short darts and curved darts are best suited to a rounded hip while longer darts and straight darts are usually best for the sloping hip. The darts in this commercial skirt pattern needed to be lengthened for a desirable fit. The most obvious pattern problem in this study seemed to be that the short darts with small takeup caused a waistline to be of correct measurement, but failed to provide the ease needed from 5 to 10 inches

below the waistline. To fit properly patterns need to add width from the waistline to the fullest part of the hip and increase dart length and width accordingly.

The findings of this study of figure, pattern, and skirt analysis have implications for the fields of clothing and textiles in helping teenage girls to understand their figure problems better and to determine satisfactory adjustments and alterations for patterns used in clothing construction. The accepted practice of choosing a basic (sheath) skirt pattern by waist measure is satisfactory only for the girl with a normal waistline-hipline differential. The 69 per cent of girls with a larger or smaller than normal waistline-hipline differential have greater problems in selecting a pattern to fit their body measurements. If skirts could be sold in small, average, and large differential, they would tend to fit a larger per cent of girls whose measurements lie outside the average (10 1/2 to 11 3/8 inch) differential. If pattern companies could evaluate and analyze pattern sizes more realistically, a larger per cent of teenage girls could expect to be fitted with commercial patterns with a minimum of adjustment. Additional research with large and small differential groups could prove helpful to clothing teachers and others interested in the clothing construction field.

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APPENDIXES

APPENDIX A

Individual Measurement Data Sheet

Name _____

_____ Age

_____ Height (without shoes)

_____ Weight (without shoes)

_____ Bust (over fullest part)

_____ Waist

_____ Hips (over fullest part)

_____ Distance from waist to hip measure

(All measurements should be snug, not tight)

Alterations needed in pattern. Check those applicable.

_____ Small Hip

_____ Large Hip

_____ Small Waist

_____ Large Waist

_____ Asymmetrical or unbalance

_____ Other

_____ Pattern used: McCalls, Simplicity, Vogue, Butterick

_____ Second choice of pattern, if any

_____ Pattern size used (new sizing)

_____ Reason for choosing the above pattern such as availability,
better fit, style, other.

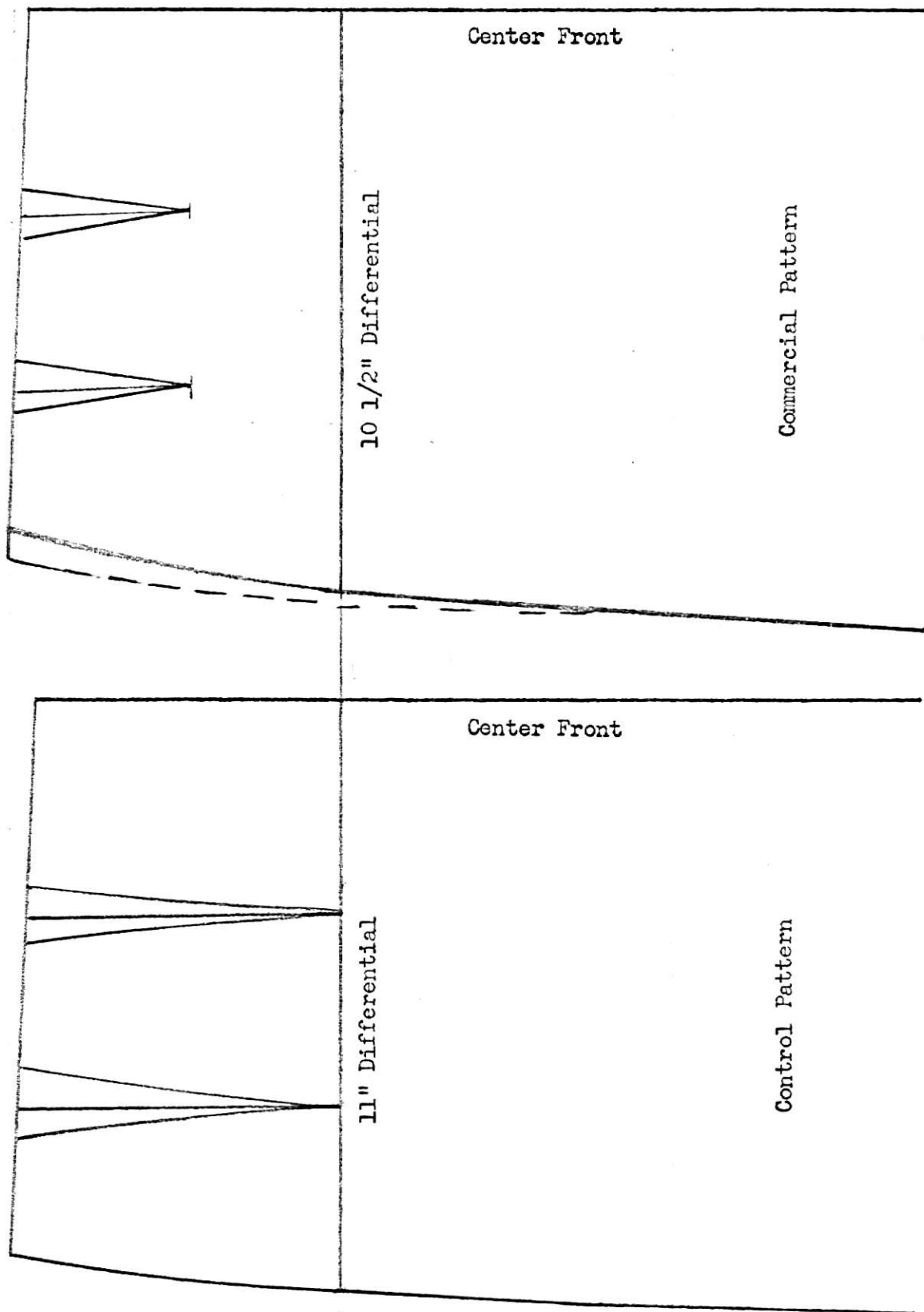
APPENDIX B

Measurement Chart for All Pattern Companies
 Approved by the Measurement Standard Committee
 of the Pattern Fashion Industry

Body Measurement (inches)	Misses Pattern Sizes						
	6	8	10	12	14	16	18
Bust	30 1/2	31 1/2	32 1/2	34	36	38	40
Waist	22	23	24	25 1/2	27	29	31
Hip	32 1/2	33 1/2	34 1/2	36	38	40	42
Differential*	10 1/2	10 1/2	10 1/2	10 1/2	11	11	11

*Difference in waistline-hipline measurement.

APPENDIX C



APPENDIX D

Check Sheet for _____

Age _____

Waist Measure _____ (snug but not tight)

Hip Measure _____ (7 1/2 inches below waistline)

Differential _____ (difference between waist measure
and hip measure)

Pattern Size _____

Ready-made Skirt Size _____

Check Points To Determine Fit of Skirt Sloper	Simplicity		Brockman	
	Yes	No	Yes	No
Back waistline:				
requires lowering	_____	_____	_____	_____
requires raising	_____	_____	_____	_____
Sideseam lines:				
fall backward	_____	_____	_____	_____
fall forward	_____	_____	_____	_____
Center-front grain line:				
falls to the right	_____	_____	_____	_____
falls to the left	_____	_____	_____	_____
Center-back seam line:				
falls to the right	_____	_____	_____	_____
falls to the left	_____	_____	_____	_____
Ease through the torso area:				
necessary sitting ease	_____	_____	_____	_____
good silhouette with no cupping	_____	_____	_____	_____
in or out	_____	_____	_____	_____
trim fit without wrinkles	_____	_____	_____	_____
Front darts for an easy, smooth fit:				
correct length	_____	_____	_____	_____
correct location	_____	_____	_____	_____
correct takeup	_____	_____	_____	_____
Back darts for an easy, smooth fit:				
correct length	_____	_____	_____	_____
correct location	_____	_____	_____	_____
correct takeup	_____	_____	_____	_____
General overall effect:				
more pleasing to wearer	_____	_____	_____	_____
more pleasing to researcher	_____	_____	_____	_____

SUGGESTED ALTERATION PROCEDURES FOR COMMERCIAL SKIRT
PATTERNS BASED ON FIGURE ANALYSIS OF TEENAGE GIRLS

by

BEULAH FREY HAVER

B. S., Kansas State University, 1933

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

1970

The purpose of the study was to analyze causes of poor fit in a basic skirt so that guidance and help could be given the teenage girl in the fit of commercial skirt patterns. The evaluation of a commercial skirt pattern was made in relation to the normal figure with average differential.

The first part of the study was conducted with high school home economics classes in Fowler and Meade, Kansas, in which one hundred and twenty-seven girls were measured and their measurements analyzed. The data from the questionnaire was tabulated with the purpose of finding:

1. The prevalence and degree of deviation from the standard differential (difference in waistline-hipline measurement) used by pattern companies.
2. The relationship of this deviation to such factors as age, height, and weight.

The second part of the study was made with fifty girls in four high schools in Fowler, Meade, Minneola, and Montezuma, Kansas, who were judged to have figures with normal differential on the basis of the previous study. Two muslin skirts were constructed in sizes 10, 12, and 14; one using a commercial basic (sheath) skirt pattern and one using a basic skirt pattern for the Bauman dress form. The pattern of the Bauman dress form was used as the control pattern, since it is one of the dress forms generally used in industry. Each girl modeled two skirts in her size, and a check sheet was used by the school home economist in judging the comparative fit of the skirts.

Since the findings were based on a limited number of girls, statistical reliability was not possible, however, it was concluded that the fit of the skirt has a direct relationship to the differential (difference between the waistline-hipline measurement) of the individual. It was also concluded that darts have a direct relationship to the fit of the skirt and must be made to conform to the body curves. Short darts and curved darts are best suited to a rounded hip while longer darts and straight darts are usually best for the sloping hip. Darts in commercial patterns often need to be lengthened for a desirable fit. The most obvious pattern problem seems to be that short darts with small takeup cause the waistline to be of correct measurement but fail to provide the ease needed through the torso area from 5 to 10 inches below the waistline. To correct this fault, commercial basic (sheath) skirt patterns need to add width at the waistline and increase the dart length and width accordingly.

Graphs, tables, and pattern diagrams have been used in this study to substantiate these findings.