



An historical study of U.S. apparel size labeling
by Penney Lynn Wiley

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in
Home Economics
Montana State University
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Abstract:

Consumers, producers and distributors of apparel in the United States would benefit from clarity and efficiency of size labeling. To be adequate, the current practice must be straightforward in communicating the essential information necessary for the consumer to make an accurate size choice. The result would be efficient marketing of size labeling while providing the consumer with satisfaction and optimal allocation of economic resources. Current efforts by industry to improve sizing has not dealt with the size labeling but rather with manipulations of the size charts. The primary objective of this study was to conduct an historical analysis of size labeling changes within the U.S. apparel industry from 1840 to 1991.

This is an historical study based on the naturalistic approach. A chronology of Men's, Women's and Children's size labeling from Sears & Roebuck, Co. catalogs from 1897 to 1990 was developed for the study. A review of literature from J.C. Penney's, McCall's, government documents, trade journals, popular and professional literature supplement the study and aid in the analysis of the Sears chronology.

Size labeling has remained invalid, unreliable and uninformative about the body measurements they represent.

The exception to this is Men's sizing which has been based on control body dimensions. Although, sizing agencies have made attempts to correct sizing confusion, improved body dimension charts based on a current body measurement study of the general U.S. population would be necessary.

With or without improved body dimension information, apparel sizing could be vastly improved. Incorporating body measurements into all size labels as has always been the case for men's sizing would make size selection more straightforward.

Therefore, this study recommends implementation of a mandatory labeling system depicting a body form pictogram with associated body measurements for the type of apparel being marketed. Mandatory labeling, using body measurements would lead to more reliability of the U.S. apparel industry.

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APPROVAL
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Penney Lynn Wiley

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

12/11/91
Date

Carol Silusso Leonier
Chairperson, Graduate Committee

Approved for the Major Department

12/11/91
Date

[Signature]
Head, Major Department

Approved for the College of Graduate Studies

December 17, 1991
Date

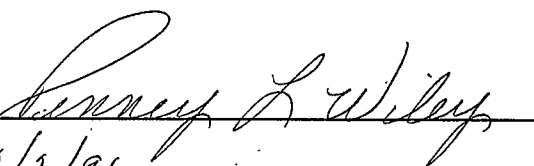
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ABSTRACT

Consumers, producers and distributors of apparel in the United States would benefit from clarity and efficiency of size labeling. To be adequate, the current practice must be straightforward in communicating the essential information necessary for the consumer to make an accurate size choice. The result would be efficient marketing of size labeling while providing the consumer with satisfaction and optimal allocation of economic resources. Current efforts by industry to improve sizing has not dealt with the size labeling but rather with manipulations of the size charts. The primary objective of this study was to conduct an historical analysis of size labeling changes within the U.S. apparel industry from 1840 to 1991.

This is an historical study based on the naturalistic approach. A chronology of Men's, Women's and Children's size labeling from *Sears & Roebuck, Co.* catalogs from 1897 to 1990 was developed for the study. A review of literature from *J.C. Penney's*, *McCall's*, government documents, trade journals, popular and professional literature supplement the study and aid in the analysis of the *Sears* chronology.

Size labeling has remained invalid, unreliable and uninformative about the body measurements they represent. The exception to this is Men's sizing which has been based on control body dimensions. Although, sizing agencies have made attempts to correct sizing confusion, improved body dimension charts based on a current body measurement study of the general U.S. population would be necessary.

With or without improved body dimension information, apparel sizing could be vastly improved. Incorporating body measurements into all size labels as has always been the case for men's sizing would make size selection more straightforward.

Therefore, this study recommends implementation of a mandatory labeling system depicting a body form pictogram with associated body measurements for the type of apparel being marketed. Mandatory labeling, using body measurements would lead to more reliability of the U.S. apparel industry.

INTRODUCTION

Clothing is our most intimate environment. It is an unique environment because it is carried or worn everywhere by an individual, creating its own climate within the larger context of an individual's surroundings. The importance of clothing is both functional and social. With regard to function, clothing may be a key factor in regulating an individual's body temperature (e.g. wearing clothing for warmth), and in protection (e.g. flame retardant clothing worn by firemen). With respect to social importance, clothing is important for signaling various roles played by certain individuals in society (e.g. frock worn by a minister).

Because of the importance of clothing in the daily lives of individuals, it is of interest to consider the process involved in the creation of clothing and the attendant underlying problems. For example, apparel sizing is based on sets of body proportions which are communicated to the consumer by a size label. Apparel size labeling is a code which may employ arbitrary titles or numbers for a given compilation of anthropometric measurements. The measurements are for individuals whose body measurements are within the range of body measurements for a particular size (Solinger 1988). Because the labels may represent an

arbitrary code, the body measurements represented by the codes may vary from manufacturer to manufacturer.

Apparel size labeling is as important to the manufacturer of apparel as it is to the consumer buying the garments. This study will focus on an analysis and historical review of apparel size labeling within the U.S. Apparel Industry. The main purpose of this study is to better understand present size labeling practices by examining landmark practices of the past.

The first step in this analysis is to examine the problems of validity and reliability associated with size labeling.

PROBLEM ANALYSIS

The human body is a three-dimensional arrangement of surfaces which vary in their relative proportions, depending upon the particular individual in question (Solinger 1989). To design and manufacture apparel for groups of people, variability in body proportions must be categorized into discrete measurement intervals.

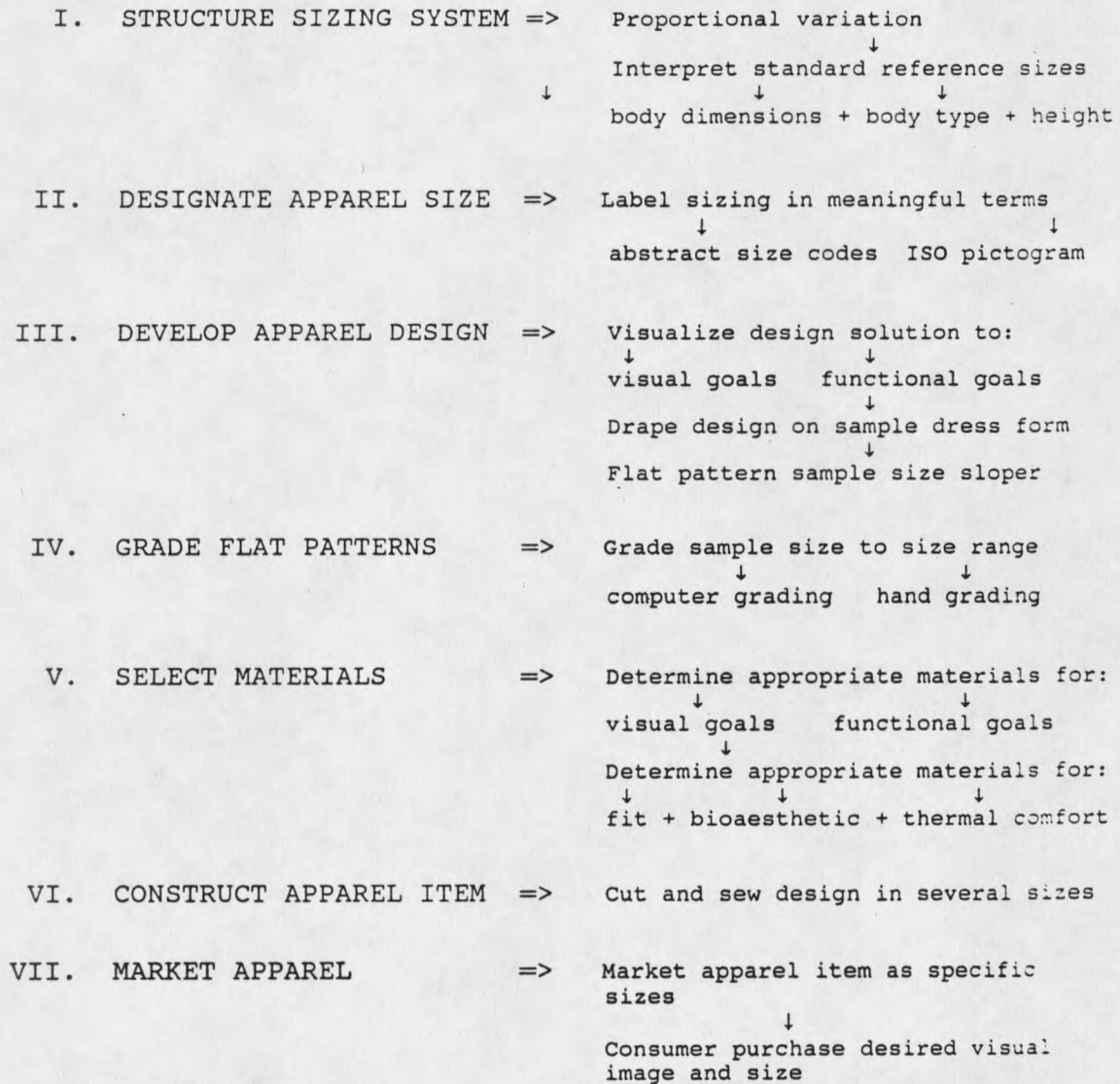
This, in turn, gives rise to several fundamental issues for the apparel industry. For example, in rendering a continuous variable as discrete, what range of apparel sizes should be represented discretely? How fine will the gradations be as one proceeds from one size to the next on the apparel scale? How consistently can the finite gradations be reproduced by the same or different manufacturers? Finally, how valid will the size labeling be given a certain degree of consistency in the reproduction of the gradations (French 1975).

At the heart of these issues are the concepts of reliability and validity across the apparel manufacturing process outlined in Figure 1 (Salusso-Deonier 1982). Reliability of measurement refers to the degree to which a given measurement process is repeatable or consistent. For sizing and size labeling to be reliable, the same range of sizes, the same gradations in size, and the same labels

reflecting these gradations would be used consistently within and across manufacturers. Manufacturers could, for example, follow guidelines set down by individual production departments or by the American Society for Testing and Materials voluntary standards.

Validity of measurement, on the other hand, refers to the degree to which a given measurement process is accurate. For sizing and size labeling to be valid, the range of sizes, the gradations in size, and the label reflecting those gradations would be accurate in fitting intended wearers. For example, a given size labelled "small" should actually refer to a small-sized garment that fits a small-sized person, not a medium or large size person. Again, manufacturers could either follow guidelines set down by their production department or follow published sizing standards. Finally, note that reliability is a necessary, but not sufficient, condition for validity. For example, apparel manufacturers may consistently label (i.e. reliability) apparel with a particular size code, but that code may actually be an incorrect one, such as a small size consistently labelled large.

Figure 1. Role of Size Labeling within the U.S. Apparel Industry.



(Adapted with permission from Salusso-Deonier 1982)

In short, both reliability and validity are important for sizing and the construction of patterns and garments, because the range of sizes and the coarseness/fineness of the gradations should be consistent and valid within and across manufacturers. Reliability and validity are also important for size labeling, because the same label should be applied consistently to a given physical size and that label should also be the correct one.

In order for the issues of validity and reliability to be clearly understood it is necessary to examine how size labeling is represented throughout each stage of the apparel production process. A brief discussion of Figure 1 follows.

Structure sizing system

Creation of a sizing system became one of the primary issues of the mail order industry. Recurrent efforts have been made across this century to devise and implement an adequate sizing system. Throughout these efforts, the emphasis has been on gathering the necessary anthropometric data from a sample population. This is the primary step to developing a sizing system (Jay 1976). From the data collected sizes are classified to represent variations in body types and size. Accurate data and body form classification and consistent use of a sizing system by the

apparel industry lends itself to reliable and valid communication. Valid and reliable sizing and size labeling information throughout each step of the production process and the consumer is crucial to successful apparel marketing.

The apparel size label communicates to the consumer what has transpired throughout the production process, in more detail, the proportional formula is created which determines a particular size code label for the garment, the garment is designed, the garment is graded out to the prescribed proportional formula based on the type of fabrics chosen for the particular garment design, which is constructed in a prescribed way in order to retain the proportional formula intact, the garment is marketed and the consumer either accepts or rejects the end product based on the aesthetic and functional aspects of the garment. The label communicates to the consumer what they are purchasing (Salusso-Deonier 1982).

Designate apparel size

Apparel size labeling has been the primary communication link between the design/production and the marketing/consumption segments of the apparel industry. Size labeling identifies a garment "size" typically

represented by a figure type/age category and number designation (Kunick 1978). Consumers rely on size labels as the single indicator of garment proportions.

A garment "size code" typically represents size and proportions with a figure type/age category and number designation. For example, Misses size 10 refers to 34½"-35" bust, 26½"-27" waist, 37-37½" hip. These body proportions also refer to Junior's size 9 or Jr./Miss size 9/10 (PS 42-70). Lack of consistency in fit or garments labeled the same size creates confusion for the consumer.

Develop apparel design

The apparel design process must take into account the visual and functional goals of the garment. The design is draped on a dressform to create a particular style which plays an important role in the size labeling of the garment.

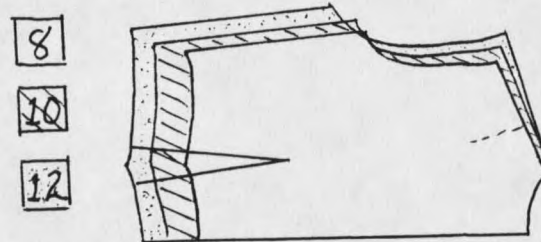
Throughout history women's fashions have been targeted towards a conceptualized 'average' women who is believed to represent the general female population. 'Average' is typically determined by the producer's interpretation of sample size proportions and a limited size range (Clothes 1 February 1977; 15 May 1969; 1 September 1969; 15 December 1975).

Apparel producers frequently use dress forms as a basis for sizing. Dressforms represent concepts of "average" proportions at a given time. Manufacturers may prefer to use the one from last year or they may decide to create their own dress form. The use of the dressform has made ready-to-wear very impersonal and has abstracted human bodies to the dressform. Another major criticism of dressforms is the unrealistic posture represented in the forms (Salusso-Deonier 1989). Thus, the dressform size chosen is a major determining factor in the quality of sizing.

Grade flat patterns

Grading is a term given to a method of enlarging or reducing any given pattern(or garment), to produce the same style garment in many sizes (Rohr 1965). Theoretically, grading allows efficiency in incorporating dimensions across the sizing system into three-dimensional patterns.

Figure 2: Illustration of graded bodice, Misses size 8 - 12.



However, grading seems to distort rather than reflect sizing system proportions. There is evidence of a 'poetic license' in the grading process from grading out from a sample size. Proportional variations result even from the same size code in the grading process (Clothes 1 February 1977). Validity is further jeopardized when different sized samples are used in the process.

More variations occur in this process due to the many interpretations of the sizing specifications. Design fullness is left to interpretation as the sizing specifications do not allow for this. Therefore, validity of size labeling can be retained or destroyed at this stage of the apparel production process.

Currently, grading can be performed by hand or by computer. Computer grading can eliminate some errors but still relies on traditional grading concepts as a basis for

grading proportions. Therefore, determining the accuracy of the end product by any variances produced throughout the grading process is necessary. For example, a $\frac{1}{2}$ " more or less could have major effects on the size of the resulting apparel item.

Select materials

The type of fabric or materials selected for a particular end product will have a definite influence on the visual and functional qualities of the item. Textiles are important in the final outcome of the product as they may be used for aesthetic and/or functional properties and must interact with the style and fit of the garment. Textiles can conform to the body or drape from the body. For example, a fitted blouse made of tightly woven cotton muslin in comparison with a fitted blouse made of cotton knit fabric will have a very different consequence. Small-Medium-Large styles of stretch knit exercise sportswear allow for collapsing size categories to result in generalized sizes. Therefore, sizing must be determined relative to garment style and fabric in order to protect the validity of the size label.

Construct apparel item

The process of fit and sizing apparel is clearly an art form depending on the skill, equipment, and experience of the apparel industry participants. Controlling production variations requires time, skill, and dedication to quality control. Widely adopted sizing/size labeling standards may help reduce size variations among manufacturers. Some factors that may cause changes in garment quality during production include: (a) tolerances allowed in cutting and sewing; (b) fabric distortion during spreading, sewing, pressing; (c) inaccurate cutting and sewing; (d) shrinkage from heat, steam and fusing (Glock & Kunz 1989). Generally, the variations begin with the dress forms, grading specifications, and stylistic interpretations (Clothes 15 May 1975). Further reliability and validity problems arise when garments of similar proportions are labeled different sizes. For example, expensive clothing manufacturers may size their garments larger so as to give the customer the feeling of being smaller than actual body measurements indicate (Belkin 1986).

Market Apparel

The label communicates to the consumer the interpretation of the structured sizing system. The label

alone may be the single factor to determine if the product is purchased. Common practice among industry has been to create their own sizing proportions/labeling. Therefore, a size 10 of Brand A, and size 10 of Brand B would rarely fit the same consumer the same way, creating constant confusion for the consumer (Belkin 1986). Major retailers/mail order have created their own specifications for the manufacturer of their products. Thus, providing the consumer with the desired visual image and size of garment has not been readily successful.

Mass production of apparel has been aided by sizing and is further aided by reliable labeling by all producers. Interpretation and use of apparel sizing by designers, producers and consumers requires labeling to be understandable and reliably used by the producer or the consumer. Whether or not this has been the case is yet to be seen in the apparel industry.

Consistent use and communication among producers lends reliability to the process and the sizing standard being used. When the sizing standard is used universally in the same way it is a reliable tool in the production process. When the sizing standard is based on body measurements of the current population, validity becomes more likely. The German sizing system has been the most successful world

wide. The Germans have a mandatory sizing standard, which is based on a database of new measurements of the general population prepared every ten years (Auflage 1972).

Summary

Having discussed the basic issues of reliability and validity for sizing and size labeling, the development of the size labeling process throughout the history of the U.S. apparel industry, from the year 1840 to 1991, will be the principal focus of this study. The methodology of this study follows in the next section.

METHODOLOGY

Approach

This is an historical case study based on "Naturalistic Inquiry". Naturalistic Inquiry is defined as evaluation which: 1) focuses on naturalistic generalizations on the part of the audience; 2) targets non-technical audiences such as teachers or the public at large; 3) uses ordinary language; 4) employs informal everyday reasoning; and 5) makes extensive use of arguments which attempt to establish the structure of reality.

Typically, historical research is a method of research which is highly descriptive. Collection and understanding of facts is the body of the research. It is not the function of the researcher to manipulate or control variables. Data for an historical study comes from all possible sources. Patterns begin to form categories as data is collected (Guba 1978).

Procedures

This study combines a review of literature and data collection to develop a chronology of size labeling (Appendix A). Using the naturalistic approach, data on **Mens's, Women's and Children's** size labeling from *Sears & Roebuck, Co.* catalog is the core of the study. *Sears* was

chosen as an index because it has been a leading merchandiser of apparel that has been in existence for over one hundred years. The mail order industry has historically shown the most concern for reliability and validity of apparel sizing. Without the opportunity to try on clothing, accurate sizing becomes much more critical in preventing returns of apparel and loss of sales. A better understanding of the evolution of size labeling will be attained with this focus. As a leading mail order business for almost 100 years, *Sears* is the best obtainable barometer of the apparel industry.

Data Collection and Analysis

Data for this study has been obtained from *Sears & Roebuck* catalog size charts and garment descriptions from 1897 to the present. Data are limited to information at landmarks of change in size labeling of tailored garments for Men and Women's apparel and general garments for Children. The entire chronology is included in Appendix A.

Using the naturalistic inquiry approach, the resulting apparel size labeling chronology in Appendix A is analyzed relative to context information found in the literature.

A review of literature from *J.C. Penney's*, *McCall's Pattern*

Co., Government documents, trade journals, popular and professional literature supplements the study and aids in describing the data from *Sears*.

For convenience, this history is grouped into 8 landmark change periods. Each period was selected to represent landmark periods beginning with 1840-1896 and ending with 1984-1991.

RESULTS AND DISCUSSION

The results of this study are discussed in terms of key developments in the evolution of size labeling used by Sears. Developments are discussed for each of the 8 landmark change periods in terms of reliability and validity of size labeling practices as applied by Sears.

1840 - 1896

Eighteen-forty was chosen as the starting point of this time period because apparel sizing became more of an issue as apparel production became more organized. Eighteen-ninety six was chosen as the end of the period because it is the year prior to the beginning of the *Sears Chronology* (Appendix A).

Many events throughout history ignited the interest and need for apparel sizing. The Industrial Revolution which took place during a span of over one hundred years resulted in the evolution of skilled labor. Representative of the skilled labor movement were many fine master tailors and dressmakers who trained many helpers and seamstresses. Specialization in the areas of patternmaking, cutting and inspecting of the final product made the production of

clothing a more efficient process. Improved transportation allowed for the clothing to be shipped to more cities. The apparel industry was dominated from 1860 - 1890 by highly skilled German tailors, and marketed by German Jews (Kidwell & Christman 1974).

Women's dressmaking took many roads, following many different drafting system authorities such as, S.T. Taylor in 1850, McFadden in 1853, to Demorest patterns in *Godey's* on its way to manuals, such as those by Hapgood and Banner in the 1890's, which were intended for the classroom. By contrast, menswear drafting followed a continuous course from the first system introduced by Amanda Jones in 1822 until Mitchell became popular.

Newspapers and magazines such as Godey's Ladys Magazine, Demorest's Magazine and Ladies Home Journal permitted the advertisement of clothing manufacturing and retail as well as patterns for clothing. Lewis and Hanford, a catalog aimed towards the clothing manufacturer, was also in print at this time. Technological advances commenced as industry moved from the home to the factory and labor moved from hand to machinery. The pace of life quickened and many advances were being made in the area of machinery, such as the carding and drawing machinery used with wool. More

textiles were available for selection by the consumer as well as the manufacturer (Kidwell & Christman 1974).

Apparel sizing emerged as a transition took place in the 1840's, from custom production to the manufacture of garments for the masses. As the idea of made-to-order became more popular, the great bulk of 19th century clothing can be characterized as having been made for *somebody* but not *anybody*. Garments were ordered by a particular size and if the consumer did not find the fit of the garment satisfactory, it could be altered easily by a tailor or dressmaker. *Hudson and Reed* of Boston advertised in 1853 to carry "more than a HUNDRED sizes" (Kidwell 1979).

A differentiation emerged between ready-to-wear and custom-made, based on technology available. Custom-made clothes at this time were of high quality and good fit. Fabrics were usually draped on the body by a highly experienced tailor or dressmaker and altered to a near perfect fit. Only the "well-to-do" were permitted the luxury of custom-made clothing. Thus, the 19th century ready-made industry lacked style, fit and quality.

At the inception of the mail order business, *Sears* asked its customers to follow their measurement instructions and describe their general build when ordering clothing.

Sears stated that due to their size ranges customers could think of themselves as a particular size and order accordingly.

Garments were sold without actual sewn in labels but were sold labelled "size 40" referring to the bust size of a blouse. The consumer had to rely on this label in order to find the proper fitting garment. Women in 1883 ordered sizes based on bust sizes 34,36,38,40... the waist and hip size were proportioned accordingly. Usually these garments were made with ample ease that a dressmaker or tailor could easily alter to fit at little cost (Kidwell & Christman 1974). In 1899, more measurements were considered; bust, waist and skirt length measurements were stated in the *Sears* catalog. It wasn't long after this that manufacturers were urged to sell odd sizes also and create less reason for alteration after the purchase.

In the late 1800's and early 1900's sailors created a demand for clothing that could be worn immediately, as they were rarely in one place for very long. Waiting for a garment to be tailored was not feasible. Nor did the sailor have enough money to pay for such a service as custom tailoring. Clothing consisting of jackets, shirts, and trousers, coats and Pea jackets were regularly imported from Europe and advertised for sale (Kidwell & Christman 1974).

The garments marketed towards the sailor became known as "slops" or cheap ready-made clothing. If a fit were achieved it was quite by accident. These "slops" were later marketed as clothing for slaves (Kidwell & Christman 1974).

The early ready-made industry in general seemed to have one primary flaw and that was in the matter of fit. It was expected that three coats or four overalls sizes would fit ten thousand or more men in one way or another (Kidwell & Christman 1974).

The Civil War era(1861-65) brought the need for anthropometric data for the creation of army uniforms. Men were measured and an anthropometric data base was gathered on a large sample. The Civil War database provided a statistical resource for the form of the American male. Following the war this database was released to men's clothing manufacturers.

Prior to the availability of this database, ready-made manufacturers used their favorite drafting system and own expertise to arrive at an acceptable pattern in hopes of fitting the most people. The basis for most systems was the concept of proportional sizing where one measurement was used to derive overall body proportions. At this time of

tremendous experimentation, manufacturers had a multitude of resources on various proportional systems available to them (Kidwell 1974). Albert Bolles in this 1879 *Industrial History of the United States* stated that for a long time there was prejudice against the ready-made garment industry because they did not always fit (Bolles 1879).

The war database was helpful as a guide but many body dimensions were omitted and arriving at a good fit based on scientific methods was not achieved. Manufacturers continued to experiment with drafting systems and sets of body proportions to reach the goal of good fit as evidenced in the Location Index of American Pattern Drafting Systems (Trautman 1987).

Many retail apparel businesses claimed that people could now think of themselves as a particular size during this time period. For example, one store advertised that sizes were indicated by number and that once a customer became familiar with that number there would be no need to try on a second garment (Kidwell & Christman 1974). In 1895 Sears assured their customers an adequate fit in their ready-made garments (Sears 1985).

Men's

Manufacturers began to recognize the differences in figure types of men and that some proportions were more "average" than others (Poole 1936). Throughout this period of the apparel industry, many body type labels have been used to refer to the size of clothing. For example, Men's may have been referred to as: slender, stout, fat, extra stout, regular, corpulent or an extra size man. Apparel sized this way were selected by the body measurements provided by the customer for the tailor or mail order catalogs.

Women's

The only ready-made clothing for women were cloaks. Not until the census of 1860 was the manufacture of women's clothing deemed worthy of enumeration.

Women's clothing has never been considered to be completely adequate in quality of fit (Kidwell & Christman 1974). With the inability to try garments on, the consumer was left at the mercy of the manufacturer to create a quality fit. Ready-to-wear garments needed to fit the majority of wearers with as few size categories as possible. Ready-made apparel available for women at this time

was sized by using the bust measurements or best fit was chosen after the customer provided body measurements.

Children's

At this time, children's apparel was primarily custom-made by the dressmaker, tailor or home seamstress. Some articles of clothing were available in mail order catalogs sized according to age of child.

Assessing Validity and Reliability

During this development period experimentation and trial and error concepts of sizing practices did not focus on either validity or reliability in sizing. Achieving a good fit was a matter of luck or good alteration skills. The uncertainty of sizing within the apparel industry at this time is evidenced in the inconsistency of the reported fit of ready-made apparel.

1897 - 1914

This time period begins with 1897 to reflect the beginning of the Sears Chronology (Appendix A). Nineteen fourteen was chosen as the end of this time period because

it is when actual size charts are provided for **Misses'**, **Juniors** and **Children's** ready-made garments in mail order catalogs.

Young Men's apparel sizing in 1906 was based on a set of body dimensions as well as age. **Young Men's** ready-made garments began to flourish. The fashion focus of this time period was on youth and a youthful appearance (Anspach 1967). The importance of the sizing of apparel was becoming apparent.

Dressmaking became quite an art early in the 20th century as the availability of fashion magazines increased and added instructions to their patterns and a number of different styles were available during the final quarter of the century.

Dressforms have been used extensively since the first patent was applied for a "Dress Fitting Model" in the 1880's. Dressforms have taken on many forms since their inception. Depending on the clothing styles of the day, the form would take on a particular style. When fashion dictated the famous 'S' shape in women's wear in the early 1900's, the dressform also took on the 'S' shape.

With the excitement in the advancements of the machine, factory, and power sources the climate was ripe for ready-made clothing. From 1860 to 1920, mass production developed

an organized production process. The availability of textiles increased further. The production process allowed for maximum use of machinery and the large labor force of varying skill levels (Kidwell 1979).

As the sewing machine became available clothes were more readily produced. The sewing machine gave rise to the famed "sweat shop" phenomenon, where many women and children were worked many hard hours with very little pay. During the Industrial Revolution improvements in the machinery of the clothing production process and construction became more organized. The sewing machine brought specialization to the manufacturing process and a task system was developed. Work was divided between workers: a machine operator, a baster and a finisher who worked together to complete a certain number of garments each day. Pressing was done separately and was common for one presser to be assigned to each team.

More modern methods introduced more intricacy, and perfect styling and durability to the multiplication of parts. The early nineteenth century was a time of fertile experimentation in the field of proportional drafting systems and measurement devices.

The publication of over 400 drafting and sizing systems by personal clothiers between 1822 and 1900 exemplify the growing need for appropriate technology (Trautman 1987).

These sizing systems were a significant technological and economic breakthrough. They reduced the amount of time and skill required to cut a fashionable garment that fit well. Various types of sizing systems have been devised and used throughout the history of the apparel industry. The nineteenth century drafting systems were based on proportional sizing where one body measurement was used to derive overall body proportions. For example, men's sizing revolved around chest circumference. Women's sizing was derived from men's and thus was based on bust circumference. Both Men's and Women's apparel were sized using this method. Height was used to vary average proportions to obtain tall and short sizing. Proportional sizing derived from these early drafting systems became the basis for the sizing systems of the paper pattern industry and the ready-to-wear industry (Kidwell 1979).

The manufacture of clothing for a mass market presupposed standardized patterns designed to fit a certain number of various body sizes. At this early time manufacturers created their sizes to meet their own specifications. In the early 1900's when styles became looser there became a larger choice of sizes in all dimensions. Closer fitting apparel created a large margin for error. The inability of the consumer to try specific

garments on prior to purchasing led to a considerable number of returns and industry had to accept the returns and take the losses (Slom 1978).

An important contribution to the women's garment industry was the system of pattern drafting, or, as sometimes termed flat pattern designing. It has become recognized as a practical method for making patterns because they can be made with greater speed and efficiency. The concept of flat patterning/grading originated from early drafting systems mentioned earlier. The practice of grading came into being with the inception of the wholesale clothing manufacturer. In the early days, it was assumed that human beings developed in regular arithmetical progression; these notions have been primarily retained today (Poole 1936).

Men's

Between 1897 and 1906 Young Men's apparel sizes were based on age and weight only with no reference to body dimensions. Men's apparel during this time period were represented by terms such as "lean" and "stout" forms/sizes. Some other terms referring to the forms of men were corpulent, regular, tall, long, short, and so on. (Kidwell & Christman 1974).

Men's apparel at this time is based on chest

measurements provided by the customer. **Men's** upper body garments were based on chest girth measurements; lower body garments were based on waist and inseam.

Men's sizing has traditionally been based on body measurements from the inception of ready-made apparel. Master tailors (fitters) noticed the regularity of particular sizes/forms of men and drew from the measurements a pattern by which to develop **Men's** sizing. At this time, **Men's** apparel could be selected from a range of body measurements.

Women's

Women's apparel was primarily made-to-order early in this time period. The early 1900's brought some basic sized fashions to the ready-made market for women.

Women's garments were sized based on **Men's** sizing. For example, the sizing was proportional to the bust measurements as **Men's** sizing was proportional to the chest measurement.

The label **Ladies** of the early 1900's is synonymous with **Misses'** of the 1990's. **Ladies** in the 1900's were referred to as normally developed and having mature proportions. Some of the terms used to describe the female figure were stout, short, or long. Other terms describing Women were

mature, immature, or well-developed.

Junior size labeling was first introduced in 1910. **Junior's** provided for more youthful styling for the young women entering the work force. **Junior's** corresponded to style and age as the only determinate of size. During this same time **Junior** and **Intermediate** sizing corresponded to age for older girls and young women. **Intermediate** later evolved into **Half-sizes** for women.

Labeling sometimes referred to the styling of the garment rather than the body dimensions involved. For example, **Juniors** sizing was introduced to represent youthful styling for young women already represented by Misses size categories. Consumer were led to believe they were getting a more precise fit when in fact they were getting new styling (Anspach 1937).

Children's

Children's apparel was sized by age. In 1897 garments were primarily custom-made to fit body measurements provided by the customer. Body measurements were sent to mail order companies and the garment reflecting the most accurate dimensions was placed in the order. More styling was added to children's apparel and size categories were added to facilitate this at this time.

Mail order catalogs at this time asked that customers determine if children were large or small for their age. Imagine the way most of those garments fit?

In 1902 ready-made garments were still made to order. Mail order clothing was based on body dimensions and age provided by the customer. **Girl's** and **Misses'** size categories were synonymous.

Assessing Validity and Reliability

During this time period the apparel industry began to see the importance of proper fitting garments. Custom-made clothing for men and women was based on actual customer body measurements. Mail order clothing was based on expected body measurements relative to childrens' ages. Sizing systems lacked validity and reliability because they lacked appropriate scientific data.

1918 - 1923

Nineteen-eighteen begins this time period with the continued practice of using age as a basis for size labeling for **Children's** and **Junior** and **Intermediate** size categories.

In 1923 Extra Large or Stout Men's styling and sizing was highlighted.

Men's

Size labels were assigned to a set of body measurements in 1918. In 1923 Men's size categories extended to include the large and stout men's styling and sizing.

Women's

Ladies abstract size codes were used until 1918 and then Misses was reinterpreted as adult rather than young woman. Ladies tailor-made suits were custom-made relative to customers' measurements. Ladies was renamed to Women's and reinterpreted to represent a "young, slimmer, smaller figure" (Kidwell & Christman 1974).

Children's

Age continued to be used as size code.

Assessing Validity and Reliability

During this time period age continued to be used as a size indicator for Children's apparel. The lack of actual body sizes resulted in inaccuracies in the sizing practices resulting in unreliable and invalid size categories. The

reinterpretation of a child's size such as, **Misses'** to adult representation is a mind boggling concept. Also **Ladies** was reinterpreted as a young, slimmer, smaller figure labeled **Women**. **Men's** apparel began to included large and stout styling and sizing.

1929 - 1945

In 1929 sizing began to be increasingly important in the apparel industry with increased numbers of size categories in hopes of fitting many people most of the time. A period of evolution took place in 1941 as size labeling began to be referred to as a set of body proportions.

Men's

In the 1930's **Men's** labels became more standard: short, regular, or long. Size standards were published in 1941 for **Young Men** but not for mature men. **Young Men's** sizing was based on data collected for the purpose of apparel sizing in the 1940's (Glock & Kunz 1989).

Women's

Women's apparel was sized according to particular garments. For example, skirts and dresses were sized differently using separate size charts. Specialty dress lines were marketed using terms such as, Average, Short and Tall (i.e. "Anne Williams Dress", Sears 1936).

Misses tailored garments were still sized from 12 to 22 ranging from a size 33" bust to 41" bust.

In 1941, Junior's is reflected as a youthful adult female figure rather than the older girls' figure described earlier. The trend during this time was focusing more and more on youthfulness in all aspects of life. Clothing styles reflected this trend (Anspach 1967).

Children's

During this time period, size charts appeared for Boy's and Girl's separately. The reasons for the separate size charts may be reflective of style and sex differences. Age continues to correspond to the sizes given. Boy's sizing bears a resemblance to Men's sizing using the control body measurements of waist and inseam for pant sizing.

In 1929, Boy's suits were sold in sizes 5-10 and 11-16 which referred to average body proportions for age intervals.

Assessing Validity and Reliability

Age continued to be used as a size code for children's apparel. Labels are changed throughout this time period but achieving a good fit is still a trial-and-error effort. Categories for **Women** continue to include smaller sizes and more youthful styling. **Men's** apparel continue to include short, regular and large size categories.

1946 - 1957

Nineteen forty-six was chosen as the beginning of this time period because Women's figure types were defined in the Sears catalogs. Nineteen fifty-seven was a year prior to the publishing of the first Women's sizing standard CS215-58.

In 1950 the National Bureau of Standards (NBS) published a size standard for Infants/ Babies, Toddlers and Children, CS151-50. Unfortunately, these size charts overlap with duplicate measurements which creates more confusion. The reason for these particular size categories is the degree of self-locomotion. The degree of self-locomotion determines the standards of minimum allowance above body dimension required for proper garment utility

such as providing for a diaper. **Infants** are those who cannot creep or sit unassisted. **Babies** are those who can creep or sit on their own. **Toddlers** are those who can stand up unassisted, but cannot walk without assistance and **Children** are those who can walk or run on their own (U.S. Dept. of Commerce 1958).

Industry made some efforts to improve sizing by the issuance of CS151-50 based on the self-locomotion of developing children.

Men's

Size labels reflected control body dimensions making sizing more straightforward for Men's apparel. For example, chest measurements, sleeve length and height were used to select the size for a sport's jacket. Men's apparel sizing has remained more consistent with body dimensions and less has been recorded in reference to "bad sizing" in Men's apparel (Ensom 1987).

Women's

Women's figure types were defined in Sears catalogs and reflect a set of body measurements as stated in Table 1. In

1946, **Misses'** size charts added size 10 to compensate for smaller women wanting more variety of styling. Larger sizes were added to the **Juniors** category and in 1954 size 8 was added to **Misses**, again reflecting the need for smaller sizes. **Teens** and **Short Teens** size categories appeared in 1954.

Table 1 imparts interesting terminology relative to the female human form. **Junior** and **Misses'** were considered youthful, **Misses'** was considered well developed and youthful and average. **Women's** was defined as well-proportioned and mature.

Table 1. Sears 1946 apparel figure descriptions

Junior figure is slightly shorter than a Misses'. the bustline is higher, the waistline slimmer. Garments are youthful in style for youthful figures of all ages.

Misses' figure has a well-developed but youthful bustline. The waist is slender. The figure is well proportioned throughout. This average figure type has the widest choice of styles.

Women's figure is well proportioned, mature figure with waistline slightly larger than Misses' figure.

In 1955 size charts include **Junior's** 7 - 17; **Misses'** 8 - 20 and **Women's** 34 - 44. All three size categories had obvious overlapping sizes. **Misses'** 12-20 overlaps with **Junior's** 13-19. **Misses'** was synonymous with **Girl's** (Children) from 1887 to 1906. **Misses'** evolved to encompass sizing for young women. An example of overlapping of **Women's** size 34, **Misses'** 16 and **Junior's** 17 follows.

Table 2. Sears 1946: Junior's 17 versus. Misses' 16 versus. Women's 34 comparison.

Size	17	16	34
Bust	36½	35½	36
Waist	29	28½	29
Hip	39	38	38½

This chart shows slight differences between sizes of ½" to 1". Given that ease is added to body dimensions in creating patterns, it is logical to say that these minimal differences have little effect in the fit of the garments.

Factually, one set of body proportions can fit easily into several different size categories. The need for all the size variations is not clear. At this time little variation in body proportion is represented.

Therefore, why all the different size categories? Figure type descriptions in Table 1 suggest that styling rather than sizing was the main differentiation among figure types for adult women's sizing. Is there a need for these categories when no reference to different body forms was represented?

Children's

In 1946 Children's(girls) size labeling corresponded to a set of body dimensions also labelled **Teen** and **Growing Girl's**. Body proportions were larger but no evidence as to why the increase in circumferences exists. Body proportions reflected the apparel style at that time rather than better fit.

Also at this time sizes were added to include **Teen Girls'** and **Growing Girl's**. **Teen** and **Growing Girl's** were standard size labels corresponding to a set of body measurements (bust, waist, hip, dress length). Many of the size labels in these two categories were redundant. **Teen** sizes 10 - 16 were very similar in body dimensions to **Growing Girl's** 10 - 16. The size ranges encompass 1/2" to 1 inch difference. No explanation is given for the two categories, styling is the only logical difference.

With the deluge of categories for children, it is no

surprise that achieving a good fit would be confusing, if not impossible. The following are categories for children's apparel: **Infants** sizes (newborn)NB - XL, **Toddlers** sizes 1T - 4T, **Little boys** sizes 4 slim - 7 regular, **Boys** and **Teens** sizes 8 slim - 20 regular, **Little boys/boys** jeans sizes 4 slim - 7 regular, husky sizes 10 - 20 husky, **Little Girl's** sizes 4 - 6X, **Little Girl's/Girl's** sizes XS - XL, **Girl's** sizes 7S - 18, and **Pretty Plus(PP)** sizes 8PP - 18 PP.

Assessing Validity and Reliability

Men's apparel sizes remain more consistent at this time. During this time period, body types were considered in the sizing of garments. Children's clothing reflected body types based on the differences between infants and walking toddlers. Whereas, adults' clothing reflects more styling differences rather than body type differences.

Accurate and consistent measurement practices would lead to reliable and valid sized garments within the apparel industry, but this was not the case. Trial and error purchasing of the proper sized garment was still a trend. Size categories were increased up to this time creating a more complex selection of sizes from which to choose.

1958 - 1970

Nineteen fifty-eight was chosen as the beginning of this time period because CS215-58 was issued to industry. In 1970 the "range of body measurement sizing" concept for Men's and Women's apparel was introduced.

In 1958, CS215-58, a National Bureau of Standards(NBS) voluntary product standard, *Body Measurements for the Sizing of Women's Patterns and Apparel* (U.S. Department of Commerce 1958), was published. The database for this standard was a 1941 survey conducted by O'Brien and Sheldon. This survey sample consisted of 10,042 mostly young, white, single adult female volunteers from eight states. This standard was accepted by the apparel industry.

Body types represented in CS215-58 were for Women **Short, Average and Tall** within each of the following categories: **Junior Petite, Misses Petite, Juniors, Misses, Misses Tall and Stout** which encompassed Women's and Half-sizes.

Young Men's sizes included **Short, Regular and Tall** sizes. Children's sizes included **Average sizes: Infants, Babies, Toddlers, Children's Preschoolers, Boy's Regular,**

Girl's Regular; Boy's Slim, Girl's Slim and Boy's Husky, Girl's Chubby sizes.

The success of the voluntary product standard relied primarily on consistent and adequate sizing. Although producers were more consistent in their use of sizing language, the sizing dimensions they represented were not consistent (Kunick 1967).

Labeling within CS215-58 consisted of size codes used to designate all parameters of a given size. For example, three hip sizes were provided per bust size per figure type. The parameters associated with each size code were available in sizing tables through mail order catalogs and pattern books or from the NBS.

In 1968, the size categories are the same as represented in CS215-58 however, **Junior Tall** is not represented and in PS 42-70 the **Junior Tall** category was eliminated. **Women's** size categories increased to include **Junior's, Petite Junior's, Misses', Petite Misses' and Tall Misses', Women's, and Women's Half-Sizes.** Sportswear were sized separately from the other garments and based on bust measurement only. In 1970, **Junior/Miss** merged once again and resulted in no visual difference. Adolescent sizing was no longer for young girls but was marketed for adults. Fit was like adolescent sizing. Primarily these clothing sizes

were purchased by **Junior** sized women who weren't adolescents.

As a voluntary standard, Commercial Standard CS215-58 *Body Measurements for Sizing of Women's patterns* could be used, rejected, revised in whole or part by each apparel manufacturer. Thus, as a voluntary sizing standard it allowed for interpretation by each manufacturer which contributed to the unreliability and invalidity of sizing/size labeling practices.

Men's

A range of body measurements sizing was adopted for use in **Men's** apparel size labeling. For example, size 40 Men's jacket reflected the chest measurements of 38½" - 39". Men's tailored jackets ranged in chest sizes from 32½" to 47".

Women's

Junior's and **Misses** sizes were expanded to include additional smaller sizes, size 5, 6 and 8 respectively. This change reflected the need for more small sizes and created even more overlapping between **Junior's** and **Misses'** size categories. Styling remained the main difference in the **Junior's** and **Misses'** size categories. **Misses'** had the

most styling variety while Juniors was aimed toward youthful tastes.

Children's

Catalog customers were asked to order by size not by age. Categories for children included Girls, Growing Girls, Boys, Growing Boys, Young Teens, Student Sizes, Toddlers and Infants. Infant's through Boys and Girl's apparel at this time was based on the child's height. Size categories for growing children categories were based on height and hips or height and chest depending on the type of garment purchased.

Assessing Validity and Reliability

During this time period, the range of sizes and the gradations which each range represents lacked consistency. CS215-58 was developed to create industry-wide consistency but as a voluntary standard it only reflected existing body types and styles representative of status quo industry practices. Women's apparel was bombarded by size categories, which added to the confusion.

Men's apparel kept to the traditional body measurement sizing. Children's apparel were ordered by body measurements through mail order catalogs and no longer by age. More use of body measurements for selecting children's

sizing shows signs of potential improvement in reliability and accuracy.

1971 - 1980

Nineteen seventy-one was chosen as the starting point for this time period as range sizing became well established in the mail order business and the **Women's** sizing standard was revised. Nineteen eighty was chosen as the end of this time period due to the sizing by garment types. For example, pants, jackets, blazers, skirts were listed as different size categories at this time. A particular size of jacket did not fit the same as the same size blazer.

In 1971, PS45-71 was published for **Young Men** listing three size ranges; Regular, Long and Short which had 11 sizes in each size range; 32 to 42. This standard was based largely on the anthropometric study made by the U.S. Dept. of Agriculture, published in Miscellaneous Publication No. 366, in 1941, and sampling studies made later (Solinger 1988). The same language used at this time was used prior to this time in reference to size categories. As a new sizing standard PS 42-71 reflected what had already occurred in industry.

In 1971, the National Bureau of Standards published *Body Measurements for Sizing of Women's patterns (PS 42-70)*. This sizing standard was published to update the existing standard (CS151-58) to more accurately reflect the current U.S. female population. This publication was based on measurements taken in the 1940's. Using such outdated body measurement data it is evident that a true representation of the current U.S. female population is unlikely.

PS 42-70 was a simplification of the production process which meant omitting sizes manufacturer did not chose to produce thus, simplifying the labeling process and reflecting what had been routinely produced. Eliminations from CS215-58 were: 1) slim and full hip options within all figure types; and 2) the tall option with **Juniors** and **Women's** figure types.

In 1971 the NBS issued the publication of **Boys** (PS36-70) sizing standards which updated a previous standard. This publication was in three size groups, **Boy's Regular**, **Boy's Slim** and **Boy's Huskies**.

The United States has never had a published standard for Men's apparel throughout the history of the apparel industry. The Federation of Clothing Designers and Executives of the United Kingdom have contributed size scales for young men and men. The Greek Government

published an anthropometric study of 6,297 Greek men from Athens and Salonika in 1972. This study was made expressly for use in sizing men's clothing and listed data for 12 out of 24 dimensions measured in the study (Solinger 1988).

In 1972, the NBS published another update of a size standard for Girl's (PS54-72) for sizes 4, 5, 6, 6X and three size groups, Slims, Regular and Chubbies. These children's standards were not based on the age or body measurements of the child, only on the degree of self-locomotion developed in 1940. The degree of self-locomotion determines the standards of minimum allowance above body dimensions required for proper garment utility. It is hard to imagine how a consumer would prepare to purchase children's clothing without knowing the actual body measurements of the child. Realistically, buying by age alone would not result in a proper fitting garment.

A new marketing concept was introduced to the mail order industry in early 1980, known as brand sizing. The brand sizing concept did not deal with sizing per se, rather it explained the inconsistency and unreliability of the sizing. Out of desperation came brand sizing hoping dealing with each brand would make it more efficient for the consumer. This concept also has added to the invalidity and unreliability of sizing.

Men's

In the 1970's, styling as well as size labeling was simplified and a range of body dimensions corresponded with the size labels. Later, during this time period Men's apparel was sized according to the category of apparel. For example, garments were sized for shirts; sportcoats, blazers and outerwear; knit garments; and pants. Pants were sized primarily by their brand as all manufacturers differ.

Women's

In the 1970's a simplification took place in Women's styling and size labeling corresponded to a range of body dimensions so as to encompass many body variations. The general attitude was "Back to Basics" for the 1970's (Batterbury & Batterbury 1977). The styles of this period made the change appear efficient rather than detrimental to the fit of apparel (Anspach 1967; Davis 1967). This revision did not affect labeling per se: it just gave the consumer fewer options in size proportion categories.

Industry began to simplify sizing at this time and the revised sizing standard for Women (PS42-70) reflected the industry's practices.

In 1975, **Junior/Misses** replaced **Young Teens** and by 1980 **Junior/Misses** was reinterpreted to be two separate size categories once again yet remained very similar.

Children's

In the 1970's, Children's (boy's & girl's) reflected the unisex phenomenon. The unisex sizing was based on a body type rather than styling, a contrast to adult sizing. Size labeling in charts corresponded to a range of body proportions rather than one measurement. More simplification was evident at this time period in styling as well as size labeling.

Assessing Validity and Reliability

During this time period, the issues of validity and reliability of measurement are challenged in many different sizing practices in the U.S. Apparel Industry. Sizing standards are published in hopes of gaining industry-wide consistency but consistent and accurate use of standards are necessary in order to achieve this.

Men's garment types were sized separately and this time resulted in less reliable and valid sizing information. Women's sizes were merged so less categories needed to be produced thus, the revised standard reflected what was

already occurring in industry. Children's apparel was very simplified to include the unisex concept, colors of garments may have been the only differentiation. Children's sizing standard was based on self-locomotion. Buying children's clothing was still difficult and confusing.

The brand sizing concept of Men's, Women's and Children's apparel did not deal with sizing per se, rather it explained the inconsistency and unreliability of the sizing. Out of desperation brand sizing was created in hopes that dealing with each brand would make it more efficient for the consumer. This concept also has added to the invalidity and unreliability of sizing.

1984 - 1991

Nineteen eighty-four was chosen as the beginning of this time period as brand sizing was entering the mail order catalogs as a marketing concept. By 1991 the concept of brand sizing was well established for Women's apparel.

While size labeling has been relatively consistent, the proportions they represent have not (Kunick, 1967). The use of general size codes have long been in use, even prior to the development of standard sizing. General size codes are often used to deviate from standard sizing. Deviation

results in trial-and-error shopping to find the particular garment that is the proper size to attain a suitable fit.

Industry by this time had given up the sizing battle and had gone to all different labels (brands), unreliability was on the upswing by 1984. In 1984 companies began trying to do something about the unreliability of sizing. The mail order industry suffered the most from this phenomenon as they bravely published their sizing information thus giving the consumer the most accurate information in their best interest.

Sears has revamped their entire organization around the Brand marketing concept. Now known as *Sears Brand Central* all size charts contained in the latest catalogs are arranged by the brand name of the product. Rather than deal with sizing holistically, brand sizing has been chosen as a solution to ease consumer confusion (Mueser 1991).

Land's End collapsed all figure types and size categories into **Women's**, **Men's** and **Children's** only. **Women's** and **Men's** were sized Regular, Petite, Tall and Regular, Short and Tall respectively. Height referred to the arm length measurement. No reference to **Junior's** or **Misses'** was made (Land's End 1990). Simplification has been *Land's End* solution to the sizing question.

J.C. Penney's has revised their **Women's** sizing. Many manufacturers industry-wide have followed suit in the hope of making sizing less confusing for the consumer. In an informal interview of local women's dress stores the new sizing has been confusing and size charts have been provided so the consumer can relabel themselves. **Women's** sizes 34, 36 are now coded 14W, 16W which traditionally have been used as **Misses** size codes. *J.C. Penney's* has their own manufacturing specifications but apparel still varies according to the manufacturer. Conversion charts hang in dressing rooms to help the consumer adjust to the new concept (Wiley 1990).

Pattern sizes and mail order size charts give consumers an idea of their physical size in relation to a size code and set of body measurements. Without these published sizes women and children would be bewildered as to what body codes represent. Mail order has been a communication tool throughout the apparel industry informing the consumer with sizing information.

In 1991 a cooperative effort began between the Cooperative Extension, the apparel industry and others in the clothing field to collect measurements of women 55 years of age and older. This age range was completely neglected in PS42-70. This data collection can contribute up-to-date

straightforward labeling practices for apparel (Reich & Goldberry 1991).

These attempts at change are seen by this researcher as trying to improve the sizing situation. Mail order companies have been the only ready-to-wear producers in the garment industry to print their size charts. To actually have body measurements referring to a particular size code has proven their faith in getting as much information to the consumer as possible. Buying apparel off the rack, the consumer is given a hang tag with an abstract size code or S-M-L sizing to choose. Salespeople are unable to tell the consumer what body measurements a particular code represents. Therefore, the consumer is back at square one with the trial and error purchasing strategy. Consumers must try on several garments to get one that fits satisfactorily.

Men's clothing seems to be sized to suit the consumer better. Body measurement size labeling is more logical and common in men's clothing. About 80 per cent of people replying to a 1987 survey conducted by Canadian Consumer reveals body measurement size/labeling gave the most satisfactory fit which is the way Men's clothing has traditionally been sized (Ensom 1987).

No size standard has been published in the United States for Men's apparel throughout the history of the apparel industry. Great Britain has contributed sizing scale information for Men's apparel designations (Solinger 1988).

In the past decade, S-M-L sizing has become popular. S-M-L sizing has appeared in all types of garments, jackets, pants, t-shirts, exercise apparel, sweaters, and sportswear. The unit concept refers to entire stores in shopping malls throughout the country marketing individual pieces of knit clothing that mix and match and are sold by the S-M-L system. A growing proportion of imports is being labeled this way.

Small-Medium-Large sizing is derived from size ranges aimed at fitting a range of body types and proportions rather than a specific size segment. For example, Small may refer to sizes 36 - 38 in proportional sizing (36-38 chest, 26-30" waist, 29-32" inseam).

A very successful marketing concept for S-M-L has been the unit concept. Garments of all types are sized this way.

Figure 3. Small-Medium-Large Size Ranges

6	8	10	12	14	16
SMALL		MEDIUM		LARGE	

In a recent informal interview, it was revealed that Small-Medium-Large (S-M-L) sizing and knitwear have created more turmoil in the sizes of Men's clothing than ever before. Foreign countries have exported S-M-L sizing in men's tailored sport shirts produced in various types of fabrics. Finding adequate fit has not been easy. S-M-L sizing for knits has been accepted more universally than in any other type of garment. Various local retail stores have stopped ordering some foreign as well as domestic men's shirts and pants sized S-M-L, due to their poor fit (Wiley 1991).

In an informal survey of various local children's apparel stores this researcher found that manufacturers label in their own way: some using age and child's weight; S-M-L and weight; weight alone; or just age. Each manufacturer may provide size charts for each brand of

apparel but salespeople don't tend to use them because of inaccuracies and inconsistencies in dimensions. Consumers must take into account the type of fabric the garment is made of such as garments of 100% cotton may shrink down a full size causing the consumer to purchase a size larger. Consumers purchasing **infants** and **toddlers** apparel usually purchase up a size, for example, if your child is 9 months old they would purchase a size 12 months or bigger. Some brands of children's apparel are known to run big in comparison to other brands and in actuality are more true to size than other brands.

Children's clothing has become a fashionable gift market. Clothing is chosen by aunts, uncles and grandparents as gifts much more often today than ever before in the history of the apparel industry. Age has been a convenient indicator of size but an unreliable one. Children are choosing their own clothing now more than ever before in the history of the apparel industry. Without a parent's guidance a child would undoubtedly have problems finding the right size garment alone.

J.C. Penney's labels their children's apparel by age and weight. *J.C. Penneys'* manufacturers in foreign countries must adhere to labeling specifications created by *Penney's* or the products are not accepted by *Penney's*.

Therefore, manufacturers adhere to specifications and no size charts are necessary; hang tags on garments must specify any acceptable deviation from the standard company specifications. The majority of infants and toddlers clothing at *Penney's* have age and weight or other size specifications on hang tags as well as neck labels. It was interesting to note that physique (body type) is being used more on labels during this time. The labels on larger children's clothing varied (Wiley 1990).

The foreign market of children's apparel is labelled with age only, no size charts are available for these garments. In an interview with children's mail order businesses, imported children's clothing show no evidence of new labeling or body dimensions associated with a size code. Most garments are sold with a size code associated with the age of the child. *Surtout*, a mail order company for children's apparel in Bozeman, MT imports apparel from several foreign countries and no reference to body dimensions in relation to size codes has been evidenced in the labels or otherwise (Werner, 1990).

Men's

From 1984 through 1991 Men's apparel was labelled according to type of garment and by brand of garment.

Garments were available in 5 body types; Short (5'3" - 5'7"), Regular (5'7" - 5'11"), Tall or Long (5'11" - 6'3"), Extra-Tall or Extra Long (6'3" - 6'7") and Big (5'7" - 5'11"). Precise measurement directions were provided to the consumer to assist in attaining the most adequate fit.

Women's

During the 1980's and 90's size codes were manipulated in such a way to provide false connotations. For example, expensive apparel which includes many designer garments are sized one or two sizes larger than the size code. In so doing, a size 10 in a less expensive brand apparel would be a size 8 in the more expensive apparel. This practice has been called vanity sizing (Handford 1974, Stonliey 1989). Thus, the consumer is lead to believe she is smaller than her physical measurements indicate. In turn, women may feel inadequate if they are not able to wear a familiar size because a particular manufacturer has a different interpretation of the sizing dimensions. Ultimately this results in the woman believing that she is at fault, not the clothing.

Junior's was originally created as a need for more youthful styling not sizing. In 1991 **Junior** sizing referred

to a more youthful styling as well as a shorter waist fit and in contrast **Women's** sizing referred to a more mature styling. When comparing the body proportions and selection criteria for **Misses'** and **Junior's** it is hard to see any substantial difference using this information. Bust, waist and hip proportions differ hardly at all for **Junior**, **Misses'**, or **Women's** as represented here. Therefore, Sears gave a brief description (page 37), much like the catalogs of today, of each size category; in hopes of helping the consumer visualize what figure type the sizes refer. No figure type is actually described rather, height is the main reference point and the body dimensions speak for themselves.

Brand charts were more prevalent at this time and by the Fall of 1990 Sears had changed their name to "**Sears Brand Central**" due to the concept of brand marketing. Women alone have 9 different size categories from which to choose (Appendix A). With many different size charts it is not surprising that the sizing standards have been abdicated.

Children's

Presently, **Children's** labeling is multifaceted. Size labeling is inconsistent in children's apparel. Sears has increased size categories for children's apparel. There are

over ten different size categories from infants to teens represented alone or by brands of apparel in Sears.

Examples of typical size categories: **Infants**

sizes range from newborn(NB) to XL, **Toddlers** sizes 1T - 4T, **Little boys** sizes 4 slim - 7 regular, **Boys** and **Teens** sizes 8 slim - 20 regular, **little boys/boys** jeans sizes 4 slim - 7 regular, **husky** sizes 10 - 20 husky, **Little Girl's** sizes 4 - 6X, **Little Girl's/Girl's** sizes XS - XL, **Girl's** sizes 7S - 18, and **Pretty Plus(PP)** sizes 8PP - 18PP. Based on age, an infants size newborn garment could feasibly fit a child from 5 pounds to 10 pounds.

Assessing Validity and Reliability

During this time period which brings us to the present there remains little consideration of the consistent and accurate use of size labeling practices in women's and children's apparel. Men's apparel continues to size by body measurement by brand and garment type. However, S-M-L sizing is eroding quality of fit for men's apparel. Women's apparel is sized solely by brand at this time. Women's apparel has 9 different categories in Sears from which to chose. Children's apparel is sized by 10 different categories (Sears) making it difficult to find a good fitting garment on the first try.

The brand sizing concept is certainly evidence that unreliability has become recognized. *Sears* has recognized this and has realized that it is better to print brand size charts of the brands they carry than to try for consistency in sizing. No valid sizing standard exists today because no current database exists. *Sears* has only been realistic in trying to make amends to the consumer and make their lives simpler with brand sizing.

In the next section conclusions and recommendations are made that may assist the apparel industry in attaining reliability and validity in its sizing and size labeling practices.

CONCLUSIONS AND RECOMMENDATIONS

The human body is a three-dimensional form of continuous spatial extent, which must be clothed using discrete patterns. The fundamental issues of size labeling for the apparel industry are: (1) What range of apparel sizes will be produced; (2) how fine will the gradations be from one size to another, and (3) how valid will the label be that is given to each size (French 1975). Size labeling identifies a garment "size" typically represented by a figure type/age category and number designation. Consumers rely on size labels as the single general indicator of garment proportions. Yet, apparel size labeling has been the most misunderstood communicator throughout the design/production and the marketing/consumption segments of the apparel industry.

Conclusions

Across the 150 year time frame represented by this study consumers have been forced to use trial-and-error purchasing practices in order to cope with frequently unreliable and invalid size labels. Many attempts by industry to alleviate consumer confusion have only added to the confusion. For example, the National Bureau of

Standards and the American Society of Testing and Materials have reevaluated size labeling language throughout the years but the changes did not affect the actual size of the garments being labeled. Leading retailers in the U.S., such as *Sears and J.C. Penney's*, have revised their sizing systems in hopes of communicating more information to the consumer. Using body measurements to select sizes within men's apparel across the history of size labeling has proven to be the most efficient and straightforward method. Yet, today's imported apparel and U.S. apparel manufactured in foreign countries has been found to be inconsistent with the body measurement sizing. A size 40 garment manufactured in a foreign country does not necessarily fit a size 40 inch chest measurement. The advent of Small-Medium-Large sizing has also brought inconsistency into the men's apparel market, a small sized garment within and between manufacturers may fit a consumer in a variety of ways.

Size labeling communicates to the consumer what has transpired throughout the production process. The proportional formula created determines a particular size code label for the garment. The label communicates to the consumer the size of garment being purchased. The garment is designed and graded out to the prescribed proportional formula based on the types of fabric chosen for the

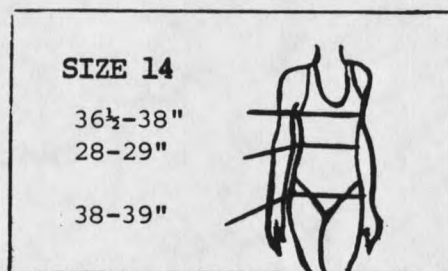
particular garment design. It is constructed in a prescribed way in order to retain the proportional formula. The garment is marketed and the consumer either accepts or rejects the end product based on the aesthetic and functional aspects of the garment. The label communicates to the consumer what they are purchasing. The label alone may be the single factor to determine if the product is purchased.

Common practice within the apparel industry has been to create their own sizing proportions/labeling. Therefore, a size 10 of Brand A, and size 10 of Brand B would rarely fit the same consumer the same way, creating constant confusion for the consumer. A comparison of dimensions of size 8 dresses produced by four manufacturers revealed that no two dresses in size 8 were the same. Each dress would have fit differently because of the different body proportions associated with size 8 labeling (Belkin 1986).

Consistent use and communication among producers lend reliability to the process and the sizing standard being used. When the sizing standard is used universally in the same way, it is a reliable tool in the production process. The German sizing system has had the most success worldwide. The Germans have a mandatory sizing standard, which is based on a database of new measurements of the general

population prepared every 10 years (Auflage 1972). Size labels reliably reflect sizing proportions. Care labels for textile products provide a model for successful labeling. Care labels and their informational symbols have been accepted in the U.S. and worldwide. The simple symbols used in communicating the proper care a garment requires are similar to the International Sizing Organization's recommended pictogram label for size labeling as illustrated in Figure 4.

Figure 4. ISO label adaptation.



(French 1975 adaptation)

Recommendations

Across the history of the U.S. apparel industry it is evident that problems of validity and reliability were significant for sizing and size labeling, and moreover, such problems were rarely addressed by manufacturers in any

systematic fashion. To remedy this situation the following recommendations are made:

(1) There is a need for greater communication within and across the U.S. apparel industry as well as the international apparel market. There is a need for reliability and validity in size labeling within and across manufacturers in order to promote increased consumer satisfaction. As a communicator, size labeling has an important role in attaining a goal of valid and reliable sizing practices.

Mandatory body measurement labeling in the U.S. would improve the consumers' ability to comprehend sizing used for a range of garments. By making size labeling more straightforward, reliability will increase as consumers seek out those garments that give them a satisfactory fit. Thus, the information will come back to manufacturers, consumers will demand more sizing information, and the validity of sizing will be increased. The use of body measurement information on size labels is not asking the manufacturer to do anything more than tell the consumer what the label means. Labels need to communicate more than an arbitrary title or number; rather they need to communicate the actual body measurements for which the garment was created. For example, the adapted pictogram and body measurement label in

Figure 4 demonstrates how clearly sizing information could be presented across the apparel production and consumption process.

(2) There is a need for a systematic and uniform database of body sizes from which sizing standards could be derived. This should maintain a higher degree of control within and across the apparel industry and keep the database current with the sizes of the general population. Sears mail order has provided the body measurements for a very long time and has made a genuine effort to inform the consumer. Germany has experienced the successful procurement of up-to-date body measurement database at ten year intervals. The current cooperative database collection for women 55 years and over could achieve this. This database collection project could be used as a model to design a procurement project for the rest of the population. If successfully demonstrated, industry and government could establish a database and maintain it on a regular basis. Validity in sizing and reliable use of sizing standards and size labels could greatly improve sizing quality. Perhaps mail-order companies such as Sears will finally attain the sizing quality they have sought for decades. The entire U.S. apparel industry will benefit from their leadership.

In summary, the establishment of mandatory body measurement labeling will improve the reliability and validity of sizing across the apparel industry. With or without mandatory sizing proportions, body measurement labeling would ease considerable confusion for the consumer in apparel size selection. Better sizing will result in better products, greater consumer satisfaction, and a more successful U.S. apparel industry.

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APPENDICES

APPENDIX: A
Sears Chronology 1897 - 1991

Table 3. Sears Chronology 1897-1990

Year	Figure Type Description	Selection Criteria
1897	Men's Tailor made suits	Based on measurements customer provided
	Ladies Tailor made suits	Based on measurements customer provided
	Children's apparel	size based on age
1902	Men's Tailor made suits	34 to 44 inch breast measure 30 to 42 inch waist measure. How to Measure chart provided
	Ladies tailor made suits	Bust 32 to 42 inches Skirt length 38 to 44 inches Waist-back average 16 inches Inside sleeve 18.5 to 19 inches
	Children's	From 2 ½ to 6 years. provide age.
1904	Men's tailored suits	chest girth 34 to 42 inches waist 30 to 40 inches inseam 30 to 36 inches
	Ladies Tailor made suits	Based on measurements provided by customer
	Children's	Selected by age

Table 3 cont'd.

1906	Men's Tailor made suits	Based on measurements provided customer			
		14	17	18	20
	Young Men's (age corresponds to size)	Chest 30	33	34	36
		Waist 28	31	31	33
		Inseam 28	31	33	34
		Weight 90	120	130	140
	Ladies Tailor made suits	Based on measurements provided by customer			
	Girl's or Misses' age corresponds to dress size)	Bust 21	32	34	36
		Skirt length 32	33	34	36
1914	Men's	Made to Order/Guarantee a perfect fit Measurements provided by customer			
	Women's	Waist & dress length measurements/Made to Order			
	Misses'	14	16	18	20
		Bust 32	34	36	38
		Front skirt length 34	35	37	38
	** Send measurements with garment order				
	Junior's	13	15	17 Years	
	State age	Bust 32	34	36	
		Skirt Length 32	34	36	
	Girl's(State Age)	6	8	10	12 14 Years
		Chest 26	28	30	32 34
		Length 26	28	32	38 42
	Boy's	Based on same measurements as Girl's and measurements sent by customer			

Table 3 cont'd.

1918	Men's Suits							34 to 44 inches breast measure 30 to 42 inches waist measure 30 to 36 inches inseam measure Also provide age and weight
	Ladies tailored made suit							Made to order
	Junior and intermediate dresses (age corresponds to size)							state age
				6	8	10	12	14
	Children's (size corresponds to body measurements)	Bust	28	29	30	32	34	
		Skirt Length	26	28	32	38	42	
1923	Men's	Chest	34 - 44					
		Waist	29 - 42					Extra Large & Stout also
		Inseam	29 - 36					
	Young Men's							Difference in styling only/ Made to Order Measurements provided by customer
	Women's, Misses', Junior's							Measurements provided by customer
	Girl's & Boy's							Sized according to chest measurements and age

Table 3 cont'd.

1929	Men's	Sized same as previous years					
	Junior/Miss		13	15	17	19	
		Bust	31	33	35	37	
		Skirt	37	38	38	39	
	Women's						
		Bust	34	36	38	40	42
		Length from back of neck					44
		to hem	41	41	41	41	41
	Girl's	"Age Size"					
		Age		2 - 9			
		Chest		21 - 28			
		Skirt length		22 - 33			
	Boy's (Suits)						
		Sizes	5 - 10		Sizes	11 - 16	
		Chest	24 - 27		Chest	27½ - 33	
		Waist	23½ - 26½		Waist	26 - 30	
		Inseam	18 - 23		Inseam	24 - 29	

Table 3 cont'd.

1936	Men	Suit jackets by chest measurement and length Pants by waist and inseam measurements				
	Women's	Skirts	14	16	18	20
		Waist	36	38	38	40
		Hip	37			51
		Length	32	34	34	35
		Dresses				
		Bust	36 - 44			
		Length	50			
		"Anne Williams Dress"		14	16	18 20
				lengths		
		Average		48 - 49		
		Short		50 - 51		
		Tall		45 - 46		
		*Select actual bust measurement				
	Misses'		14	16	18	20 -
		Bust	32	36	40	44 - 53
		Lengths	48	49	50	50
	Girl's	Years	7	8	10	12 14
		Chest	26	28	30	32 33
	Boy's	Years	3 - 18			
		Chest	22 - 34			
		Waist	23 - 30½			
		Inseam	14 - 32			

1941	Men's	Sizes range from: 33 to 44 in., chest; 29 to 41 in. waist; 28 to 35 in. inseam. Regulars, Shorts Longs.						
	Women's garments	Bust	34	36	38	40	42	44
		Waist	29	31	33	35	37	39
		Hips	38½	40½	42½	44½	46½	48
			12	14	6	18	20	22
	Misses' tailored	Bust	33	34	35	37	39	41
		Waist	25	26	28	29	31	33
		Hips	35	36	38	39	41	43
	Junior's (youthful adult female figure)		9	11	13	15	17	19
		Bust	31	32	33½	35	36½	38½
		Waist	23½	24½	26	27½	29	30½
		Hips	33½	34½	36	37½	39	40½
	Children	size codes referring to a set of body measurements						

Children

size codes referring to a set of body measurements

Table 3 cont'd.

1946	Men's	Regular sizes: 34 to 44 in. chest; 28 to 41 in. waist; 29 to 35 in. inseam. Regulars, shorts, longs. State chest, waist, inseam & sleeve length.							
	Junior's	Bust	30½	9	11	13	15	17	
		Waist	23½	32	33	35	36½	36½	
		Hips	34	24½	26	27½	29	29	
				35	36	37½	39	39	
	Junior figure is slightly shorter than a Misses'. The bustline is higher, the waistline slimmer. Garments are youthful in style for youthful figures of all ages.								
	Misses'		10	12	14	16	18	20	
		Bust	31	31½	34	35½	37	39	
		Waist	24	25½	27	28½	30	32	
		Hips	34	35	36½	38	39½	41	
		Dress length	41	41½	42	42½	43	43½	
								44	
	Misses' figure has a well-developed but youthful bustline. The waist is slender. The figure is well proportioned throughout. This average figure type has the widest choice of styles.								
	Children's(girls)		7	8	10	12	14		
		chest	26	27	29	30½	32		
		waist	23	23½	24½	25½	26½		
		hips	27½	28½	31	33	35		
		dress length	26	28	31	34	36		
	Boy's	*Similar to Girl's sizing							

Table 3 cont'd.

1954	Men's	Regular sizes: 34 to 44" chest; 28 to 41" waists Shorts and Longs available also.					
	Women's	Sizes 34 through 44, bust measurements 37" to 47".					
	Misses'	Added a size 8 / interpolated sizes 10 and 12					
	Junior's	Added Larger bust measurements					
	Young Men's(Student)	Sized 2 through 22 based on measurement guide provided in catalog.					
	Teen's		10	12	14	16	
		Bust	30½	32	33½	35	
		Hips	32½	34½	36½	38½	
		Dress Length	42	43	44	45	
	Short Teen's		8s	10s	12s	14s	
		Bust	28½	30	31½	33	
		Hips	30	32	34	36	
		Dress Length	38	39	40	41	
	Girl's		7	8	9	10	12 14
		Height w/shoes	50	52	54	56	58½ 61
		Chest	26	27	28	29	30½ 32
		Waist	23	23½	24	24½	25½ 26½
		Hips	27½	28½	29½	31	33 35
	Tot's & Small Girl's	Sizes	1 - 6X				
	Boy's	Ages	3 - 8				
		Sizes	4 - 12				

Table 3 cont'd.

1955	Men	Tailored dress trousers feature 'proportioned fit'							
	Women's		34	36	38	40	42	44	
		Bust	37	39	41	43	45	47	
		Waist	29	31	33½	36	38½	41	
		Hips	38	40	42	44	46	48	
		Dress Length	46	46½	47	47½	48	48	
		Shorter and Larger Women's sizes available also.							
	Misses'		8	10	12	14	16	18	20
		Bust	31	32½	34	35½	37	39	41
		Waist	23½	24½	25½	27	28½	30½	32½
		Hips	32½	34	36	38	40	42	44
		Dress Length	45	45½	46	46½	47	47½	48
	Junior's			7	9	11	13	15	17
		Bust		30½	32	33½	35	36½	38
		Waist		22½	23½	24½	26	27½	28
		Hips		32	33½	35	37	39	40
		Dress Length		45	45½	46	46½	47	48

1961	Men's	Garments size much the same as previous years Regular, Long, Short categories
	Women's	Size charts remain much the same as previous years
	Misses'	Add Size 6 & 8
	Junior's	Add Size 5
	Children	Age code refers to set of body measurements

Table 3 cont'd.

1968	Men's	Consistent body measurement sizing											
	Women's	Half- Sizes											
	Junior's	Size Range from 3 - 15											
	Junior High Girls	Categories are added to facilitate for more body types resulting in more overlapping of sizes. Styling is main focus of these added size categories.											
	Growing Girls(3 categories)												
	Growing Boys	All categories represented by size code and sets of body measurements											
	Student's	Basically, previously known as Young Men's sizing											
1970													
Men's Chest	34 32½-33	35 33½-34	36 34½-35	37 35½-36	38 36½-37	39 37½-38	40 38½-39	42 39½-41	44 41½-43	46 43½-45	48 45½-47		
Women's				38	40	42	44	46	48	50			
				Bust 41-42½	43-44½	45-46½	47-48½	49-50½	51-52½	53-54½			
				Waist 33-34½	35-37	37½-39½	40-42	42½-44½					
Misses	These two categories remain much the same as previous years												
Juniors													
Young Adults & Children	Set of body measurements and size codes; begin to see ranges within each size category much like Men's and Women's.												

Table 3 cont'd.

1972 Men's (sportscoats, blazers)

	34	35	36	38	39	40	42	44	46	48
chest	33-33½	34-34½	35-35½	36-36½	37-37½	39-39½	40-41½	42-43½	44-45½	46-47½

Women's

	38	40	42	44	46	48	50	52
bust	41-42½	43-44½	45-46½	47-48½	49-50½	51-52½	53-54½	55-56½
waist	33-34½	35-37	37½-39½	40-42	42½-44½	45-47	47½-49½	50-52
hip	42-43½	44-45½	46-47½	48-49½	50-51½	52-53½	54-55½	56-57½

Misses'

	6	8	10	12	14	16	18	20	22
bust	31½-32	32½-33	33½-34	34½-35½	36-37	37½-38½	39-40½	41-42½	43-44½
waist	22½-23	23½-24	24½-25	25½-26½	27-28	28½-29½	30-31½	32-33½	34-35½
hip	33½-34	34½-35	35½-36	36½-37½	38-39	39½-40½	41-42½	43-44½	45-46½

Junior's

	3	5	7	9	11	13	15
bust	30-30½	31-31½	32-32½	33-33½	34-35	35½-36½	37-38
waist	21-21½	22-22½	23-23½	24-24½	25-26	26½-27½	28-29
hip	32-32½	33-33½	34-34½	35-35½	36-37	37½-38½	39-40

Children's (Little girls & boys) Sizes 1,2,3,4,5,6x

Girl's/Boys

Sizes 7 Reg. & Slim to 18PP & 20 Reg. respectively

1975 Junior/Misses replaces Young Teens

**All other size categories remain the same as previous years

1980 Women's & Misses' Reg. & Full Bust measurements included in sizing charts.

Junior's & Misses' Jeans are sized according to Full or Regular Hip

**All other size categories remain the same as previous years

Table 3 cont'd.

1984	Men's	Remain to be sized according to body measurements		
	Women's			
	Misses	Brand Size charts appear in catalog for these female size categories		
	Junior's			
	Children	Age as abstract size codes representative of set of body measurements		
1987	Men's	Sizes reflect Stature Short Regular Tall		
		Big Big Tall Extra Tall		
	Women's	Remain same as previous years		
	Junior's	1,3,5,7,9,11,13,15		
	Misses'	2,4,6,8,10,12,14,16,18,20,22		
	Junior/Misses'	1/2,3/4,5/6,7/8,9/10,11/12,13/15,17/18		

Table 3 cont'd.

1991	Misses Clothes That Fit	6	8	10	12	14	16
	Reg. Bust (A & B cup)	32½-33	33½-34	34½-35	35½-36	37-38	38½-39½
	Full Bust (C or D cup)	33-34½	35-35½	36-36½	37-38	38½-39½	40-41
	Waist	23½-24	24½-25	25½-26	26½-27½	28-29	29½-30½
	Reg. Hip (Avg. figure in hip, thigh)	34½-35	35½-36	36½-37	37½-38½	39-40	40½-41½
	Full Hip (Rounded full figure in hip, thigh)	36-36½	37-37½	38-38½	39-40	40½-41½	42-43

In 1991, Sears lists these sizes:

Men's:

Men's sweaters, knit shirts
Men's sportcoats, blazers, separates, outerwear
Men's sport shirts, work 'n leisure shirts

Women's:

Misses' & Junior's/Misses'
Misses' Levi & Lee jeans
Misses' Petite
Misses Clothes That Fit
Women's & Women's Petite
Women's Levi's & Lee jeans
Women's Clothes That Fit
Women's Petite
Junior's

Childrens's:

Little girl's
Little girl's/girls
Girl's (slim & regular)
Pretty Plus
Infants
Toddlers
Little Boys
Little boys/boys jeans
Boys & Teens
Husky

** Sears has reorganized and have changed their sizing along with this.
Conversion charts are provided for the consumer for all sizes.

** Photocopies provided for 1991 sizes/conversion charts.
Sears & Roebuck, Co. Mail order catalog. Fall 1991.

APPENDIX: B
CS151-58 Body Measurements for the Sizing of
Apparel for Infants,
Babies, Toddlers 1953

TS-5184
June 2, 1953

BODY MEASUREMENTS FOR THE SIZING OF APPAREL
FOR INFANTS, BABIES, TODDLERS AND CHILDREN
(For the Knit Underwear Industry)¹
COMMERCIAL STANDARD CS151-50

On September 10, 1945, at the instance of the Mail Order Association of America, a Recommended Commercial Standard on Body Measurements for the Sizing of Apparel for Infants, Babies, Toddlers, and Children was presented to interested producers, distributors, and users for written acceptance. The knit underwear industry has accepted and approved the commercial standard as shown herein. The standard is effective for the knit underwear industry from October 30, 1948.

PURPOSE

1. The purpose is to provide standard classifications, size designations, and body measurements for the sizing of infants', babies', toddlers', and children's ready-to-wear apparel for the guidance of those engaged in producing or preparing specifications for, ready-to-wear garments and patterns. Another purpose is to recommend methods of determining lengths of dresses, coats, skirts and slacks (outseams) from appropriate body measurements. Size ranges for the more important types of babies' garments are given.

SCOPE

2. This standard covers:

(a) Classifications and size ranges

- (1) Infants -- in one size only
- (2) Babies --- in sizes from 3 mo. to 36 mo.
- (3) Toddlers - in sizes from number 1 to 4
- (4) Children - in sizes from number 2 to 6X.

Sizing of Apparel - Infants to Children

- (b) Size designations
- (c) Composite body measurements of boys and girls for "regular" sizes, up to a stature of 48" and a weight of 54 pounds.
- (d) Lengths of garments
- (e) Methods of measuring
 - (1) General
 - (2) Vertical measurements of body
 - (3) Girth measurements of body
 - (4) Width and length measurements of body
 - (5) Garment lengths
- (f) Relationships of stature measurements to the sizing system.
- (g) Recommend methods of identification
- (h) Explanation of adjustments made in body measurements

APPLICATION

- 3. The methods and measurements given herein are applicable to:
 - (a) Coordination of body measurements of the child, as defined, with ready-to-wear size designations.
 - (b) Garment patterns and specifications, as a basis of gradations between sizes.
 - (c) Length measurements of the finished garment as delivered by the manufacturer.

DEFINITIONS

- 4. Definitions of the more important body landmarks in figure 1, are given in paragraph 5.

Sizing of Apparel - Infants to Children

Table 1. INFANT'S and BABIES' A Body Measurements
(Composite of boy's and girl's measurements)

Measurement	SIZE					
Age	3 mo	6 mo	12 mo	18 mo	24 mo	36 mo
Stature, in.	24	26½	29	31½	34½	36½
Weight, lbs.	13	18	22	26	29	32

GIRTH MEASUREMENTS

	in.	in.	in.	in.	in.	in.
Chest	17	18	19	20	21	22
Vertical trunk	27	29	31	32½	34½	36½

LENGTH MEASUREMENT

Shoulder & arm length	9	10¼	11½	12½	13 ¼	15
-----------------------	---	-----	-----	-----	------	----

VERTICAL MEASUREMENTS

Head & neck	5 3/4	6	6 1/8	6 3/8	6 5/8	6 3/4
Cervical-Ht	18 1/4	20 1/2	22 7/8	25 1/8	27 3/8	29 3/4
Cervical-knee	13	14 1/2	16 1/8	17 1/2	18 3/4	20 3/8
Cervical-waist	6 1/8	6 7/8	7 1/2	8	8 3/8	8 3/4
Waist height	12 1/8	13 5/8	15 1/2	17 3/8	19 1/4	21 1/8
Waist-knee	6 7/8	7 3/4	8 3/4	9 5/8	10 5/8	11 5/8
Waist-hip	2 5/8	2 7/8	3 1/8	3 1/2	3 7/8	4 1/4
Crotch height	7 3/4	9 1/8	10 1/2	11 7/8	13 1/4	14 5/8
Knee height	5 1/4	6	6 3/4	7 5/8	8 1/2	9 3/8

Table 2. BABIES' Garment Lengths

Garment	SIZE				
	3 mo.	6 mo.	12 mo.	18 mo.	24 mo.
Coat	-0-	14 1/2	15 1/2	16 1/2	-0-
Dress	-0-	14 _A	15	16	-0-
Bands & Skirts	10 1/2	11 1/2	12 1/2	14	15 1/2

A The relationship between the body measurements in Table 1 and the garment measurements in Table 2 can be illustrated by the following:

Cervicale to knee - Table 1 - 14 1/2 inches for size 6 mo.

Bottom of dress to
above knee - Table 2 - 1/2" for size 6 mo.

The difference 14 1/2 inches, the dress length (Table 2)

Sizing of Apparel - Infants and Children

SIZE	1	2	3	4
STATURE	31	34	37	40
WEIGHT	25	29	34	38
GIRTH MEASUREMENTS				
Chest	20	21	22	23
waist	20	20 $\frac{1}{2}$	21	21 $\frac{1}{2}$
V. trunk	32 $\frac{1}{2}$	32 $\frac{1}{2}$	36 $\frac{1}{2}$	39
Thigh	11 $\frac{1}{2}$	12	12 $\frac{1}{2}$	13
Neck base	9 $\frac{5}{8}$	10	10 $\frac{3}{8}$	10 $\frac{3}{4}$
Armscye	8 $\frac{1}{2}$	9	9 $\frac{1}{2}$	10
Upper arm	5 $\frac{7}{8}$	6 $\frac{1}{8}$	6 $\frac{3}{8}$	6 $\frac{5}{8}$
WIDTH & LENGTH MEASUREMENTS				
Cross back	8 $\frac{1}{8}$	8 $\frac{5}{8}$	9	9 $\frac{3}{8}$
Shoulder lg	2 $\frac{1}{2}$	2 $\frac{5}{8}$	2 $\frac{3}{4}$	2 $\frac{7}{8}$
Scye depth	3 $\frac{3}{4}$	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$
Ttl crotch	16	17	18	19
Shoulder & arm lgth	12 $\frac{1}{2}$	13 $\frac{3}{4}$	15	16 $\frac{1}{2}$
VERTICAL MEASUREMENTS				
Head & neck	6 $\frac{1}{4}$	6 $\frac{5}{8}$	7	7 $\frac{1}{4}$
Cervicale	24 $\frac{3}{4}$	27 $\frac{3}{8}$	30	32 $\frac{3}{4}$
Cervicale - knee	17 $\frac{1}{4}$	18 $\frac{7}{8}$	20 $\frac{1}{2}$	22 $\frac{1}{4}$
Cervicale - waist	8	8 $\frac{1}{2}$	9	9 $\frac{1}{2}$
Waist ht.	17			
Waist - knee		19 $\frac{1}{4}$	21 $\frac{1}{2}$	23 $\frac{3}{4}$
Waist - hip	9 $\frac{1}{2}$	10 $\frac{3}{4}$	12	13 $\frac{1}{4}$
Crotch ht.	3 $\frac{3}{8}$	3 $\frac{7}{8}$	4 $\frac{3}{8}$	4 $\frac{3}{4}$
Knee ht.	11 $\frac{1}{2}$	13 $\frac{1}{8}$	14 $\frac{7}{8}$	16 $\frac{5}{8}$
Ankle ht.	7 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	10 $\frac{1}{2}$
	1 $\frac{5}{8}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$

Table 8. CHILDREN'S Garment Length

Garment- WM	SIZE (Number)					
	2	3	4	5	6	6X
Coat, CB	17 $\frac{1}{2}$	19	20 $\frac{1}{2}$	22	23 $\frac{1}{2}$	25
Dress, CB	17	18 $\frac{1}{2}$	20	21 $\frac{1}{2}$	23	24 $\frac{1}{2}$
Bottom of dress	2	2	2	2	2 $\frac{1}{2}$	2
Skirt, CB	3/4	11	12	13	14	15
Distance above waist	2 $\frac{1}{2}$	1	3/4	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Bottom of skirt	2 $\frac{1}{2}$	2	2	2	2	2
Slacks, OS	20	21 $\frac{1}{2}$	23 $\frac{1}{2}$	25 $\frac{1}{2}$	27 $\frac{1}{2}$	29
Distance	1 $\frac{3}{4}$	1	3/4	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Bottom of slacks	1	1	1	1	1	1

CB = Center Back, OS = Outseam, WM = Where measured,
Distance = garment extends above waistline

APPENDIX: C
PS42-70 Body Measurements for the Sizing of Women's
Patterns and Apparel

Body Measurements for the Sizing of Women's Patterns and Apparel

Effective December 22, 1970 (See section 8.)

(This Voluntary Product Standard, initiated by the Mail Order Association of America, has been developed under the *Procedures for the Development of Voluntary Product Standards*, published by the U.S. Department of Commerce, as a revision of CS 215-58, *Body Measurements for the Sizing of Women's Patterns and Apparel*. See Section 9, *History of Project*, for further information.)

1. PURPOSE

The purpose of this Voluntary Product Standard is to provide standard classifications, size designations, and body measurements for consistent sizing of women's ready-to-wear apparel. This information is provided for the guidance of those engaged in producing or preparing specifications for patterns and ready-to-wear garments. It is also intended to provide the consumer with a means of identifying her body type and size from the wide range of body types covered, and to enable her to be fitted properly by a single size regardless of price, type of apparel, or manufacturer of the garment.

2. SCOPE AND CLASSIFICATION

2.1. Scope—This Voluntary Product Standard includes standard classifications, size designations, and body measurements. This Standard also covers the application of the sizing system, definitions and methods of measurement, and recommended methods for identifying products that are sized in accordance with this Standard. The measurements given in this Standard are *body, not garment, measurements*.

2.1.1. Span chart—As a reference to facilitate locating a particular body type and size, a span chart using key measurements is provided in appendix A.

2.1.2. Grading—A guide to grading has been included in appendix B. The difference between similar body measurements of consecutive sizes within a classification is called the grade.

2.1.3. Foundation garment adjustments—Adjustments to compensate for the effect of foundation garments, for converting tables 1 through 7 to "nude" measurements, are given in appendix C.

2.2. Classification—This Standard includes body measurements for four classifications of women as follows: Juniors', Misses', Women's, and Half-sizes (shorter women). Tables 1 through 7 give values for 45 body measurements for the four classifications and their related body types as follows:

- a. Juniors' petite sizes ranging from 3P to 15P—Table 1

- b. Juniors' sizes ranging from 3 to 17—Table 2
- c. Misses' petite sizes ranging from 8P to 18P—Table 3
- d. Misses' sizes ranging from 6 to 22—Table 4
- e. Misses' tall sizes ranging from 10T to 22T—Table 5
- f. Women's sizes ranging from 34 to 52—Table 6
- g. Half-sizes ranging from 12-1/2 to 26-1/2—Table 7

3. APPLICATION

The measurements given herein are applicable to:

- a. Sizing or grading garment patterns.
- b. Preparing specifications for ready-to-wear apparel and model forms.
- c. Coordinating body measurements of women, as defined, with size designations for ready-to-wear apparel—underwear and outerwear.
- d. Studying marketing aspects of ready-to-wear sizing.

4. DEFINITIONS

Definitions of the principal body landmarks shown in figure 1 are as follows:

- a. Crown—Top of head.
- b. Cervicale—The prominence on the seventh or lowest cervical vertebra at the back of the neck which becomes more prominent when the head is bent forward. (Cervicale height measurements are taken, however, only when the head is in an erect position.)
- c. Waist—The natural waistline, 3/8 inch (for petites), 1/2 inch (for regulars), and 5/8 inch (for tall) below the lower edge of the lower floating rib, located at the side of the body in a line directly below the center of the armpit.
- d. Abdominal extension (high hip)—The level of greatest protuberance of the abdomen as viewed from the side, figure 1.
- e. Hip—The outer bony prominence of the upper end of the thigh bone (the femur), figure 1.

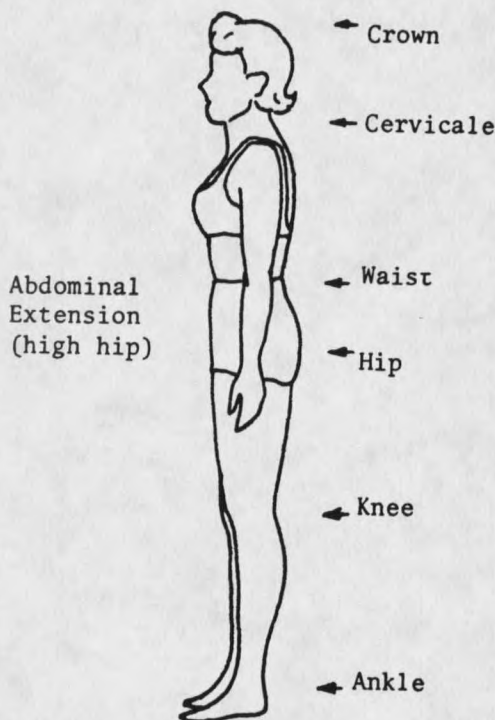


FIGURE 1. General location of principal body landmarks.

- f. Knee—The inner bony prominence of the upper end of the tibia, the larger of the two bones of the leg extending from knee to ankle, figure 1.
- g. Ankle—The inner bony prominence of the lower end of the tibia, figure 1.

5. MEASUREMENT

5.1. **General**—All measurements should be taken while the subject is in the standing position, except for the sitting spread girth measurement. The principal girth measurements and related arcs are to be taken over foundation garments, i.e., a girdle and a brassiere. Measurements given in tables 1 through 7 have been adjusted to compensate for the effect of foundation garments. Figure 2 illustrates the type of foundation garments to be worn. Vertical measurements should be taken without shoes. Weight should be taken without clothes.

5.2. Girth measurements—

- a. Bust girth—The girth is measured horizontally at the level of the fullest part of bust, figure 2.
- b. Waist girth—The girth is measured horizontally at waist level, figure 2.

- c. Hip girth—The girth is measured horizontally at hip level, figure 2.
- d. Neck base girth—Measured around the neck touching the cervicale at the back, and the upper borders of the collar bone at the front, and following the curve that would be made by a fine-linked chain passing over these landmarks (A through C to A, figures 3 and 4).
- e. Mid neck—Measured at the average height at which a button type collar would be fastened. This measurement is taken below the projection in front of the neck formed by the largest cartilage of the larynx, approximately 1 inch above the neck base girth.
- f. Armscye girth—Measured from a point at the armhole edge of the shoulder, midway between the acromion and the highest prominence at the lateral end of the collar bone, and through the underarm midpoint, D around the arm to D, figures 3 and 4.
- g. Abdominal extension (high hip) girth—The girth is measured horizontally at abdominal extension (high hip) level, figure 2.
- h. Sitting spread girth—Measured around both legs at the most lateral extension of the

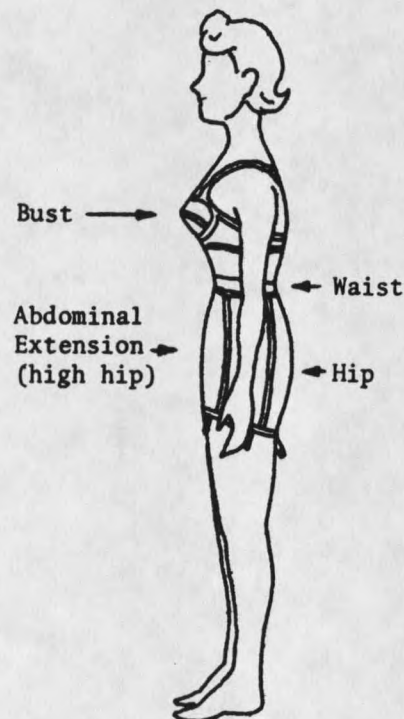


FIGURE 2. Location of important girth and arc measurements that are to be taken horizontally.

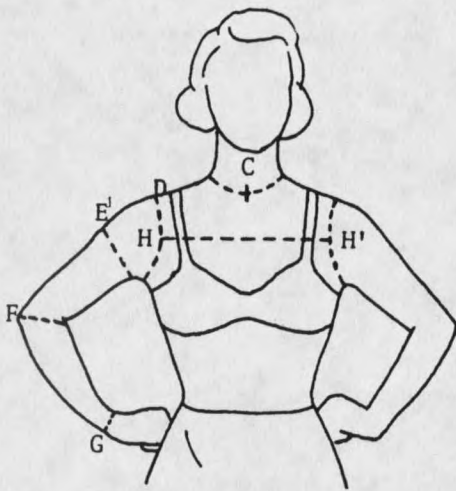


FIGURE 3. Cross-chest width; neck base, armscye, upper arm, elbow, and wrist girths.



FIGURE 5. Sitting spread girth.

- upper thighs, when the subject is seated, figure 5.
- i. Thigh girth, maximum—Measured horizontally around the upper part of the leg, close up to the crotch, figure 7.
 - j. Thigh girth, mid—Measured horizontally around the leg midway between the hip and the knee, figure 7.
 - k. Knee girth—Measured horizontally around the leg over the knee cap, figure 7.

- l. Calf girth—Measured horizontally around that portion of the leg below the knee at the level of maximum girth, figure 7.
- m. Ankle girth—Measured horizontally around the leg over the greatest prominence of the ankle, figure 7.
- n. Upper arm girth—With the arm down, measured around the arm with the upper edge of the tape measure at the level of the bottom of the armscye, E around the arm, figure 3.
- o. Elbow girth—With the forearm at right angle to the upper arm, measured diagonally around the arm over the lower prominence on the armscye, F around the arm figure 3.

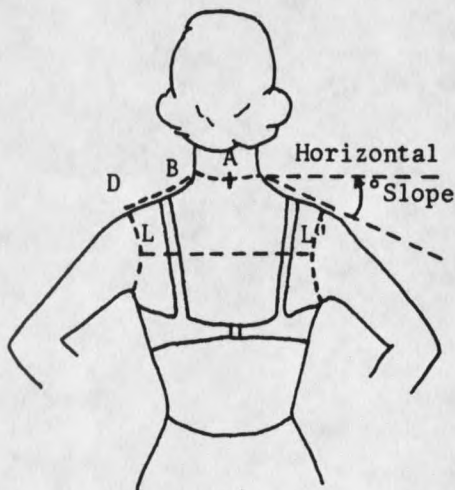


FIGURE 4. Cross-back width; neck base and armscye girths; shoulder length; and slope.

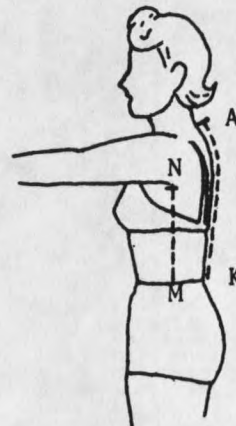


FIGURE 6. Back waist length and armscye to waist.

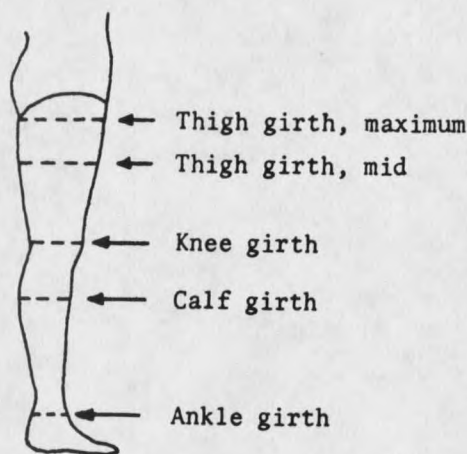


FIGURE 7. Girths of the leg.

- p. Wrist girth—Measured around the arm over the prominence at the lower end of the ulna, the inner of the two bones of the forearm. G around the arm, figure 3.
- q. Vertical trunk girth—Measured from a point on the shoulder, midway between the neck and the normal armhole line, as defined by armscye girth, through the crotch. The measurements should be taken without

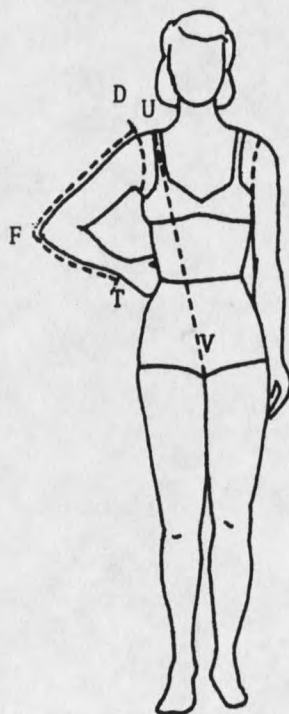


FIGURE 8. Arm lengths, shoulder to elbow and to wrist; and vertical trunk girth.

constriction at crotch, U through V to U, figure 8.

5.3. **Arc measurements**—All arc measurements are taken from the imaginary vertical line extending from the mid-underarm point to the hip bone along one side of the body to a similar line on the other side.

- a. Bust, front—The arc is the front portion of the bust girth.
- b. Waist, front—The arc is the front portion of the waist girth.
- c. Abdominal extension (high hip), front—The arc is the front portion of the abdominal extension (high hip) girth.
- d. Hip arc, back—The arc is the back portion of the hip girth.

5.4. Vertical measurements—

- a. Stature—Measured from crown to soles of feet.
- b. Cervicale height—Measured from cervicale to soles of feet.
- c. Waist height—Measured from waist to soles of feet. The waist height establishes the waist level around the body.
- d. Abdominal extension (high hip) height—Measured from abdominal extension (high hip) level to soles of feet.
- e. Hip height—Measured from hip to soles of feet.
- f. Crotch height—Measured from base of trunk, as defined by vertical trunk girth to soles of feet.
- g. Knee height—Measured from knee to soles of feet.
- h. Ankle height—Measured from ankle to soles of feet.

5.5. Width and length measurements—

- a. Cross-back width—Measured across the back from armscye to armscye approximately at the same level as the cross-chest width, L to L', figure 4.
- b. Cross-chest width—Measured across the front of the chest from armscye to armscye midway between shoulder and bottom of armscye, H to H', figure 3.
- c. Bust point to bust point—Measured from bust point to bust point horizontally, J to J', figure 9.
- d. Neck to bust point—Measured from intersection of shoulder and neck base lines to bust point, B to J, figure 10.
- e. Scye depth—Measured along the spine from the cervicale to a point level with the mid-underarm point, A to P, figure 11.
- f. Armscye to waist—Measured from the mid-underarm point downward along the side

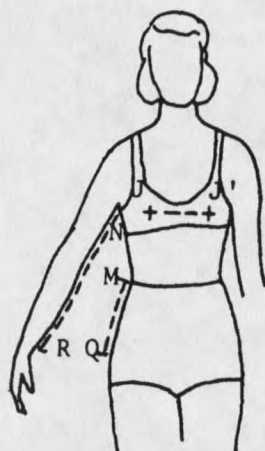


FIGURE 9. Bust point to bust point across; underarm length, armscye to wrist; and waist to hips.

of the body to the waist level, N to M, figure 6.

- g. Waist to hips—Measured along the side of the body from the waist level to the hip point directly below. Because of the curvature of the body, this will usually be greater than the vertical difference between the waist and hip height, M to Q, figure 9.
- h. Shoulder length—Measured along a line corresponding to the customary shoulder line of a garment from the neck base to the armscye line, B to D, figure 4.
- i. Shoulder slope—Slope (measured in degrees) of the shoulder with respect to the horizontal, figure 4.
- j. Arm length, shoulder to wrist—Measured from the intersection of the armscye and shoulder lines, along the outside (posterior surface) of the right arm, over the elbow to the greatest prominence on the outside of the wrist, D through F to T, figure 8.

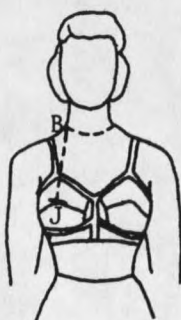


FIGURE 10. Neck to bust length.

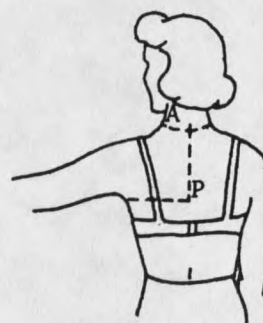


FIGURE 11. Scye depth.

- k. Arm length, shoulder to elbow—The upper portion of the previous measurement taken to the prominence of the elbow, D to F, figure 8.
- l. Underarm length—With the arm down, measured from the point on the inside of the upper arm corresponding to the underarm mid-point on the trunk to the mid-point on the inside of the wrist in line with the greatest prominence, N to R, figure 9.
- m. Crotch length, total—Measured from waist level at the front, through the crotch to the waist level at the back without constriction, O through crotch to K, figure 12.
- n. Cervicale to center front at waist—Measured from cervicale at center back, along the neck line to shoulder line and then down the figure to the waist level at the center front, A through B to O, figure 13.
- o. Waist length, front—Measured at center front from neck base girth line to waist level, C to O, figure 13.



FIGURE 12. Total crotch length.

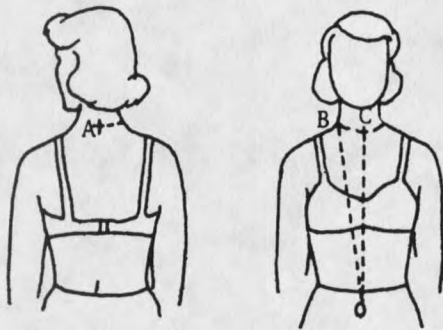


FIGURE 13. Front waist length and cervicale to center front at waist.

p. Waist length, back—Measured along the spine from cervicale to waist level, A to K, figure 6.

6. TABLES OF SIZE RANGES AND CORRESPONDING MEASUREMENTS¹

Size ranges and corresponding adjusted "body" measurements are given in tables 1 through 7.

¹Weights were determined according to relationships established by a survey of United States Air Force women. Height (H_t), Bust (B), Waist (W), and Hip (H_p), in the relationship of $\text{Weight} = 1.66 H_t + 1.77 B + 1.72 W + 3.35 H_p - 212.35$, were shown to be reliable predictors of weight within the limitations of the sample survey. The weights may not be entirely accurate for all women, but are offered as further guides in defining size.

TABLE 1. Junior Petite¹

Size	3P	5P	7P	9P	11P	13P	15P
GIRTH MEASUREMENTS (inches)							
Bust -----	30	31	32	33	34½	36	37½
Waist -----	20½	21½	22½	23½	25	26½	28
Hip -----	32	33	34	35	36½	38	39½
Mid neck -----	12¾	13	13¼	13½	13¾	14¼	14¾
Armhole -----	13	13¾	13¾	14¼	14¾	15¾	16
Abdominal extension (high hip) -----	27¾	28¾	29¾	30¾	32¼	33¾	35¼
Sitting spread -----	32	33	34	35	36½	38	39½
Thigh, maximum -----	17½	18¼	19	19¾	20¾	21¾	22¾
Thigh, mid -----	15¾	16¾	16¾	17¾	18¼	19¾	20
Knee -----	11½	11¾	12¼	12¾	13¾	13¾	14¾
Calf -----	11	11¾	11¾	12¼	12¾	13¾	13¾
Ankle -----	7¾	8	8¼	8½	8¾	9	9¾
Upper arm -----	9¾	9¾	9¾	9¾	10¼	10¾	11
Elbow -----	8¾	9	9¼	9¼	9½	9¾	10
Wrist -----	5¾	5¾	5¾	5½	5¾	5¾	5¾
Vertical trunk -----	50½	52	53½	55	56½	58	59½
ARC MEASUREMENTS (inches)							
Bust, front -----	16¼	17	17¾	18½	19½	20½	21½
Waist, front -----	10¾	11¾	12	12¾	13½	14¾	15¾
Abdominal, front (high hip) -----	14¾	15¾	16	16¾	17¾	18¾	19¾
Hip, back -----	16¼	16¾	17	17¾	18	18¾	19¾
VERTICAL MEASUREMENTS (inches)							
Stature (total height) -----	58	58½	59	59½	60	60½	61
Cervical height -----	49	49½	50	50½	51	51½	52
Waist height -----	35¾	36	36¾	36¾	37¾	37¾	37¾
Abdominal extension height (high hip) -----	33¾	33¾	33¾	34¼	34¾	34¾	34¾
Hip height -----	29¼	29¾	29¾	29¾	29¾	29¾	30
Crotch height -----	26¾	26¾	26¾	26¾	26¾	27	27¾
Knee height -----	15¾	15¾	16	16¼	16¼	16¾	16¾
Ankle height -----	2¾	2¾	2¾	2¾	2¾	2¾	2¾
WIDTH AND LENGTH MEASUREMENTS (inches)							
Cross-back width -----	11¾	11¾	12¼	12¾	12¾	13¾	13¾
Cross-chest width -----	11¾	11¾	11¾	12	12¼	12½	12¾
Bust point to bust point -----	6¾	6¾	6¾	7¼	7¾	7¾	7¾
Neck to bust point -----	7¾	8	8¼	8½	8¾	9¼	9¾
Scye depth -----	6½	6¾	6¾	6¾	7	7¼	7¼
Armhole to waist -----	7¼	7¾	7¾	7¾	7¾	7¾	8
Waist to hips -----	6¾	7¼	7¾	7¾	7¾	8¼	8¾
Shoulder length -----	4	4½	4½	4½	4½	4½	4¾
Shoulder slope (degrees) -----	23	23	23	23	23	23	23
Arm length, shoulder to wrist -----	20¾	21½	21¼	21½	21¾	21¾	22
Arm length, shoulder to elbow -----	11¾	12	12¼	12¼	12¾	12¾	12¾
Underarm length -----	15¾	15½	15½	15½	15¾	15¾	15¾
Crotch length, total -----	23½	24¼	25	25¾	26¾	27¼	28
Cervical to center front at waist -----	17¾	17¾	17¾	18¼	18¾	18¾	19¾
Waist length, front -----	11½	11¾	12	12¼	12½	12¾	13
Waist length, back -----	13½	13¾	14	14¼	14½	14¾	15
WEIGHTS (pounds)							
Weight, approximate -----	79	87	95	103	114	125	136

¹ 1 inch equals 2.54 centimeters, 1 pound equals 0.45 kilograms.

TABLE 2. Juniors¹

Size	3	5	7	9	11	13	15	17
GIRTH MEASUREMENTS (inches)								
Bust -----	30	31	32	33	34½	36	37½	39
Waist -----	20½	21½	22½	23½	25	26½	28	29½
Hip -----	32	33	34	35	36½	38	39½	41
Mid neck -----	12¾	13	13¼	13½	13¾	14¼	14¾	15
Armseye -----	13½	13½	13¾	14¼	14¾	15½	16½	16¾
Abdominal extension (high hip) -----	27¾	28¾	29¾	30¾	32¼	33¾	35¼	36¾
Sitting spread -----	32	33	34	35	36½	38	39½	41
Thigh, maximum -----	17½	18¼	19	19¾	20¾	21¾	22¾	23¾
Thigh, mid -----	15¾	16¾	16¾	17¾	18¾	19¾	20	20¾
Knee -----	11½	11¾	12¼	12¾	13¾	13¾	14¾	14¾
Calf -----	11	11¾	11¾	12¾	12¾	13¾	13¾	14¾
Ankle -----	7¾	8	8¼	8½	8¾	9	9¼	9½
Upper arm -----	9¼	9¾	9¾	9¾	10¼	10¾	11	11¾
Elbow -----	8¾	9	9¼	9¼	9¾	9¾	10	10¼
Wrist -----	5¼	5¼	5¾	5½	5¾	5¾	5¾	6
Vertical trunk -----	52½	54	55½	57	58½	60	61½	63
ARC MEASUREMENTS (inches)								
Bust, front -----	16¼	17	17¾	18½	19½	20½	21½	22½
Waist, front -----	10¾	11¾	12	12¾	13¾	14¾	15¼	16¾
Abdominal, front (high hip) -----	14¾	15¾	16	16¾	17½	18¾	19¼	20¾
Hip, back -----	16¼	16¾	17	17¾	18	18¾	19¼	19¾
VERTICAL MEASUREMENTS (inches)								
Stature (total height) -----	61½	62	62½	63	63½	64	64½	65
Cervicale height -----	52½	53	53½	54	54½	55	55½	56
Waist height -----	38¼	38½	38¾	39¼	39¾	40	40¾	40¾
Abdominal extension height (high hip) --	35¾	35¾	35¾	36¾	36¾	36¾	36¾	37¾
Hip height -----	31¼	31¾	31¾	31¾	31¾	31¾	32	32½
Crotch height -----	28¼	28¾	28½	28¾	28¾	28¾	29	29½
Knee height -----	16¾	16¾	17	17½	17¼	17¾	17½	17¾
Ankle height -----	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾
WIDTH AND LENGTH MEASUREMENTS (inches)								
Cross-back width -----	11¾	11¾	12¾	12¾	12¾	13¾	13¾	13¾
Cross-chest width -----	11¾	11¾	11¾	12	12¼	12½	12¾	13
Bust point to bust point -----	6¾	6¾	6¾	7¾	7¾	7¾	7¾	8¾
Neck to bust point -----	7¾	8¾	8¾	8¾	9	9¾	9¾	10¾
Scye depth -----	6¾	6¾	7	7¼	7¼	7¾	7¾	7¾
Armseye to waist -----	8	8¼	8¼	8¾	8½	8¾	8¾	8¾
Waist to hips -----	7¾	7¾	7¾	8¾	8¾	8¾	8¾	9¾
Shoulder length -----	4	4¼	4¼	4¼	4¼	4¼	4¾	4¾
Shoulder slope (degrees) -----	23	23	23	23	23	23	23	23
Arm length, shoulder to wrist -----	22¾	22¾	22¾	22¾	23¾	23¾	23¾	23¾
Arm length, shoulder to elbow -----	12¾	12¾	13	13¼	13¼	13¾	13¾	13¾
Underarm length -----	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾
Crotch length, total -----	24½	25¼	26	26¾	27½	28¼	29	29¾
Cervicale to center front at waist -----	18¾	18¾	18¾	18¾	19¾	19¾	20	20¾
Waist length, front -----	12¼	12½	12¾	13	13¼	13¾	13¾	14
Waist length, back -----	14¼	14½	14¾	15	15¼	15½	15¾	16
WEIGHTS (pounds)								
Weight, approximate -----	85	93	101	108	119	130	142	153

¹ 1 inch equals 2.54 centimeters, 1 pound equals 0.45 kilograms.

TABLE 3. Misses Petite¹

Size	8P	10P	12P	14P	16P	18P
GIRTH MEASUREMENTS (inches)						
Bust	32½	33½	35	36½	38	40
Waist	23½	24½	26	27½	29	31
Hip	34½	35½	37	38½	40	42
Mid neck	13¾	13¾	14	14¾	14¾	15¼
Armhole	14¾	14¾	15¼	15¾	16¾	17¾
Abdominal extension (high hip)	30¾	31¾	33¼	34¾	36¼	38¼
Sitting spread	34½	35½	37	38½	40	42
Thigh, maximum	19½	20¼	21¼	22¼	23¼	24½
Thigh, mid	17½	18	18¾	19½	20¼	21¼
Knee	12¾	12¾	13¼	13¾	14¼	14¾
Calf	11¾	12¼	12¾	13¼	13¾	14¼
Ankle	8¾	8¾	8¾	9¾	9¾	9¾
Upper arm	9¾	10¼	10½	10¾	11¼	11¾
Elbow	9¾	9½	9¾	10	10¼	10¾
Wrist	5¾	5½	5¾	5¾	5¾	6
Vertical trunk	54	55½	57	58½	60	61½
ARC MEASUREMENTS (inches)						
Bust, front	18½	19¼	20¼	21¼	22¼	23¾
Waist, front	12½	13¾	14	14¾	15¾	17
Abdominal, front (high hip)	16½	17¾	18	18¾	19¾	21
Hip, back	17¼	17¾	18¼	18¾	19½	20¼
VERTICAL MEASUREMENTS (inches)						
Stature (total height)	59½	60	60½	61	61½	62
Cervical height	50½	51	51½	52	52½	53
Waist height	36¾	37	37¾	37¾	38¾	38¾
Abdominal extension height (high hip)	34	34¼	34½	34¾	35	35¼
Hip height	29¾	29¾	29¾	30	30¾	30¾
Crotch height	26¾	26¾	26¾	27	27½	27¼
Knee height	16	16¾	16¼	16¾	16½	16¾
Ankle height	2¾	2¾	2¾	2¾	2¾	2¾
WIDTH AND LENGTH MEASUREMENTS (inches)						
Cross-back width	12¼	12½	12¾	13¼	13¾	14¼
Cross-chest width	12	12½	12¾	12¾	12¾	13¼
Bust point to bust point	7	7¼	7½	7¾	8	8¼
Neck to bust point	8¾	8¾	9¼	9¾	10	10½
Scye depth	6¾	7	7¾	7¼	7¾	7¾
Armhole to waist	7¾	7¾	7¾	8	8¼	8¼
Waist to hips	7½	7¾	8	8¼	8½	8¾
Shoulder length	4¼	4½	4¾	4¾	4½	4¾
Shoulder slope (degrees)	23	23	23	23	23	23
Arm length, shoulder to wrist	21¾	21¾	21¾	21¾	22½	22½
Arm length, shoulder to elbow	12¼	12¾	12¾	12¾	12¾	12¾
Underarm length	15¾	15¾	15¾	15¾	15¾	15¾
Crotch length, total	25¾	26¾	27¾	27¾	28¾	29¾
Cervical to center front at waist	18¼	18¾	18¾	19¾	19½	20
Waist length, front	12¼	12½	12¾	13	13¼	13¾
Waist length, back	14¼	14½	14¾	15	15¼	15¾
WEIGHTS (pounds)						
Weight, approximate	100	108	118	130	141	155

¹ 1 inch equals 2.54 centimeters, 1 pound equals 0.45 kilograms.

TABLE 4. Misses¹

Size	6	8	10	12	14	16	18	20	22
GIRTH MEASUREMENTS (inches)									
Bust	31½	32½	33½	35	36½	38	40	42	44
Waist	22½	23½	24½	26	27½	29	31	33	35
Hip	33½	34½	35½	37	38½	40	42	44	46
Mid neck	13½	13¾	13¾	14	14¾	14¾	15¼	15¾	16¼
Armseye	13¾	14¼	14¾	15¼	15¾	16½	17¼	18	18¾
Abdominal extension (high hip)	29¾	30¾	31¾	33¾	34¾	36¼	38¾	40¾	42¾
Sitting spread	33½	34½	35½	37	38½	40	42	44	46
Thigh, maximum	18¾	19½	20¼	21¼	22¼	23¼	24½	25¾	27
Thigh, mid	17	17½	18	18¾	19½	20¼	21¼	22¼	23¼
Knee	12	12¾	12¾	13¼	13¾	14¼	14¾	15¼	15¾
Calf	11½	11¾	12¼	12¾	13¼	13¾	14¼	14¾	15¼
Ankle	8¾	8¾	8¾	8¾	9¾	9¾	9¾	9¾	10¾
Upper arm	9¾	9¾	10¾	10¾	10¾	11¼	11¾	12¾	13¾
Elbow	9¼	9¾	9¾	9¾	10	10¼	10¾	11	11¾
Wrist	5¼	5¾	5¾	5¾	5¾	5¾	6	6¼	6¼
Vertical trunk	55½	57	58½	60	61½	63	64½	66	67½
ARC MEASUREMENTS (inches)									
Bust, front	17¾	18½	19¼	20¼	21¼	22¼	23¾	25	26¾
Waist, front	11¾	12½	13¾	14	14¾	15¾	17	18¼	19¾
Abdominal, front (high hip)	15¾	16½	17¾	18	18¾	19¾	21	22¼	23¾
Hip, back	16¾	17¼	17¾	18¼	18¾	19½	20¼	21	21¾
VERTICAL MEASUREMENTS (inches)									
Stature (total height)	62½	63	63½	64	64½	65	65½	66	66½
Cervicale height	53½	54	54½	55	55½	56	56½	57	57½
Waist height	38¾	39¾	39¾	39¾	40¼	40¾	41	41¾	41¾
Abdominal extension height (high hip)	35¾	36	36¼	36½	36¾	37	37¼	37½	37¾
Hip height	31½	31¾	31¾	31¾	32	32¼	32¼	32¾	32¾
Crotch height	28¾	28¾	28¾	28¾	28¾	29	29¾	29¾	29¾
Knee height	16¾	17	17¼	17¼	17¾	17¾	17¾	17¾	17¾
Ankle height	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾
WIDTH AND LENGTH MEASUREMENTS (inches)									
Cross-back width	12	12¼	12½	12¾	13¼	13¾	14¾	14¾	15¾
Cross-chest width	11¾	12	12¾	12¾	12¾	12¾	13¼	13¾	14
Bust point to bust point	6¾	7	7¼	7½	7¾	8	8¼	8½	8¾
Neck to bust point	8½	8¾	9	9¾	9¾	10¼	10¾	11¼	11¾
Scye depth	7	7¾	7¼	7¾	7¾	7¾	7¾	7¾	8
Armseye to waist	8	8¾	8¼	8¾	8¾	8¾	8¾	8¾	9
Waist to hips	7¾	8	8¼	8½	8¾	9	9¼	9½	9¾
Shoulder length	4½	4¼	4½	4¾	4¾	4¾	4¾	4¾	4¾
Shoulder slope (degrees)	23	23	23	23	23	23	23	23	23
Arm length, shoulder to wrist	22½	22¾	23½	23¼	23¾	23¾	23¾	24	24½
Arm length, shoulder to elbow	13	13¾	13¼	13¾	13¾	13¾	13¾	13¾	14
Underarm length	16½	16¾	16½	16¾	16¾	16¾	16¾	17	17½
Crotch length, total	26¾	27¾	27¾	28¾	29¾	30¾	30¾	31¾	32¾
Cervicale to center front at waist	18¾	18¾	19¾	19¾	19¾	20¼	20¾	21¼	21¾
Waist length, front	12¾	13	13¼	13½	13¾	14	14¼	14½	14¾
Waist length, back	14¾	15	15¼	15½	15¾	16	16¼	16½	16¾
WEIGHTS (pounds)									
Weight, approximate	98	106	113	125	136	147	161	176	190

¹ 1 inch equals 2.54 centimeters, 1 pound equals 0.45 kilograms.

TABLE 5. Misses Talls¹

Size	10T	12T	14T	16T	18T	20T	22T
GIRTH MEASUREMENTS (inches)							
Bust	33½	35	36½	38	40	42	44
Waist	24½	26	27½	29	31	33	35
Hip	35½	37	38½	40	42	44	46
Mid neck	13½	14	14½	14¾	15¼	15¾	16¼
Armseye	14¾	15¾	16	16½	17¾	18¾	18¾
Abdominal extension (high hip)	31¾	33¾	34¾	36¾	38¾	40¾	42¾
Sitting spread	35½	37	38½	40	42	44	46
Thigh, maximum	20¾	21¼	22¼	23¼	24½	25¾	27
Thigh, mid	15	18¾	19½	20¼	21¼	22¼	23¼
Knee	12¾	13¼	13¾	14¼	14¾	15¼	15¾
Calf	12¾	12¾	13¼	13¾	14¼	14¾	15¼
Ankle	8¾	8¾	9¾	9¾	9¾	9¾	10¾
Upper arm	10¾	10¾	10¾	11¼	11¾	12¾	13¾
Elbow	9¾	9¾	10	10¼	10¾	11	11¾
Wrist	5½	5¾	5¾	5¾	6	6¼	6¼
Vertical trunk	61½	63	64½	66	67½	69	70½
ARC MEASUREMENTS (inches)							
Bust, front	19¼	20¼	21¼	22¼	23¾	25	26¾
Waist, front	13¾	14	14¾	15¾	17	18¼	19½
Abdominal, front (high hip)	17¾	18	18¾	19¾	21	22¼	23¾
Hip, back	17¾	18¼	18¾	19¼	20¼	21	21¾
VERTICAL MEASUREMENTS (inches)							
Stature (total height)	67½	68	68½	69	69½	70	70½
Cervicale height	58½	59	59½	60	60½	61	61½
Waist height	42½	42¾	43¼	43¾	44	44¾	44¾
Abdominal extension height (high hip)	39¼	39¼	39¾	40	40¼	40¾	40¾
Hip height	34¾	34¾	34¾	34¾	34¾	34¾	34¾
Crotch height	30¾	31	31¾	31¾	31¾	31¾	31¾
Knee height	18¾	18¾	19	19¼	19¼	19¾	19¾
Ankle height	3	3	3	3	3	3	3
WIDTH AND LENGTH MEASUREMENTS (inches)							
Cross-back width	12½	12¾	13¼	13¾	14¾	14¾	15¾
Cross-chest width	12¾	12¾	12¾	12¾	13¼	13¾	14
Bust point to bust point	7¼	7½	7¾	8	8¼	8½	8¾
Neck to bust point	9¼	9¾	10	10¾	10¾	11¾	11¾
Scye depth	7½	7¾	7¾	7¾	8	8¼	8¼
Armseye to waist	8¾	8¾	9	9¼	9¼	9¾	9¾
Waist to hips	8¾	9¼	9¾	9¾	9¾	10¾	10¾
Shoulder length	4½	4¾	4¾	4¾	4¾	4¾	4¾
Shoulder slope (degrees)	23	23	23	23	23	23	23
Arm length, shoulder to wrist	24½	24¾	24¾	25	25½	25¾	25¾
Arm length, shoulder to elbow	14	14¾	14¾	14¾	14¾	14¾	14¾
Underarm length	17¾	17¾	17¾	17¾	17¾	17¾	18
Crotch length, total	29¾	30¾	31¾	31¾	32¾	33¾	34¾
Cervicale to center front at waist	19¾	20¼	20¾	20¾	21¾	21¾	22¾
Waist length, front	14	14¼	14¾	14¾	15	15¼	15¾
Waist length, back	16	16¼	16¾	16¾	17	17¼	17¾
WEIGHTS (pounds)							
Weight, approximate	120	131	142	153	168	182	197

¹ 1 inch equals 2.54 centimeters, 1 pound equals 0.45 kilograms.

TABLE 6. Women's¹

Size	34	36	38	40	42	44	46	48	50	52
GIRTH MEASUREMENTS (inches)										
Bust	38	40	42	44	46	48	50	52	54	56
Waist	30	32	34	36½	39	41½	44	46½	49	51½
Hip	39	41	43	45	47	49	51	53	55	57
Mid neck	14½	15	15½	16	16½	17	17½	18	18½	19
Armscye	16¾	17½	18¾	19	19¾	20½	21¼	22	22¾	23½
Abdominal extension (high hip)	37	39	41	43¼	45½	47¾	50	52¼	54½	56¾
Sitting spread	39¼	41¼	43¼	45¼	47¼	49¼	51¼	53¼	55¼	57¼
Thigh, maximum	22½	23¾	25	26¾	27½	28¾	30	31¼	32¼	33¾
Thigh, mid	19¾	20¾	21¾	22¾	23¾	24¾	25¾	26¾	27¾	28¾
Knee	13¾	14¾	14¾	15½	15¾	16½	16¾	17½	17¾	18½
Calf	13¾	13¾	14¾	14¾	15½	15¾	16½	16¾	17½	17¾
Ankle	8¾	9¾	9¾	9¾	9¾	10½	10¾	10¾	10¾	11½
Upper arm	12	12¾	13¼	13¾	14½	15¼	15¾	16¾	17	17¾
Elbow	10¼	10¾	11	11¾	11¾	12½	12½	12¾	13¼	13¾
Wrist	5¾	5¾	6	6½	6¼	6¾	6½	6¾	6¾	6¾
Vertical trunk	62½	64	65½	67	68½	69¾	71	72¼	73½	74¾
ARC MEASUREMENTS (inches)										
Bust, front	21¾	23¼	24¾	26	27¾	28¾	30¾	31½	32¾	34¼
Waist, front	16¾	18	19¼	20¾	22¼	23¾	25¼	26¾	28¼	29¾
Abdominal, front (high hip)	19¾	21	22¼	23¾	25¼	26¾	28¼	29¾	31¼	32¾
Hip, back	19½	20¼	21	21¾	22½	23¼	24	24¾	25½	26¼
VERTICAL MEASUREMENTS (inches)										
Stature (total height)	64½	65	65½	66	66½	66½	66½	66½	66½	66½
Cervicale height	55½	56	56½	57	57½	57½	57½	57½	57½	57½
Waist height	40¾	40¾	41¾	41½	41¾	41¾	41¾	41¾	41¾	41¾
Abdominal extension height (high hip)	36¾	36½	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36¾
Hip height	32	32½	32¼	32¾	32½	32½	32½	32½	32½	32½
Crotch height	28¾	28¾	28¾	29	29½	29½	29½	29½	29½	29½
Knee height	17¾	17½	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾
Ankle height	3	3	3	3	3	3	3	3	3	3
WIDTH AND LENGTH MEASUREMENTS (inches)										
Cross-back width	13½	14	14½	15	15½	16	16½	17	17½	18
Cross-chest width	12½	12¾	13¼	13¾	14	14¾	14¾	15¼	15½	15¾
Bust point to bust point	8	8¼	8½	8¾	9	9¼	9½	9¾	10	10¼
Neck to bust point	10¾	11¾	11¾	12½	12¾	13½	13¾	14½	14¾	15½
Scye depth	7¾	8	8¾	8¼	8¾	8½	8¾	8¾	8¾	9
Armscye to waist	8¾	8¾	8¾	8½	8¾	8½	8¾	8¾	8¾	8
Waist to hips	8¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾
Shoulder length	4½	4¾	4¾	4½	4½	4½	4½	4½	4½	4½
Shoulder slope (degrees)	24	24	24	24	24	24	24	24	24	24
Arm length, shoulder to wrist	23½	23¾	23½	24½	24½	24½	24½	24½	24½	24½
Arm length, shoulder to elbow	13¾	13½	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾
Underarm length	16½	16¾	16½	16¾	16½	16½	16½	16½	16½	16½
Crotch length, total	30¾	31¾	32½	32¾	33¾	34	34¾	34¾	35¾	35½
Cervicale to center front at waist	19½	20	20½	21	21½	22	22½	23	23½	24
Waist length, front	13¾	13¾	14¾	14¾	14¾	14¾	15¼	15¾	15¾	15¾
Waist length, back	15¼	16	16¼	16½	16¾	16¾	16¾	16¾	16¾	16¾
WEIGHTS (pounds)										
Weight, approximate	144	159	173	189	204	219	233	248	262	277

¹ 1 inch equals 2.54 centimeters, 1 pound equals 0.45 kilograms.

TABLE 7. Half-Sizes¹

Size	12½	14½	16½	18½	20½	22½	24½	26½
GIRTH MEASUREMENTS (inches)								
Bust	36	38	40	42	44	46	48	50
Waist	28	30	32	34	36½	39	41½	44
Hip	37	39	41	43	45	47	49	51
Mid neck	14	14½	15	15½	16	16½	17	17½
Armhole	15¾	16¾	17¾	18	18¾	19½	20¾	21
Abdominal extension (high hip)	35	37	39	41	43¼	45½	47¾	50
Sitting spread	37¼	39¼	41¼	43¼	45¼	47¼	49¼	51¼
Thigh, maximum	21¼	22½	23¾	25	26¼	27½	28¾	30
Thigh, mid	18¾	19¾	20¾	21¾	22¾	23¾	24¾	25¾
Knee	13¾	13¾	14¾	14¾	15¾	15¾	16¾	16¾
Calf	12¾	13¾	13¾	14¾	14¾	15¾	15¾	16¾
Ankle	8¾	8¾	9¾	9¾	9¾	9¾	10¾	10¾
Upper arm	11¾	12	12¾	13¼	13¾	14½	15¾	15¾
Elbow	9¾	10¼	10¾	11	11¾	11¾	12¾	12¾
Wrist	5¾	5¾	5¾	6	6¼	6¼	6¾	6¾
Vertical trunk	58¾	60¼	61¾	63¼	64¾	66¼	67¾	69¼
ARC MEASUREMENTS (inches)								
Bust, front	20½	21¾	23¼	24¾	26	27¾	28¾	30¾
Waist, front	15½	16¾	18	19¼	20¾	22¼	23¾	25¾
Abdominal, front (high hip)	18½	19¾	21	22¼	23¾	25¼	26¾	28¾
Hip, back	18¾	19¾	20¾	21	21¾	22½	23¼	24
VERTICAL MEASUREMENTS (inches)								
Stature (total height)	60½	61	61½	62	62½	63	63½	64
Cervical height	51½	52	52½	53	53½	54	54½	55
Waist height	37¾	37¾	38¾	38¾	38¾	39¼	39¾	40
Abdominal extension height (high hip)	34¾	34¾	34¾	34¾	34¾	34¾	34¾	35
Hip height	29¾	30	30¾	30¾	30¾	30¾	30¾	30¾
Crotch height	26¾	26¾	26¾	27	27¾	27¾	27¾	27¾
Knee height	16¾	16¾	16¾	16¾	16¾	16¾	17	17¾
Ankle height	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾
WIDTH AND LENGTH MEASUREMENTS (inches)								
Cross-back width	13	13½	14	14½	15	15½	16	16½
Cross-chest width	12¾	12¾	12¾	13¼	13¾	14	14¾	14¾
Bust point to bust point	7¾	8	8¼	8¾	8¾	9	9¼	9¾
Neck to bust point	9¾	10¾	10¾	11¾	11¾	12¾	12¾	13¾
Scye depth	7½	7¾	7¾	7¾	8	8¾	8¾	8¾
Armhole to waist	7¾	7¾	7¾	7¾	7¾	8	8¾	8¾
Waist to hips	8	8¼	8½	8¾	9	9¼	9½	9¾
Shoulder length	4¼	4½	4¾	4¾	4¾	4¾	4¾	4¾
Shoulder slope (degrees)	24	24	24	24	24	24	24	24
Arm length, shoulder to wrist	21¾	22½	22¾	22¾	22¾	22¾	23	23½
Arm length, shoulder to elbow	12½	12¾	12¾	12¾	13	13¾	13¾	13¾
Underarm length	15½	15¾	15¾	15¾	15¾	15¾	15¾	15¾
Crotch length, total	29¾	30¾	30¾	31¾	32¾	33¾	33¾	34¾
Cervical to center front at waist	18½	19	19½	20	20½	21	21½	22
Waist length, front	12¾	13	13¼	13½	13¾	14	14¼	14½
Waist length, back	14¾	14¾	15¾	15¾	15¾	15¾	16¾	16¾
WEIGHTS (pounds)								
Weight, approximate	123	138	153	167	183	198	214	229

¹ 1 inch equals 2.54 centimeters, 1 pound equals 0.45 kilograms.

APPENDIX: D
Permission to Use



Herrick Hall
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Bozeman, MT 59717-0354

Telephone 406-994-3241

August 9, 1991

Penney Wiley
405 Jefferson
Belgrade, Montana

Dear Penney,

Permission is granted to use an adapted form of Figure 1.1, Diagram of steps within the production of an apparel item, found in my doctoral dissertation dated 1982.

Sincerely,

A handwritten signature in cursive script, which appears to read 'Carol Salusso-Deonier', is written over the typed name.

Carol J. Salusso-Deonier, Ph.D.
Assistant Professor of Textiles and Clothing

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