

THE DESIGN AND EVALUATION OF SELECTED
FASHIONABLE GARMENTS FOR A
PARAPLEGIC TEEN AGE GIRL

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PREFACE

This study deals with the design, construction and evaluation of one pair of slacks and two blouses for a paraplegic teen age girl. These garments were to be comfortable, to have self-help features, to cover or camouflage conspicuous features, and to be considered fashionable by the wearer.

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CHAPTER I

INTRODUCTION

As the number of handicapped persons increases so does the need for clothing designed especially for them. A handicapped person can develop independence by being able to dress himself through special clothing and rehabilitation.

Studies have shown a need for fashionable, comfortable, and easy to manipulate clothing. Usually each handicapped person has a unique handicap or a unique combination of handicaps, so that no one style will be suitable for all handicapped persons.

This study was conducted to yield insight into the design of fashionable, comfortable and easy to manipulate garments for a paraplegic teen age girl.

Problem

The purpose of this study was to design, construct, and evaluate one pair of slacks and two different blouses for a teen age girl with spina bifida.

Objectives

Specific objectives of the study were:

To develop patterns for a pair of slacks and two blouses, and to construct those garments using a fashion fabric for a teen age girl

with spina bifida which

- (1) are comfortable,
- (2) have self-help features,
- (3) cover or camouflage the handicap or conspicuous features, and
- (4) are considered fashionable by the wearer.

To determine the garment wearability through wear and evaluation by the participant.

To make recommendations for modifications or changes in the design and/or construction of the three garments.

Assumptions

The following assumptions were basic to the study:

Attractive, comfortable clothing can be developed for physically handicapped teen age girls.

Clothing can be designed to cover or minimize a handicap or deformity.

Self-help features can assist a physically handicapped girl to dress herself.

A teen age girl can evaluate accurately and completely the three garments.

Limitations

The study was limited in the following ways:

Only three garments were designed.

Garments were designed for a specified teen age girl with spina bifida.

Fabrics used were limited to those which were appropriate for

summer wear and which could be laundered easily.

The garment designs were limited to what was considered fashionable by the teen age girl.

Definition of Terms

Fashionable--Conforming to the current style (Morris, 1970).

Paraplegia--The paralysis of the lower half of the body, including both legs (Morris, 1970).

Physical handicap--Limited use and movement of a part of the body due to neuro-muscular or orthopedic malfunctions or impairments (Rice, 1971).

Rehabilitation--To restore to useful life through education and therapy (Morris, 1970).

Spina bifida--A developmental anomaly characterized by a defect in the bony encasement of the spinal cord (Agnew et al., 1965).

Therapy--The treatment of illness or disability (Morris, 1970).

Description of Subject

The participant in this study was a fifteen year old girl who had spina bifida. She was a paraplegic and was, therefore, wheelchair bound. The participant had a limited arm movement range making it impossible to fasten garments with back closures. During the period of the study she was involved in school and therapy at Children's Convalescent Hospital in Bethany, Oklahoma.

CHAPTER II

REVIEW OF LITERATURE

In 1974 there were 29,292,000 persons in the United States with conditions which resulted in activity limitation. Of these 29 million approximately 15 million were female. (U. S. Department of Commerce, 1976). Every year injuries and birth defects add to the number of handicapped persons. Every age can be affected, from the infant with a birth defect to the elderly person suffering from the diseases of the aged.

Limited research has been conducted in the area of clothing for the physically handicapped, and much of that research was conducted prior to 1970. Fashions in clothing change continually and physically handicapped persons have as much desire to be fashionable as non-handicapped persons (Newton, 1973).

Rehabilitation Process as It Relates to Clothing

Rehabilitation is the process of restoring a handicapped person to a useful life (Morris, 1970). This involves the entire person, both his physical and his psychological being. Rehabilitation can not be considered complete until both the physical and psychological needs are met (Hallenbeck, 1966). Fashion therapy, which may be a part of the rehabilitation program, improves the psychological state of a physically

handicapped person by keeping him in style with fashionable clothing (Thompson, 1962).

The handicapped person may find psychological problems more difficult to overcome than physical problems. The handicapped person may experience inferiority, loss of worth or shame as a result of the handicap. A negative self concept tends to cause a lack of initiative, drive, effort, and acceptance of the disability (Talon Corporation). Clothing that is comfortable and attractive will help the handicapped person feel good about himself (Ater, 1964). Since appearance is a symbol of self, clothing and personal grooming are more important in making first impressions than is the physical handicap (Talon Corporation).

Research has been conducted to determine how handicapped persons rate the importance of clothing. Within a group composed of only handicapped persons, clothing importance was rated lower by males than by females. Also married persons rated clothing importance lower than did unmarried persons (Friend, 1970).

"To help the handicapped cope with their physical restrictions and at the same time to provide them with attractive styles they can enjoy . . ." was a challenge presented by Newton (1973, p. 29). Special clothing has for some time been recognized as important in the rehabilitation process (May, Waggoner, and Hotte, 1964). Special clothing needs of the physically handicapped are self-help features for dressing, elimination of fabric strain, and comfort (Hallenbeck, 1966).

Self-help clothing is needed to enable a handicapped person to achieve independence (Boettke, 1963). "Self-help features are those features that make dressing easier for the handicapped individual"

(Sullivan, 1972, p. 1). Full length center-front openings are essential in self-help styles. Fullness in the bodice or blouse helps prevent tearing out at the armholes or riding up in the back (Hallenbeck, 1966).

Clothing for the handicapped should not be recognized as something different from ordinary clothing but should be as similar as possible. If a person looks his best, the visual effect of the disability is minimized. Clothing of a fashionable design will help minimize a disability (Schwab and Sindelar, 1973).

Research on Clothing for the Handicapped

Parental efforts were begun as early as 1930 to make simple clothing adaptations for their physically handicapped children (Schwab and Sindelar, 1973). Increased attention was directed toward the problem during the 1950's with Cookman's development of functional fashions (1961). By 1960 the fashion trend concerning clothing for the handicapped emphasized individual attraction and detracting from the handicap. Handicapped clothing research has led to adaptation of the results by several commercial pattern companies (Schwab and Sindelar, 1973).

Research on Self-help Alterations

McGuire (1970) constructed garments for girls three to twelve years old who had cerebral palsy. The eight garments had self-help features which she had identified from her review of pertinent literature and a wrap-around style. The design features were evaluated through a wear test which indicated that the features did help these

girls in dressing themselves.

Zaccagnini (1970) used teaching boards to instruct a physically handicapped child in how to use various fasteners. The fasteners used were Velcro, a large zipper, and a gold clasp with an oval ring. The fasteners with which the child had the least trouble were used to replace buttons on knit tops. Zaccagnini concluded that the child in this study could be aided by the substitution of Velcro for buttons on ready-made garments.

Siefert (1972) investigated ways to increase dressing skills for selected physically and mentally disabled girls. She used board training mechanisms and self-help dresses for each girl. The four types of fasteners used in the study were Velcro, a one and five-eighths inch flat button, a three-quarter inch half ball button, and gripper snaps on cotton tape. The girls were given a pre-test which indicated with what type of fasteners they should start working. As the girls' abilities developed more difficult fasteners were used. At the end of ten weeks a post-test was given to check the amount of progress each girl had made.

Research on Special Designs

One of the earliest research studies reported was conducted by Taylor in 1960. She determined design features needed by handicapped girls between the ages of five and twelve years who used braces, crutches and wheelchairs. The design features that she determined were incorporated into a coat and four dresses. The garments were modeled by handicapped girls and subjectively evaluated by persons viewing the show.

Frescura (1963) designed three dresses: a middy dress, a coat-style dress, and a two-piece dress. Two dresses were constructed from each design, each of which was worn by two handicapped girls. Among the twelve girls who wore the six garments there was a multiplicity of handicaps and appliances used ranging from braces and crutches to wheelchairs. After the dresses were worn they were evaluated by one mother or foster mother, by two occupational therapists, and by Helen Cookman, the designer who originated Functional Fashion.

The middy dress was found to be a good design because it allowed for ease in dressing, was comfortable, covered medical aids, and allowed adequate room for movements and growth. Most of the problems with this garment involved the dickey, as it had a tendency to catch on the hands and chins of the girls as they were dressing.

The coat-dress was not a particularly good style for the girls because it came open in front while the girls were playing. The wrap-around style of the coat dress did not allow for ease in dressing, however it did provide adequate room for movement.

The two-piece dress was an attractive design for some girls but it was not suitable for others. The adjustable waistband was found to be an advantage when sitting or standing. The unpressed pleats were not attractive over a pelvic band but were attractive on girls with very small bodies from the waist down. The blouses which had large neck openings did not flatter some girls but neither did they bind. The raglan sleeves with bias gussets contributed to the garment comfort. The cotton plaid fabric for the garments did not withstand wear caused by the braces.

Rice (1971) developed an instruction pamphlet on how to alter patterns for garments to be worn by handicapped women. The instructions were tested by handicapped women who constructed garments using alterations from the pamphlet. All of the women were able to follow the instruction pamphlet, and then wore the garments to check for fit. All alterations used were satisfactory in the wear test.

Sullivan (1972) conducted a study on clothing problems of pre-teen age girls handicapped by spina bifida. Fit and back fastenings were found to be two major problems. A smock and slack ensemble adapted through the use of a pattern which had been altered to fit properly was found to be preferred. This study was concerned with fit and self-help features but not with fashion.

Dedmon (1974) used a questionnaire to determine clothing problems of persons who used a Milwaukee brace. Ready-to-wear garments were found to be unsuitable for use with the brace. A garment was developed to be worn over a Milwaukee brace utilizing the results of the questionnaire.

Evaluation of Clothing for the Handicapped

Dallas (1965) interviewed twenty-four girls with cerebral palsy and twenty-four non-handicapped girls. From her interview she determined the features most worn and most preferred by both the non-handicapped girls and by the girls with cerebral palsy which were:

Shirt-waist style, one piece dresses with round necklines, buttoned closures, set-in belts, and action pleats in the bodice back were features worn by the greatest number of girls in both groups. (p. 112)

Composite sketches were made for two garments. One composite depicted

a garment including features worn most often by the girls with cerebral palsy while the other one depicted a garment including features worn most often by the non-handicapped girls. Two garments were then designed which incorporated features desired by both handicapped and non-handicapped girls which could be worn by girls in either group. The garments were only sketched and were not constructed as a part of the research.

Smiley (1971) constructed and tested an instrument with which "to measure degrees of feeling of clothing perceptions of early adolescents as they involved the clothing configuration phenomena" (p. 60). She found no difference in the attitudes of handicapped girls and of non-handicapped girls with respect to age and school system.

Johnson (1972) obtained data, through a questionnaire, from fourteen mothers of three to six year old children who had upper extremity disabilities. Johnson determined from the data that attractive and comfortable clothing could and should be made for the disabled child. To further show that this was feasible she constructed one garment for each of four selected handicapped children. After a wear study was completed it was determined that the garment design project was successful.

Research pertaining to clothing for the handicapped can also be applied to elderly women. Schuster (1973) identified specific functional and aesthetic clothing needs of physically handicapped elderly women. The preferred style features which she identified were:

Shift dresses, one-piece dresses, jewel necklines, convertible collars, above-elbow sleeves, raglan sleeves, straight-hem sleeve finishes, A-line skirts, beltless dresses, zipper fasteners, center-front closures from neck to hem, action pleats in back bodice, fabrics made

of fiber blends, knit fabrics, floral fabric designs, and pink or red fabric colors. (p. 54)

Schuster (1973) concluded that there was a need for "specially designed clothing for physically handicapped elderly women" (p. 55). Dresses for elderly women could be designed by combining certain style features that are appropriate for many types of handicaps.

Jordan (1971) collected information concerning parental satisfaction and dissatisfaction in the garment design attributes of clothing for their physically handicapped children. Most of the thirty parents used in the study were satisfied with the garments worn by their children. Parental responses were influenced by the price of the garment, the individual needs of the child, the durability of the garment and the severity of the handicap. Jordan concluded that "more research is needed to determine the types and characteristics of garments considered most satisfactory by handicapped individuals" (p. 43).

Williams (1975) identified clothing problems of physically handicapped men. The major problems identified were improper fit, difficulty in manipulating the fasteners, and lack of ease in dressing. Garments which caused the most problems were slacks, shirts, suits and shoes.

Bright (1974) explored the concepts held by therapists about the use of functional clothing. An instrument was designed to test "the therapists' awareness and knowledge of functional clothing and their feelings about functional clothing's contribution to the enhancement of one's self-concept" (p. 55). Information and results collected from sixty-five physical and occupational therapists disclosed that the

therapists were "generally unpressed with functional clothing and its contribution to the rehabilitation of handicapped persons" (p. 55).

The reason that they were unpressed was that they were uninformed about functional clothing. It was recommended that steps be taken to adequately inform the therapists.

Desirable and Undesirable

Clothing Features

Although there is a limited amount of research on clothing for the handicapped, research has yielded both desirable and undesirable clothing features.

Desirable Features

Easy-on, easy-off features are needed not only to make the handicapped individual more independent but also for safety. If the garment catches fire the person needs to be able to remove it quickly. Features that make a garment easy-on, easy-off are large openings, ample cut in fitted areas such as armholes and waistlines and easy-to-reach and easy-to-manipulate fasteners (May, Waggoner, and Bottke, 1968). Over-the-head designs with no fasteners are good for persons who have free shoulder and arm movements but who lack finger coordination (Ater, 1964). Raglan or kimono sleeves with a diamond or oval gusset add to the ease of dressing and undressing (Barton, 1972).

Fit is of top priority for any garment. When working with the physically handicapped, disproportionate measurements are the rule rather than the exception making it impossible for a garment in a standardized size to fit the person. A clothing designer for the

handicapped must have detailed and accurate measurements of the person or must be able to have the person present during the fitting process. The designer must also know the individual's particular needs or combinations of needs (Hallenbeck, 1966).

Undesirable Features

A handicapped person's problems are compounded if he dislikes or has difficulties with his clothing. According to Boettke (1963), clothing problems may stem from physical disabilities such as lack of hand or arm control, paralysis of one or both legs, lack of arm muscle power, use of only one hand, general body weakness, and body deformities. Problems may also result from the garment. Garments which are hard to put on, do not wear well, or do not fit well may cause greater problems than those caused by the physical disability. Boettke found that the most difficult items of apparel to put on were "shoes and socks, slacks, shorts and overalls, underwear, pajamas, snowsuits, mittens and gloves, jackets and coats, and bathing suits" (p. 640).

A piece of clothing may be disliked because it has no room for physical aids, no easy-on or easy-off features, or no provision for disguising or covering up abnormalities (Boettke, 1963). Loose sleeves, dangling ties, belts, scarves, or excessively long skirts will be a hindrance to the handicapped person, therefore garments with these features are usually disliked (May et al., 1968). Knit fabrics tend to catch, cling and snag making these garments no longer desirable for wear (Talon Corporation).

Features of Individual Garments for the Handicapped

Features have been identified which make dressing and undressing much easier for the handicapped person. Some features apply to several garments and others to only one garment.

Slacks

Some handicapped women prefer wearing slacks because they are warm and will cover braces, other medical appliances, and body deformities (Barton, 1972). Slacks should have easy-on, easy-off features and adequate fullness (May et al., 1968; Barton, 1972). Easy-on, easy-off features for slacks include Velcro in the fly, Velcro in the side leg seams, zippers in the side leg seams, and a separating zipper in the crotch seam (Lowman and Klinger, 1969; Shipley and Rosencranz, 1959; May et al., 1968). Slacks which have been lined or reinforced will prevent excessive fabric wear (Talon Corporation). Knit slacks should never be worn with braces as the fabric can catch and cling (May et al., 1969). Slacks made like an apron will aid the handicapped in independent toileting. These slacks are designed with a waistband that ties in the back and have no seat. Drop seat slacks, made by placing zippers on each upper side seam, will aid in much the same way (Smith, 1965).

Slacks for the wheelchair bound person need to have a high crotch, long back rise, short front rise, and plenty of width at the knee (Hallenbeck, 1966; Barton, 1972). The back crotch seam needs to be approximately four inches longer than it would be normally (Talon

Corporation). Half-hitch pockets in slacks are easier to use than are set-in pockets for the seated person (Hallenbeck, 1966).

Slacks for children may need special features that are not required for adults. Children who must be lifted to and from a seated position will need slacks with strong belt loops which can be used as an aid in the lifting process. Suspender pants or overalls tend to stay up better for children than slacks (May et al., 1968).

Blouses and Shirts

Blouses or shirts are frequently worn by handicapped people, female or male, young or old. Over-blouse styles will cover irregularities for either sex. Persons with meromelia arms may require an extra piece of fabric inserted into the armhole to fill in the excess room left by the tiny arm. Sleeves in shirts or blouses should have roomy armholes but need to be cut high under the arm for those who use crutches (May et al., 1968). Short sleeves are desirable as they do not interfere with the use of ambulatory aids (Lowman and Klinger, 1969).

To increase the wear life of a blouse or shirt when crutches are used, patches at points of strain may be applied. The garment may be lined, seam tape can reinforce the underarm seam, and/or knit or stretch fabric can be used (Talon Corporation). The armhole must fit closely and bulk must be eliminated if axillary crutches are used (Barton, 1972). When long sleeves are preferred a loop may be sewn inside the lower edge of the sleeve to slide the thumb through while putting on a coat thereby holding the sleeve down. When there is a limited arm movement range a shirt or blouse may have Velcro inserted

into the side seams to aid in dressing (Lowman and Klinger, 1969).

Dresses and Separates

Separates are usually more comfortable than one piece garments for those with braces because the part of the garment affected by the brace may be made of a heavier fabric. Damage caused by a brace can be more readily repaired by replacing a part of the outfit when separates are worn (Shipley and Rosencranz, 1959). Separates may also fit better and are easier to wear for the person in a wheelchair (Newton, 1973).

Dresses designed for persons with handicaps involving hands or fingers are sometimes easier to put on and take off than are separates (Shipley and Rosencranz, 1959).

Depending on the handicap and the woman's abilities, most women will find either a skirt which opens all the way down the front or a wrap-around skirt which may wrap front or back the easiest for dressing (Lowman and Klinger, 1969). If a skirt has a side zipper rather than a front opening, the zipper should be opposite the strongest hand (May et al., 1968). A non-wrap-around skirt may be split in the back and have a snap sewn to each corner so that it may be snapped across the lap for personal care (Scott, 1968).

The fullness of a skirt should be related to the needs of the woman. Adequate room in the hipline of a skirt will allow for long leg braces, a pelvic band, or a colostomy bag (Lawton, 1963). Skirts with front fullness allow for graceful sitting (Hallenbeck, 1966). Gored skirts are best for those who use crutches (Barton, 1972). The best over all type seems to be a moderately full skirt (Shipley and Rosencranz, 1959). The skirt must allow adequate room for movement;

however, overly full garments may catch in the wheels of wheelchairs (Talon Corporation).

For the woman who prefers dresses, a wrap-around or a front zipper design will make dressing easier. Plenty of ease is needed in the bodice of a dress (May et al., 1968). Golf dresses provide a great deal of ease since they are designed for the active woman, and may be used effectively for the handicapped (Lowman and Klinger, 1969). Kimono sleeves in dresses do not cling to skin made moist from perspiration which may be a major problem for some women (Shipley and Rosencranz, 1959).

Underwear

Underwear is the most basic of all garments and many times it presents the most difficulty during dressing. Back fasteners and tight pull-on garments are especially difficult for the handicapped.

Incontinency is probably the most embarrassing problem for the handicapped. Rubberized cotton pants can be used for this problem. A drop front in pants may be convenient as absorbent pads can then be changed without removing the pants (Lawton, 1963).

Many handicapped women need brassieres which do not fasten in the back. Several types of brassieres may be purchased such as front zippered long line brassieres, wrap-around brassieres, completely flexible stretch brassieres which have no fasteners. Any of these brassiere types will eliminate back fastening problems for the handicapped women (Lowman and Klinger, 1969). Several methods of fastening the brassiere may be used to replace or aid in the fastening of hooks for those with hand involvement in the handicap. Velcro may be used

on the wrap-around brassieres (May, et al., 1968). A regular front closing brassiere may have loops added to each side at the opening through which the woman may insert her fingers and pull the hooks and eyes together. Another method of fastening which may be done with one hand is by the use of a loop of small round elastic. The eyes of the brassiere are replaced with hooks. The loop of elastic is then clamped in place with one of the top hooks, and the brassiere may then be laced together with the loop (Lowman and Klinger, 1969).

Some women who wear dresses or skirts will also want to wear a slip. Bra-slips help simplify the dressing process through the elimination of garments. Bra-slips may be a pull-on style or they may have a front zipper design. A front zipper may also be added to a regular slip to make dressing easier. If a woman likes wrap-around dresses or skirts she may also like wrap-around slips which have the same advantages for dressing and undressing as does wrap-around outer clothing. For incontinent women, slips with terry cloth in the back may be desirable (Lowman and Klinger, 1969).

Wheelchair bound women may find panties an especially difficult garment to wear with regard to comfort. Panties may have an extended crotch which can be raised or lowered while seated. If the woman must slide to and from a wheelchair, long leg panties of a slippery fabric will aid in the transfer. Seamless seated panties will add to a person's comfort when seated for long periods of time (Lowman and Klinger, 1969).

Men may find boxer shorts preferable to jockey styles for a number of reasons. If braces are worn boxer shorts will slip over them more easily than other styles. Mid-length shorts are better than

a jockey style as they will protect the legs if sliding transfers are used and also because they do not ride up as much (Lowman and Klinger, 1969).

Wraps

A low activity level may cause a handicapped person to feel the cold more than a non-handicapped person. Overlapping styles and layered clothing provide extra warmth, but jackets and coats will be needed outside in cold climates (Newton, 1973). Short coats or jackets are best for the person in a wheelchair (May et al., 1968). If Lofstrand crutches are used coat sleeves can be slashed to provide allowance for the arm piece. Coats with cape sleeves will make use of crutches easier (Lowman and Klinger, 1969).

Accessories

No fashionable garment or appearance is complete without accessories. Men who have trouble tying a tie can have the back of a tied tie cut and elastic or Velcro added so that the tie may be slipped over the head (Barton, 1972; Boettke, 1963). Belts may be buckled, cut under the overlay, and fastened with Velcro. Purses can also be adapted for easier opening by replacing fasteners with Velcro (Lowman and Klinger, 1969). Gloves with leather palms may be worn to aid in holding onto things or propelling a wheelchair (Lawton, 1963). Lap robes may serve as an accessory as well as providing added warmth. Lap robes for persons in wheelchairs should be fitted so that they cover the back of legs, are smooth in appearance and do not catch in the wheels (Barton, 1972).

Closures and Fasteners

Fastener problems occur with jackets, coats, shoes, shirts, blouses, slacks, shorts, overalls, sweaters, and snow suits (Boettke, 1963). A change of fastener type may help solve this problem. Fasteners which may be easier to use are zippers, buttons, magnetic fasteners, Velcro, hooks and eyes, and grippers. Zippers should have large tabs or pull rings (May et al., 1968). Zippers may be added to the front of a garment (Ater, 1964). Buttons must be large, be attached loosely, and be flat and smooth. Facings under buttonholes should be stitched to prevent interference in buttoning (Lowman and Klinger, 1969). Very little skill or force is needed to use magnetic fasteners. Little finger dexterity is needed to operate Velcro, but it does not launder as easily as some other fasteners (May et al., 1968). Velcro may be used to replace buttons, zippers, or ties (Barton, 1972; Lowman and Klinger, 1969). Velcro may also be placed in seams to open garments where they do not normally open. Large, bar-type hooks and eyes are much easier to use than small ones (May et al., 1968). Hooks are easier to fasten if there is a sturdy backing behind them (Lowman and Klinger, 1969). Grippers tend to create problems in fastening because much pressure is required to close them, but they do open easily (May et al., 1968). Snaps are easier for some persons to use than are small buttons (Lawton, 1963). Problems with underwear fastenings may be solved by replacing hooks and eyes with Velcro, using front opening brassieres, having four zippers on girdles and using step-into slippers. Some fastening problems can be avoided by using expandable neck openings and no fasteners (May et al., 1968).

Summary

Physically handicapped persons in the United States account for almost 30 million of the people that must be clothed. Well designed clothing can be used as a tool for rehabilitation. Since rehabilitation is both physical and psychological, clothing can be used to improve one's self concept. A person's feeling about himself can be diminished by his inability to dress and undress himself.

Research on clothing for the physically handicapped was not evident until around 1930. During the twenty years between 1950 and 1970 many adaptations were identified to assist in providing clothing for the physically handicapped.

Clothing that does not fit or that has not been adapted for the person's specific handicap may be disliked and uncomfortable. Loose or dangling parts of a garment will be a hindrance to the person. A garment can be adapted with the use of action pleats, tucks, or gussets. Easy-on, easy-off features and proper fit will make a garment appealing to a handicapped person.

Research has shown that individual handicaps create problems peculiar to that specific handicap. A handicapped person usually has a combination of problems which create clothing needs unique to his handicap.

More research has been conducted on comfort and wearability than on the attractiveness of clothing for the handicapped. Because of the importance of clothing to the development of a positive self concept, research in this area is needed.

CHAPTER III

METHODS AND PROCEDURE

The purpose of the study was to design, construct, and evaluate one pair of slacks and two different blouses for a physically handicapped teen age girl. The garments were to be designed in such a way that they were comfortable and were considered fashionable by the wearer. Other requirements of the design were self-help features for ease in dressing and camouflage features to cover or minimize deformities.

Selection of the Participant

Children's Convalescent Hospital in Bethany, Oklahoma was selected because of the administrators' willingness to allow the researcher to work with children in the institution. At the time of the study only one teen age girl a paraplegic as a result of spina bifida was living there. Most of her time was spent in a wheelchair but on occasion she did some crutch walking in physical therapy. A colostomy bag and a leg urinal were also used. She was over weight and disproportionate in body features.

The administrators decided that the girl was mature enough to be able to make the decision to participate in the study. During the first meeting, the researcher and the participant discussed exactly what the study would include and the responsibilities involved. The

participant was very excited about having some new clothes, particularly some clothes designed especially for her. She agreed to select designs which she felt were fashionable, to wear the garments, to complete the garment evaluation forms, and to participate in interviews after wearing the garments.

Body Measurements

At the second meeting with the subject thirty-two measurements of her body were taken. Individual measurements were made where needed for right and left side. Specific areas to be measured were determined after a study of three references: (1) How to take measurements for Family Circle's custom-made patterns (Family Circle, May 1972), (2) Principles for Creating Clothing (Warden, Golding and Stam, 1969), and (3) measurement chart for men's clothing devised by a graduate student (Appendix A). The chart of the measurements taken is shown in Appendix B.

Selection of Patterns

One objective of the study was to design garments which the participant judged to be fashionable for herself. During the first meeting the participant had indicated that blue jeans and blouses were currently the most fashionable garments for teen agers. During the second meeting she was shown commercial pattern pamphlets from various commercial pattern companies and a design notebook which had been developed earlier by the researcher. From these sources a basic idea of her likes and dislikes was formulated. During the third meeting specific designs were presented from which she selected two blouses.

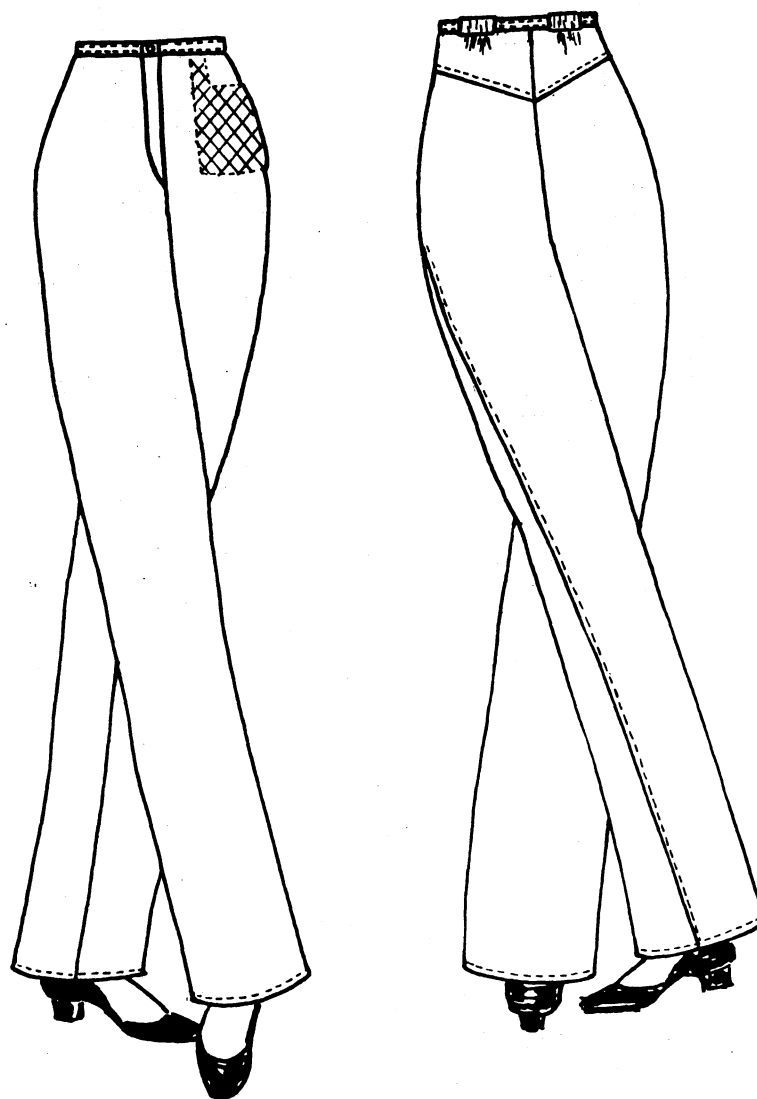
The girl suggested that the researcher selected a pattern for the blue jeans that would "look like boy's blue jeans." The blouse patterns selected were McCall's 4821 (blouse 1) and McCall's 5115 (blouse 2). The researcher selected Simplicity 7185 pattern for the jeans.

Alteration of Patterns

From the participant's measurements the researcher determined that a size twenty-two pattern would be needed. The largest jeans pattern available was a size twenty, and the largest pattern available for one of the blouses was a size sixteen. For the other blouse a medium size was the largest available. Each pattern was increased in size to a twenty-two by using a cut and spread method according to the technique described in Grading Techniques for Modern Design (Price and Zamkoff, 1974). Additional alterations were made to the jeans and to one of the blouses to accommodate specific problems of the girl.

The jeans pattern (Figure 1) had set-in front pockets which were omitted. To balance the bulge created by the colostomy bag worn on the right side, a pocket of woven strips of denim was added to the left front of the jeans. Elastic inserts were added to the side back of the waistband for comfort and to allow the waistband to adjust to the body when crutch walking was done in therapy.

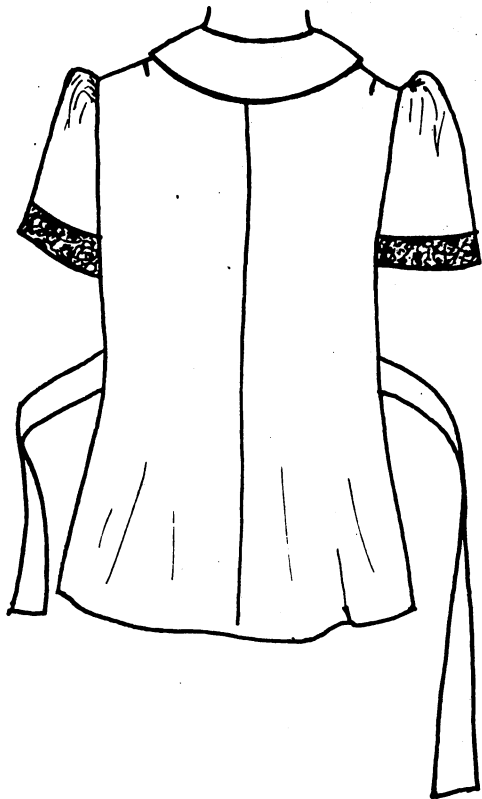
Blouse 1 (Figure 2) was designed with a four inch long center front seam above the midriff which was trimmed with lace and buttons. For ease in dressing the seam was converted to a slit with lace sewn along each side and buttoned with elastic loops. The original blouse was designed with a tie in the center back. This was changed to tie on the left side so that it would not cause discomfort when the



Jeans Front View

Jeans Back View

Figure 1. Jeans for a Paraplegic
Teen Age Girl



Blouse 1 Back View



Blouse 1 Front View

Figure 2. Blouse 1 for a Paraplegic Teen Age Girl

participant was seated in the wheelchair. The new tie position also allowed for ease in tying. Hidden pleats were added under the arm in the armscye seam following a method proposed by Rice (1971). The exact pleat pattern designed by Rice could not be made to fit this particular design so a different shaped pleat was devised. The new pleat consisted of a bias strip one and one-fourth inches wide and seven inches long sewn into the armscye seam. The purpose of the pleat was to allow for added ease for moving the arms. Blouse 2 (Figure 3) required no further alteration after it was enlarged.

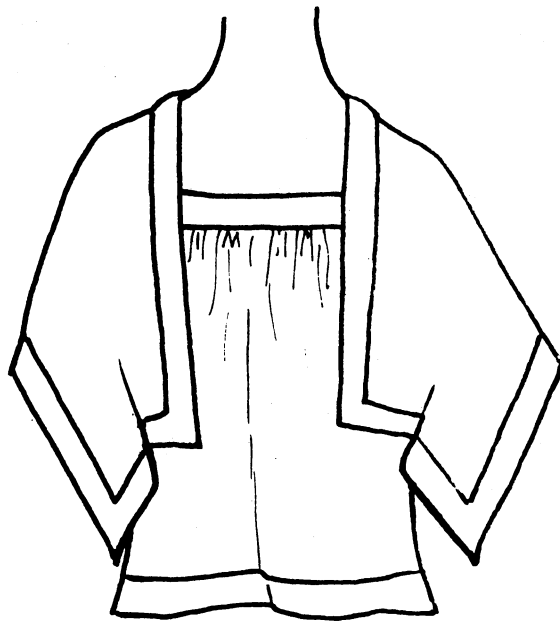
Construction and Fitting of Muslin Samples

After all the pattern alterations had been made, the three garments were constructed in unbleached muslin and fitted on a dress form which had been adjusted to the girl's measurements. After the blouses had been properly fitted to the dress form and the jeans had been constructed, the garments were fitted on the participant.

The jeans did not fit the participant. The waistline and the hipline were too large and the length was too short. The jeans pattern was decreased to a size twenty pattern in the hip area while the waist was slightly decreased. Five inches were added to the jeans length.

Blouse 1 fit the participant but the neckline was too low for the desired degree of modesty. The only alteration made raised the neckline at the center front one inch and added one button.

Blouse 2 was a perfect fit on the dress form and on the participant. This blouse, however, was not suitable for wear because the flowing sleeves caught in the wheels of her wheelchair. McCall's 5084



Blouse 2

Figure 3. Blouse 2 for a Paraplegic
Teen Age Girl

blouse pattern (blouse 3), shown in Figure 4, was selected to replace this blouse. The pattern was enlarged from a size sixteen to a size twenty-two using the same enlargement as was used for the other three patterns.

Construction of Garments

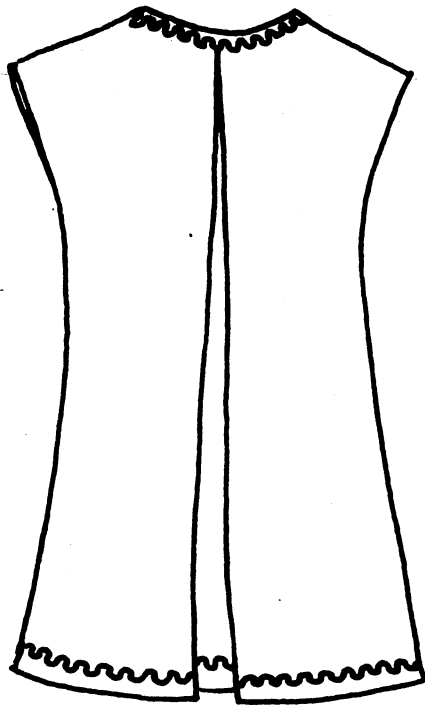
After the final alterations had been made to the patterns, the garments were constructed of fashion fabric. The jeans were made of a heavy cotton blue denim fabric. Gold stitching, a heavy jean zipper, a gold gripper snap and navy blue waistband elastic were used in the construction. The total cost of the jeans was eight dollars and eighty-three cents.

Blouse 1 was made of off-white India gauze trimmed with off-white lace and off-white ball buttons. Cost of this blouse was twelve dollars and fourteen cents.

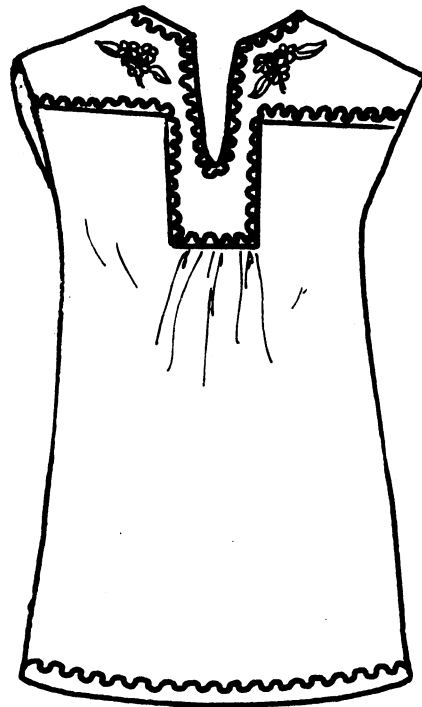
Blue chambray was used for blouse 3. It was trimmed in medium size lemon-yellow rick rack and iron-on embroidery of light blue flowers with green stems and lemon-yellow centers. In fitting the blouse to the dress form during construction it was discovered that there was not enough ease across the shoulders. A five inch inverted pleat was added to the center back from the neckline to the hem. The cost of blouse 3 was six dollars and thirty-three cents.

Data Collection

When the garments had been completed they were delivered to the participant together with the garment evaluation forms. At the end of each of the next two months additional evaluation forms for each



Blouse 3 Back View



Blouse 3 Front View

Figure 4. Blouse 3 for a Paraplegic Teen Age Girl

garment were delivered. Garment evaluation forms were to be collected at the end of each month for three months, and at that time the questions on the interview schedule were asked about each of the three garments. Results of the evaluation are presented in Chapter Four.

CHAPTER IV

EVALUATION OF GARMENTS

The purpose of the study was to design, construct, and evaluate one pair of slacks and two different blouses for a teen age girl physically handicapped as a result of spina bifida. The three garments were evaluated over a three month period.

Method of Garment Evaluation

A garment evaluation form (Appendix C) was developed by the researcher. The participant was asked to keep a record of the dates and the hours worn, and the number of times washed for each garment. The activities in which the participant participated while the garment was worn were also to have been recorded by means of a checklist which indicated physical therapy, occupational therapy, prolonged sitting, school, recreation (type to be specified), and other (to be specified). The form was designed so that the entire form could be filled out with numbers, check marks and one-word answers.

A second instrument used in the evaluation of the garments was an interview schedule (Appendix D). The questions on the interview schedule were: (1) Was this garment comfortable? If not, what was the problem? (2) Was this garment easy to get into and out of? If not, what was the problem? (3) Did you like this garment? What did you like or dislike about it? After all the questions were answered

the participant had the opportunity to offer other comments concerning the garment.

Evaluation by Wearer

A problem developed with the garment evaluation forms. The garments and the garment evaluation forms were delivered to the participant at her home where she was spending part of the summer. When the participant was returned to the hospital the garment evaluation forms were left at home, so they had not been completed for the first month. After the second month the participant reported that she had been keeping the garment evaluation forms with the garments, but when the housekeeper took the clothes to the laundry the garment evaluation forms were also taken and had not been returned. After the third month the participant had not filled out the evaluation forms, nor would she give any reason for not having done so. The researcher stressed the importance of the garment evaluation forms each time they were given to the participant. This lack of cooperation caused a serious deficiency in the collected information. The garment evaluation forms were designed to describe how long each of the garments was worn and what activities were performed while the garment was being worn; therefore, this information is not available.

At the end of each of the three months during the wearing period the questions on the interview schedule were asked with respect to the three garments. The information collected from the interviews is shown in Table I.

TABLE I
RESULTS OF THREE INTERVIEWS WITH THE
SUBJECT FOR GARMENT EVALUATION

Question	Response	Jeans			Blouse 1			Blouse 3		
		Month			Month			Month		
		1	2	3	1	2	3	1	2	3
Was this garment comfortable?	yes	X	X	X	X	X	X	X	X	X
	no									
Was this garment easy to get into and out of?	yes	X	X	X	X	X	X	X	X	X
	no									
Did you like this garment?	yes	X	X	X	X	X	X	X	X	X
	no									

When asked if the jeans were comfortable the answer was always yes. Additional comments made concerning the jeans during the first interview indicated that they were too big, too long and that they were ripping. During the second interview the comment was made that the jeans were stiff and were ripping around the waistband. The researcher was not able to determine the reason for the ripping because the jeans were not available for examination. During the second interview the comment was made that the jeans "went with anything." When questioned about the ease of putting on and taking off the jeans was asked, response always indicated this was not a problem. The participant always expressed happiness with the jeans and indicated that she liked

them. Comments made by the participant indicated that the jeans were comfortable and that they looked good to her. During the last interview the subject indicated that the zipper would no longer lock. The participant said that holes had begun to develop around the waistband.

Blouse 1 received only two comments during the three months. The girl indicated that the tie was hard to tie and that she especially liked the fabric. Answers to the questions on the interview schedule were always yes.

Blouse 3 seemed to be the favorite blouse. The participant reported that the blouse was very comfortable, very easy to put on and take off, pretty and "goes with things." All of the questions about this blouse received a positive response. A comment was made that the blouse was big. The researcher, after seeing the blouse on the girl, felt that the comment was made because of the style rather than because of the blouse size. The participant told the researcher that she wore blouse 3 and the jeans to a party.

Evaluation by Researcher

The researcher had the opportunity to observe the participant wearing the jeans and blouse 3 to the state fair. In the opinion of the researcher those two garments fit the girl properly. The jeans were very long for the participant but this length had been originally requested by the participant. Blouse 3, in the researcher's opinion, was very fashionable and flattered the participant. The researcher did not have the opportunity to see the participant wear blouse 1 except when the muslin version was being fitted. The researcher felt at that time that the blouse fit properly. The garments did effectively

camouflage the leg urinal and the colostomy bag.

The researcher was not able to examine any of the garments during the evaluation interviews because each wing of the hospital had one central room which contained all of the children's clothing. The researcher, therefore, could not evaluate the wear, the holes, or check for evidence of strain.

Recommended Changes in Design

The most desirable features of the designs as identified by the researcher were the underarm pleats in blouse 1, the inverted back pleat in blouse 3, and the waistband inserts in the jeans, all of which added to the comfort of the garments. In terms of fashion the most desirable added feature on the jeans was the woven denim front pocket. The only undesirable feature was the tie on blouse 1 because even though it had been relocated it was still difficult for the participant to tie. A suggested change for this garment was the addition of a loop to the left side of the blouse through which the tie could be threaded. This would have eliminated the participant having to reach behind her in order to get the long tie and around to the side.

CHAPTER V

SUMMARY AND CONCLUSIONS

The objective of the study was to design, construct, and evaluate one pair of slacks and two different blouses for a teen age girl with spina bifida. After the selection of the patterns for the three garments, each pattern was enlarged and additional alterations were made to the jeans and one of the blouses. In fitting the garments to the girl it was found that one of the blouses was not suitable because the flowing sleeves caught in the wheels of her wheelchair. The researcher selected a different blouse pattern (blouse 3) and enlarged it. The jeans and the final two blouses were constructed in fashion fabric. The garments were delivered along with the garment evaluation forms. After each of three months, the garment evaluation forms were to have been collected, however the subject never completed the evaluation forms. Conclusions were drawn from information gathered at each of the three monthly interviews.

Conclusions

The researcher concluded that fashionable designs could be adapted and garments constructed that were comfortable, had self-help features, and covered or camouflaged deformities of a particular subject. It was also concluded that comfort could be added to some blouses by adding underarm pleats and that an inverted pleat in the back can add ease

across the shoulders and provide comfort to wheelchair patients. A heavy pocket was identified as an effective method for balancing a bulge made by a colostomy bag. One of the assumptions made by the researcher, however, was incorrect because the girl did not completely evaluate the garments even though she was continually asked to do so; and at the beginning of the study, the girl had agreed to complete the forms. Not every design that met all of the apparent requirements was really appropriate for the subject.

Recommendations

At the conclusion of the study it was recommended that in a similar study a parent or nurse should be asked to fill out the garment evaluation forms. It is also recommended that one garment be developed with self-help features and tested by several girls with different handicaps. A study should be conducted to compare the clothing preferences of handicapped and non-handicapped teen age girls to determine whether there are differences in their likes and dislikes. Clothing appropriate for specific occupational situations should be developed for the handicapped and evaluated.

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APPENDIXES

APPENDIX A

MEASUREMENT CHART FOR MEN'S CLOTHING

Measurement Chart for Men's Clothing

Designed by Susan Pisarra

Directions: Take personal body measurements and complete first column. Using pattern book measurement charts, complete second column with one or two sets of pattern "body" measurements which are near your measurements. Determine pattern size and purchase. After purchasing a pattern, complete third column. Allow for ease, then complete final column for any necessary adjustment amounts.

	Personal Body Measurement	Pattern "Body" Measurement(s)	Actual Pattern Measurement	Adjustment (+ or -)
Neck				
Chest				
Front waist length				
Back waist length				
Back width				
Arm length				
Shoulder length				

Bicep (circumference
of the arm)

Wrist

Waist

Hip (seat)

Crotch length

Outseam

Inseam

Thigh

Knee

Calf

Other: (comment here on unusual extra measurement(s) or special considerations)

Overall height (without shoes) ____feet ____inches

Pattern
size
selected ____

Build: ____Husky ____Regular ____Slim

APPENDIX B

BODY MEASUREMENTS OF SUBJECT

	Left	Right
1. Bust	44	
2. Waist	44	
3. Hips	40	
4. Back waist length	19	
5. Front waist length	13½	
6. Front waist over bust length	17	15½
7. Back waist over shoulder blades length	19	19
8. Upper back width across back from one armhole to the other	15	
9. Width across shoulder blades from armhole to armhole 7 inches down from shoulder seam	18	
10. Back neck seam from shoulder seam to shoulder seam	9	
11. Shoulder length along shoulder seam	5	5
12. Chest width 6 inches down from neckline from armhole to armhole	14	
13. Armhole depth from shoulder seam at neckline to level with bottom of armhole in front	7½	6 3/4
14. Shoulder height from shoulder seam at neckline to level with bottom of armhole in back	8	8
15. Underarm length to elbow	7	8
16. Sleeve length with arm bent	22½	22½

17. Lowerarm length from elbow	10	10
18. Sleeve cap length from top of armhole to level of bottom of armhole	6½	5
19. Upper arm circumference	12½	13
20. Elbow circumference	11	10 3/4
21. Neck	15	
22. Crotch length	12	
23. Outseam waist to ankle	35	31
24. Thigh circumference	23	23
25. Knee circumference	19	19
26. Calf circumference	17	20
27. Center neck to shoulder back	9½	8½
28. Center neck to shoulder front	8	7½
29. Apex to shoulder seam at armhole	12½	12½
30. Bust spread apex to apex	10	
31. Waist to knee outseam	22	20
32. Wrist circumference	6 3/4	6 3/4

See Figure 5 for description.

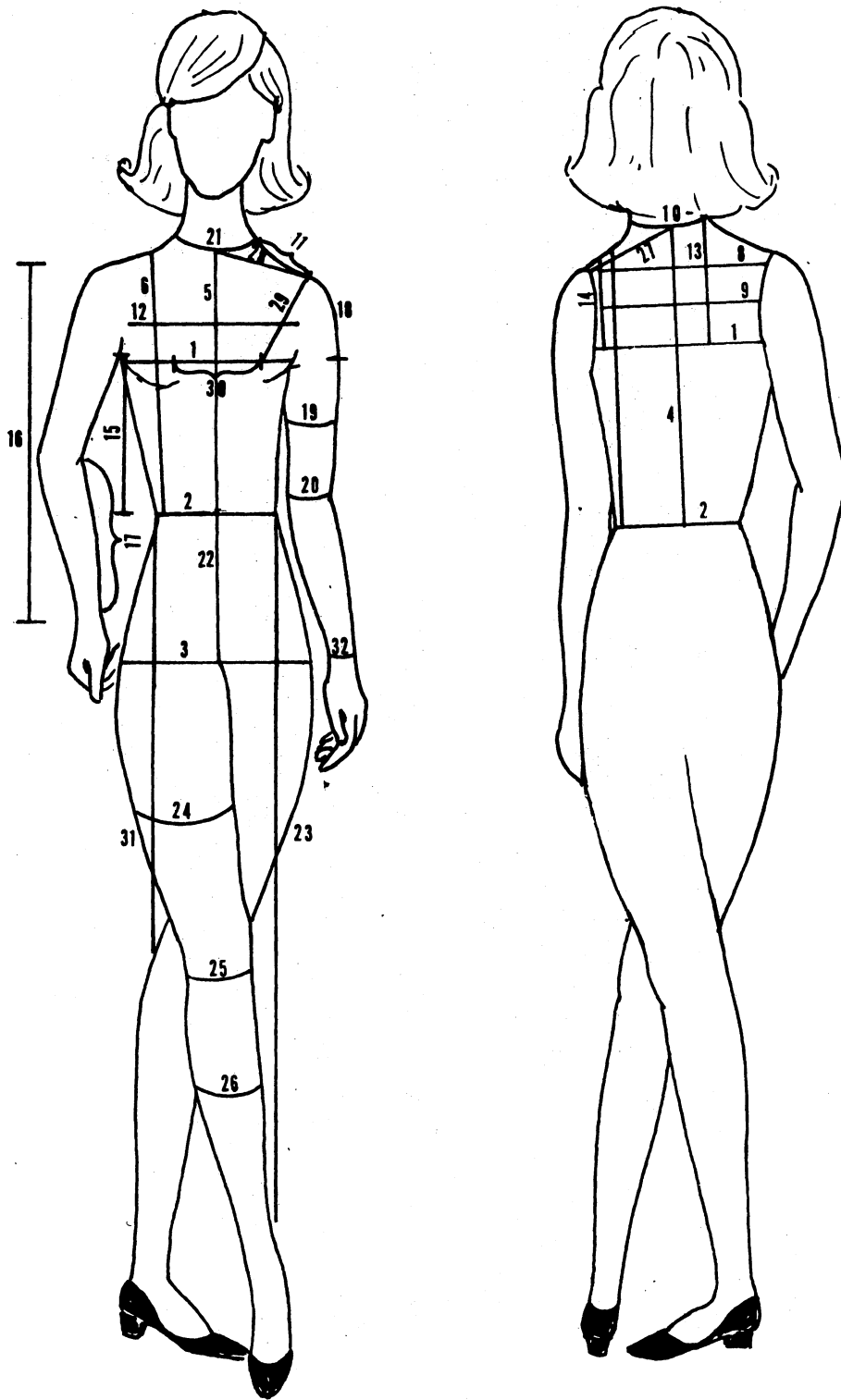


Figure 5. Guide for Measurements

APPENDIX C

GARMENT EVALUATION FORM

APPENDIX D

INTERVIEW SCHEDULE

Interview Schedule

Was this garment comfortable?

Yes

No

If no, what was the problem?

Was this garment easy to get into and out of?

Yes

No

If no, what was the problem?

Did you like this garment?

Yes

No

What did you like or dislike about it?

Do you have any other comments about the garment?

VITA

Nell Eda Fowler

Candidate for the Degree of

Master of Science

Thesis: THE DESIGN AND EVALUATION OF SELECTED FASHIONABLE GARMENTS
FOR A PARAPLEGIC TEEN AGE GIRL

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