CLOTHING NEEDS OF MEN WITH A PHYSICAL DISABILITY WEARING BRACES OR ARTIFICIAL LIMBS

by

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SIGNED: Caroline Marx Ewald

APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

Naomi Reich
Associate Professor
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August 7, 1975
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ABSTRACT

The purpose of this study was to investigate the attitudes and preferences concerning clothing worn by men with a physical disability wearing braces or artificial limbs.

An interview schedule was developed and used to interview thirty-four men wearing braces or artificial limbs. Information was solicited on the type of trousers, shirts and jackets worn, clothing purchase, criteria used in selecting clothing, alterations performed and knowledge of informational services. Subjects were also requested to indicate on a questionnaire their degree of satisfaction with each of fifteen garment design attributes for trousers, shirts and jackets.

It was concluded that the most important criteria in selecting their clothing was fit, ease in putting on and taking off and durability. The major problems presented by clothing were excessive abrasion and wear from assistive devices, durability of construction, ease in putting on and taking off and fasteners.

Few men interviewed altered their clothing. No subject was aware of any informational service regarding clothing for individuals with a physical disability.
CHAPTER I

INTRODUCTION

Advances in medicine and surgery have enabled patients to survive previously fatal diseases and accidents. Physical disabilities, whether incurred through congenital causes, accident, disease or war, are becoming increasingly common. Kessler (1953) estimated that twenty-five per cent of the world's population is physically handicapped. Wolfson (1969) stated that in the United States alone, there are thirty million individuals with a physical disability. The number of persons with a disability varies from author to author according to what degree of disability is included. The term physically disabled has many meanings and interpretations and there is no unanimity of opinion regarding its scope. However, for the purpose of this study, interpretation of the term shall be confined to a physical impairment, objectively described by a doctor, which may prevent an individual from leading a normal domestic, social or working life.

Research for the disabled has, thus far, been aimed at therapeutic devices to aid in their independence in daily activities of living. It has been realized that
a patient's ability to dress and undress independently is an important stage of his rehabilitation. Studies have indicated that the problems encountered in dressing and wearing garments were manifested as one of the needs of the disabled person (Cookman and Zimmerman 1961). Only recently has interest been aroused in providing specialized or adapted clothing for these individuals.

The disabled should be provided with clothing that enables them to cope with their physical restriction, and at the same time provide psychological value (Newton 1973). Spock and Lérrigo (1965) specify that clothing for the child with a disability should be easy to put on and take off, easy to wear, easy to care for, easy to look at and easy on the budget.

Comfort is an important attribute. If clothing is antagonistic to movement it will prove fatiguing as well as irritating (Scott 1961). Clothing should not cause the individual any unnecessary physical pain.

Functional clothing is necessary. Garments that are easy to put on and take off encourage independence and aid in giving a person confidence in his own capabilities (Boettke 1963; Ryan 1966; Scott 1961). Garments should be durable in both materials and workmanship. Aids and devices such as braces and artificial limbs require clothing appropriate to their use. Clothing should fit
certain deformities and, if desirable, disguise that disability (Reich 1975).

A most important asset of clothing is its psychological value.

For most people, clothing provides a positive means of satisfying the need for self-enhancement. It can beautify the appearance, make the physical self more desirable, increase acceptance by the group, and prevent rejection. It may be a source of overt admiration, resulting in increased self-esteem, self-respect, self-confidence and security (Horn 1968, p. 105).

The person with a disability desires the same good design that others do. It is important to the disabled to have clothes that do not set them apart (Ryan 1966). Attractive clothing which conforms to the clothing mores of the general population can lead to greater social acceptance and increased confidence. If clothing is different in appearance from current styles, the individual with a disability may feel that it emphasizes rather than minimizes his handicap (Jordan 1971).

Those individuals with a physical disability living within the community have problems and difficulties not encountered by patients in long stay hospitals. The latter have their clothing provided, laundered and usually have assistance in dressing (Reich 1975). Those living at home find information about clothing difficult to obtain. Shopping may prove a great difficulty and individually designed clothing is expensive. Ready-made clothing is
designed for the average figure without physical impairments. If adaptations or alterations on ready-mades are necessary, assistance for the disabled may be unavailable. Laundry services are expensive, but may provide the only method of garment care for those living alone.

The problems of special clothing are complex and so far research has been limited. Adaptions have been developed to meet specific needs or for a specific disability. Often this clothing has little or no application outside the specific area for which it was designed (Forbes 1971; Lord 1970). Very little information has been published concerning clothing for persons with a disability, nor has this information been made available to those it would benefit the most, the disabled, their relatives, and staff members of hospitals and other establishments caring for the disabled.

Research on clothing for persons with a physical disability has, thus far, been limited to women and children. Men have also shown a concern for their clothing, but there have been few investigations related to men's clothing. This is one area of clothing for the physically disabled in which extensive research remains to be done,
Objectives of the Study

The purpose of this study was to investigate the attitudes and preferences concerning clothing worn by men with a physical disability wearing braces or artificial limbs. The objective of this study has been to survey the problems presented by clothing currently used by men wearing braces or artificial limbs and to make recommendations for further and more specific study.

Based upon this main objective, the following goals were formulated:

1. to determine what criteria men with a physical disability use when selecting their clothing.
2. to discover if men with a physical disability encounter and recognize specific problems of clothing.
3. to discover how men with a physical disability overcome problems encountered with their clothing.
4. to determine if men with a physical disability are aware of informational resources regarding clothing.

Assumptions

It is assumed that those participating in the study answered all questions truthfully. The reliability of the data gathering instrument is based upon accurate statements by those men participating.
Limitations

Since this study dealt only with men with artificial limbs or braces, the results may not apply to other physical disabilities. Because the entire population of men with a physical disability wearing braces or artificial limbs is not known, the sample may not be representative of the entire population.

The garments which were studied included trousers, shirts and jackets. Since underwear, nightwear, footwear and accessories were excluded, results cannot be generalized to apply to those areas.

It is recognized that the climate in Tucson, Arizona may necessitate attributes not necessary in clothing in other locales. Furthermore, local fashion may influence personal satisfaction.

Definitions of Terms Used

For purposes of this study, the following terms are defined.

Artificial limb -- a prosthetic appliance provided for amputations and congenital defects. "These are commonly called prosthesis, even though the term actually refers to any sort of artificial substitute for a body part" (A Manual for Training the Disabled Homemaker 1961, p. 158). The approximate site of amputation divides artificial limbs into the following categories: above
knee (AK), below knee (BK), above elbow (AE), and below elbow (BE).

**Bi-lateral amputee** — a person with an amputation on both sides of the body.

**Brace** — a steel, duraluminum or plastic support for the lower extremities. Short leg braces end below the knee while a long leg brace extends to the thigh. The purposes of a brace are: (1) to give support to weak muscles, (2) to prevent deformities, (3) to prevent involuntary movement (A Manual for Training the Disabled Homemaker 1961; Hirschberg, Lewis and Thomas 1964).

**Comfort** — a state of mental and physical ease that is free from worry, pain or distress.

**Durability** — the ability to last in spite of frequent use or wear.

**Function** — the performance or duty required of a garment or item.

**Fashion** — any style that has gained widespread acceptance in a given period (Horn 1968, p. 13).

**Physical disability** — "any physical ... impairment which prevents anyone from leading a normal domestic, social or working life" (Gamwell and Joyce 1966, p. 16).

**Quadruple amputee** — a person with an amputation of all four limbs, commonly called a quad amputee.
CHAPTER II

REVIEW OF LITERATURE

There has been a considerable amount written on the subject of clothing for the child with a disability (Boettke 1963; Friend, Zaccagnine, and Sullivan 1973; Forbes 1971; Jordan 1971; Spock and Lerrigo 1965). Lord (1970) lists thirty references devoted solely to disabled children's clothing and fourteen solely to clothing for women with a disability.

Clarice Scott (1959, 1961) has specialized in the field of the physically disabled homemaker. She initiated a study for the purpose of developing functional clothing to meet the daily needs of homemakers who have ambulatory handicaps. Her findings indicated that durability and comfort of fabric were the most important garment attributes. The majority of women studied purchased ready-made clothing but found shopping for clothing a difficult task.

Clothing for elderly women (Johnson 1974) and arthritic women (Wolfson 1969) has been studied on a limited basis. Wolfson found a problem of communication and education regarding clothing for the disabled.
Sindelar (1969) investigated clothing satisfactions and preferences of physically disabled homemakers. She, too, found a communication problem and suggested that more rapport be established between clothing manufacturers, the rehabilitation institutes and agencies and the physically disabled themselves. She recommended the establishment of a central information center for special clothing for the disabled.

In 1971, Richardson conducted a study regarding dramatic play clothing for preschool boys wearing leg braces. She reported that the wear on clothing from orthopedic devices was a major problem and that much of the wear began on the interior of the garment. Specific wear points of trousers included: 1) side knee lock area, 2) areas where leather cuff fastenings are located, 3) across the top of the knee, 4) at the ankle where trousers may catch in the brace joint and 5) just below the waistline at the side of the trousers. Other problems mentioned were: trousers being too narrow and restricting, insufficient room for movement and knee locks being difficult to reach. Arm amputees require shirts that allow for more room in the shoulder area. Also mentioned was the problem of knit fabric catching on the prosthesis.

Cookman and Zimmerman (1961) analyzed the dressing problems of fifty-one men and women with eight different
types of disabilities. Letters received regarding clothing problems were also analyzed. This study was based on a small sample with a wide variety of disabilities. The major problem indicated by their study was with fasteners. Footwear and trousers also posed a number of problems. Two below the knee amputees were included in the study, but these individuals listed no problems regarding dressing. The publication "Functional Fashions for the Physically Handicapped" was based on the results of their study.

The Disabled Living Foundation located in London, sponsored a study (1966) by Ann Gamwell and Florence Joyce which was conducted over a one year period. Fifty-six disabled persons and one hundred and ten people caring for them were interviewed concerning problems and suggestions regarding clothing for the disabled. In addition, one hundred and eighty-two persons or organizations offered problems or suggestions by mail. They found the main problem for the disabled lay in size and design, unusual wear, putting on and taking off and fastening. Few of those caring for the disabled considered these as major problems. Rather, those caring for the disabled listed as main problems: laundering and cleaning, social customs and administrative problems. The garments presenting the most problems to the disabled and those caring
for them were trousers. Jackets and corsets also presented problems for the disabled while those caring for the disabled listed problems connected with incontinence and nightwear. Most suggestions offered in the study were connected with comfort, size and design, fastening and putting on and taking off.

Many complaints from both men and women were listed concerning the design of trousers. Putting on trousers proved difficult for many individuals with a physical disability, and once on, problems with fastenings were frequently mentioned. The study found that "most adaptations to fly fastenings were said to be unsatisfactory by those who had tried them" (Gamwell and Joyce 1966, p. 50).

Most problems with shirts appeared to be connected with fasteners. Buttons, particularly those at the cuff, posed great difficulty for many. A number of people interviewed found jackets and coats difficult to put on. Set-in sleeves caused most of the problems related to putting them on and were the main factor in the tearing of linings.

A major recommendation arising from this study was that an information service and regular publication on clothing for the disabled be set up for the use of individual disabled persons, and all professional staffs and relatives who may be concerned with them. This should include advice on methods and techniques, in addition to specific information from manufacturers, and should utilise(sic)
relevant information from other countries (Gamwell and Joyce 1966, p. 66).

Also recommended was that manufacturers "be approached for their co-operation in initiating and developing and marketing designs and sizes of garments or items suited to the particular needs of the disabled" (Gamwell and Joyce 1966, p. 66).

Clothing for the Handicapped Child by Gillian Forbes (1971) and Clothes Sense for Handicapped Adults of All Ages by P. Macartney (1973) were two publications which arose from the survey conducted by Gamwell and Joyce. These books were designed to assist disabled people in the community and those who shop and care for their clothing. Advice is given on the selection of new clothing with emphasis on features of greatest benefit to the disabled wearer. Aids which may lead to independence in dressing are stressed including fastenings, adaptations, dressing techniques and dressing aids. Simple adaptations to ready made clothing, which can be made at home, are suggested. Information is given concerning types of clothing and adaptations that can be made to them.

Summary of Related Literature

Research in the area of clothing for individuals with a physical disability has been concerned primarily with the clothing of children and women. Few studies
were found that included the clothing of adult men with a physical disability. Research devoted entirely to the study of clothing for men with a physical disability could not be located.

The research into women and children's wear indicated that clothing may have significant psychological value. Clothing aids in establishing the identity of a person, may increase acceptance by the group, satisfy the need for self adornment and aid in giving a person self confidence. Clothing which minimizes a disability will affect an individual's conceptions of his appearance, thus being of value in the rehabilitation process.

A review of pertinent literature emphasized the value of comfort, durability, ease in putting on and taking off and ease in fastening of clothing for individuals with a physical disability. Specially designed clothing is generally unavailable in this country and where obtainable, is above the price range of the average individual. Adaptations may be helpful, but beyond the skill of some physically disabled people.

The literature brought forth the severe lack of information regarding clothing available to the physically disabled and those caring for them. Studies emphasized the need for improved communication and education. The needs and solutions of clothing for the disabled should be
given wider publication so that the manufacturers, the general public, the disabled themselves and those caring for them may become aware of the problem. Studies indicated that the establishment of an information bureau or service on clothing for the disabled would benefit all concerned.
CHAPTER III

METHODS AND PROCEDURE OF INVESTIGATION

This section contains a description of subjects, the development of the instrument, clearing the investigation with the Human Subjects Committee, the method of data collection and analysis of data.

Description of Subjects

All subjects involved in the study were between the ages of twenty and sixty-five and lived in a home situation. Requirements were that they wear either braces or an artificial limb and be independent enough to dress and care for themselves.

A total of ninety-five men were sent introductory letters requesting their participation in the study (Appendix A). Names of potential subjects were furnished by Special Services of Pima Community College and two Tucson, Arizona medical supply stores. In addition, the prosthetics office of the Veterans Hospital in Tucson assisted in securing volunteers. A reply form was enclosed with the letter which included a short questionnaire (Appendix B). Information on subject's age, occupation,
education, nature of disability and length of disability was requested in order to determine his qualifications.

Of the ninety-five letters mailed, thirty-four men responded indicating a willingness to participate in the study. Five of those responding were disqualified as they were unable to dress and care for themselves, were over sixty-five, or else lived at too great a distance from Tucson to allow for an interview. An additional seven subjects were interviewed at a field day for the disabled bringing the total number of men interviewed to thirty-six.

Of the thirty-six men interviewed two interviews were considered invalid and are not included in the results of this study. One interviewee was prescribed braces but was not able to wear them because he was unable to obtain trousers that would fit over the braces and that he could put on and take off. This individual was, therefore, confined to a wheelchair. The other disqualified subject was an above the knee amputee. He chose not to wear a prosthesis, preferring instead the use of a wheelchair.

An additional subject, a quad amputee, was a wheelchair user. He was fitted with two leg prosthesis but elected not to wear them. However, as he did wear artificial arms, his data is included with those men wearing artificial arms.
It was felt that thirty-four subjects should provide an adequate sample of the entire population. Additionally, since the subjects were asked for comments and suggestions concerning their clothing, this sample provided a considerable amount of subjective information.

**Development of the Instrument**

The use of a mail questionnaire was considered but the researcher felt that personal contact enabling discussion was the best method of acquiring information. It was felt the development of an interview schedule was of utmost importance and considerable time was spent on its development. Questions were designed to be easy to understand and worded to reduce ambiguity and avoid embarrassment concerning the interviewee's disability. Some questions were adapted from similar studies (Jordan 1971; Sindelar 1969; Wolfson 1969).

The interview schedule was developed in two parts. The first section contained questions related to clothing purchase and use (Appendix C). Probe questions were included to obtain more accurate information. Included in this section were questions related to the type of trousers, shirts and jackets worn by the subject. Black and white line drawings of garments printed on 8½" by 11" poster board were used for these questions (Appendix D). Question number two pertained to the type of fabric the
the subject's trousers were usually made of. Fabric swatches were used for clarity in answering this question. Three fabrics were chosen that were typical of men's trousers available in Tucson. A twill weave was chosen to represent jeans and similar trousers, a polyester double knit fabric exemplifying knit trousers and a plain weave typical of men's dress slacks. All fabric samples selected were blue in color to reduce the chance of subjects making a choice of material by color only.

Part two consisted of a questionnaire in which the subject was requested to rate fifteen garment characteristics in terms of four classifications: very satisfactory, satisfactory, unsatisfactory and very unsatisfactory (Appendix E). Three garments were rated: trousers, shirts and jackets. Probe questions were designed for use following completion of the questionnaire.

The interview schedule was pre-tested six times during its development with men similar to those selected for the major portion of the study. Men of varying educational levels were chosen in order to test the clarity of questions. The interview schedule was revised and modified based on the results of those interviews. Pre-testing enabled the investigator to be sure that the questions elicited information applicable to the study, to determine
the time required to conduct the interview and provided experience for the interviewer.

Human Subjects Committee

All research involving human subjects conducted under The University of Arizona's auspices requires approval of the Human Subjects Committee to insure that the individuals are not subject to any physical or psychological risk. In compliance with this regulation, the data gathering instrument, proposal and necessary forms were first submitted to Joseph T. Bagnara, referee for the Human Subjects Committee. With his approval the proposal then went to the Human Subjects Committee which granted final approval to the project on April 23, 1975.

Method of Data Collection

Members of the potential sample were sent introductory letters explaining the project and asking for their participation in the study (Appendix A). A stamped, addressed reply form was included with the letter (Appendix B). Background information of subject's age, occupation, education, nature of disability and length of disability was solicited at that time. A short questionnaire was included on the reply form. This information was used to determine if the respondent met the qualifications specified in the proposal,
Each respondent to the introductory letter was contacted by telephone to confirm his participation in the study and to schedule an interview. Contact was arranged so that the interview would be held within three days.

All interviews except two were conducted on an individual basis. The exceptions were due to an interviewee being accompanied by a friend who also met the qualifications of this study, and both were interviewed together. This proved to be a satisfactory arrangement as discussion between the two men prompted more information than may have otherwise been obtained.

Interviews were conducted at The University of Arizona, School of Home Economics or at the subject's home, depending on his preference. It was recognized that the individual's impairment may limit traveling, and although interviews at The University of Arizona were encouraged, the respondents were given their choice as to the site of the interview.

**Interview Procedure**

Part one of the interview schedule was administered following the interviewer's introductory comments (Appendix F). Interviewees were asked probe questions when deemed appropriate as indicated on the interview schedule part one (Appendix C). Responses were reviewed with the subject to ascertain their accuracy.
Subjects were then asked to complete a questionnaire (Appendix E) concerning garment characteristics. After completion of the questionnaire, subjects were asked probe questions regarding their responses in order to acquire more information about specific satisfactions and dissatisfactions. Additional comments and suggestions regarding their clothing were solicited at the termination of the interview.

Analysis of Data

The results from the interview schedule were transcribed into computer readable format. The data were then analysed using the Statistical Package for the Social Sciences (Nie, Bent and Hull 1970) program on a CDC 6400 computer. The computer output was then distilled into the tables presented in Chapter IV.

The following statistical procedures were employed on the data:

1. frequency counts
2. mean, mode, median and range calculations
3. cross tabulations between satisfaction ratings and garment preference, length of disability, clothing selection criteria and problem areas in selecting garments.
CHAPTER IV

FINDINGS

The findings include responses from the interview schedule, questionnaire and information gained through the interviews.

Characteristics of Men Participating in the Study

In order to evaluate the data in perspective, it was first necessary to compile basic background information on the men studied.

As shown in Table 1, of the thirty-four men included in the study, seven wore leg braces, thirteen wore a below the knee (BK) prosthesis, seven an above the knee (AK) prosthesis and seven used artificial arms (AA). Of the seven wearing braces, one wore a short leg brace while the other six wore long leg braces. Five of the latter used crutches while one used canes. Two of the braces were the newer total contact plastic brace while the others were steel.

The type of artificial leg used by the twenty lower limb amputees varied considerably. The common quality among all these limbs was that the basic component was wood laminated with plastic. All used some metal
**TABLE 1**

**DISABILITY, DEVICES USED, AGE, MARITAL STATUS, OCCUPATION, EDUCATION AND LENGTH OF DISABILITY OF PHYSICALLY DISABLED MEN STUDIED**

<table>
<thead>
<tr>
<th>Number of disabled men</th>
<th>Braces</th>
<th>BK</th>
<th>AK</th>
<th>AA</th>
<th>Total</th>
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</tr>
<tr>
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<td>1</td>
<td>13</td>
<td>6</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td>crutches</td>
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<tr>
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<td>over 30 years</td>
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<td>9.3</td>
<td>16.8</td>
<td>18.6</td>
<td>19.4</td>
<td>16.1</td>
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</table>
components, either at a joint, a fastening, or where the fastening attaches to the artificial leg. One member of the above knee (AK) category was a bi-lateral amputee and was the only member of the two artificial leg groups to use any type of assistive device. This subject used two canes.

Two of the men interviewed with artificial arms wore the cosmetic-type hand prosthesis while the other five used the hook-type. Two of the latter were bi-lateral, below the elbow amputees. As mentioned in Chapter III, one of this group was a quad amputee and confined to a wheelchair.

The average age of the men studied was 43.4 years with the range being from twenty-two to sixty-five years. Only three subjects were single, the remainder were married at the time of this study. The subject's occupations varied, but the largest group (thirteen) were retired. However, retirement does not coincide with age in this study, as retirement was as low as twenty-six years of age. This was due to two factors: 1) the nature of the disability and 2) the number of retired military men included in this study. Twenty-six of the thirty-four men studied were veterans, however, not all of those were disabled while on active duty.
Table 1 indicates a range of education from eighth grade through college graduates, the mean education was approximately 12.7 years of schooling.

The number of years since the disability was incurred ranged from one to fifty-four years. The average length of disability was 16.1 years. Eight of those studied had had their disability less than five years; the largest category (nine) was 6-10 years, seven were in the 11-20 year group, five were in the 21-30 year bracket and five of the men had their disability for over thirty years.

Description of Garment Preferences

Subjects were asked to indicate the type of trousers, shirts and jackets usually worn. If a subject indicated he wore more than one type, he was asked to select his favorite, making these forced choice questions. In addition to indicating their selection of a type of particular garment, a number of subjects felt the need to explain in further detail. These comments are included where clarification is deemed pertinent to the study.

The majority (twenty-two) of the men studied, as shown in Table 2, preferred to wear straight leg trousers. Only twelve chose flare leg trousers. Most of those subjects with lower extremity braces or artificial limbs said that the most important criteria in selecting trousers was
TABLE 2

TYPE OF TROUSERS, SHIRTS AND JACKETS WORN BY MEN STUDIED

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<td>Trousers</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>straight leg</td>
<td>6</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>flared leg</td>
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<td>5</td>
<td>5</td>
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<td>Fabric of trousers</td>
<td></td>
<td></td>
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<tr>
<td>twill weave</td>
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<td>10</td>
<td>2</td>
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<td>22</td>
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</tr>
<tr>
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<td>Jackets</td>
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<td>10</td>
<td>3</td>
<td>2</td>
<td>21</td>
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</table>
the diameter of the trouser leg at the cuff and at the knee. A number of the men indicated that they preferred casual clothes, particularly jeans, which may account for twenty-two of the men selecting the twill weave fabric as the type of fabric of which their trousers were made. Seven men preferred their trousers of knit fabric while five chose plain weave fabric. Several of those interviewed complained that the knit fabrics had a tendency to catch on their prosthetic appliance and would cling to the leg rather than slide up and down.

Button down the front shirts represented the largest category in shirt preference; twenty-seven of the thirty-four men chose this style. It is interesting to note that of the seven men with artificial arms, six chose the button down the front style while one indicated he wore pull-on shirts. The main reason given for the preference of button down the front shirts was the ease in putting on and taking off the garment.

Twenty-one of the men preferred the CPO or pea-type jacket, eleven wore sport coats or suit coats and two selected wind breaker jackets with raglan sleeves. There was no consistency of jacket preference among men wearing artificial arms, however, both bi-lateral amputees chose the CPO or pea-type jacket. These men stated they were
unable to fasten the two-piece zippers normally found on wind breaker jackets.

Five of those interviewed said they were required to wear a uniform to work. Seven additional men stated the garments they chose were specified for work; for example, suits or sport coats being the proper working attire.

Garment Purchase and Use

As shown in Table 3, twenty-seven of the men interviewed purchased their clothing in a department store. Six shopped at a discount store and one individual indicated he purchased his clothing in a second-hand shop. The majority (nineteen) did their own shopping while eight stated both they and a relative shopped together. A relative did all the shopping in seven cases. The relative was the wife in all but one instance, in which case it was the subject's parents who did all the shopping.

Subjects were asked to rank the three most important features they looked for when selecting their clothing. Answers were weighted by giving three points to each first choice, two to each second choice and one to each third choice. Items were then ranked with the characteristic receiving the most points number one and so on. The ranking listed for the total sample is an average of the responses from all individuals in the study. Ranking by
TABLE 3
TYPE OF STORE AND BUYER OF CLOTHING WORN BY MEN STUDIED

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<td><strong>Clothing purchased by</strong></td>
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<td></td>
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<td>9</td>
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<td>2</td>
<td>19</td>
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<td>self and relative</td>
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<td>2</td>
<td>8</td>
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</table>

The results of this ranking are listed in Table 4. The total sample ranked fit as the most important characteristic followed by ease in putting on and taking off, durability, comfort, style, color and ease of care, in that order. Those wearing a below the knee prosthesis ranked fit first followed by ease in putting on and taking off and durability. Those with an AK prosthesis chose ease in putting on and taking off as the most important feature and then fit. The brace category ranked durability number one with fit and ease of putting on and taking off
TABLE 4
CLOTHING SELECTION CRITERIA BY RANK*

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*The subject's answers were weighted by giving three points to their first choice, two to their second and one to each third choice.
The most significant difference of ranking was in the artificial arm group. They rated comfort number one and ease of putting on and taking off, which ranked in the top three by all the other groups, dropped down to the sixth position. Fit was also deemed important by this group, but color was ranked higher than by the other groups.

The data in Table 5, problem areas in selecting garments, were calculated by weighting the problem areas answers in the same manner as the clothing selection criteria. The major problem cited was that the clothing is difficult to put on and remove. Also important to this group of men is the problem of salespeople who are not willing to take the time to assist them. This problem was followed by hard to fit, lack of good design, price and choice of fabric. The AK group ranked the problems in that same order. Those individuals in the BK group also ranked clothing difficult to put on and remove as the major problem followed by lack of good design, salespeople are not willing to take the time to assist, hard to fit, price and choice of fabric. The brace category ranked the items in the following order: salespeople not willing to take the time to help, clothing is difficult to put on and remove, hard to fit, lack of good design and price. None
TABLE 5
PROBLEM AREAS IN SELECTING GARMENTS BY RANK

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<td>Clothing difficult to put on and remove</td>
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<tr>
<td>Salespeople not willing to take time to help</td>
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<tr>
<td>Hard to fit</td>
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<td>3</td>
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<td>3</td>
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<tr>
<td>Lack of good design</td>
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<td>4</td>
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<td>Price</td>
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<tr>
<td>Garment difficult to care for**</td>
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</tr>
</tbody>
</table>

*The subject's answers were weighted by giving three points to their first choice, two to their second and one to each third choice.

**Not rated as a problem by any men in this category.

***Not rated as a problem by any men involved in this study.
of the men in the brace group considered choice of fabric as a problem.

The artificial arm group differed considerably from the other three groups, listing hard to fit as the number one problem and dropping salespeople not willing to help to the fifth position. Those in the AA group ranked clothing difficult to put on and remove second followed by lack of good design, price, salespeople not willing to take the time to help and choice of fabric number six. It was interesting to note that no subject in the study indicated that care of the garment was a problem when selecting clothing.

It appeared that the majority of men interviewed wear ready-made garments as they are purchased. Only eight men modified or altered their garments in some manner (see Table 6). Only one subject altered his shirts and one altered his jackets. Both these men indicated that the alteration was to improve the fit and was in no way connected to their disability.

Seven men with lower limb disabilities required alterations on their trousers either all or part of the time. All alterations were related to their disability with the main requirement being to make it easier to put on and remove the garment. The reason for one specified alteration was to reinforce an area where extra wear was
<table>
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<td>7</td>
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<tr>
<td><strong>Performed by</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>relative</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>paid seamstress or tailor</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Reason</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>make it easier to put on and take off the garment</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>improve the fit</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>reinforce areas where extra wear is put on one part of the garment</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
put on the garment. Alterations were made by the wife in five cases, by a daughter in one and by a paid seamstress or tailor in the remaining two instances.

There were two types of alterations performed on trousers. The most frequently encountered was the insertion of a zipper in the inside seam of the trouser leg. This was always performed on straight leg pants: jeans, work clothing and uniform trousers. Those individuals requiring this modification indicated they were satisfied with the results and that the trousers were easier to put on and remove.

The other type of alteration encountered was the reinforcement of an area where extra wear or strain is put on the garment. This modification consisted of lining the trouser leg from the waist to just below the knee. This proved to be satisfactory to the individual as it was possible to replace the lining when it showed signs of wear rather than the entire garment.

Two subjects stated they had in the past tried iron-on patches at the greatest point of wear, but both were dissatisfied with the results and discontinued the practice. Reasons given for abandoning the procedure were that the patches were too bulky, caused the area to be stiff, and that they tended to peel off and did not stop the fabric from fraying or wearing out.
Knowledge of Information Services

When subjects were asked if they were aware of any informational services available regarding clothing for the disabled the comment from all thirty-four men was no. A large number of the men inquired, "is there any?" During discussion several subjects indicated they would appreciate information on alterations. Two of the men wearing artificial arms specified they would like information on fasteners. These findings agreed with previous studies that the establishment of a clothing information service for the physically disabled would be of benefit.

Satisfaction Ratings of Selected Garment Attributes

Subjects were instructed to rate three types of garments, trousers, shirts and jackets, according to the way they felt about fifteen garment characteristics. There were four possible responses for each characteristic and the subjects were asked to circle the appropriate answer. All responses were scored on a four-point scale with the score of (1) representing very satisfactory, (2) satisfactory, (3) unsatisfactory and the score of (4) being very unsatisfactory. The mean scores are reported according to that scale in Tables 7, 8 and 9. The response of a low number (1) indicated that the garment was extremely satisfactory according to a specific attribute,
while a rating of a high number (4) indicated extreme dissatisfaction.

The subjects' responses for most garment characteristics were found to be highly skewed toward a very satisfactory rating, indicating a high satisfaction level by most of the subjects considering these specific attributes. Ratings given each garment attribute plus information gained through discussion with the subject will be explained by each type of garment studied. Discussion will begin with trousers and continue with shirts and jackets.

Trousers

Table 7 shows the mean score for each characteristic and the overall rating for trousers. Attributes relating to durability; **fabric is resistant to abrasion and wear from assistive devices** (mean 3.1) and **durability of construction** (mean 2.5), were found to have the least satisfactory ratings of all the attributes. **Fabric is resistant to abrasion** was rated 3 or higher by all groups except those with artificial arms. Those individuals with artificial arms (mean 2.6) had problems with the pockets of trousers wearing out. This was caused by the prosthetic appliance or the excessive use of pockets on one side of the trousers with the "normal" hand. Those individuals wearing braces (mean 3.0) stated that the main
### TABLE 7

**MEAN SCORES OF TROUSER ATTRIBUTES**

<table>
<thead>
<tr>
<th>Garment Attribute</th>
<th>Braces</th>
<th>BK</th>
<th>AK</th>
<th>AA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of disabled men</td>
<td>7</td>
<td>13</td>
<td>7</td>
<td>7</td>
<td>34</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>3.0</td>
<td>3.4</td>
<td>3.1</td>
<td>2.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Durability of construction</td>
<td>2.4</td>
<td>2.2</td>
<td>3.0</td>
<td>2.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Minimizes or hides disability</td>
<td>2.1</td>
<td>1.8</td>
<td>2.4</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Ease in putting on and taking off</td>
<td>2.1</td>
<td>1.7</td>
<td>2.6</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Ease in opening and closing fasteners</td>
<td>1.7</td>
<td>1.5</td>
<td>2.3</td>
<td>2.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Room for movement or assistive devices</td>
<td>2.7</td>
<td>1.5</td>
<td>2.0</td>
<td>1.4</td>
<td>1.8</td>
</tr>
<tr>
<td>Fit</td>
<td>2.4</td>
<td>1.7</td>
<td>1.7</td>
<td>1.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Ability of the fabric to hold its shape</td>
<td>1.9</td>
<td>1.8</td>
<td>2.0</td>
<td>1.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Placement of fasteners</td>
<td>1.7</td>
<td>1.5</td>
<td>2.0</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Garment is attractive and in style</td>
<td>1.2</td>
<td>1.6</td>
<td>2.0</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td>2.0</td>
<td>1.5</td>
<td>1.4</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Comfort of fabric</td>
<td>1.7</td>
<td>1.6</td>
<td>1.7</td>
<td>1.4</td>
<td>1.6</td>
</tr>
<tr>
<td>Ability of the fabric to resist wrinkles</td>
<td>1.9</td>
<td>1.5</td>
<td>1.4</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
<td>2.0</td>
<td>1.6</td>
<td>1.3</td>
<td>1.4</td>
<td>1.6</td>
</tr>
<tr>
<td>Ease of care</td>
<td>1.4</td>
<td>1.3</td>
<td>1.1</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>All attributes</td>
<td>2.0</td>
<td>1.8</td>
<td>2.1</td>
<td>1.8</td>
<td>1.9</td>
</tr>
</tbody>
</table>

*The subjects rated each characteristic according to the scale: 1-very satisfactory, 2-satisfactory, 3-unsatisfactory, 4-very unsatisfactory. Mean scores are reported according to that scale.
points of wear are at a joint area, where the device fastenings are located and across the top of the knee. Abrasion is, in this case, a general wearing away of the fabric and it begins on the interior of the garment.

The BK and AK groups rated fabric is resistant to abrasion and wear 3.4 and 3.1 respectively. There appeared to be two types of abrasion or excessive wear pertinent to these men. The first was the general abrading or wearing away of the fabric. Special areas of concern were the knee area, side seams, thigh area for AK prosthesis and areas where fastenings are attached to the prosthesis or the body. Knee areas face excessive wear from walking and sitting while those with an AK prosthesis find trousers abrade heavily under the thigh from sitting. The second type of excessive wear found among men wearing lower limb prosthetic appliances was the development of small holes in the fabric. This was caused by hitting the prosthesis against something hard, such as chair legs, door frames, desks and such. Threads are broken causing small holes to develop which gradually enlarge. Men experiencing this type of wear generally find their trousers do not last long enough to also have a general abrading problem. Average life of trousers ranged from a low of four months to approximately eighteen months depending upon the individual.
The development of small holes tended to be pertinent to woven fabrics while knit trousers generally abraded rather than develop these holes. It is thought that the knit fabrics have more give and stretchability allowing the threads to give when hit against something hard rather than break. However, further study is warranted to substantiate this fact.

**Durability of construction** was rated 2.5 by the total sample with the AK group rating it the highest, 3.0. Problems in this area appeared to be related more to poor construction of garments rather than the disability itself. Often mentioned as problems were seams splitting, buttons and zippers breaking and hems falling out.

The attribute **minimizes or hides disability** was rated 2.1 by the sample. This characteristic drew the most questions, not only among trousers, but shirts and jackets as well. Often asked was "how can it minimize my disability?" It was felt that most unsatisfactory ratings stemmed from confusion over the question rather than dissatisfaction alone.

**Ease in putting on and taking off** was rated 2.1 by the total sample. Problems for the artificial arm group (mean 2.1) were greater for the bi-lateral amputees than those with only one prosthesis. Men wearing artificial arms indicated they put on their prosthesis before
their trousers which aided somewhat in pulling them on. Those men wearing an AK experienced the most dissatisfaction (mean 2.6) in this area while those men with a BK rated this characteristic 1.7. Most problems stated by those men with artificial legs were related to the diameter of the trouser leg at the cuff and knee. The diameter of the pant leg was too small and difficult to fit over the prosthesis in many cases. Those men wearing braces (mean 2.1) also indicated that in many cases the diameter of the leg was too small. In addition to the difficulty of putting the garment on, men wearing braces also experienced trouble reaching the knee lock area.

The four characteristics described above (fabric is resistant to abrasion and wear from assistive devices, durability of construction, minimizes or hides disability and ease in putting on and taking off) were the only attributes rated higher than 2.0 by the total sample. The remaining characteristics were rated between very satisfactory and satisfactory by the sample with a few exceptions which will be discussed. Particular problems in each area will also be explained.

Those men wearing artificial arms found less satisfaction (mean 2.4) with opening and closing fasteners than other groups with the exception of those in the AK group who rated this attribute 2.3. Of special mention by
the latter were the zippers and especially that the zipper pulls were too small. Those men with artificial arms found it difficult to fasten buttons and the large hook and eye found on many trousers. The main problem with zippers and zipper pulls were that many were too small making them difficult to maneuver.

Room for movement or assistive devices and fit were two attributes rated highest by those men wearing braces (means 2.7 and 2.4, respectively). The problems related to these characteristics were caused by the diameter of the trouser leg. Complaints were that the trousers were too narrow to allow for braces and, when purchased with an ample diameter in the leg, did not fit elsewhere. Several men wearing artificial legs said that often the knees of trousers were too snug, especially the flared leg pants. It was also mentioned, in regards to fit, that the trouser leg covering the prosthesis must be longer in length to accommodate the extra width of the prosthesis.

With respect to the attribute, ability of the fabric to hold its shape, it was occasionally mentioned by artificial leg wearers that the trousers would tend to stretch out and bag at the knee. This was caused by the extra width of the prosthesis at the knee.
No special problems were connected with placement of fasteners. The subjects were satisfied with the style of their trousers and felt they conformed to their peer group. Comfort of fabric was rated satisfactory by all subjects and no problems were mentioned in this area. However, one subject did mention he preferred cotton trousers and expressed a desire for more natural fiber fabrics rather than man-made fabrics.

Subjects were satisfied with the performance of the trousers with regard to ability to resist wrinkles, resistance of the fabric to spots and dirt and ease of care. The only problem brought forth in this area was that polyester knit fabrics tend to retain stains. The high rating ease of care received can probably be attributed to the fact that trousers sold today are usually "easy care" garments. Several men indicated they did their own laundry and were especially satisfied with the ease of care characteristics trousers possess. The number of men involved in laundry duties would preclude attributing the high rating to someone else doing the work.

The mean scores of all attributes ranged from 1.8 to 2.1. The total sample registered a mean of 1.9 for all the attributes.
Shirts

While it was realized that those men wearing artificial arms would experience the most problems with shirts and jackets, it was felt that a disability in one portion of the body might have an effect on the entire body. Therefore, satisfaction ratings by men with a lower limb disability were calculated and reported on shirts and jackets.

The mean scores of shirt characteristics are presented in Table 8. The highest rating was fabric is resistant to abrasion and wear from assistive devices with a mean of 2.3. As expected, those men wearing artificial arms had the highest dissatisfaction rate (mean 3.4). Abrasion was extremely critical across the shoulder area where straps attaching the prosthesis are located. One individual stated that he wore out approximately one shirt per month due to the cables abrading the shoulder area. Abrasion was also apparent at the elbow joints, along the sleeve from cables abrading the fabric, at the cuff and at pockets. These men also experienced the problem of small holes developing in the sleeve fabric caused from hitting the prosthesis against something hard. This wear was similar to that found in trousers of men with artificial legs. The brace group rated this attribute 2.1. Of special mention here was the abrasion caused by the
TABLE 8
MEAN SCORES OF SHIRT ATTRIBUTES

<table>
<thead>
<tr>
<th>Garment Attribute</th>
<th>Braces</th>
<th>BK</th>
<th>AK</th>
<th>AA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of disabled men</td>
<td>7</td>
<td>13</td>
<td>7</td>
<td>7</td>
<td>34</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>2.1</td>
<td>1.9</td>
<td>1.9</td>
<td>3.4</td>
<td>2.3</td>
</tr>
<tr>
<td>Durability of construction</td>
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<td>2.1</td>
<td>2.1</td>
<td>2.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Fit</td>
<td>1.6</td>
<td>1.8</td>
<td>2.0</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Ease in opening and closing fasteners</td>
<td>1.6</td>
<td>1.7</td>
<td>1.9</td>
<td>2.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
<td>1.4</td>
<td>1.8</td>
<td>1.9</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Garment is attractive and in style</td>
<td>1.6</td>
<td>1.8</td>
<td>2.0</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td>1.6</td>
<td>1.8</td>
<td>1.9</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Minimizes or hides disability</td>
<td>1.6</td>
<td>1.6</td>
<td>1.7</td>
<td>2.1</td>
<td>1.7</td>
</tr>
<tr>
<td>Placement of fasteners</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Ability of the fabric to resist wrinkles</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Comfort of fabric</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Room for movement or assistive devices</td>
<td>1.6</td>
<td>1.6</td>
<td>1.7</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Ease in putting on and taking off</td>
<td>1.6</td>
<td>1.6</td>
<td>1.7</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Ability of the fabric to hold its shape</td>
<td>1.6</td>
<td>1.7</td>
<td>1.6</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Ease of care</td>
<td>1.4</td>
<td>1.6</td>
<td>1.7</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>All attributes</td>
<td>1.6</td>
<td>1.7</td>
<td>1.8</td>
<td>2.0</td>
<td>1.8</td>
</tr>
</tbody>
</table>

*The subjects rated each characteristic according to the scale: 1-very satisfactory, 2-satisfactory, 3-un-satisfactory, 4-very unsatisfactory. Mean scores are reported according to that scale.
use of crutches. Underarm crutches caused excessive wear on shirts under the armpits and down the side of the shirt. Those using elbow crutches stated wear was excessive along the sleeve.

Durability of construction was rated 2.2 by the total sample. The main problems, as with trousers, were related to poor quality construction. The only incidence that was related to a disability was described by a subject wearing an artificial arm. This individual buttoned his cuff before putting his shirt on. The strain of pulling the sleeve over the hand eventually caused the seam to pull apart where the sleeve connects to the body of the shirt.

Complaints with regard to fit of shirts were attributed to the cut of shirts and body size. That is, individuals who were extremely heavy or thin stated that they had problems with the fit of a shirt.

Opening and closing fasteners was a major problem for the bi-lateral arm amputees interviewed but only a minor problem for those with one artificial arm. Those wearing two artificial arms stated that snaps were preferable to buttons and attempted to purchase shirts with snaps whenever possible. If the shirt buttoned, they required the assistance of another person in fastening and unfastening the buttons. The disadvantage of snaps was
the tendency of the fabric to tear around the snap. Buttons on cuffs were a hindrance to all men wearing artificial arms. Solutions were to leave the cuffs unbuttoned, have someone else button the cuffs, or button the cuff before putting the shirt on. This latter solution caused the armscye seam to weaken as mentioned previously. None of the men interviewed had tried using buttons with elastic links or replacing the buttons with other fasteners such as Velcro.

Although resistance of the fabric to spots and dirt was rated satisfactory by the majority of men interviewed, two of those wearing artificial arms stated that their prosthesis stained the cuffs of shirts. This was caused by the metal and/or rubber and proved extremely difficult to remove.

The total sample was satisfied with the style of shirts and felt they conformed to the mores of their social group. The attribute minimizes or hides disability again brought questions as to how it was possible to hide an artificial arm, etc. However, all those in the artificial arm category indicated they always wore long sleeved shirts, even in the summer. This was, in effect, to cover or minimize the visibility of their prosthesis.

Subjects were satisfied with the placement of fasteners, ability of the fabric to resist wrinkles and
comfort of the fabric. One man in the artificial arm group stated he always chose lightweight fabric in order to keep his body cool. He avoided any bulky garments that would hinder movement. Room for movement was rated satisfactory by the majority of men (mean 1.7). It appeared that through careful selection, problems were avoided in this area. No problems were noted in putting on and taking off shirts. All men in the artificial arm category were able to dress themselves although both bi-lateral amputees stated they required assistance in putting their prosthesis on.

Subjects were very satisfied with the ability of the fabric to hold its shape (mean 1.7) and ease of care (mean 1.6). The mean for all the attributes was 1.8 and ranged from 1.6 for the brace category to 2.0 for those men wearing artificial arms. This indicated an above average satisfaction level with shirts by the men interviewed. General comments regarding shirts by men wearing artificial arms were that the pockets were too few and the shirt tails were too short.

Jackets

Jackets elicited a high satisfaction response from all men except those in the artificial arm category and the only problems mentioned were by those men wearing artificial arms. The following discussion of Table 9 will
<table>
<thead>
<tr>
<th>Garment Attribute</th>
<th>Braces</th>
<th>BK</th>
<th>AK</th>
<th>AA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of disabled men</td>
<td>7</td>
<td>13</td>
<td>7</td>
<td>7</td>
<td>34</td>
</tr>
<tr>
<td>Ease in opening and closing fasteners</td>
<td>1.9</td>
<td>1.6</td>
<td>1.7</td>
<td>2.7</td>
<td>1.9</td>
</tr>
<tr>
<td>Durability of construction</td>
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<td>1.8</td>
<td>1.6</td>
<td>2.7</td>
<td>1.9</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>1.9</td>
<td>1.8</td>
<td>1.6</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Placement of fasteners</td>
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<td>1.6</td>
<td>2.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
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<td>1.8</td>
<td>1.6</td>
<td>2.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Ease of care</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>2.1</td>
<td>1.7</td>
</tr>
<tr>
<td>Room for movement or assistive devices</td>
<td>1.6</td>
<td>1.5</td>
<td>1.6</td>
<td>2.1</td>
<td>1.7</td>
</tr>
<tr>
<td>Ability of the fabric to resist wrinkles</td>
<td>1.6</td>
<td>1.7</td>
<td>1.6</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Ability of the fabric to hold its shape</td>
<td>1.6</td>
<td>1.7</td>
<td>1.6</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Ease in putting on and taking off</td>
<td>1.6</td>
<td>1.5</td>
<td>1.6</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Minimizes or hides disability</td>
<td>1.6</td>
<td>1.5</td>
<td>1.6</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Comfort of fabric</td>
<td>1.6</td>
<td>1.5</td>
<td>1.4</td>
<td>1.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Fit</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Garment is attractive and in style</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>All attributes</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>2.1</td>
<td>1.7</td>
</tr>
</tbody>
</table>

*The subjects rated each characteristic according to the scale: 1-very satisfactory, 2-satisfactory, 3-unsatisfactory, 4-very unsatisfactory. Mean scores are reported according to that scale.*
refer only to those men wearing artificial arms unless otherwise specified.

Fasteners again proved to be a major problem for those men wearing artificial arms (mean 2.7). Several individuals stated they were unable to fasten the two piece zippers usually found on wind breaker type jackets. Zippers with small pull tabs were common complaints. The two bi-lateral amputees said they generally wore their jackets unbuttoned, that if it were necessary to fasten them, they required the assistance of another person. No type fasteners other than buttons or zippers had been tried.

Problems of durability were concerned only with jacket linings. *Durability of construction* rated 2.7 by men wearing artificial arms and *fabric is resistant to abrasion and wear from assistive devices* was rated 2.0 by the same men. The lining of the sleeve of the prosthetic arm tended to wear heavily as did the back shoulder area. Also, seams in the area of the armscye and back area split frequently. These problems can be attributed to the force of putting the prosthetic arm through the sleeve. One subject stated he covered his prosthetic hand with a hankerchief or scarf before putting his hand into the sleeve which minimized wear to the lining.
Dissatisfaction with placement of fasteners (mean 2.6) was related more to the ability to open and close the fasteners than location itself. The only problem mentioned in connection with care of jackets was that most jackets require dry cleaning and cost limited the frequency of cleaning. Room for movement (mean 2.1) was the only other attribute rated higher than 2.0 by those men wearing artificial arms. It was mentioned that loose, lightweight clothing was preferred by one subject and jackets were usually bulky, therefore his dissatisfaction with this attribute.

All other jacket characteristics were rated between satisfactory and very satisfactory by all individuals and no complaints were registered.

The Effect of Length of Disability and Type of Garment Preferred on the Ratings Given Garment Attributes

While the comparison of length of disability and type of garment preferred to satisfaction ratings was not a major objective of this study, it was believed that results should be reported in this chapter as a basis for further study. The relationship between these variables and satisfaction ratings of garments are briefly discussed.

Table 10 shows the mean scores of trouser attributes broken down by length of disability. Those men in the group of 21 to 30 years experienced the greatest
### TABLE 10

**MEAN SCORES OF TROUSER ATTRIBUTES BY LENGTH OF DISABILITY**

<table>
<thead>
<tr>
<th>Garment Attribute</th>
<th>0-5 Years</th>
<th>6-10 Years</th>
<th>11-20 Years</th>
<th>21-30 Years</th>
<th>30+ Years</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of subjects</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>3.0</td>
<td>3.7</td>
<td>2.9</td>
<td>2.8</td>
<td>2.8</td>
<td>3.1</td>
</tr>
<tr>
<td>Durability of construction</td>
<td>2.6</td>
<td>2.6</td>
<td>2.6</td>
<td>2.6</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Minimizes or hides disability</td>
<td>2.0</td>
<td>2.4</td>
<td>2.0</td>
<td>1.8</td>
<td>2.0</td>
<td>2.1</td>
</tr>
<tr>
<td>Ease in putting on and taking off</td>
<td>2.3</td>
<td>1.9</td>
<td>2.3</td>
<td>2.0</td>
<td>1.8</td>
<td>2.1</td>
</tr>
<tr>
<td>Ease in opening and closing fasteners</td>
<td>1.8</td>
<td>1.8</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>1.9</td>
</tr>
<tr>
<td>Room for movement or assistive devices</td>
<td>2.1</td>
<td>1.7</td>
<td>1.9</td>
<td>1.6</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Fit</td>
<td>2.3</td>
<td>1.8</td>
<td>1.7</td>
<td>1.2</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Ability of the fabric to hold its shape</td>
<td>1.8</td>
<td>1.9</td>
<td>2.0</td>
<td>1.6</td>
<td>1.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Placement of fasteners</td>
<td>1.6</td>
<td>1.6</td>
<td>1.9</td>
<td>1.8</td>
<td>1.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Garment is attractive and in style</td>
<td>1.8</td>
<td>1.7</td>
<td>2.0</td>
<td>1.4</td>
<td>1.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td>1.8</td>
<td>1.6</td>
<td>2.0</td>
<td>1.4</td>
<td>1.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Comfort of fabric</td>
<td>1.6</td>
<td>1.6</td>
<td>1.7</td>
<td>1.4</td>
<td>1.8</td>
<td>1.6</td>
</tr>
<tr>
<td>Ability of the fabric to resist wrinkles</td>
<td>1.5</td>
<td>1.8</td>
<td>1.7</td>
<td>1.2</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
<td>1.9</td>
<td>1.4</td>
<td>1.7</td>
<td>1.2</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Ease of care</td>
<td>1.4</td>
<td>1.2</td>
<td>1.3</td>
<td>1.2</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>All attributes</td>
<td>2.1</td>
<td>1.9</td>
<td>2.0</td>
<td>1.6</td>
<td>1.8</td>
<td>1.9</td>
</tr>
</tbody>
</table>

*Mean scores are reported according to the scale of: 1-very satisfactory, 2-satisfactory, 3-unsatisfactory, 4-very unsatisfactory.*
satisfaction with trousers registering an average of 1.6 on all the attributes. Those in the over 30 years category experienced a satisfaction rate of 1.8 followed by the 6-10 year group with a mean of 1.9 and the 11-20 year group with a mean of 2.0. Those men in the 0-5 year group rated all the attributes 2.1.

The younger men rated the majority of characteristics higher than those in the over twenty years categories. The major difference was in opening and closing fasteners and placement of fasteners. These attributes were rated higher by the older men. The younger men appeared to experience fewer problems related to fasteners.

The mean scores of all attributes for shirts by length of disability (see Table 11) were similar for the following groups: 0-5 years (mean 1.7), 6-10 years (mean 1.6) and 21-30 years (mean 1.7). The 11-20 year group registered a mean of 1.9 while those in the over 30 group rated all the attributes 2.1. The number of men in each age group with artificial arms apparently had some effect on the ratings as the two groups with the highest satisfaction ratings (11-20 years and over 30 years) each contained two men with artificial arms while the remaining groups each had one (refer to Table 1 for breakdown of length of disability by type of disability). This distribution also had a bearing on the mean scores of jacket
## TABLE 11
#### MEAN SCORES OF SHIRT ATTRIBUTES BY LENGTH OF DISABILITY

<table>
<thead>
<tr>
<th>Garment Attribute</th>
<th>0-5 Years</th>
<th>6-10 Years</th>
<th>11-20 Years</th>
<th>21-30 Years</th>
<th>30+ Years</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of subjects</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>2.3</td>
<td>2.0</td>
<td>2.6</td>
<td>2.0</td>
<td>2.6</td>
<td>2.3</td>
</tr>
<tr>
<td>Durability of construction</td>
<td>2.3</td>
<td>2.1</td>
<td>2.3</td>
<td>2.0</td>
<td>2.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Fit</td>
<td>1.8</td>
<td>1.9</td>
<td>1.7</td>
<td>1.6</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Ease in opening and closing fasteners</td>
<td>1.8</td>
<td>1.4</td>
<td>1.9</td>
<td>2.0</td>
<td>2.2</td>
<td>1.8</td>
</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
<td>1.6</td>
<td>1.9</td>
<td>1.9</td>
<td>1.6</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Garment is attractive and in style</td>
<td>1.5</td>
<td>1.9</td>
<td>2.0</td>
<td>1.6</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td>1.6</td>
<td>1.7</td>
<td>2.0</td>
<td>1.8</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Minimizes or hides disability</td>
<td>1.6</td>
<td>1.6</td>
<td>1.9</td>
<td>1.8</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Placement of fasteners</td>
<td>1.6</td>
<td>1.4</td>
<td>1.9</td>
<td>1.8</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Ability of the fabric to resist wrinkles</td>
<td>1.6</td>
<td>1.4</td>
<td>2.0</td>
<td>1.6</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Comfort of fabric</td>
<td>1.6</td>
<td>1.4</td>
<td>1.9</td>
<td>1.6</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Room for movement or assistive devices</td>
<td>1.6</td>
<td>1.4</td>
<td>1.7</td>
<td>1.8</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Ease in putting on and taking off</td>
<td>1.6</td>
<td>1.4</td>
<td>1.7</td>
<td>1.8</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Ability of the fabric to hold its shape</td>
<td>1.6</td>
<td>1.4</td>
<td>1.9</td>
<td>1.6</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Ease of care</td>
<td>1.4</td>
<td>1.4</td>
<td>1.7</td>
<td>1.6</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>All attributes</td>
<td>1.7</td>
<td>1.6</td>
<td>1.9</td>
<td>1.7</td>
<td>2.1</td>
<td>1.8</td>
</tr>
</tbody>
</table>

*Mean scores are reported according to the scale of: 1-very satisfactory, 2-satisfactory, 3-unsatisfactory, 4-very unsatisfactory.*
attributes by length of disability (Table 12) as the same two groups again had the highest satisfaction ratings.

In Table 11, the fabric is resistant to abrasion attribute also reflects the type of disability in each length of disability category. The 11-20 and over 30 years groups each registered a mean skewed toward unsatisfactory, 2.6, and the 0-5 year group responded with a mean of 2.3. This latter group contained four men wearing braces who experienced a high rating due to abrasion caused by the use of crutches while the 11-20 and over 30 year groups each contained two men with artificial arms. Ease in opening and closing fasteners was rated higher among the older men as it did with trousers.

As shown in Table 12, mean scores of jacket attributes by length of disability, the 11-20 year category had the highest mean of 2.1. The over 30 year group registered a mean of 2.0 while the 0-5 year group had a mean of 1.5. The 6-10 year group shows a mean of 1.6 and the 21-30 year group had the lowest mean of 1.3. As discussed previously, the two groups with the highest means each contained two men with artificial arms while the other groups each contained one. These were the only categories to register higher than 2.0 on any of the fifteen attributes.
### TABLE 12

**MEAN SCORES OF JACKET ATTRIBUTES BY LENGTH OF DISABILITY**

<table>
<thead>
<tr>
<th>Garment Attribute</th>
<th>0-5 Years</th>
<th>6-10 Years</th>
<th>11-20 Years</th>
<th>21-30 Years</th>
<th>30+ Years</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of subjects</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td>Ease in opening and closing fasteners</td>
<td>1.9</td>
<td>1.8</td>
<td>2.3</td>
<td>1.4</td>
<td>2.2</td>
<td>1.9</td>
</tr>
<tr>
<td>Durability of construction</td>
<td>1.8</td>
<td>1.4</td>
<td>2.6</td>
<td>1.6</td>
<td>2.2</td>
<td>1.9</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>1.8</td>
<td>1.7</td>
<td>2.1</td>
<td>1.4</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Placement of fasteners</td>
<td>1.6</td>
<td>1.7</td>
<td>2.3</td>
<td>1.4</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
<td>1.8</td>
<td>1.8</td>
<td>2.0</td>
<td>1.2</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Ease of care</td>
<td>1.5</td>
<td>1.6</td>
<td>1.9</td>
<td>1.2</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Room for movement or assistive devices</td>
<td>1.5</td>
<td>1.6</td>
<td>2.0</td>
<td>1.4</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Ability of the fabric to resist wrinkles</td>
<td>1.6</td>
<td>1.6</td>
<td>2.0</td>
<td>1.2</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Ability of the fabric to hold its shape</td>
<td>1.6</td>
<td>1.6</td>
<td>2.0</td>
<td>1.2</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td>1.5</td>
<td>1.6</td>
<td>2.0</td>
<td>1.4</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Ease in putting on and taking off</td>
<td>1.5</td>
<td>1.6</td>
<td>1.9</td>
<td>1.4</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Minimizes or hides disability</td>
<td>1.5</td>
<td>1.6</td>
<td>1.9</td>
<td>1.4</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Comfort of fabric</td>
<td>1.5</td>
<td>1.3</td>
<td>2.0</td>
<td>1.2</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Fit</td>
<td>1.5</td>
<td>1.7</td>
<td>1.9</td>
<td>1.2</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Garment is attractive and in style</td>
<td>1.4</td>
<td>1.4</td>
<td>2.0</td>
<td>1.2</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>All attributes</td>
<td>1.5</td>
<td>1.6</td>
<td>2.1</td>
<td>1.3</td>
<td>2.0</td>
<td>1.7</td>
</tr>
</tbody>
</table>

*Mean scores are reported according to the scale of: 1-very satisfactory, 2-satisfactory, 3-unsatisfactory, 4-very unsatisfactory.*
The mean scores of trouser attributes by trouser preference (Table 13) shows little difference between the two types of trousers. Twenty-two of the men studied chose straight leg trousers and twelve chose flared leg trousers. Those individuals wearing straight leg trousers rated all the attributes 1.8 while those wearing flared leg trousers rated all the attributes 2.0.

Fabric is resistant to abrasion and wear from assistive device was rated 3.4 by those men wearing flared leg trousers and 2.9 by those in the straight leg category. It appears that those men selecting flared leg trousers have more problems with abrasion because the knee is tighter and would experience more abrading against the prosthesis. Also, the flare below the knee would tend to move more while walking causing the rubbing to be greater than in straight leg trousers.

Durability of construction, minimizes disability and ease in putting on and taking off were all rated higher by those men wearing flared leg trousers. The common complaint regarding all these attributes was the diameter of the trouser leg at the knee. The flared leg trousers are often too small at the knee to be easily put on and this stretching causes seams to rip. The tightness of the knee also makes the prosthesis more apparent.
**TABLE 13**

**MEAN SCORES OF TROUSER ATTRIBUTES BY TROUSER PREFERENCE** *

<table>
<thead>
<tr>
<th>Garment Attribute</th>
<th>Straight Leg</th>
<th>Flared Leg</th>
<th>Total / Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of subjects</td>
<td>22</td>
<td>12</td>
<td>34</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>2.9</td>
<td>3.4</td>
<td>3.1</td>
</tr>
<tr>
<td>Durability of construction</td>
<td>2.4</td>
<td>2.7</td>
<td>2.5</td>
</tr>
<tr>
<td>Minimizes or hides disability</td>
<td>2.0</td>
<td>2.3</td>
<td>2.1</td>
</tr>
<tr>
<td>Ease in putting on and taking off</td>
<td>1.9</td>
<td>2.3</td>
<td>2.1</td>
</tr>
<tr>
<td>Ease in opening and closing fasteners</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Room for movement or assistive devices</td>
<td>1.9</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Fit</td>
<td>1.9</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Ability of the fabric to hold its shape</td>
<td>1.7</td>
<td>1.9</td>
<td>1.8</td>
</tr>
<tr>
<td>Placement of fasteners</td>
<td>1.7</td>
<td>1.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Garment is attractive and in style</td>
<td>1.7</td>
<td>1.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Comfort of fabric</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Ability of the fabric to resist wrinkles</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
<td>1.5</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Ease of care</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>All attributes</td>
<td>1.8</td>
<td>2.0</td>
<td>1.9</td>
</tr>
</tbody>
</table>

*Mean scores are reported according to the scale of: 1-very satisfactory, 2-satisfactory, 3-unsatisfactory, 4-very unsatisfactory.*
Table 14 shows the mean scores of trouser attributes by fabric of trouser preference. The majority of men studied (twenty-two) indicated they wore twill weave trousers. The experienced more dissatisfaction (mean 3.4) than did those wearing knit (mean 2.3) or plain weave (mean 3.0) trousers when considering the attribute fabric is resistant to abrasion and wear. The structure of twill weave fabric exhibits more float yarns than plain weave fabric causing more abrasion. The knit fabrics were rated lower because they do not develop the small holes caused by yarn breakage which was discussed in Satisfaction Ratings of Selected Garment Attributes--Trousers.

The attribute durability of garment construction was rated lower by those men selecting twill weave trousers. Perhaps this was because twill weave is typical of jeans and similar trousers which are designed for heavy wear, whereas knits and plain weave trousers are generally lighter weight garments.

Ease in opening and closing fasteners was rated 2.3 by men wearing knit trousers and 1.7 by those in the twill category. The twill weave trousers generally have a larger, heavier zipper while the knit trousers usually have a lightweight zipper. As discussed in Satisfaction
TABLE 14
MEAN SCORES OF TROUSER ATTRIBUTES
BY FABRIC OF TROUSER PREFERENCE*

<table>
<thead>
<tr>
<th>Garment Attribute</th>
<th>Twill Weave</th>
<th>Knit</th>
<th>Plain Weave</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of subjects</td>
<td>22</td>
<td>7</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>3.4</td>
<td>2.3</td>
<td>3.0</td>
<td>3.1</td>
</tr>
<tr>
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</tr>
<tr>
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<td>2.1</td>
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<td>2.3</td>
<td>2.2</td>
<td>1.9</td>
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<tr>
<td>Room for movement or assistive devices</td>
<td>1.9</td>
<td>1.6</td>
<td>1.8</td>
<td>1.8</td>
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<tr>
<td>Fit</td>
<td>1.9</td>
<td>1.7</td>
<td>1.8</td>
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<tr>
<td>Ability of the fabric to hold its shape</td>
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<td>2.1</td>
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<td>Garment is attractive and in style</td>
<td>1.6</td>
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<td>Clothing is similar to others in social group</td>
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<td>1.6</td>
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</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
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<tr>
<td>Ease of care</td>
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</tr>
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<td>1.9</td>
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<td>1.9</td>
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</tbody>
</table>

*Mean scores are reported according to the scale of: 1-very satisfactory, 2-satisfactory, 3-unsatisfactory, 4-very unsatisfactory.
Ratings of Selected Garment Attributes—Trousers, the
men studied preferred zippers with large pull tabs.

The mean scores of shirt attributes by shirt preference were not calculated due to the majority selecting button down the front shirts. Twenty-seven subjects selected button down the front shirts, one indicated he wore T-shirts, five wore pull-on shirts and one selected the fitted body shirt.

The mean scores of jacket attributes by jacket preference are reported in Table 15. Only scores for those men selecting sport coats and CPO jackets are listed as there were only two men who selected wind breaker jackets. There was very little difference in the attribute scores for the two types of jackets. Those men choosing sport coats experienced fewer problems opening and closing fasteners than the men wearing CPO jackets. Sport coats usually have very few buttons while a CPO jacket may have up to ten. Additionally, sport coats are quite frequently left unbuttoned.

Durability of construction was rated 2.1 by those in the sport coat category and 1.7 by those selecting CPO jackets. CPO jackets generally have heavier, more durable lining as compared to sport coats. Problems related to durability of construction are discussed under Satisfaction Ratings of Selected Garment Attributes—Jackets.
<table>
<thead>
<tr>
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<th>Total</th>
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<tbody>
<tr>
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<td>21</td>
<td>32</td>
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<td>Ease in opening and closing fasteners</td>
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<tr>
<td>Durability of construction</td>
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<td>1.7</td>
<td>1.9</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Placement of fasteners</td>
<td>1.7</td>
<td>1.7</td>
<td>1.8</td>
</tr>
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<td>Resistance of the fabric to spots and dirt</td>
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<tr>
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<tr>
<td>Clothing is similar to others in social group</td>
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<tr>
<td>Comfort of fabric</td>
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<td>1.6</td>
<td>1.6</td>
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<td>Garment is attractive and in style</td>
<td>1.6</td>
<td>1.6</td>
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</tr>
<tr>
<td>All attributes</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
</tr>
</tbody>
</table>

*The subjects rated each characteristic according to the scale: 1-very satisfactory, 2-satisfactory, 3-un-satisfactory, 4-very unsatisfactory. Mean scores are reported according to that scale.
Men's Comments Section

In addition to problems discussed regarding trousers, shirts and jackets, more men commented on shoes and socks than any other item. It was brought out that socks tend to wear exceptionally fast for men with artificial legs. The wear is most notable on the bottom of the socks. Shoes wear rapidly and depending on the individual, the wear begins on either the inside or outside.

A number of men interviewed believe buying with care can be the greatest advantage in satisfaction with garments. Heavy duty fabrics were suggested for longer wearing garments.

Three individuals felt correction should be made in the prosthesis itself rather than the clothing and had, themselves, attempted correction. Solutions mentioned were the covering of hinge points with squares of suede leather and the use of a leather square attached to the back thigh area of an AK prosthesis.

An important suggestion elicited from discussion was that clothing manufacturers should gather information concerning the customers desires. The many complaints regarding durability of construction and against zippers and zipper pull tabs would reinforce this idea.

The comment most frequently encountered during discussion was "I wear normal clothing just like anyone
else." Several stated they did not consider themselves disabled. One individual summed up the way many felt regarding their disability when he stated, "I can do anything you can do, it just takes a little longer, a little more patience, and a bit more ingenuity."

Summary

The men with a physical disability studied were diverse in age, occupation and education. The men ranged in age from twenty-two to sixty-five years. The mean age of the sample was 43.4 years and the mean length of disability was 16.1 years. Five subjects used crutches, two used canes and one used a wheelchair. Except for three, all were married.

The typical subject wore straight leg trousers of a twill weave fabric, button down the front shirts and a CPO jacket. The majority of men purchased their clothing in a department store. The clothing was purchased by the male studied in nineteen of the thirty-four cases. The most frequently mentioned problem in selecting garments was that the clothing is difficult to put on and remove. Salespeople are not willing to take time to help the person and hard to fit were also mentioned as problems. The most important features looked for when selecting clothing were fit, ease in putting on and taking off and durability.
No alterations were performed on shirts or jackets that related to a disability. Seven men with lower extremity disabilities required alterations on their trousers. Alterations discussed were zippers inserted on the inside seam of the trouser leg and lining the trouser leg to reinforce the area of wear. No individual interviewed knew of any informational service available regarding clothing for the disabled.

The subjects' ratings of satisfaction with selected garment attributes were skewed toward a satisfactory rating, indicating that most of the men were satisfied with trousers, shirts and jackets when considering these attributes. Men were least satisfied with the trousers abrasion resistance, durability of construction, ability to minimize the disability and ease in putting on and taking off the trousers. They were most satisfied with the easy care qualities of trousers.

Abrasion resistance and durability of construction were the least satisfying attributes of shirts. Ease of care was the most satisfying characteristic of shirts. While all ratings for jackets were of average satisfaction or better, the least satisfaction was in opening and closing fasteners and durability of construction.

The relationship between length of disability, type of garment preferred and ratings of garment
attributes also were analyzed. It was revealed that younger men experience more dissatisfaction with trousers than older men except in the area of fasteners. The mean scores of shirt attributes and jacket attributes by length of disability were skewed because of the distribution of men with artificial arms. Men selecting flared leg trousers had more problems than those who wore straight leg trousers. Twill weave trousers abraded faster than knit or plain weave trousers but were more durable in construction. Little difference was recorded in the attribute scores for sport coats and CPO jackets.

Discussion with the interviewees revealed many problems with shoes and socks. Additional suggestions regarding clothing were to: buy with care and correct the prosthesis rather than the clothing. It was suggested that clothing manufacturers should become more aware of the consumers preferences.
CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The preceding chapter presented the major findings of this study; this chapter discusses the conclusions and recommendations drawn from these results.

The main objective of this study has been to survey the problems presented by clothing currently used by men with a physical disability wearing braces or artificial limbs and to make recommendations for further study. Four goals were formulated and followed during the course of this study. All goals were accomplished and conclusions are presented based upon these four goals:

1. to determine what criteria men with a physical disability use when selecting their clothing,

2. to discover if men with a physical disability encounter and recognize specific problems of clothing,

3. to discover how men with a physical disability overcome problems encountered with their clothing,

4. to determine if men with a physical disability are aware of informational resources regarding clothing.

The men studied indicated the most important criteria in selecting their clothing was fit, ease in putting on and taking off the garment and durability. The major
problems encountered when shopping were clothing is difficult to put on and take off, salespeople are not willing to take the time to assist them and they are hard to fit.

The second goal of this study was to discover if men with a physical disability encounter and recognize specific problems of clothing. The subjects encountered and were able to explain a number of specific problems with their clothing. These men experienced excessive abrasion and wear of fabric from assistive devices. The comments made by the men revealed they were dissatisfied with durability of construction, ease in putting on and taking off clothing and many of the fasteners found on men's wear.

To discover how these men overcome problems encountered with their clothing was the third goal of this study. Selective shopping was the most frequently used method of overcoming clothing problems. Few of the men studied attempted to have their garments altered or modified. Those that did so were satisfied with the results. It was interesting to note that three men chose to alter their artificial leg instead of the trousers. Solutions suggested for trouser problems were to install a zipper on the inside seam of the trouser leg to make it easier to put on and to line the trouser leg reinforcing the point of greatest wear. These men might also benefit by
using lightweight iron-on patches on areas of wear instead of the heavy patches attempted. Those men using artificial arms could reduce abrasion of shirts if they were designed with a deep double yoke. The addition of a partial lining on the back shoulder area could also be tested.

Fasteners posed problems for many men, and yet, no one had tried replacing the existing fasteners with Velcro. This could be used with success on shirt fronts and cuffs, jackets and even trousers. The use of elastic shanks or links on buttons would make it easier to put on a shirt if they preferred to button the cuff first.

The final goal was to determine if men with a physical disability are aware of informational resources regarding clothing. No subject was aware of any such service available to individuals with a physical disability. This study brought out the severe lack of informational resources available regarding clothing. Information is not readily available to those who desire it. These findings agree with previous studies that a central information center on clothing for the disabled should be established and promoted. It should be designed to serve not only professionals in the field but individual persons with a disability and persons who may assist in their care.

In conjunction with the above recommendation, it is felt that the needs and problems of the physically
disabled should be given wider publication. Persons involved in the rehabilitation of the disabled, organizations and agencies, the physically disabled themselves and the general public must become aware of the problems encountered by the physically disabled so that possible solutions can be suggested. Improved communication and education would benefit all persons involved in the rehabilitation of the physically disabled.

Improved communication between the garment manufacturers and consumers would improve customer satisfaction with purchased clothing. It was indicated that stores should improve salespeople-customer relationships.

The number of comments by the men studied indicated the need for further research on the problems of footwear. This should include both shoes and hosiery.

A major problem revealed by this study was the excessive abrasion and wear of fabrics from assistive devices. It is recommended that a separate study on fabrics for additional resistance against abrasion and excessive wear be conducted.

Further investigation into the problems and possible solutions of fasteners for men with a physical disability is recommended. The number of problems revealed by this study should help motivate research in that area.
APPENDIX A

INTRODUCTORY LETTER
April 7, 1975

Hello!

You are a key source of information for my current research project. The main objective of my study is to evaluate the clothing currently used by men with a physical disability wearing braces or artificial limbs. Data for this survey is being gathered by interviewing men between the ages of twenty and sixty-five.

I would like to talk with you about your clothing needs. You would be asked questions concerning purchasing and using clothing and specific garment characteristics. The interview would consume about one hour of your time. All information will be strictly confidential and no individual responses will be revealed. If desired, you will be furnished with a summary of the study.

Won't you please take a minute to fill out the enclosed form? Simply drop it in a mailbox and I will contact you soon to arrange for an appointment at your convenience. Your assistance will be sincerely appreciated.

Yours truly,

Caroline M. Ewald
Graduate Student, Division of Clothing and Textiles, School of Home Economics
APPENDIX B

REPLY FORM
YES! I am interested in participating in your study.

Please call me at ____________________________
to arrange for an interview.

I would prefer the interview to be held:

_______ at the University of Arizona
_______ in my own home

The time most convenient for me is: ___________ (A)

Name__________________________ Age________
Address____________________________________
Marital status____________single__________married
Occupation______________________________

Education (circle highest grade completed)

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<tr>
<th>Grade school</th>
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<th>6</th>
<th>7</th>
<th>8</th>
</tr>
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<td>12</td>
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<td>College</td>
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<td>Soph</td>
<td>JR</td>
<td>SR</td>
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<tr>
<td>Graduate school</td>
<td>M</td>
<td>PhD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nature of physical disability (check those that apply)

Braces:  
leg(s)  short   ___long
arm(s)___

Artificial limb:  
leg(s)  BK    ___AK
arm(s)___BE    ___AE

How long have you had the above disability?____________

Are you a veteran? ______ yes ______ no

To mail - fold bottom up to meet line "A". Fold once
more, staple or tape the upper edge and drop in mailbox!
APPENDIX C

INTERVIEW SCHEDULE -- PART 1
1. (Give subject card #1) Which one of the trousers pictured most closely resembles those you usually wear?
   - A - baggies
   - B - straight-leg
   - C - flared-leg

2. (Give subject card #2) Which one of the fabric swatches most closely resembles the material of the pants you usually wear?
   - A - twill
   - B - knit
   - C - woven

3. (Give subject card #3) Which one of the shirts pictured most closely resembles those you usually wear?
   - A - T-shirt
   - B - pull-on
   - C - button-down front
   - D - fitted body shirt

4. (Give subject card #4) Which one of the jackets pictured most closely resembles the jacket you usually wear?
   - A - sweater
   - B - sport coat
   - C - wind breaker type
   - D - fitted body shirt

   (Probe question: Why is this your favorite?)

5. In what type of store do you purchase most of your clothing?

   - neighborhood men's store
   - department store
   - discount store
   - catalogue
   - clothes specially tailored as pattern and material for home sewing
   - other

   (record answer here)
6. Who usually selects your garments?

(identify) ________________________  self ______

relative ______

friend ______

self and relative ______

7. (Give subject card #7) Which of the items listed is the main feature you look for when selecting your clothes?

fit ______

durability ______

comfort ______

ease in putting on and taking off ______

ease of care ______

color ______

style ______

What is the second most important feature? (wait for response) And the third most important feature? (rank above items 1, 2, 3)

8. (Give subject card #8) Which of the items listed do you consider the biggest problem in selecting clothes for yourself?

lack of good design ______

garment difficult to care for ______

hard to fit ______

clothing difficult to put on and remove ______

salespeople not willing to take time to help ______

choice of fabric ______

price ______

limited access to store ______

What is the second biggest problem? (wait for response) And the third biggest problem? (rank above items 1, 2, 3)

9. How often do you find that it is necessary to modify or alter ready-made trousers in any way?

always ______

frequently ______

occasionally ______

never ______
10. How often do you find that it is necessary to modify or alter ready-made shirts in any way?

- always ________
- frequently ________
- occasionally ________
- never ________

11. How often do you find that it is necessary to modify or alter ready-made jackets in any way?

- always ________
- frequently ________
- occasionally ________
- never ________

11a. Who makes the necessary alterations?

- self ________
- relative ________
- friend ________
- paid tailor or seamstress ________
- (identify)______________
- other ________

11b. Which of the following is the main reason why the alteration is needed.

- allow room for movement ________
- improve the fit ________
- improve the comfort ________
- make it easier to put on and take off the garment ________
- reinforce areas where extra wear is put on one part of the garment ________

(Probe question: Can you explain the procedure of the alteration?)
11c. How often do you find that these alterations are functional without changing the overall appearance of the garment?

- always [ ]
- frequently [ ]
- occasionally [ ]
- never [ ]

(Probe question: Can you explain why not?)

12. Are you familiar with any informational services available regarding clothing for the disabled?

- yes [ ]
- no [ ]

12a. Will you please identify those services?

- Veterans information [ ]
- Disabled Living Foundation publications [ ]
- Fashion-Able catalog [ ]
- New York University Medical Center publications [ ]
- USDA bulletins [ ]
- other [ ]

(Record answer here)

12b. From which ones do you use information:

- none [ ]
- Veterans information [ ]
- Disabled Living Foundation publications [ ]
- Fashion-Able catalog [ ]
- New York University Medical Center publications [ ]
- USDA bulletins [ ]
- other [ ]

(Record answer here)
12c. How often do you find that what they have to offer is satisfactory?

always ______
frequently ______
ocasionally ______
ever ______

(Probe question: Why is (is not) it helpful?)

13. How tall are you? ______

14. How much do you weigh? ______

15. Do you use any assistive devices?

none ______
crutches ______
cane ______
wheelchair ______
other ______

(record answer here)
APPENDIX D

DRAWINGS USED FOR QUESTIONS 1, 3 AND 4, INTERVIEW SCHEDULE--PART 1
APPENDIX E

INTERVIEW SCHEDULE -- PART 2
Please rate the following characteristics according to how you feel about them. Circle the appropriate number for each characteristic listed. If a question is not applicable, please leave the answer blank.

1 - very satisfactory
2 - satisfactory
3 - unsatisfactory
4 - very unsatisfactory

Rate the following characteristics for the TROUSERS you usually wear.

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<th>Characteristic</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Comfort of fabric</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Room for movement or assistive devices</td>
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</tr>
<tr>
<td>Fit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ease in putting on and taking off</td>
<td></td>
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<tr>
<td>Ease in opening and closing fasteners</td>
<td></td>
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</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
<td></td>
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<td></td>
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</tr>
<tr>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Ability of the fabric to hold its shape</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durability of construction (for example, seams do not rip out, zippers break)</td>
<td></td>
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<td></td>
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</tr>
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<td>Fabric is resistant to abrasion and wear from assistive devices</td>
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<td></td>
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</tr>
<tr>
<td>Garment is attractive and in style (in your opinion)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td></td>
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<td></td>
<td></td>
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</tbody>
</table>
Rate the following characteristics for the **SHIRTS** you usually wear.

<table>
<thead>
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<th>Characteristic</th>
<th>Very satisfactory</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
<th>Very unsatisfactory</th>
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<td>Comfort of fabric</td>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Garment is attractive and in style (in your opinion)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Rate the following characteristics for the **JACKET** you usually wear.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Very satisfactory</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
<th>Very unsatisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfort of fabric</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Room for movement or assistive devices</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Fit</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Ease in putting on and taking off</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Ease in opening and closing fasteners</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Placement of fasteners</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Ease of care</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Resistance of the fabric to spots and dirt</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Ability of the fabric to resist wrinkles</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Ability of the fabric to hold its shape</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Durability of construction (for example, seams do not rip out, zippers break)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Fabric is resistant to abrasion and wear from assistive devices</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Minimizes or hides disability, if desirable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Garment is attractive and in style (in your opinion)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Clothing is similar to others in social group</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX F

INTERVIEW PROCEDURE

I. Introductory Comments

Hello, (name). I'm Caroline Ewald from the Division of Clothing, Textiles and Interior Design in the School of Home Economics at The University of Arizona. Thank you for allowing me this time to discuss your clothing needs.

As I mentioned in my letter, I am trying to evaluate the clothing currently used by men with artificial limbs or braces. Many persons who have a physical disability encounter problems with their clothing. If we can pinpoint the problems that you are having, perhaps more can be done to solve them.

Your name will not be associated with what you say. There are no right or wrong answers to the questions I'll be asking - what is needed are the opinions of different people. I'd like for you to feel free to say what you think whether you believe anyone else would agree with you or not. You are not required to answer any questions you prefer not to. If there are questions you don't understand, please feel free to ask. If at any time you chose to
withdraw from the study, the interview will be terminated and all material you have supplied will be returned to you.

II. Interview Schedule - Part 1

The first section deals with clothing purchase and use.

Administer Interview Schedule, Part 1.

III. Questionnaire and Discussion

I would like you to fill out a short questionnaire concerning garment characteristics. Please rate the characteristics according to how you feel about them using the scale of: 1 - very satisfactory, 2 - satisfactory, 3 - unsatisfactory, 4 - very unsatisfactory. Feel free to ask any questions you may have while filling out the questionnaire. There are three pages, one each for pants, shirts and jackets.

Give subject Part 2 to complete. If subject has an arm disability which would interfere with his writing, the interviewer will suggest that she fill in the form for him. When Part 2 has been completed the interviewer will discuss questions rated three or four with the interviewee to acquire more information about these specific dissatisfactions. Probe questions to be used are:

1. You indicated that (garment) is (rating) in terms of (garment characteristic). Would you explain this?
2. What do you think causes that?

Do you have any additional comments or suggestions regarding your clothing?

End of interview.
SELECTED BIBLIOGRAPHY


Lord, Joan. Clothing for the Handicapped and Disabled in the Hospital or in the Community. Manchester, Great Britain: Shirley Institute, October 1970.


