Consumer acceptance and wear performance of men's knit undershirts

Neva Foster Olsen

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Consumer Acceptance and Wear Performance of Men's Knit Undershirts

Neva F. Olsen
Frances G. McDermott
Mary H. Motichek
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Consumer Acceptance and Wear Performance of Men’s Knit Undershirts

Neva F. Olsen, Frances G. McDermott, Mary H. Moticher

INTRODUCTION

Cotton knit undergarments have had an important place in personal wardrobes for many years. However, knit goods manufacturers are now using a variety of fibers alone or in combination with the cotton fiber to replace the traditionally all cotton garments. In 1966, manufacturers used 188.3 million pounds of fiber for men’s and boys’ underwear which were largely composed of 100 percent cotton (10). The same year a total of 52,048,000 sleeveless, knit, athletic-type undershirts were produced and consumed (6). In 1968, a significant increase in production occurred. That year 58,044,000 sleeveless, knit, athletic-type undershirts were produced with a value of 28.7 million dollars (12). In 1971, 169.9 million pounds of fiber were used for men’s and boys’ knit underwear, with a definite increase in use of man-made fibers (11).

Few studies are available that compare the different fiber types of undershirts being used today in situations of actual wear. The consumer is not usually interested in identifying fibers per se, but is more concerned with how certain fibers will perform in a finished cloth.

When a study involves consumer behavior, an understanding of the consumer’s social status and environment within society is automatically involved. Natural stratification is found within a society, and this exists locally as well as nationally (2, 3, 6). Many efforts have been made to describe social class in this country. The numerous studies of particular cities, towns, and areas make it clear that a given locale may have a relatively small or a relatively large number of class divisions, and that the criterion of each may vary considerably. There is no agreement about the number or size of social classes that exist in America (2). Reissman (8, p. 230) said, “classes are designated quite arbitrarily and frequently on the bases of occupation, residential area, income or education.” Hollingshead also recognized the education and occupation variables by developing an Index of Social

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1Associate Professor, Instructor, and Graduate Student, respectively, School of Home Economics, Louisiana State University, Baton Rouge, Louisiana.

2Italic numbers in parentheses refer to Literature Cited, page 15.
Position which fulfills "... the need for an objective, easily applicable procedure to estimate positions individuals occupy in the status structure of the community" (3, p. 387).

Martineau concluded from a study by the Chicago Tribune that social class differences were more significantly determinant of buying behavior than was income (5). Class has been found to influence consumer behavior because values, life styles, goals, and behavior of the several classes were distinct and different (8).

The market for some consumer products is influenced by such factors as education and occupation. From a realistic point of view, these factors are highly influential (9). Men and women who possess similar educational backgrounds will tend to have similar tastes, similar attitudes, and similar behavior patterns (4). It is important to realize that there are far-reaching psychological differences between the various social classes. They do not think literally in the same way. The high social class and the middle social class consumers function in an environment which offers information if they have the motivation and the drive to accept it. However, the low income consumer does not even know that consumer information exists. In fact, he has no consumer awareness, except that he believes that living is expensive. He does not consciously think about the choices open to him.

Social classes are homogeneous in behavior. This is a particularly important assumption for consumer analysts, because it means that "members of a particular social class tend to buy the same products, shop at the same stores, and undergo similar decision processes" (2, p. 265). Each social class displays characteristic values and behavior patterns that are useful in analyzing consumer decisions (2). The knowledge that the individual acts in a social frame of reference determined by the group of which he is a member has been important to the understanding of human behavior.

The objectives of this study were: (1) to investigate the aesthetic and economic factors that consumers of three social classes considered in selecting, and evaluating after use, garments of varying fiber content; (2) to compare the wearing qualities of these selected undershirts as determined by laboratory analysis.

MATERIALS AND METHODS

Garments

Classic sleeveless, knit undershirts were the garments used in this study. Since these staple clothing items are less subject to fashion changes than outerwear, emphasis was placed on fabric rather than fashion features. The fiber composition of the undershirts was: 100 percent cotton, 50-50 percent cotton-polyester blend, and 100 percent polyester. Major brand name garments were chosen from undershirts available on the market. The 100 percent cotton and 50-50 percent
cotton-polyester undershirts were tubular with a single filling knit in a ribbed pattern and were identical in price; the 100 percent polyester garments were made of tricot knit with side seams—the only type available on the market—and were the most expensive of the three types.

Participants

The participants were 120 married Caucasian men randomly selected from the Baton Rouge, Louisiana, area by the use of two reference directories (1, 7). Only men who were accustomed to wearing the sleeveless type undershirts and who wore them the entire year were accepted for the study. The 120 participants were categorized into high, middle, and low social class groups, with 40 men representing each group. Two factors—occupation and education—were utilized to determine social class (3). These two factors for each participant were computed from Hollingshead's system of seven scores. Multiple correlation techniques were used to determine the factor weights, which were as follows:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Factor Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation</td>
<td>7</td>
</tr>
<tr>
<td>Education</td>
<td>4</td>
</tr>
</tbody>
</table>

The Index of Social Position score for an individual was calculated by multiplying the scale value for occupation by the factor weight for occupation, and the scale value for education by the factor weight for education. The social class to which the individual belonged was determined by the sum of these two scores. The Index was arranged into groups of scores as follows:

<table>
<thead>
<tr>
<th>Social Class</th>
<th>Range of Computed Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>11-17</td>
</tr>
<tr>
<td>II</td>
<td>18-27</td>
</tr>
<tr>
<td>III</td>
<td>28-43</td>
</tr>
<tr>
<td>IV</td>
<td>44-60</td>
</tr>
<tr>
<td>V</td>
<td>61-77</td>
</tr>
</tbody>
</table>

Respondents from social classes I and II were designated as the high social class, III as the middle social class, and IV and V as the low social class. These ranks assisted in establishing the homogeneity of the three social class groups within the sample (3).

Questionnaires were administered to the husband or wife who usually purchased undershirts. The first questionnaire consisted of four sections: background information, purchasing practices when selecting men's undershirts, factors considered when purchasing, and evaluations of the selected garments. During this evaluation phase, a representative shirt of each fiber type was shown the participant. At the end of the wear phase, participants responded to another questionnaire regarding the most comfortable and desirable undershirt. The questionnaires contained check sheets and open end questions.
Wear Phase

Three undershirts, one each of the selected fiber types, were distributed to each male participant. The participants were instructed to wear each shirt once per week for one calendar year and to launder them according to their individual laundering procedure. The questionnaire was also administered during this visit to determine what factors were considered when actually purchasing undershirts. Laundering procedures to be used were recorded. It was found that for this type garment, the majority used one-half cup of built synthetic detergent, agitated for 10 minutes in a hot water wash, and followed with a warm water rinse. Approximately one-half of the participants tumble dried their laundry, while the remaining one-half dried their clothing on an outside line.

Laboratory Evaluation

Laboratory tests were conducted on a selected number of new undershirts and on those which had been worn for one calendar year. The following tests were performed according to procedures established by the American Association of Textile Chemists and Colorists and the American Society for Testing and Materials: dimensional change, color difference, and bursting strength.

RESULTS AND DISCUSSION

Consumer Acceptance Phase

It was found that the respondents' wardrobes included an average of 6-8 undershirts, with more made from 100 percent cotton than from any other fiber type. There may be a possibility that some respondents were not aware of the fiber content of each shirt they possessed, since 30-45 percent stated that they did not inspect the label before purchase and a majority selected the cotton-polyester blend as the most desirable before and after wear.

The pattern of responses regarding the aesthetic and economic factors considered when purchasing showed no significant differences, according to the chi-square test, among the social class groups. Dimensional stability, comfort, brand name, and whiteness were the major factors given by those who knew what they considered when purchasing, as shown in Figure 1. Of the total participants, 31.7 percent did not know what factors or criteria they used. Implications are that an instrument other than a questionnaire would be needed for eliciting information from these unaware consumers. This seems to support the idea that the decision-making process is not entirely conscious. Since undershirts have little or no prestige connotation, this may have accounted for the 50-65 percent who do not open packaged shirts before purchase.

Knowledge of the retail price or actual wear for a one-year period
Figure 1.—Major factors respondents consider when purchasing undershirts.
did not change the opinion of the participants that the cotton-polyester blend was the most desirable and comfortable. However, after wear, dimensional stability and fabric softness were the major reasons given for this selection. A majority of the participants rejected the 100 percent polyester undershirts after a few weeks of wear; therefore, these undershirts were removed from the laboratory evaluation phase.

Laboratory Evaluations

Data obtained from laboratory analysis of the undershirts, before and after wear, were subjected to a 2 x 3 factorial analysis of variance.

Strength.—Strength of the new and worn undershirts was determined by using the Scott Tester with ball burst attachment. Mean square values for strength showed significant differences for social class and were highly significant for the fiber content (Table 1). As expected,

Table 1.—Mean square values for strength of cotton and cotton blend undershirts

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>Mean Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>179</td>
<td></td>
</tr>
<tr>
<td>Fiber</td>
<td>1</td>
<td>70908.1709**</td>
</tr>
<tr>
<td>Class</td>
<td>2</td>
<td>341.3867*</td>
</tr>
<tr>
<td>Fiber x Class</td>
<td>2</td>
<td>121.0971</td>
</tr>
<tr>
<td>Error</td>
<td>174</td>
<td>76.0945</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.  
**Significant at the .01 level.

both the all cotton and cotton blend undershirt fabrics among all social classes lost strength after the one-year wear period, even though the strength of the shirts worn by the high social class was greater.

The ball burst strength of the new cotton-polyester undershirts was 92.80 pounds per square inch as compared with 58.46 for the all cotton (Figure 2). After the wear period the mean strength for the cotton-polyester was 80.44 pounds and for the cotton, 40.74 pounds. Wear and laundering reduced the strength of the cotton-polyester more than the cotton; however, the cotton blend continued to be stronger after the wear period.
Before Wear
After Wear
High
Middle
Low

COTTON BLEND
Before Wear
After wear
High
Middle
Low

Figure 2.—Bursting strength of cotton and cotton blend undershirts before and after one year of wear by three social class groups.

Dimensional Change.—Dimensional change was determined by measuring shirts before and after wear in the lengthwise and crosswise directions to the nearest 1/10 inch.

Highly significant differences were found for the dimensional change of the undershirts due to fiber content (Table 2). Social class was not a significant factor. Shrinkage occurred in the length of both the cotton and cotton blend shirts, with more shrinkage found after wearing for the cotton than for the cotton-polyester (Figure 3).

The new cotton undershirts were 31.6 inches in length before, and 25.1 inches after, the wear period, thus showing a shrinkage of 6.5 inches, or 20.6 percent. Shirts consisting of cotton-polyester were originally 32.8 inches in length, and after wearing were 28.4 inches, showing a mean shrinkage of 4.4 inches, or 13.4 percent.
Table 2.—Mean square values for dimensional change of cotton and cotton blend undershirts

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>Lengthwise</th>
<th>Crosswise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>179</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiber</td>
<td>1</td>
<td>492.693556**</td>
<td>392.586605**</td>
</tr>
<tr>
<td>Class</td>
<td>2</td>
<td>0.863052</td>
<td>0.094877</td>
</tr>
<tr>
<td>Fiber x Class</td>
<td>2</td>
<td>1.015894</td>
<td>1.439212</td>
</tr>
<tr>
<td>Error</td>
<td>174</td>
<td>0.989822</td>
<td>1.649264</td>
</tr>
</tbody>
</table>

**Significant at the .01 level.

Figure 3.—Lengthwise dimensional change of cotton and cotton blend undershirts, before and after one year of wear by three social class groups.
When measured in the crosswise direction, it was found that the cotton undershirts stretched 2.8 inches and the cotton-polyester 0.2 inch (Figure 4).

Figure 4.—Crosswise dimensional change of cotton and cotton blend undershirts before and after one year of wear by three social class groups.
Color Difference.—Color difference measurements were made using a Hunterlab Model D25 Color Difference Meter. The \( L \), \( a \), \( b \) scale of the model D25 gives measurements of color in units of approximate visual uniformity throughout the color solid. Highly significant differences for the \( L \) factor were due to fiber content, while \( a \) and \( b \) value changes were highly significant due to social class (Table 3).

Table 3.—Mean square values for color difference of cotton and cotton blend undershirts

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>( L )</th>
<th>( a )</th>
<th>( b )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>179</td>
<td>444.247380**</td>
<td>0.07160056</td>
<td>0.0822672</td>
</tr>
<tr>
<td>Fiber</td>
<td>1</td>
<td>8.719954</td>
<td>3.56317056**</td>
<td>27.5387039**</td>
</tr>
<tr>
<td>Class</td>
<td>2</td>
<td>1.175502</td>
<td>0.41730722</td>
<td>1.4913206</td>
</tr>
<tr>
<td>Fiber x Class</td>
<td>2</td>
<td>6.405019</td>
<td>0.71010489</td>
<td>4.3436217</td>
</tr>
<tr>
<td>Error</td>
<td>174</td>
<td>0.4719954</td>
<td>0.07160056</td>
<td>0.0822672</td>
</tr>
</tbody>
</table>

**Significant at the .01 level.

Figure 5.—Color difference of cotton and cotton blend undershirts after one year of wear by three social class groups.
The $L$ measures lightness and varies from 100 for perfect white to zero for black. Both the all cotton and the cotton-polyester undershirts became darker after wear and laundering, with the cotton blend becoming darker than the cotton. The mean $L$ value after wearing for cotton was $-4.45$ as compared with $-4.57$ for cotton-polyester, showing a significant difference due to fiber content (Figure 5).

The $a$ measures redness when plus, gray when zero, and greenness when minus. Greenness increased after wearing, with shirts worn by the high social class group containing less than those worn by the middle and low social class groups (Figure 6).

![Figure 6.—Color difference of cotton and cotton blend undershirts after one year of wear by three social class groups.](image-url)
The $b$ measures yellowness when plus, gray when zero, and blueness when minus. Both types of shirts yellowed with wear and laundering, with the shirts worn by the high social class group yellowing least (Figure 7).

![Color difference of cotton and cotton blend undershirts after one year of wear by three social class groups.](image)

**SUMMARY**

In summary, no significant differences in purchasing practices of respondents were found due to social class. This may imply that the social class to which a consumer belongs has little effect on his purchasing habits and use of staple items such as undershirts. Differences in wearing qualities due to fiber content were highly significant in most instances. This study also points up the fact that even though consumers say that they prefer cotton and select this fiber, almost 45
percent do not check the label for fiber content and may actually be using blends with cotton rather than 100 percent cotton. This may also be due to the fact that many cotton blends have almost the same appearance and hand as 100 percent cotton.

The high rejection of the 100 percent polyester, and the acceptance of the cotton blend as most desirable, emphasized the need for a better process to stabilize cotton knit fabric to prevent shrinkage and stretching. Certainly, because cotton remained whiter than the cotton blend after wearing, it is highly desirable; but consumers did not feel that whiteness was as important during wear as dimensional stability and softness.

LITERATURE CITED
