

The University of North Carolina  
at Greensboro

JACKSON LIBRARY



CG

no. 1504

UNIVERSITY ARCHIVES

KOONCE, JOAN B. *Flame Safety in the Consumer Apparel Market.* (1976)  
Directed by: Dr. Victor Salvin. Pp. 75

The purpose of this study was to determine consumer willingness to trade off some costs and fabric properties for flame resistance. It was hypothesized that consumers were indifferent to flame resistance when weighed against price, comfort, durability, ease of laundering care and carcinogenic potential.

The sample was drawn at random from the population of Greensboro, North Carolina, telephone subscribers. Analyses were performed on the results of 128 completed interviews. A sample of this size has an error level of less than 9%. Statistical procedures used included the chi-square one-sample test, the chi-square 2xk contingency table, the Kolmogorov-Smirnov one-sample test, the Kolmogorov-Smirnov two-sample test, and standard errors of the means. All conclusions were based on a 95% confidence level.

The conclusions were that consumers were unwilling to trade off comfort, durability, and ease of laundering care for flame resistance; consumers were willing to pay a higher price for flame resistance; and that consumers were unable to choose between the dangers of flammability and the threat of carcinogenic activity.

FLAME SAFETY IN THE CONSUMER APPAREL MARKET

by

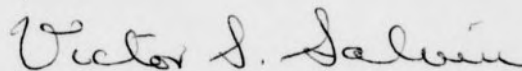
JOAN B. KOONCE

A Thesis Submitted to  
the Faculty of the Graduate School at  
The University of North Carolina at Greensboro  
in Partial Fulfillment  
of the Requirements for the Degree  
Master of Science in Home Economics

© 1976 Joan B. Koonce

Greensboro  
1976

Approved by



---

Thesis Adviser

APPROVAL PAGE

This thesis has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

Thesis Adviser Victor J. Salvin

Committee Members Dr. Abdul-Shauq  
Conrad M. Bremer

11-10-76  
Date of Acceptance by Committee

## TABLE OF CONTENTS

	Page
APPROVAL PAGE . . . . .	ii
LIST OF TABLES . . . . .	v
CHAPTER	
I. INTRODUCTION . . . . .	1
Statement of the Problem . . . . .	1
Scope of the Study . . . . .	2
Significance of the Study . . . . .	2
II. REVIEW OF RELATED RESEARCH. . . . .	3
Types of Research . . . . .	3
Consumer and Market Surveys . . . . .	3
Wear-Trial Programs . . . . .	5
Pilot Marketing Programs . . . . .	6
III. PROCEDURES . . . . .	8
Hypothesis Formation . . . . .	8
Study Design . . . . .	8
Subject Selection . . . . .	9
Questionnaire . . . . .	10
IV. DATA AND RESULTS . . . . .	13
Demographics of Sample . . . . .	13
Responses to General Section of the Questionnaire . . . . .	16
Consumer Attitudes on Paying the Costs for Flame Retardant Protection. . . . .	21
Consumer Opinions on Textile Flammability Regulating Bodies . . . . .	35

TABLE OF CONTENTS (CONTINUED)

	Page
V. SUMMARY AND CONCLUSIONS . . . . .	39
Summary . . . . .	39
Conclusions . . . . .	39
Recommendations . . . . .	40
BIBLIOGRAPHY . . . . .	44
APPENDIX 1 . . . . .	47
APPENDIX 2 . . . . .	55
APPENDIX 3 . . . . .	59
APPENDIX 4 . . . . .	62
APPENDIX 5 . . . . .	65
APPENDIX 6 . . . . .	68
APPENDIX 7 . . . . .	71
APPENDIX 8 . . . . .	73

## LIST OF TABLES

		Page
1.	Call Completion Rate . . . . .	10
2.	Age and Sex Characteristics of the Sample . . . . .	13
3.	Age Summary . . . . .	14
4.	Tabulation of Sample Household Compositions . . . . .	14
5.	Typical Household Composition. . . . .	15
6.	Annual Household Income Distribution . . . . .	15
7.	Ignition Sources in Burn Injuries Received by Respondents or Their Families . . . . .	18
8.	Consumer Awareness of Federal Textile Related Flammability Regulations . . . . .	19
9.	Consumer Willingness to Pay Increased Price for Flame Resistance . . . . .	22
10.	Consumer Willingness to Sacrifice Comfort for Flame Resistance . . . . .	26
11.	Consumer Willingness to Trade Off Durability for Flame Resistance . . . . .	28
12.	Consumer Willingness to Replace Easy Care Properties With Flame Resistance . . . . .	30-31
13.	Measures of Central Tendencies of Males and Females on Their Willingness to Replace Easy Care Properties With Flame Resistance . . . . .	31
14.	Consumer Choice Between Safety From Carcinogenic Potential and Flame Resistance . . . . .	34
15.	Consumer Selection of Regulating Body for Textile and Clothing Flammability. . . . .	35

LIST OF TABLES (CONTINUED)

	Page
16. Tabulation of Selection of Regulating Bodies by Those Selecting More Than One . . . . .	36
17. Consumer Preferences Relative to Flame Resistance . . . . .	40



CHAPTER I  
INTRODUCTION

Statement of the Problem

The technology of flame retarding textile fabrics is becoming highly developed. Actions by the federal and state governments designed to protect the consumer may be credited with being a major impetus to this development. Despite these advances, flame retardant protection has some disadvantages. Among these is the price. Flame retarding children's sleepwear has increased the price to consumers about 30%, and flame retarding other clothing is expected to have a similar impact on the price.<sup>1</sup> Comfort, durability, and ease of laundering care are also affected by flame retardant treatment. In addition, a chemical commonly used to flame retard polyester and acetate fabrics has been claimed to be a possible carcinogen by the Environmental Defense Fund.<sup>2</sup> These are all negative values to the consumer, and it is not known whether consumers are willing to pay these costs for increased flame retardant protection.

---

<sup>1</sup>Diane Specht, "The FR Controversy - Measuring the Financial Impact, Part III of a Series," Earnshaw's Review, July 1976, p. 22.

<sup>2</sup>Ann Telthorst, "Warning Label on FR Chemical Urged," Daily News Record (New York), 26 March 1976, sec. 1, p. 18.

### Scope of the Study

The scope of this study included measuring consumer willingness to pay the costs listed above for flame retardant protection. It also determined consumer opinions on the flammability danger of clothing along with knowledge of basic federal flammability regulations and burn injury experience.

### Significance of the Study

This study is significant because there is little information available on consumer opinions concerning the need for flame retardant protection or willingness to pay the various costs for it. Many federal and state regulations have been and are being considered or promulgated based on certain accident and injury statistics which are now suspect.<sup>3</sup> Consumers have had little opportunity to demonstrate their preference for flame retardant clothing because voluntary marketing of flame retardant clothing is but a small percentage of the total retail market.<sup>4</sup> Therefore, little is known about the consumer market for flame retardant clothing. This study is an attempt to significantly increase the knowledge of this market.

---

<sup>3</sup> Joan Laughlin and Judith Trautwein, "Clothing - Related Thermal Burn Injuries and Deaths in Nebraska for Fiscal Year 1975," Bobbin, September 1976, p. 210.

<sup>4</sup> "FR Implementation at a Crossroads," Clothes, 1 December 1975, p. 12.

## CHAPTER II

### REVIEW OF RELATED RESEARCH

#### Types of Research

Other research in the area of consumer attitudes and preferences have included consumer surveys, market surveys, wear trial programs, and pilot marketing programs. These have been conducted or sponsored by the federal government, trade associations, educational institutions, consulting firms, and retail chains.

#### Consumer and Market Surveys

A random telephone survey was conducted in Memphis by RAMCON.<sup>1</sup> A majority (66.7%) of the 120 adult women interviewed considered the extra price of flame retardant protection worthwhile. The respondents in this survey were willing to sacrifice some comfort, but unwilling to sacrifice permanent press properties, for flame retardant protection.

Preliminary results of a mail survey conducted by the Textile Industry Product Safety Committee indicated that consumers were least willing to sacrifice durability and comfort for flame retardant protection.<sup>2</sup>

---

<sup>1</sup>"Women Have Positive Views On Fire Retardant Apparel," News & Views, (Memphis, Tennessee: RAMCON, 223 Scott St., July 1975), pp. 2, 4.

<sup>2</sup>"Reaction Mixed on FR Sleepwear," TIPS Newsletter, (Washington, D.C.: Textile Industry Product Safety Committee, Summer 1976), p. 2.

Of the 146 respondents, 73 had experience with flame retardant children's sleepwear. Of these, 56% were generally satisfied. With this sample size, the error is approximately 10.5% at a 95% confidence level. This indicates, therefore, that these respondents were evenly split on satisfaction. On a question of voluntary marketing, only 31% indicated interest in buying flame retardant garments for the entire family. The remainder were equally divided on interest in purchasing flame retardant children's play clothes and in purchasing flame retardant garments for the elderly.

The study with the largest sample size (2,161 completed interviews) was published by the United States Department of Agriculture's Economic Research Service.<sup>3</sup> This study concentrated on fiber preferences, not on flame retardant clothing. But when asked what properties are most important in purchasing clothing for children, clothing that "Does not burst into flames easily" was usually selected after easy care, durability, and comfort features. Price was chosen after flammability behavior on the list of selection criteria.<sup>4</sup>

---

<sup>3</sup>U.S. Department of Agriculture, Economic Research Service, Mothers' Attitudes Toward Cotton and Other Fibers in Children's Lightweight Clothing, by L. Yvonne Clayton, Marketing Research Report No. 1026 (Washington, D.C.: Government Printing Office, 29 April 1973).

<sup>4</sup>Ibid., pp. 62-65, 99-101.

At the Third Springs [Mills] Consumer Advisory Panel, consumer advocates and teachers stated that consumers were not demanding flame retardancy.<sup>5</sup> Several examples were given of substitutions of non-regulated items for items regulated by the federal Children's Sleepwear Standards (FF 3-71 and FF 5-74). Such substitutions, as underwear or diapers for sleepwear, were done most frequently in lower income households unable to afford the higher priced sleepwear according to Barbara Rice, an assistant professor and extension home economist from the University of Wisconsin.<sup>6</sup>

#### Wear Trial Programs

Wear trial programs were conducted by the School of Home Economics at Winthrop College.<sup>7</sup> The subjects were young females in both studies. One study used winter weight, flame resistant nightgowns of synthetic fabrics and the other study used summer weight nightgowns. In the winter season study, all gowns were flame resistant. The other

---

<sup>5</sup>Francine Schore, "FR Leaves Consumers Cold, Springs Mills Panel Finds," Daily News Record, 18 March 1975, p. 12.

<sup>6</sup>Ibid.

<sup>7</sup>"Progress Report No. 1: Investigation of Consumer Acceptance of Flame Retardant Children's Sleepwear, Winter Nightgowns Size 7-14," Winthrop College, Rock Hill, South Carolina, 19 February 1975; "Progress Report No. 2: Investigation of Consumer Acceptance of Flame Resistant Children's Sleepwear, Winter Nightgowns, Size 7-14, Consumer Evaluations," Winthrop College, Rock Hill, South Carolina, 30 October 1975; Kenneth C. Laughlin, "Consumer Acceptance of FR Sleepwear," Textile Chemist and Colorist, 8 (March 1976): 51-55.

study included a non-flame resistant 65/35 polyester/cotton gown as a control. The participants in both studies were from the Rock Hill, South Carolina, area. The winter season study, involving 168 participants, reached the preliminary conclusions that shrinkage and durability properties were more important to consumers than flame resistance and that price and styling were less important.<sup>8</sup> The summer season study arrived at the conclusions that consumers found the quality of the flame resistant gowns to be generally acceptable and that consumers were reluctant to follow care label instructions.<sup>9</sup> The latter can be extremely critical in retention of flame resistant properties throughout the wear life of a flame resistant article of clothing. In the summer season study, 25% of the mothers of the participants resented the loss in choice due to federal regulations mandating flame resistant sleepwear.<sup>10</sup>

#### Pilot Marketing Programs

The technological advances of flame retardant development "are now acknowledged to have outpaced progress on the marketing front."<sup>11</sup>

---

<sup>8</sup>"Progress Report No. 2: Investigation of Consumer Acceptance of Flame Resistant Children's Sleepwear, Winter Nightgowns, Sizes 7-14, Consumer Evaluations," p. 6.

<sup>9</sup>Kenneth Laughlin, p. 53.

<sup>10</sup>Ibid., p. 52

<sup>11</sup>"FR Implementation at a Crossroads," p. 12.

Three catalog-retail chains have or had voluntary marketing programs of flame resistant apparel in the areas of girls' dresses and sportswear, boys' tops and bottoms, adult sleepwear, and men's and women's sportswear.<sup>12</sup> A. Dean Swift, president of Sears, Roebuck and Company, speaking to a Society of Business Writers in New York, termed flame resistant children's outerwear to be "one of the biggest disappointments" in his company's recent catalog sales history.<sup>13</sup> One of the items, boys' jeans, was offered in a flame resistant version at the same price as the non-flame retardant treated jeans. The untreated jeans outsold the treated jeans by a ratio of 200 to 1.<sup>14</sup> While this is an extreme example, it does demonstrate that flame resistance must be merchandised, like easy laundering characteristics and other features, before it becomes a marketable property.

---

<sup>12</sup> Ibid.

<sup>13</sup> A. Dean Swift, quoted in John Osbon, "FR Children's Wear a Disappointment for Sears," Women's Wear Daily (New York), 10 May 1976, p. 8.

<sup>14</sup> Ibid.

### CHAPTER III

### PROCEDURES

#### Hypothesis Formation

The consumer preference for flame resistant textiles and clothing is an unknown. Pilot marketing programs are a small part of the entire retail clothing market.<sup>1</sup> Federal<sup>2</sup> and industry<sup>3</sup> spokesmen are accusing fiber, textile, and clothing manufacturers of not promoting flammability safety, and consumers are being accused of expressing a preference for flame resistant clothing and then not purchasing it when it is made available.<sup>4</sup> Because of this lack of direction, the null hypothesis was formed prior to this study. A statement of this hypothesis is: the consumer is indifferent to flame retardant protection in textiles and clothing.

#### Study Design

Since the purpose of this research was to determine whether consumers are indifferent to the protection provided by flame resistant

---

<sup>1</sup>"FR Implementation at a Crossroads," p. 12.

<sup>2</sup>"Safety Big Selling Point, Says U. S. Aide; Ad Men Don't Agree," Daily News Record, 27 January 1976, p. 14.

<sup>3</sup>Matthew Kasten, "Industry Hit for Poor FR Promotions," Daily News Record, 16 January 1976, p. 11.

<sup>4</sup>Schore, p. 12; Osbon, p. 8.



clothing, the study was designed to obtain relevant information directly from consumers. The method employed was a telephone survey. In conducting the survey, a questionnaire was the research tool used to determine consumer values relative to flame resistant clothing. Non-parametric and parametric statistical techniques were utilized to analyze the data obtained. Conclusions were based on the results produced by these tests for significance.

#### Subject Selection

Greensboro, North Carolina, area telephone subscribers were the population from which respondents were selected. A table of random numbers<sup>5</sup> and the Greensboro telephone directory dated February 1976<sup>6</sup>, were the sources used to draw the sample. Only residential telephone numbers were included. When the random selection process produced a non-residential number, such as an office or retail establishment, the first residential number following that listing was used. A sample size of 225 produced 128 completed interviews. A callback procedure employing three attempts at different times was used. Calls were placed on weekdays, weekends, and weekday evenings during the

---

<sup>5</sup> John E. Freund, Statistics, A First Course (Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1970), pp. 314-315.

<sup>6</sup> Greensboro, N. C. Telephone Directory, February 1976, Southern Bell Telephone and Telegraph Company, 1976.

period from September 11, 1976, through September 20, 1976. Table 1 shows the completion rate for this survey.

TABLE 1  
Call Completion Rate

	<u>Number</u>	<u>Percent</u>
Total Selected	225	100
Interviews Completed	128	57
Interviews Not Completed	97	43
..... No Response	44	19
..... Refused	27	12
..... Telephone Disconnected	22	10
..... Other	4	2

#### Questionnaire

The questionnaire<sup>7</sup> consisted of four parts: introduction; general; specific; and demographic.<sup>8</sup>

The introduction was designed to introduce the interviewer and explain the purpose of the survey. The introduction was worded to be as non-threatening as possible. It was not used to determine respondent qualifications as all respondents were considered consumers and, therefore, qualified. If the individual answering the telephone indicated

---

<sup>7</sup> A copy of the questionnaire is in appendix 1.

<sup>8</sup> Charles H. Backstrom and Gerald D. Hursh, Survey Research, ed. James A. Robinson, Handbooks for Research in Political Behavior, Vol. 1 (Evanston, Ill.: Northwestern University Press, 1963), pp. 92-109.

that another person in the household was more qualified, then the interviewer normally deferred to the individual's recommendation.

The general section of the survey contained four questions. The first obtained respondents' opinions on the level of danger presented by the flammability characteristics of clothing. The second question was to determine respondents' clothing burn injury experience. The third and fourth questions were to determine general knowledge of basic federal flammability regulations, in which both statements were true. The regulation referred to in question 3 is the CS 191-53, General Wearing Apparel Flammability Standard, as amended in 1967 to include interior furnishing textiles.<sup>9</sup> Question 4 refers to the Children's Sleepwear Flammability Regulations (FF 3-71 and FF 5-74).<sup>10</sup>

The specific section of the questionnaire was constructed to determine consumer preferences relative to flame retardant protection. This included consumers' willingness to pay the costs for flame resistant clothing. These costs are price (question 1), comfort (question 2), durability (question 3), simplicity of laundering care (question 7), and the potential for toxic or carcinogenic effect of the chemicals used to

---

<sup>9</sup>"Flammable Fabrics Act Regulations," Federal Register 40 (Washington, D.C.: Government Printing Office, 30 December 1975), pp. 59884-59903.

<sup>10</sup>Ibid., pp. 59903-59931.

render fabrics flame resistant (question 8). This section also contained questions to determine the respondents' experience with flame resistant clothing articles (questions 4 and 5). Their purchase behavior relative to laundering care, one of the costs of flame resistant clothing (question 6), was also examined. After enumerating the costs of flame resistant clothing, the respondents were asked to decide what group or groups in our society should regulate the flammability properties of textiles and clothing (question 9).

The demographic section was designed primarily to obtain a description of the sample drawn for this study (questions 1, 2, 3, 4, and 7). Also it contained questions to determine the availability of potential ignition sources in these homes (questions 5 and 8). A question was asked about laundering practices to determine whether the special laundering requirements of flame resistant clothing would be a hardship for much of the population (question 6).

CHAPTER IV  
DATA AND RESULTS<sup>1</sup>

Demographics of Sample

Sex, age, household composition, and household annual income were determined for the sample. A tabulation showing the distribution of age and sex is contained in table 2.

TABLE 2  
Age and Sex Characteristics of Sample

<u>Age</u>	Sex					
	Male		Female		Total	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
under 21	3	2	5	4	8	6
21 - 40	14	11	35	27	49	38
41 - 60	14	11	32	25	46	36
over 60	4	3	20	16	24	19
Refused	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
TOTAL	35	27	93	73	128	100

Only one respondent refused to give her age. Excluding her from the analysis produced the age summary found in table 3.

---

<sup>1</sup>This chapter concentrates on total sample response. For tabulation of responses to select questions by demographic groupings, see appendixes 3 through 8.

Table 3  
Age Summary

	<u>Male</u>	<u>Female</u>	<u>Total</u>
Mean	42	45	44
Median	42	42	42

The compositions of the sample households are shown in table 4.

Table 4  
Tabulation of Sample Household Compositions

<u>Number of Children per Household</u>	<u>Number of Adults per Household</u>					<u>Total</u>	<u>Percent</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>		
0	27	42	9	4	1	83	65
1	2	9	2	1	-	14	11
2	5	12	1	1	-	19	15
3	1	4	4	-	-	9	7
4	-	1	1	-	-	2	<2
5	-	-	-	-	-	0	0
6	-	-	-	-	1	1	<1
Total	35	68	17	6	2	128	-
Percent	27	53	13	5	2	-	100

The typical household composition of this sample is described by the statistics in table 5.

Table 5  
Typical Household Composition

	<u>Mean</u>	<u>Median</u>	<u>Mode</u>
Adults	2	2	2
Children	1	0	0

The annual income distribution of the sample closely approximated the household income distribution of all households in the Greensboro area. A comparison of the annual household income of the sample with the distribution of the U. S. Census distribution<sup>2</sup> is shown in table 6. The percentages in the sample column are based on the 110 respondents who provided answers to this question.

Table 6  
Annual Household Income Distribution

<u>Income Range</u> <u>\$ / year</u>	<u>Sample</u>		<u>Census Data</u>
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
under \$5,000	22	20	17
\$5,000 - \$9,999	29	26	32
\$10,000 - \$14,999	25	23	28
\$15,000 - \$24,999	24	22	16
over \$25,000	10	9	7
No response	18	-	-

<sup>2</sup> U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census, 1970 Census of Population, vol. 1, Characteristics of the Population, pt. 35, North Carolina, March 1973, Table 89.

Using the Kolmogorov-Smirnov one-sample test, the income distribution of the sample drawn for this study was shown to be not significantly different, at a 95% confidence level, from the U. S. Census distribution. (The value of the Kolmogorov-Smirnov statistic was 0.08; whereas, a value of 0.13 would be required to be significant at the 95% level.) Of the 128 respondents, 18 either did not know their household income or refused to answer the inquiry. This 14% was dropped from the statistical analysis. Even when considering any changes in unemployment and the effects of inflation since the U. S. Census was conducted, this sample is not likely to vary much from distribution of household incomes of the population from which this sample was drawn.

#### Responses to General Section of Questionnaire

When asked if clothes were dangerously flammable, more than half the respondents replied that some or all were; only 36% of the respondents answered that they were not. Of the 128 respondents, 9% were either not sure or had no opinion. Since a sample size of 128 has an approximate error less than 9%,<sup>3</sup> between 27% and 45% of the general population hold the opinion that clothes are not dangerously flammable ( $36 \pm 9\%$ ). Of the 24% who said some clothing, but not all, was dangerously flammable, three made comments about synthetic fabrics. One said that all synthetics were dangerously flammable,

---

<sup>3</sup>Backstrom and Hursh, p. 3.



another that polyesters were, and the third that acetates were. A fourth respondent had the opposite opinion, that "the knits and nylons ball up, but cotton flannels flame dangerously."<sup>4</sup> Another respondent answered perfunctorily that 30% of all clothing was dangerously flammable. When asked if this 30% were particular types of fiber contents, he could name no specific clothing or fabric that he thought to be dangerously flammable. A respondent counted as having no opinion said she "really hadn't thought about it." That fabrics could burn had never occurred to her. Another respondent who replied no to the question said she knew fabrics could burn but did not fault the fabric. Any fabric placed in a dangerous environment would burn, so to her it was the environment, and not the fabric, that had the potential for danger.

Of the sample interviewed, twelve (9%) had experienced burn injuries relating to clothing fires in their immediate families. Five of the respondents claimed to have been themselves injured. The source of ignition in two of these cases was an open fireplace. Both of these respondents were wearing what they described as full, loose-fitting dresses when the accidents occurred, both more than thirty years ago.

---

<sup>4</sup>It is interesting that since cotton flannel has been the prime subject of flammability publicity, litigation, and legislation that less than one percent of the respondents mentioned it specifically as a flammability problem, whereas nearly 100% undoubtedly have had experience in wearing it as shirting or sleepwear fabric.

Another of these respondents burned part of the sleeve of her robe when moving it across a lighted gas stove. Both of the other incidents were related to smoking. One woman accidentally ignited her pajamas with a match when lighting a cigarette and a man dropped his cigarette and ignited his slacks. Of the seven incidents that occurred in the respondents' families, two were from cigarettes, two were from open fires (one a wood-burning stove), two were from electric ranges, and one was from a gas range. A summary for the ignition sources is shown in table 7.

Table 7

Ignition Sources in Burn Injuries Received  
by Respondents or their Families

<u>Ignition Source</u>	<u>Number of Cases</u>
Open Fire	4
Cigarette	3
Match	1
Stove - gas	2
- electric	2

These cases did not reveal any incidents in which flammable liquids were involved, considered by some burn researchers to be "a major contributing factor"<sup>5</sup> in fabric ignitions. This may be due to the small

---

<sup>5</sup>"Burn Researcher Favors Education," TIPS Newsletter, Summer 1976, pp. 1, 4.

number of burn incidents in this sample, and a more extensive study would have to be conducted to determine the relative dangers of various potential sources of ignition.

The results obtained from the two questions asked to determine consumer knowledge or awareness of federal textile and wearing apparel flammability standards differed significantly. A tabulation of the responses to these two questions is given in table 8.

Table 8  
Consumer Awareness of Federal Textile  
Related Flammability Regulations

	<u>General Wearing Apparel Flammability Standard *</u>		<u>Children's Sleepwear Flammability Standards**</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Aware	61	48	110	86
Not Aware	48	37	10	8
Not Sure	<u>19</u>	<u>15</u>	<u>8</u>	<u>6</u>
TOTAL	128	100	128	100

\* Federal Standard CS 191-53

\*\* Federal Standards FF 3-71 and FF 5-74

Comparing the awareness of the two standards by calculating the chi-square statistic for the 2 x 3 contingency table of the raw numbers

produces a value of 43.4, which with 2 degrees of freedom is highly significant. While the chi-square test is not directional, the data in table 8 coupled with the high degree of significance of the chi-square value produced (in excess of 99.9%) would strongly indicate that more people are aware of the Children's Sleepwear Flammability Standards than of the General Wearing Apparel Flammability Standard. With the error level of this sample being just less than 9%, somewhere between 77 and 95% of the general population are aware of the Children's Sleepwear Flammability Regulations. The general population awareness of the General Wearing Apparel Flammability Standard is between 39 and 57%. Two possible explanations for the difference are: (1) The General Wearing Apparel Flammability Standard is older and has not been a subject of popular media coverage for many years; and (2) The Children's Sleepwear Standard is mentioned on the labels and packages of those garments which it regulates and is included in advertising (the CS 191-53 is not included in any labeling that reaches consumers). On this latter point, many respondents who did not have children mentioned having read about flame retardance in the newspaper or retail catalogs. Others mentioned having heard of it from friends or relatives who did have children. The question on the CS 191-53 elicited one notable response during the survey. The respondent said that she would not want a standard like that and would not want the government dictating

what features in her clothing she had to buy. Another respondent, when asked about the Children's Sleepwear Flammability Standard, said that she knew a standard existed but she could not agree with the questionnaire wording calling it "rigid."

#### Consumer Attitudes on Paying the Costs for Flame Retardant Protection

The willingness of consumers to trade off for flame retardant protection was measured in five areas: price; comfort; durability; ease of laundering care; and risk of unknown dangers from the flame retardant chemicals, such as carcinogenic or toxicological activity. As might be expected, the respondents were mixed in their willingness or ability to pay such costs. Some respondents were willing to pay anything for such protection, some did not want the protection at any cost, and others varied from cost to cost, being willing to pay some but not others. There were five major questions covering the five costs included in this study. Responses were rated in intervals from 1 to 5, using the remarks shown on the questionnaire to rate the responses. A rating of 1 was least favorable to flame retardant protection, and a rating of 5 was most favorable to it. Indifference was indicated by a rating of 3. A rating of 3 was given when the respondent rated the flame retardant protection equally with the cost being covered in that question or when the respondent did not consider flame retardant protection or the cost to be

important. The intermediate ratings of 2 and 4 were used to indicate intensity of preference. Although the scale graduations may or may not have been equal (i.e., the difference between a 1 and a 2 is not necessarily equal to the difference between a 2 and a 3, even though the arithmetical difference is 1 in both cases), the scale is more than merely nominal and is at least an ordinal scale for these five questions.

Price: The first cost considered was the price. Of the 128 interviewed, 5 had no opinion. These were dropped from the statistical analysis, leaving 123 responses. These responses are summarized in table 9.

Table 9

Consumer Willingness to Pay Increased Price for  
Flame Resistance

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1. Feature not worth increased price	28	23
2. Feature worth increased price, but not to respondent	9	7
3. Respondent might buy a few items at increased price	11	9
4. Respondent willing to pay price for most items	29	24
5. Flame retardant protection so important that price is not a consideration	<u>46</u>	<u>37</u>
TOTAL	123	100

This question produced clustered, extreme responses. People were either very willing or very unwilling to pay the increased price of approximately 30%.<sup>6</sup> The Kolmogorov-Smirnov statistic was used to test this distribution. Testing the distribution that occurred against a normal distribution and against a distribution of equal frequencies in all cells produced significant results at a confidence level much greater than 95%. This means that the responses were neither normally nor equally distributed. Different pictures are obtained by using different measures of central tendencies: (1) the mean is 3.5; (2) the median is 4; and (3) the mode is 5. While these present data descriptions of differing intensities, they all show the respondents favoring flame retardant protection over price. In fact, 61% (categories 4 and 5 combined) favored flame retardant protection strongly enough to consider it a feature worth paying a higher price for most or all of the time. Even with the 9% error of this sample size, more than half (52%) of the general population can be said to be willing to pay extra money for this feature, and it may be more than two-thirds (70%) of the general population.

When answering this question, many respondents made references to the presence or absence of children in the house or to the absence of smokers. One respondent mentioned both. She thought

---

<sup>6</sup> Specht, p. 22.

flame resistance to be totally unnecessary as she had neither children nor smokers in her household. Another respondent, who had experience with flame retardant garments, said that the current quality detracted so much from the flame resistant property to cause her to be unwilling to pay extra. Another respondent who thought that flame resistance was not a property worth paying for said, "I go by price in all my buying, and I usually buy whatever is on sale."

A respondent, who said that she might pay more for some items (response 3), particularly mentioned upholstery and drapery items as being those for which she would be willing to pay extra to obtain flame resistant properties. She added that being without children, she would not be too interested in flame resistant apparel items. Another respondent who said she might be willing to buy some flame resistant items mentioned nightwear and children's clothing as the specific items for which she would be willing to pay more. Although she had no children herself, she said she did have grandchildren for whom she bought a lot of clothing as gifts. A respondent, answering that she would pay more for most items (response 4), said she would buy all children's items as flame resistant if she could get them. A respondent who said she would buy all flame resistant clothing if possible (response 5) said she bought flame resistant garments whenever possible now. When asked where she obtained items other than children's



sleepwear, she named two large catalog chains. She evidently was taking advantage of the voluntary marketing programs mentioned above in chapter II.

One subject whose response could not be classified on the ordinal scale said that he thought that flame resistance could be done for less than 30% of the retail price. At 30%, he would not consider purchasing it. When asked at what price he would consider it, he declined to say.

This claimed willingness of consumers to pay more illustrates the phenomenon mentioned earlier in chapter III. Consumers are saying they are willing to pay more for flame resistance but then do not demonstrate that willingness when given the opportunity to do so. High prices have been cited as a cause of poor business in flame resistant clothing as recently as this fall.<sup>7</sup> Opinions and attitudes are possibly at variance. Surveys are measuring opinions while markets are measuring attitudes toward paying increased prices for flame resistant apparel.

Comfort: The measured response of the population to paying for flame retardant protection in factors of comfort was quite different than paying in monetary units. There were ten respondents who had no opinion or an opinion that could not be rated on the attitude scale

---

<sup>7</sup>"Price a Factor in FR Children's Sleepwear," Women's Wear Daily, 27 September 1976, p. 1.

from 1 to 5. These ten were dropped from the statistical analysis. The remaining 118 responses are tabulated in table 10.

Table 10  
Consumer Willingness to Sacrifice Comfort  
for Flame Resistance

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1. Comfort is more important	29	25
2. Comfort is more important, but might buy a few flame resistant garments	33	28
3. Comfort and flame resistance are of equal importance	16	13
4. Safety is more important and should buy mostly flame resistant clothing	27	23
5. Safety is more important	<u>13</u>	<u>11</u>
TOTAL	118	100

An analysis using the Kolmogorov-Smirnov statistic showed these responses to be neither normally nor equally distributed. The confidence level is 95% for this statement. That they are not normally distributed can be stated at a confidence level greater than 99%. The measures of central tendencies are more nearly equivalent for comfort than they are for price: (1) the mean is 2.7; (2) the median is 2; and (3) the mode is 2. These measures show not only the same direction of favoring comfort over flame resistance, but also approximately the same level of attitude

intensity. A majority, 66%, considered comfort of equal or greater importance than flame resistance. The 9% confidence band for this data means that 57 to 75% of the general population could be expected to have the same opinion.

A respondent who considered comfort so important as to preclude purchasing flame resistant garments said, "I pay so much for clothes, I would certainly expect them to be comfortable." Another respondent with a 1 response said that he would not want a plastic suit.

One respondent said she would buy only flame resistant items that did not contact her skin because it was highly sensitive. Another respondent who said that she might buy a few items (a 2 response) expressed the opinion that the textile industry could do better at producing a comfortable fabric. Another said that she considered comfort more important when selecting her clothing than when selecting clothing for her children. She would therefore be less likely to choose flame resistant clothing for herself than she would for her children. Another mother considered comfort so important that she washed her children's flame resistant sleepwear items before they wore them. A woman who was more interested in flame resistant drapery and upholstery fabrics said she might buy a few flame resistant garments. Since her interest was predominantly non-apparel items, she said that comfort would not often have to be weighed against flame resistance in her purchase decisions.

Three respondents gave answers that could not be classified on the attitude scale. One said, "I wouldn't want to have to make that choice. I think the technology could be developed to make garments more comfortable." Another respondent said that she could not make the choice without being able to feel the fabric. The third respondent, a mother with two children, said that she did not agree with the questionnaire statement and that her children's pajamas felt very comfortable to her.

Durability: Survey responses on the importance of durability and flame resistance were more favorable to durability. Five respondents had no opinion or opinions that could not be rated. Excluding these, 123 responses were left for analysis. The results that were used for analysis are tabulated in table 11.

Table 11

Consumer Willingness to Trade Off Durability  
for Flame Resistance

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1. Durability is more important	33	27
2. Durability is important, but might buy a few flame resistant garments	30	24
3. Durability and flame resistance are of equal importance	15	12
4. Safety is more important and would buy mostly flame resistant clothing	27	22
5. Safety is more important	<u>18</u>	<u>15</u>
TOTAL	123	100

These data are distributed among the five possible responses significantly differently from the theoretical normal distribution when tested by the Kolmogorov-Smirnov statistic (at 95% confidence); however, they do not demonstrate a significant difference from an equal distribution across the five cells when tested by the same procedure. The measures of central tendencies do show a strong preference for durability: (1) the mean is 2.7; (2) the median is 2; and (3) the mode is 1. A majority, 63%, consider durability to be of equal or greater importance than flame resistance. Based on these results and an error for this sample size of slightly less than 9%, 54 to 72% of the general population would be expected to have the same opinion.

One respondent who said both properties were important (a 3 response) said that durability ought to be designed into more clothing items. She held the opinion that too many garments were "shabbily" made.

Two respondents who said they would buy mostly flame resistant clothing (a 4 response) thought durability to be unimportant for most items because styles and fashions change so rapidly. Interestingly enough, one of these respondents said that, given a choice, she would not select flame resistant sleepwear since she felt that durability was an important feature of such an item.

There was one respondent whose reply could not be categorized. She expressed the opinion that the textile and clothing industries should be able to develop flame resistant garments that were also very durable.

Simplicity of Laundering Care: Easy care was important to most respondents; however, a difference was noted between male and female respondents. The male respondents considered easy care more important relative to flame resistance than the female respondents. The results are summarized in table 12 by sex and for the total sample population. Five respondents, three females and two males, had no opinion. These were dropped from the analysis, providing thirty-three responses from males, ninety from females, for a total of 123.

Table 12  
Consumer Willingness to Replace Easy Care  
Properties With Flame Resistance

Response	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
1. Easy care is more important	10	31	21	23	31	25
2. Easy care is more important, but might buy a few flame resistant garments	9	27	25	28	34	28
3. Easy care and flame resistance are of equal importance	5	15	10	11	15	12

Table 12 - Continued

<u>Response</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
4. Safety is more important and would buy mostly flame resistant clothing	6	18	26	29	32	26
5. Safety is more important	<u>3</u>	<u>9</u>	<u>8</u>	<u>9</u>	<u>11</u>	<u>9</u>
TOTAL	33	100	90	100	123	100

Statistical tests (Kolmogorov-Smirnov and t-test) do not show these sex differences to be significant. However, an interesting trend seems to be developing that may be worthy of future study. The measures of central tendencies also show this difference. These measures are shown in table 13.

Table 13

Measures of Central Tendencies of Males and Females on Their Willingness to Replace Easy Care Properties With Flame Resistance

	<u>Males</u>	<u>Females</u>	<u>Total</u>
Mean	2.5	2.7	2.7
Median	2	2	2
Mode	1	4	2

The Kolmogorov-Smirnov test was run on the distribution of the total sample. It was found to be significantly different (at a 95% confidence level) from an equal or a theoretical normal distribution. A significant majority, 65%, stated that easy care was equally or more important than flame resistance. With the 9% error level of this sample size, a minimum of 56% of the general population would be expected to have this opinion. It may be as much as 74% of the general population.

One woman, a Ph.D., said that she had to have clothing that was easy to take care of because she "can't find the iron and the children cut the labels out of their clothes." Another respondent who gave a 1 response said she would feel differently if she had small children.

Two respondents who were given 2 ratings said that the few items they would buy were children's clothes. Neither had children living at home.

A respondent, who said she would purchase mostly flame resistant clothing (a 4 response), claimed she would buy all flame resistant clothing for children. She had no children living at home.

"Any human's life is more important than a little extra work," said one respondent. This response was rated as a 5.

Carcinogenic Potential: On March 24, 1976, the Environmental Defense Fund and Robert H. Harris petitioned the U.S. Consumer Product



Safety Commission to require labeling on garments containing the flame retardant chemical tris (2, 3 - dibromopropyl) phosphate (common name, Tris) and to establish a testing program to be required of industry.<sup>8</sup>

Harris reported potential carcinogenicity and toxicity for this chemical as a result of experimentation.<sup>9</sup> Although it has not yet been conclusively determined that Tris is a carcinogen, the mere possibility is a cost to consumers, both direct and indirect. When asked to weigh the potential danger against flammability protection, reaction from consumers was quite mixed and very strong. The results are shown in table 14. Thirteen respondents had to be dropped from the analysis. The measures of central tendencies demonstrate how divided the responses were: (1) the mean is 2.9; (2) the median is 3; and (3) the mode is 4. The Kolmogorov-Smirnov statistic shows these data to be neither normally nor equally distributed across the range of responses. The number of respondents unwilling to take chances that the chemical might be carcinogenic (response 1 or 2) is almost the same as those unwilling to take chances with flammability (response 4 or 5). There

---

<sup>8</sup> Environmental Defense Fund and Robert H. Harris, "Petition Pursuant to 15 U.S.C. § 2059, to the Consumer Product Safety Commission to Commence a Proceeding for the Issuance of a Consumer Product Safety Rule," (Washington, D.C.: Environmental Defense Fund, 1525 18th Street, N.W., 24 March 1976), pp. 1-2.

<sup>9</sup> *Ibid.*, pp. 3-12.

were 44 respondents (38%) who gave responses that were classified as a 1 or a 2, and 42 respondents (37%) gave responses classified as a 4 or a 5.

Table 14

Consumer Choice Between Safety From Carcinogenic  
Potential and Flame Resistance

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1. All chemicals could be dangerous and should be avoided	7	6
2. Threat of cancer negates advantages of flame resistance	37	32
3. Chemicals should be tested before they are allowed on the market	29	25
4. Flame resistance is important so chemical should remain on the market until it is proven dangerous	39	34
5. Flame resistance is more important	<u>3</u>	<u>3</u>
TOTAL	115	100

Almost one-third of the respondents commented that so many things were being said to cause cancer that being told that did not particularly upset them. One respondent favored doing away with synthetics and chemicals as much as possible and using cotton. Another responded to the question with the comment, "Baloney!"

Consumer Opinions on Textile Flammability  
Regulating Bodies

When consumers were asked who should regulate the flammability properties of textiles and clothing, the only thing they agreed upon was that they should be regulated. Nine respondents had no opinion and were dropped from analysis. All but nine of the remaining respondents said there should be regulation. These results are summarized in table 15.

Table 15

Consumer Selection of Regulating Body for  
Textile and Clothing Flammability

<u>Regulating Body</u>	<u>Number</u>	<u>Percent</u>
Federal Government	37	31
State Governments	8	7
Textile Industry	28	23
Scientific Associations	9	8
More Than One	28	23
None	<u>9</u>	<u>8</u>
TOTAL	119	100

Those twenty-eight respondents selecting more than one regulating body made their selections as shown in table 16.

Table 16

Tabulation of Selection of Regulating Bodies  
by Those Selecting More Than One

<u>Regulating Bodies</u>	<u>Number</u>	<u>Percent</u>
Federal and State Governments	3	11
Federal Government and Textile Industry	5	17
Federal Government and Scientific Associations	6	21
State Governments and Textile Industry	2	7
State Governments and Scientific Associations	1	4
Textile Industry and Scientific Associations	6	21
Federal and State Governments and Textile Industry	1	4
State Governments, Textile Industry, and Scientific Associations	1	4
All Four	<u>3</u>	<u>11</u>
TOTAL	28	100

Respondents seemed to find it difficult to answer this question without explaining their reason for the selection.

Among the reasons for those selecting the federal government were lack of confidence in the industry to regulate itself, protection to those companies that would regulate themselves from those that would

not, and to put "teeth" into the regulations. One respondent who selected the federal government as the regulator said that standards were needed for children's garments only. Another said the federal government should uphold the current regulations, but that no new regulations are needed.

A respondent who selected scientific associations said that she did not select federal or state governments because "Government people don't know any more about it than ordinary citizens."

A respondent who selected the textile industry and scientific associations said she selected these over the government bodies "because they should know what they're doing."

Many respondents who chose the textile industry made that selection because they perceived the industry as possessing the knowledge necessary to make reasonable regulations. Another reason frequently cited was the encroachment of government in too many activities beyond its scope. One said, "I'm a government regulator and I know that whoever's brother got elected probably wouldn't know the first thing about textiles." Another reason cited by one respondent was, "Industry is doing a good job as it is." The freedom to choose was named by one respondent as her reason for selecting the industry over government. She expressed the opinion that if the federal government regulated flammability properties, then consumers would not be

able to decide for themselves whether or not they wanted to purchase the flame resistant feature. One consumer selected the textile industry for an entirely different reason, that the industry is liable for its products. She said she selected the textile industry "because they're the ones who have to pay for it if someone gets burned up."

## CHAPTER V

### SUMMARY AND CONCLUSIONS

#### Summary

This research was conducted to determine consumer opinions on willingness to pay the costs for flame resistant clothing. These costs are: (1) price; (2) comfort; (3) durability; (4) ease of care; and (5) the potential of carcinogenic activity by the flame retardant chemicals. The sample was drawn by randomizing procedures from Greensboro area telephone subscribers. September 11 through September 20, 1976, was the period during which the survey was conducted. The telephone interviews resulted in 128 completed questionnaires, thereby producing an error level of less than 9%. This was the data base used for analysis. Statistical procedures used included the chi-square one-sample test, the chi-square 2xk contingency table, the Kolmogorov-Smirnov one-sample test, the Kolmogorov-Smirnov two-sample test, and standard errors of the means to determine significant differences. All conclusions are based on a 95% confidence level.

#### Conclusions

Based upon the results of statistical analyses, it may be concluded that consumers are unwilling to pay the costs of flame

resistant fabrics and clothing by sacrificing all the desirable qualities addressed in this survey. Table 17 shows consumer preferences relative to flame resistance of fabrics and clothing.

Table 17

Consumer Preferences Relative to  
Flame Resistance

I. Properties Preferred to Flame Resistance

Ease of care  
Comfort  
Durability

II. Properties of Equal Value to Flame Resistance

Freedom from threat of carcinogenicity

III. Properties of Lower Preference Than Flame Resistance

Price

It may also be concluded from these results that consumers would be more willing to purchase flame resistant clothing at an even higher price level if the laundering, comfort, and durability properties of these garments are not perceived as being significantly different than non-flame resistant clothing.

Recommendations

Education: This survey was conducted to obtain consumer opinions on paying the costs for flame resistant clothing. While not



measured in any quantitative way by this survey, a clear need for consumer education became obvious.

Many consumers were surprised to learn that there were costs for flame resistance other than price and that they would have to endure some trade-offs in order to have flame resistant clothing.

While the textile and garment industries have tremendous expertise concerning the technical aspects of flammability, information on safety in general, hazardous environments, and hazardous human behavior will need to be disseminated by other sources having more direct communications with the consumer. That smokers were found in 50% of the households interviewed demonstrates that a common source of garment ignitions is prevalent. Of those who had experience with flame resistant children's sleepwear, most followed laundering procedures detrimental to the maintenance of flame resistance, apparently ignoring the instructions the law requires on the permanent care labels. Organizations such as the Consumer Product Safety Commission, the National Safety Council, the National Fire Protection Association, International Association of Fire Chiefs and similar state and local organizations should expand their efforts to educate the public on the dangers of fire and potentially hazardous sources of ignition. Another link in the chain of consumer education could be professional

home economists and the American Home Economics Association.<sup>1</sup>

In the current situation, textile-related industries may be hesitant to sell and promote independently flame resistant safety as they may feel that before consumers will buy flame resistant products they must make the determination that current goods are unsafe.

Many of those refusing to participate in the survey appeared from their telephone voices to be elderly females. After young children, this is the group most frequently injured in garment fires.<sup>2</sup> Their awareness of this fact must be very low if they are "not interested" or do not care to participate in a telephone survey when advised that it concerns clothing and textile flammability. Perhaps this indifference is reflected in the accident statistics. Attempts to educate this segment of the population are obviously necessary, although the efforts may be in vain.

Future Flammability Regulations: The federal government should move carefully and with deliberation before promulgating new regulations.

---

<sup>1</sup>Naomi Albanese, "The Co-Responsibilities of the Producers of Textiles and the Consumer," Sources and Resources 6, ed. Morton Schlesinger (New York: Textile Information Sources, 1973), pp. 6-7.

<sup>2</sup>"Flammable Fabrics and the Elderly," CPSC leaflet cited by Robert E. Blanchard, "Caution to the Elderly," Perspective on Aging, May/June 1976, pp. 19-21.

Only 31% of the respondents desired the federal government as the sole regulatory body. With the error level being 9%, this is less than half of the general population (22 to 40%).

Any regulations should offer choices to consumers. Many respondents, although selecting different regulatory bodies, commented that consumers should be allowed to choose what they want.

Future Consumer Research: There are many items of interest that could not be included in a survey and study of this scope without making it unmanageable.

Consumer concepts of the burning behavior of textiles is one area that should yield interesting results. This includes definitions of terms and expectations of burning characteristics.

Another area of interest would be a study similar to this including other fabric properties such as soil release, sewability and mendability, and garment design limitations.

A different type of study is also needed that would force consumers to make at the check-out counter the choices addressed in this research. Differences, if any, in purchasing behavior before and after being educated to the dangers of flammability and to the costs of flame resistance would be especially useful information.

BIBLIOGRAPHY

- Albanese, Naomi. "The Co-Responsibilities of the Producers of Textiles and the Consumers." Sources and Resources 6. ed. Morton Schlesinger. New York: Textile Information Sources, 1973, pp. 6-7.
- Backstrom, Charles H., and Hursh, Gerald D. Survey Research. ed. James A. Robinson. Handbooks for Research in Political Behavior, vol. 1. Evanston, Ill.: Northwestern University Press, 1963.
- "Flammable Fabrics Act Regulations." Federal Register 40. Washington, D. C.: Government Printing Office, 30 December 1975, pp. 59884-59931.
- "Flammable Fabrics and the Elderly." CPSC leaflet cited by Robert E. Lanchard. "Caution to the Elderly." Perspective on Aging, May/June 1976, pp. 19-21.
- "FR Implementation at a Crossroads." Clothes, 1 December 1975, pp. 12-13.
- Freund, John E. Statistics, A First Course. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1970.
- Kasten, Matthew. "Industry Hit for Poor FR Promotions." Daily News Record, 16 January 1976, p. 11.
- Laughlin, Joan, and Trautwein, Judith Besel. "Clothing-Related Thermal Burn Injuries and Deaths in Nebraska for Fiscal Year 1975." Bobbin, September 1976, p. 210.
- Laughlin, Kenneth C. "Consumer Acceptance of FR Sleepwear." Textile Chemist and Colorist 8 (March 1976): 51-55.
- "Mothers Are Willing to Spend to Protect Baby." American Dyestuff Reporter, 2 June 1969, pp. 20-21.

- "Price a Factor in FR Children's Sleepwear." Women's Wear Daily (New York), 27 September 1976, pp. 1, 15, 16.
- Rock Hill, South Carolina. Winthrop College. "Progress Report No. 1: Investigation of Consumer Acceptance of Flame Retardant Children's Sleepwear, Winter Nightgowns, Size 7-14." 19 February 1975.
- Rock Hill, South Carolina. Winthrop College. "Progress Report No. 2: Investigation of Consumer Acceptance of Flame Resistant Children's Sleepwear, Winter Nightgowns, Size 7-14, Consumer Evaluations." 30 October 1975.
- "Safety Big Selling Point, Says U.S. Aide; Ad Men Don't Agree." Daily News Record, 27 January 1976, p. 14.
- Schore, Francine. "FR Leaves Consumers Cold, Springs Mills Panel Finds." Daily News Record (New York), 18 March 1975, p. 12.
- Segall, William M. "You Can't Sell Safe Fabrics." Modern Textiles Magazine, November 1968, pp. 55-57.
- Specht, Diane. "The FR Controversy - Measuring the Financial Impact, Part III of a Series." Earnshaw's Review, July 1976, pp. 20-24.
- Swift, A. Dean. quoted in John Osbon, "FR Children's Wear a Disappointment for Sears." Women's Wear Daily (New York), 10 May 1976, p. 8.
- Telthorst, Ann. "Warning Label on FR Chemical Urged." Daily News Record (New York), 26 March 1976, sec. 1, p. 18.
- Newsletter. Washington, D.C.: Textile Industry Product Safety Committee, Summer 1976.
- U.S. Department of Agriculture. Economic Research Service. Mothers' Attitudes Toward Cotton and Other Fibers in Children's Lightweight Clothing, by L. Yvonne Clayton. Marketing Research Report No. 1026. Washington, D.C.: Government Printing Office, 29 April 1973.

U. S. Department of Commerce. Social and Economics Statistics Administration. Bureau of the Census. 1970 Census of Population. Vol. 1, Characteristics of the Population, pt. 35, North Carolina.

"Women Have Positive Views on Fire Retardant Apparel." News & Views. Memphis, Tennessee: RAMCON, 223 Scott Street, July 1975.

## Appendix 1

### The Questionnaire

A copy of the questionnaire used to conduct this research follows. While this wording was closely followed, it was occasionally varied when a respondent seemed to have difficulty in understanding it. The choices provided for in questions 1, 2, 3, 7, and 8 were used by the interviewer to rate responses and were not read to the subject.

## QUESTIONNAIRE

## I. INTRODUCTION.

Hello, my name is Joan Koonce. I am a student in Home Economics at UNC-G and I'm working on a study of consumer opinions on textile and clothing flammability.

The federal government and many state governments are passing laws on this subject with apparently little or no input from consumers.

I am conducting this survey to determine whether or not we as consumers want these flammability regulations related to textiles and clothing. I have a series of questions which will help to determine our attitudes. Your telephone number was picked at random and your responses will not be linked to your name in any way.

## II. GENERAL

1. In your opinion, is clothing dangerously flammable?  
Yes or no.
2. Have you or anyone in your immediate family ever been injured in an accident involving your clothing catching on fire? Yes or no.

If yes: What was the source of ignition?

What was the age of the burn victim?

What was the sex of the burn victim?  
Male or Female.

3. True or False:

There is in effect a federal law setting standards for the flammability of all fabrics used in clothing and interior furnishings?



## 4. True or False:

Currently, there is a special federal standard setting rigid requirements for the flammability of children's sleepwear, sizes 0 - 14?

## III. SPECIFIC.

In the next few questions, I will be using the term "flame retardant" which means it ignites but doesn't burn up.

1. Application of flame retardant finish to fabrics increases the price of clothing made from these fabrics about 30%. Are you willing to pay for this greater protection for you and your family?

- (1) I think clothes are safe enough and I would not pay extra for that feature.
- (2) I think that it is reasonable to pay more for flame retardant clothing, but I don't think it is worth it for my family or me.
- (3) I might be willing to pay more for some items, but would not convert my family's or my entire wardrobe over for all clothing items.
- (4) I would probably pay more for flammability protection nearly all the time.
- (5) I think clothing needs to be safer from flammability and the increased price would not be important; I would always buy flame retardant clothing.

2. While flame retardant treatments stiffen some fabrics, they tend to give others a "slimy" or "soapy" feeling. How important do you consider such comfort factors when weighed against the increased protection?

- (1) Comfort is most important, and I would not buy flame retardant garments.
- (2) Comfort is more important, but I might buy flame retardant garments for some uses.

- (3) Comfort is only moderately important and if I liked or needed the garment I would not refrain from purchasing it.
  - (4) Safety is more important and I would buy flame retardant garments whenever possible.
  - (5) Safety is the only important criterion and I would never purchase anything else but flame retardant clothing if it were available in all wearing apparel.
3. With the current flame retardant technology, garments made from flame retardant fabrics are generally not as durable as garments from non-treated fabrics. Flame retardant garments just do not hold up through as many washings and wearings. This increases the costs of owning flame retardant clothing as garments must be replaced more frequently. How important do you consider durability?
- (1) Decreased wear life is enough reason to not choose flame retardant garments.
  - (2) Decreased wear life is important, but I might buy flame retardant garments from time to time.
  - (3) Decreased wear life is a consideration, but not enough in itself to prevent me from purchasing flame retardant clothing.
  - (4) Safety is more important and I would buy flame retardant garments except for those items that need to be extra tough.
  - (5) Safety is most important and I would buy flame retardant garments all of the time.
4. Have you bought any children's sleepwear in the last year? Yes or no.
- If yes: Was it as a parent?
- If yes: What detergent(s) do you use when laundering these garments? (brand)

What bleach(es) do you use when laundering these garments? None or (brand)

Do you tumble dry? Yes, no, or sometimes.

Do you line dry - indoors? Yes, no, or sometimes;

outdoors? Yes, no, or sometimes.

Have you found the care labels difficult or impractical to follow? Yes or No.

5. Are you aware that flame retardant fabrics in garments require special care? Yes or no.
6. Do you read care labels before purchasing a garment?
  - (1) Never.
  - (2) Rarely.
  - (3) Sometimes.
  - (4) Usually.
  - (5) All the time.
7. How important, relative to flame retardant safety, do you consider simplicity of care?
  - (1) Ease and simplicity of care are more important to me.
  - (2) Easy care is important, but not so important as to preclude ever purchasing flame retardant garments.
  - (3) Ease of care is not very important, but neither is flame retardancy. Neither factor would play an important part in my decision to purchase an article of clothing.
  - (4) Ease of care is not as important as flame retardancy. Generally, I would select flame retardancy regardless of how complex the care instructions are.

- (5) Flame retardancy is more important. Ease of care would not enter into my decision to purchase.
8. There has been much in the news lately about one of the flame retardant chemicals being a POSSIBLE cancer-causing agent. Whether or not it is cancer causing has yet to be determined, however, it has raised questions about the importance of balancing such unknown dangers against increased flammability protection. What is your opinion on this?
- (1) Any chemicals could cause cancer, so I would never buy flame retardant garments.
- (2) Even the most remote threat overcomes any gain from increased flammability protection.
- (3) Chemicals should be approved for use only after undergoing a rigid investigation to eliminate the possibility of their being cancer causing.
- (4) Flame retardant protection is important, so remote chances of the chemicals causing cancer should not be deterrents to their use.
- (5) Flammability protection is so important that I don't see any reason not to use any chemicals that will make fabrics flame retardant.
9. In your opinion, should the flammability properties of textiles and clothing be regulated by:
- (a) The federal government?
- (b) The state government?
- (c) The textile industry?
- (d) Scientific associations?
- (e) There should be no regulation at all.

## IV. DEMOGRAPHIC.

1. Sex of respondent? Male or female.
2. What is your age?
3. How many persons above age 18 live with you?
4. How many persons less than 18 live with you?
5. Are you or anyone in your household a smoker? Yes or No.

If yes: Does the smoker(s) most often use matches or a lighter?

6. Do you own your own automatic washing machine? Yes or no.

- tumble dryer? Yes or no.

If no: How do you do your laundry?

- (a) At a laundromat?
- (b) It is done by a professional cleaner.

(c) Other \_\_\_\_\_  
Please specify

7. What is your household annual income?
  - (a) Less than \$5,000.
  - (b) \$5,000 to \$9,999.
  - (c) \$10,000 to \$14,999.
  - (d) \$15,000 to \$24,999.
  - (e) More than \$25,000.

8. What type of stove do you have?

(a) Gas.

(b) Electric.

(c) Other \_\_\_\_\_  
Please specify

## Appendix 2

## Answer Form With Tabulated Results

Following is a copy of the answer form used to record responses while conducting the survey. Where possible, the results obtained are tabulated by number/percent of responses obtained for each category.

## ANSWER FORM

Respondent # \_\_\_\_\_

Check here if refused \_\_\_\_\_

Check here if unable  
to reach respondent \_\_\_\_\_

- II. 1. No 46/36%      Some not all 39/30%  
 Yes 31/24%      No opinion 12/10%
2. No 116/91%  
 Yes 12/9%  
 (source) \_\_\_\_\_  
 (age) \_\_\_\_\_  
 (sex) \_\_\_\_\_
3. False 48/37%      No opinion 19/15%  
 True 61/48%
4. False 10/8%      No opinion 8/6%  
 True 110/86%
- III. 1. 28/22%    9/7%    11/8%    29/23%    46/36%  
 (1)      (2)      (3)      (4)      (5)  
 Other (describe) 5/4%  
 \_\_\_\_\_  
 \_\_\_\_\_
2. 29/23%    33/26%    16/12%    27/21%    13/10%  
 (1)      (2)      (3)      (4)      (5)  
 Other (describe) 10/8%  
 \_\_\_\_\_  
 \_\_\_\_\_
3. 33/26%    30/23%    15/12%    27/21%    18/14%  
 (1)      (2)      (3)      (4)      (5)  
 Other (describe) 5/4%  
 \_\_\_\_\_  
 \_\_\_\_\_



4. No 101/79%

Yes 27/21%

No 7/5%

Yes 20/16%

detergent (brand) \_\_\_\_\_

bleach (none) \_\_\_\_\_

(brand) \_\_\_\_\_

Yes \_\_\_\_\_

No \_\_\_\_\_

Sometimes \_\_\_\_\_

Yes \_\_\_\_\_

No \_\_\_\_\_

Sometimes \_\_\_\_\_

Yes \_\_\_\_\_

No \_\_\_\_\_

Sometimes \_\_\_\_\_

Yes \_\_\_\_\_

No \_\_\_\_\_

5. No 76/59%

Yes 52/41%

6. 17/13% 7/6% 17/13% 39/30% 49/38%  
(1) (2) (3) (4) (5)

7. 31/24% 34/26% 15/12% 32/25% 11/9%  
(1) (2) (3) (4) (5)

Other (describe) 5/4%

8. 7/5% 37/29% 29/23% 39/31% 3/2%  
(1) (2) (3) (4) (5)

Other (describe) 13/10%

9. 37/29% 8/6% 28/22% 9/7% 9/7%  
(1) (2) (3) (4) (5)

More Than One 28/22%

Not Sure or No Opinion 9/7%

IV. 1. Male 35/27%  
Female 93/73%

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. No 64/50%Yes 64/50%Matches 22/17% Lighter 33/26% Both 9/7%6. Yes 99/77%No 29/23%Yes 77/60%No 24/19%(a) 22/17%(b) 1/1%(c) 4/3%7. 22/17% 29/22% 25/20% 24/19% 10/8%Refused 18/14%8. (a) 11/8%(b) 115/90%(c) 2/2%

## APPENDIX 3

Consumer Awareness of Federal Fabric Flammability  
Regulations by Demographic Groupings

	AGE							
	<u>&lt;21</u>		<u>21-40</u>		<u>41-60</u>		<u>&gt;60</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
CS 191-53								
Aware	5	62	18	37	25	54	13	54
Not Aware	2	25	21	43	18	39	6	25
Not Sure	<u>1</u>	<u>13</u>	<u>10</u>	<u>20</u>	<u>3</u>	<u>7</u>	<u>5</u>	<u>21</u>
TOTAL	8	100	49	100	46	100	24	100
FF 3-71 and FF 5-74								
Aware	8	100	41	84	43	94	18	75
Not Aware	0	0	6	12	1	2	2	8
Not Sure	<u>0</u>	<u>0</u>	<u>2</u>	<u>4</u>	<u>2</u>	<u>4</u>	<u>4</u>	<u>17</u>
TOTAL	8	100	49	100	46	100	24	100

Consumer Awareness of Federal Fabric Flammability  
Regulations by Demographic Groupings (Continued)

	SEX			
	Male		Female	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
CS 191-53				
Aware	21	60	40	43
Not Aware	10	29	38	41
Not Sure	<u>4</u>	<u>11</u>	<u>15</u>	<u>16</u>
TOTAL	35	100	93	100
FF 3-71 and FF 5-74				
Aware	32	91	78	84
Not Aware	1	3	9	10
Not Sure	<u>2</u>	<u>6</u>	<u>6</u>	<u>6</u>
TOTAL	35	100	93	100

Consumer Awareness of Federal Fabric Flammability  
Regulations by Demographic Groupings (Continued)

	INCOME (HOUSEHOLD)											
	<u>&lt; \$5,000</u>		<u>\$5,000- \$9,999</u>		<u>\$10,000- \$14,999</u>		<u>\$15,000- \$24,999</u>		<u>&gt; \$25,000</u>		<u>Unknown</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
CS 191-53												
Aware	13	59	17	59	8	32	10	42	5	50	8	44
Not Aware	3	14	9	31	14	56	11	46	4	40	7	39
Not Sure	<u>6</u>	<u>27</u>	<u>3</u>	<u>10</u>	<u>3</u>	<u>12</u>	<u>3</u>	<u>12</u>	<u>1</u>	<u>10</u>	<u>3</u>	<u>17</u>
TOTAL	22	100	29	100	25	100	24	100	10	100	18	100
FF 3-71 and FF 5-74												
Aware	18	82	27	94	20	80	21	88	9	90	15	83
Not Aware	1	5	1	3	4	16	2	8	0	0	2	11
Not Sure	<u>3</u>	<u>13</u>	<u>1</u>	<u>3</u>	<u>1</u>	<u>4</u>	<u>1</u>	<u>4</u>	<u>1</u>	<u>10</u>	<u>1</u>	<u>6</u>
TOTAL	22	100	29	100	25	100	24	100	10	100	18	100

## APPENDIX 4

Consumer Willingness to Pay Increased Price for  
Flame Resistance by Demographic Groupings

Response	AGE							
	<u>&lt; 21</u>		<u>21-40</u>		<u>41-60</u>		<u>&gt; 60</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring price	1	12	11	22	9	20	7	30
2.	0	0	3	6	5	11	1	4
3.	2	25	5	10	3	7	1	4
4.	1	13	12	25	10	21	6	25
5. Most favoring flame resistance	4	50	15	31	18	39	8	33
Other	<u>0</u>	<u>0</u>	<u>3</u>	<u>6</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>4</u>
TOTAL	8	100	49	100	46	100	24	100

**Consumer Willingness to Pay Increased Price for  
Flame Resistance by Demographic Groupings (Continued)**

<u>Response</u>	<u>SEX</u>			
	<u>Male</u>		<u>Female</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring price	4	11	24	26
2.	3	9	6	6
3.	2	6	9	10
4.	6	17	23	25
5. Most favoring flame resistance	16	46	30	32
Other	<u>4</u>	<u>11</u>	<u>1</u>	<u>1</u>
TOTAL	35	100	93	100

Consumer Willingness to Pay Increased Price for  
Flame Resistance by Demographic Groupings (Continued)

Response	INCOME (HOUSEHOLD)											
	<u>&lt;\$5,000</u>		<u>\$5,000- \$9,999</u>		<u>\$10,000- \$14,999</u>		<u>\$15,000- \$24,999</u>		<u>&gt; \$25,000</u>		<u>Unknown</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring price	4	18	3	10	4	16	7	29	6	60	4	22
2.	1	5	2	7	2	8	2	8	1	10	1	6
3.	2	9	2	7	2	8	4	17	0	0	1	6
4.	4	18	8	28	3	12	7	29	1	10	6	33
5. Most favoring flame resistance	11	50	11	38	14	56	4	17	1	10	5	27
Other	<u>0</u>	<u>0</u>	<u>3</u>	<u>10</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>10</u>	<u>1</u>	<u>6</u>
TOTAL	22	100	29	100	25	100	24	100	10	100	18	100



## APPENDIX 5

Consumer Willingness to Sacrifice Comfort for  
Flame Resistance by Demographic Groupings

Response	AGE							
	<u>&lt; 21</u>		<u>21-40</u>		<u>41-60</u>		<u>&gt; 60</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring comfort	0	0	14	29	12	26	3	13
2.	1	12	13	27	12	26	7	29
3.	3	38	7	14	3	7	3	12
4.	3	38	10	20	9	19	5	21
5. Most favoring flame resistance	1	12	3	6	7	15	2	8
Other	<u>0</u>	<u>0</u>	<u>2</u>	<u>4</u>	<u>3</u>	<u>7</u>	<u>4</u>	<u>17</u>
TOTAL	8	100	49	100	46	100	24	100

**Consumer Willingness to Sacrifice Comfort for  
Flame Resistance by Demographic Groupings (Continued)**

<u>Response</u>	<u>SEX</u>			
	<u>Male</u>		<u>Female</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring comfort	13	37	16	17
2.	7	20	26	28
3.	4	11	12	13
4.	8	23	19	20
5. Most favoring flame resistance	2	6	11	12
Other	<u>1</u>	<u>3</u>	<u>9</u>	<u>10</u>
TOTAL	35	100	93	100

Consumer Willingness to Sacrifice Comfort for  
Flame Resistance by Demographic Groupings (Continued)

Response	INCOME (HOUSEHOLD)											
	<u>&lt; \$5,000</u>		<u>\$5,000- \$9,999</u>		<u>\$10,000- \$14,999</u>		<u>\$15,000- \$24,999</u>		<u>&gt; \$25,000</u>		<u>Unknown</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring comfort	4	18	6	21	5	20	7	29	4	40	2	11
2.	7	32	9	31	7	28	7	29	0	0	3	17
3.	1	4	5	17	1	4	2	8	1	10	3	17
4.	4	18	5	17	6	24	5	22	4	40	6	32
5. Most favoring flame resistance	3	14	2	7	4	16	2	8	1	10	3	17
Other	<u>3</u>	<u>14</u>	<u>2</u>	<u>7</u>	<u>2</u>	<u>8</u>	<u>1</u>	<u>4</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>6</u>
TOTAL	22	100	29	100	25	100	24	100	10	100	18	100

## APPENDIX 6

Consumer Willingness to Trade Off Durability  
for Flame Resistance by Demographic Groupings

<u>Response</u>	<u>AGE</u>							
	<u>&lt; 21</u>		<u>21-40</u>		<u>41-60</u>		<u>&gt; 60</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring durability	0	0	14	29	10	22	8	33
2.	3	37	11	22	8	17	8	33
3.	0	0	7	14	7	15	0	0
4.	3	38	12	25	10	22	4	16
5. Most favoring flame resistance	0	0	5	10	9	20	2	9
Other	2	25	0	0	2	4	2	9
TOTAL	8	100	49	100	46	100	24	100

Consumer Willingness to Trade Off Durability  
for Flame Resistance by Demographic Groupings (Continued)

<u>Response</u>	<u>SEX</u>			
	<u>Male</u>		<u>Female</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring durability	7	20	26	28
2.	10	29	20	21
3.	5	14	10	11
4.	6	17	21	23
5. Most favoring flame resistance	4	11	14	15
Other	<u>3</u>	<u>9</u>	<u>2</u>	<u>2</u>
TOTAL	35	100	93	100

Consumer Willingness to Trade Off Durability  
For Flame Resistance by Demographic Groupings (Continued)

Response	INCOME (HOUSEHOLD)											
	<u>&lt;\$5,000</u>		<u>\$5,000- \$9,999</u>		<u>\$10,000- \$14,999</u>		<u>\$15,000- \$24,999</u>		<u>&gt;\$25,000</u>		<u>Unknown</u>	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring durability	6	27	7	24	5	20	7	29	3	30	5	28
2.	5	23	7	24	5	20	6	25	2	20	5	28
3.	1	4	5	17	2	8	5	21	0	0	2	11
4.	3	14	9	31	5	20	4	17	3	30	3	17
5. Most favoring flame resistance	5	23	1	4	6	24	2	8	2	20	2	11
Other	<u>2</u>	<u>9</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>8</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>5</u>
TOTAL	22	100	29	100	25	100	24	100	10	100	18	100

## APPENDIX 7

Consumer Willingness to Replace Easy Care Properties  
With Flame Resistance by Demographic Groupings

Response	AGE							
	<21		21-40		41-60		>60	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
1. Most favoring easy care	0	0	11	22	15	33	4	17
2.	3	38	15	31	9	19	7	29
3.	1	12	7	14	4	9	3	12
4.	4	50	13	27	10	22	5	21
5. Most favoring flame resistance	0	0	2	4	6	13	3	13
Other	0	0	1	2	2	4	2	8
TOTAL	8	100	49	100	46	100	24	100

## SEX

(See table 12 on pp. 30-31 for response by sex.)

Consumer Willingness to Replace Easy Care Properties  
With Flame Resistance by Demographic Groupings (Continued)

Response	INCOME (HOUSEHOLD)											
	<\$5,000		\$5,000- \$9,999		\$10,000- \$14,999		\$15,000- \$24,999		>\$25,000		Unknown	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
1. Most favoring easy care	6	27	4	14	4	16	7	29	5	50	5	28
2.	5	23	8	27	5	20	7	29	3	30	6	33
3.	2	9	4	14	4	16	2	8	1	10	2	11
4.	6	27	11	38	7	28	5	21	0	0	3	17
5. Most favoring flame resistance	1	5	2	7	4	16	3	13	1	10	0	0
Others	2	9	0	0	1	4	0	0	0	0	2	11
TOTAL	22	100	29	100	25	100	24	100	10	100	18	100



## APPENDIX 8

Consumer Choice Between Safety from Carcinogenic Potential  
and Flame Resistance by Demographic Groupings

Response	AGE							
	< 21		21-40		41-60		> 60	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
1. Most favoring carcinogen protection	0	0	1	2	6	13	0	0
2.	1	12	12	24	13	29	11	46
3.	3	38	15	31	5	11	6	25
4.	1	12	14	29	18	39	5	21
5. Most favoring flame resistance	0	0	1	2	2	4	0	0
Other	<u>3</u>	<u>38</u>	<u>6</u>	<u>12</u>	<u>2</u>	<u>4</u>	<u>2</u>	<u>8</u>
TOTAL	8	100	49	100	46	100	24	100

Consumer Choice Between Safety from Carcinogenic Potential  
and Flame Resistance by Demographic Groupings (Continued)

Response	SEX			
	Male		Female	
	<u>No.</u>	<u>Pct.</u>	<u>No.</u>	<u>Pct.</u>
1. Most favoring carcinogen protection	2	6	5	6
2.	12	34	25	27
3.	11	31	18	19
4.	8	23	31	33
5. Most favoring flame resistance	0	0	3	3
Other	<u>2</u>	<u>6</u>	<u>11</u>	<u>12</u>
TOTAL	35	100	93	100

Consumer Choice Between Safety From Carcinogenic Potential  
and Flame Resistance by Demographic Groupings (Continued)

Response	INCOME (HOUSEHOLD)											
	< \$5,000		\$5,000- \$9,999		\$10,000 \$14,999		\$15,000- \$24,999		> \$25,000		Unknown	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
1. Most favoring carcinogen protection	0	0	2	7	2	8	2	8	0	0	1	6
2.	12	54	7	24	4	16	5	21	4	40	5	28
3.	3	14	5	17	9	36	4	17	1	10	7	38
4.	4	18	10	35	6	24	12	50	3	30	4	22
5. Most favoring flame resistance	0	0	1	3	1	4	1	4	0	0	0	0
Others	<u>3</u>	<u>14</u>	<u>4</u>	<u>14</u>	<u>3</u>	<u>12</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>20</u>	<u>1</u>	<u>6</u>
TOTAL	22	100	29	100	25	100	24	100	10	100	18	100