MARKET SEGMENTATION ANALYSIS:
EXAMINING SHOPPING AND BUYING DECISIONS

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FOR DISCUSSION PURPOSES ONLY

# BACKGROUND

# ABSTRACT

This paper examines the factors considered by women consumers in
the purchase of personal wearing apparel.  Seventy-five in-depth
interviews with consumers at the point of purchase were followed
by 356 mail survey interviews that asked women to retrace a most
recent purchase of an item of clothing they had purchased for them-
selves.  The women were interrogated concerning the behavior, pre-
dispositions, information and product cues, demographics, and buyer
goals associated with that purchase.  The data were then subjected
to the MCA computer analysis to determine those variables that had
the greatest impact on choice of store type for both shopping and
buying.  These variables were then processed through the AID
analysis to formulate tree diagrams that graphically depict both
the shoppers and buyers for each particular type of store.  Both
analyses show a greater predictive power for predispositional and
behavioral characteristics in market segmentation and a relative
nonimportance of standard demographic characteristics.

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# Introduction

Several recent studies have shown that two methodological techniques--
AID (Automatic Interaction Detector) and MCA (Multiple Classification
Analysis)--can be powerful tools for examining consumer behavior and for
market segmentation.[1] This paper demonstrates the use of these two
computer tools with a well-connected hypothetical construct of buyer be-
havior in an attempt to identify those dimensions that are the best pre-
dictors of women's fashion-buying behavior.

# Research Design

The first step was to conduct 75 in-depth interviews with women con-
sumers in three southwestern Missouri stores. The women were approached as
they completed an apparel purchase and were interviewed concerning that
purchase decision. This interview provided the basis for the design of a
mail questionnaire which examined specific variables that emulated the
behavioral modeling work of Howard[2] and Howard and Sheth.[3] The variables

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[1]Dennis Gensch and Richard Staelin, "The Appeal of Buying Black,"
Journal of Marketing Research, IX (May, 1972), 141-48; Joseph Newman and
Richard Staelin, "Prepurchase Information Seeking for New Cars and Major
Household Appliances," Journal of Marketing Research, IX (August, 1972),
249-57; Henry Assael, "Segmenting Markets by Group Purchasing Behavior:
An Application of the Aid Technique," Journal of Marketing Research, VII
(May, 1970), 153-58; William Wilkie, "Extension and Tests of Alternative
Approaches to Market Segmentation," Working Paper No. 323 (Lafayette, Ind.:
Institute for Research in the Behavioral, Economic, and Management Sciences,
Purdue University, September, 1971); William Peters, "Using MCA to Segment
New Car Markets," Journal of Marketing Research, VII (August, 1970), 360-63.

[2]John A. Howard, Marketing Management (Rev. ed.; Homewood, Ill.:
Richard D. Irwin, Inc., 1963), Chapters 3 and 4.

[3]John A. Howard and Jagdish Sheth, The Theory of Buyer Behavior
(New York: Harper & Row, Inc., 1969).

were categorized as: behavior, predispositions, information and product cues, demographics, and buyer goals. Each woman was asked to retrace her most recent purchase of an item of apparel for herself. Then she was questioned about the variables shown in Figure 1 as they related to that purchase (p. 4).

Two retail trade areas in Missouri--Joplin and Springfield--were chosen for this study. The main reason for this selection was merchant cooperation, but another reason was that the two areas showed differences in socioeconomic status and growth.[4/] Additionally, the two areas are geographically close, thereby controlling for regional differences. The major factors differentiating the two markets are population growth, educational levels attained, median and mean income levels, and median value of housing (Table 1, p. 5).

The mail survey obtained 356 usable responses. The distribution of the respondents was compared to the age, marital status and employment distributions of the 1970 census to check for nonrepresentative samples, and it was found that the distribution of the respondents was similar in configuration to that of the general population.

The original in-depth interviews led to the conclusion that there are differences in consumer behavior associated with different types of retail stores. The respondents were asked to identify, by name, the stores in which they had shopped and the store in which the purchase of a particular item of apparel had been made. With the assistance of a five-member re-tailer panel in both cities, the 96 stores mentioned were classified into general categories. Among these categories were three distinctive types, which were studied further:

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[4/]Bureau of the Census, Census of the Population 1970, PC (1), A27, B27, and C27 (Washington, D.C.: Government Printing Office, 1971).

| | |
|---|---|
| High-fashion women's specialty stores | -- Principally selling apparel for women in the middle and upper price ranges |
| Mass merchandiser stores | -- Restricted to Sears, Penney's, and Montgomery-Ward cnly |
| Independent department stores | -- Full-line department stores other than those cited in the mass merchandiser category |

## First-Level Analysis

The objective of the first level of analysis was to determine whether the variables shown in Figure 1 contribute to understanding where women shop and buy clothes for themselves. The MCA program[5] was used to test six dependent variables:

> Department store buyers
> Department store shoppers
> Buyers in high-fashion women's specialty store
> Shoppers in high-fashion women's specialty store
> Buyers in mass merchandiser store
> Shoppers in mass merchandiser store

There were 33 explanatory variables used in this analysis (Figure 2).

When the model for all variables was used, significantly high correlation coefficients were obtained for each dependent variable (Table 2), which led to the conclusion that many of the predictors of women's fashion-buying behavior had been measured in the study. (See pp. 6 and 7.)

## Second-Level Analysis

### Design

Bass, Tigert, and Lonsdale recognized the need for a multivariate analysis to examine the variations in such grouped data.[6] Certainly the

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[5] Frank Andrews, James Morgan, and John Sonquist, Multiple Classification Analysis (Ann Arbor: Institute for Social Research, University of Michigan, 1967).

[6] Frank Bass, Douglas Tigert, and Ronald Lonsdale, "Marketing Seg-mentation: Group Versus Individual Behavior," Journal of Marketing Research. V (August, 1968), 264-70.

Demographics:

> Marital status
> Age
> Employment status of respondent
> Employment status of husband of respondent, if married
> Number and ages of children
> City of residence

Predispositions:

> Negative colors--garment colors respondent would not buy
> Negative fabric characteristics--fabrics respondent would not buy
> Garment care characteristics wanted
> Wardrobe accessory matching
> Upper and lower price limits to purchase
> Had charge account where shopping and buying reported
> Previously bought apparel in store of purchase
> Prepurchase planning:
>> General
>> Specific--positive color wanted
>>         positive fabric wanted

Product and Information Cues:

> Comparison shopping at alternate stores
> Utilization of price limitations
> Method of payment
> Sought out particular sales clerk
> Use of "shopping pals"
> Used sales clerk evaluations of style and fit of garment
> Evaluation of mass media helpfulness in purchase decision

Buyer's Goals:

> Self-evaluation of fashion awareness
> Factors used in developing level of fashion awareness
> Shopping enjoyment in buying clothes for self

Behavior:

> Coordinating items purchased
> Type of garment purchased
> Number of stores shopped
> Number of stores shopped on day of purchase
> Color of garment purchased
> Fabric of garment purchased
> Garment care requirement for item purchased

Fig. 1. Buyer construct.

TABLE 1

1970 Census Characteristics of Joplin and Springfield, Missouri

| Census Characteristic | Springfield Standard Metropolitan Statistical Area (SMSA) | Joplin Retail Trade Area | |
|---|---|---|---|
| | | Jasper County | Newton County |
| Population growth (in percentage) | 8.5 | 6.9 | 8.1 |
| Median years of education for males | 12.3 years | 11.8 years | 11.5 years |
| Percentage of population having completed high school | 58.9 | 48.7 | 47.3 |
| Median income | $8,215 | $7,312 | $6,887 |
| Mean income | $9,310 | $8,410 | $7,785 |
| Owner-occupied household's median value | $13,900 | $9,000 | $9,800 |
| Renter-occupied household's median rent | $73 | $55 | $55 |

Source:  Bureau of the Census, Census of the Population, 1970, PC(1), A27, B27, C27 (Washington, D.C.: Government Printing Office, 1971).

City of residence of respondent
Life cycle--combination of marital status and age variables
Employment status of respondent
Employment status of respondent's husband
Number of children


Item purchased
Number of total stores shopped
Number of stores shopped on day of purchase
Prepurchase planning
Positive color preference
Positive fabric preference
Lower and upper price limitations
Method of payment
Charge account in store of purchase and/or shopping
Previous purchase of personal apparel in store


Evaluation of sales clerk assistance with style and/or fit
Predisposition to use a male sales clerk
Self-evaluation of fashion consciousness or awareness
Amount of shopping enjoyment in buying for self
Frequency with which respondent uses newspaper advertising
    in fashion purchasing and evaluation of helpfulness of
    such ads
Method most helpful to respondent in developing her fashion
    awareness
Prepurchase discussion of buying decision with others
Frequency of shopping with other persons
Tendency of respondent to shop alone
Type of store shopped
Type of store where purchase was made


Fig. 2.  Explanatory variables--first MCA run.

TABLE 2

MCA Analysis--Correlation Coefficients

| Dependent Variable | $R^2$ |
|---|---|
| Shopper in high-fashion women's specialty store | .50635 |
| Department store shopper | .38177 |
| Shopper in mass merchandiser store | .41322 |
| Buyer in high-fashion women's specialty store | .50264 |
| Department store buyer | .48303 |
| Buyer in mass merchandiser store | .40457 |

limits imposed by 356 respondents and 33 predictive variables argue against

the more simplistic multiple cross-classification suggested by those authors.

Limitations of AID. Assael has demonstrated the effective use of the

AID algorithm in market segmentation.[7] There are, however, several sub-

stantive limitations to such use. AID computes the ratio of the between

sum of squares for each variable by the total sum of squares for the group

to be split. It then selects the highest ratio for the binary split of the

respondents. All of the subsequent splits are contingent on the subgroups

formed by the first split; yet it is possible that there is a small difference

in discrimination between the variable split and the second variable; The

resultant tree diagram produced by a split on the second variable could be

quite different. Assael[8] and Newman and Staelin[9] have suggested that a

sensitivity analysis consisting of subsequent AID runs be used. Under this

technique the analyst eliminates the first split, reruns the analysis with-

out the initial variable, and compares the structures produced. The major

drawbacks to this technique are the expense of programming and computer time

charges and the arbitrary judgments used in comparing the different tree

diagrams.

Another limitation to the use of AID is that the independent variables

may be closely interdependent and there may be high intercorrelation among

the predictors.

Finally, there is the problem of judging where to terminate the AID

tree, i.e., what criteria are to be used for aborting the iterative process?

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[7]Assael, "Segmenting Markets", pp. 157-58.

[8]Ibid., pp. 155-56.

[9]Newman and Staelin, "Prepurchase Information Seeking", pp. 250-52.

Overcoming the limitations. It is suggested that the MCA program be used to partially overcome these limitations. In its elementary form the MCA program produces measures of simple associations--pairwise correlations--between the dependent variables and the independent variable. This is reflected in the $Eta^2$ score output of the program. $Eta^2$ indicates the "ability of the predictor, given the categories given, to explain the variation in the dependent variable." [10] The scores provide a foundation for the need to undertake the type of sensitivity analysis that has been suggested and the content of such analysis. Certainly they form the basis for halting the tree diagram construction to some defined limit, e.g., in this study only those variables with an $Eta^2$ score of beyond .02 were used. Finally, MCA can aid in indicating the presence of possible high inter-correlations among predictors. The MCA iteration process fails to converge or converges very slowly with oscillations when such a possiblity exists. [11] The analyst would then stop the process and examine the variables for interdependence rather than proceed with the costly, subsequent AID analysis.

Results

MCA analysis. When the MCA analysis was used with each of the six dependent variables and the limitation of an $Eta^2 > .02$ was imposed, the result was the identification of the applicable independent variables (Table 3). These then formed the basis for the subsequent AID analysis.

AID analysis. The results from the use of the AID algorithm are shown in the tree diagrams in Figures 3-8. The numerical figure is the percentage of that type buyer or shopper occupying that particular branch

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[10] Andrews, Morgan, and Sonquist, Multiple Classification Analysis, p. 22.

[11] Ibid., p. 32.

TABLE 3

Independent Variables with Eta$^2$ Greater Than .02

| Shopper in High-Fashion Women's Specialty Store | Department Store Shopper | Shopper in Mass Merchandiser Store | Buyer in High-Fashion Women's Specialty Store | Department Store Buyer | Buyer in Mass Merchandiser Store |
|---|---|---|---|---|---|
| Location: Joplin or Springfield | Location: Joplin or Springfield | Age of buyer | Location: Joplin or Springfield | Location: Joplin or Springfield | Age of buyer |
| Husband's employment status | Age of buyer | Woman's employment status | Age of buyer | Age of buyer | Woman's employment status |
| Age of buyer | Woman's employment status | Husband's employment status | Husband's employment status | Woman's employment status | Number of children |
| Number of stores shopped | Number of children in family | Number of children | Number of stores shopped | Husband's employment status | Number of store shopped |
| Prepurchase planning | Number of stores shopped | Number of stores shopped | Prepurchase planning | Number of children | Prepurchase planning |
| Price limitations | Prepurchase planning | Prepurchase planning | Prepurchase positive color preference | Number of stores shopped | Prepurchase positive color preference |
| Method of payment | Prepurchase positive color preference | Prepurchase positive fabric preference | Price limitation | Prepurchase planning | Method of payment |
| Previously purchased | Prepurchase positive fabric preference | Price limit | Method of payment | Prepurchase positive color preference | Store charge account |
| Use of sales clerk in store | Method of payment | Method of payment | Previously purchased in store | Prepurchase positive fabric preference | Use of sales clerk in purchase decision |
| Enjoyment in shopping for self | Store charge account | Store charge account | Use of sales clerk in purchase decision | Method of payment | Enjoyment of shopping for self |
| Helpfulness of newspaper advertising in buying decision | Use of sales clerk in purchase decision | Use of sales clerk in decision | Enjoyment in shopping for self | Store charge account | Helpfulness of newspaper ads in purchase decision |
| Fashion awareness | Predisposition to use a male sales clerk | Enjoyment in shopping for self | Helpfulness of newspaper ads in buy decision | Predisposition to use a male sales clerk | Fashion awareness |
|  | Enjoyment of shopping for self | Helpfulness of newspaper ads in purchase decision | Fashion awareness | Enjoyment of shopping for self |  |
|  | Helpfulness of newspaper ads | Fashion awareness |  | Helpfulness of newspaper ads |  |
|  | Fashion awareness |  |  | Fashion awareness |  |
|  |  |  |  | Discuss with others |  |
|  |  |  |  | Shop with others |  |

of the analytical tree to that point. For example, the farthest right-hand

branch of the tree for department store shoppers shows that 55.9 percent of

those shoppers enjoy shopping for themselves, find newspaper advertising

helpful in their purchase decision for personal clothing, and shop in more

than one store. In fact, when department store shoppers were examined, the

maximum reduction in the unexplained sum of squares is obtained by splitting

this cadre of shoppers by the number of stores in which they shopped.

The tree diagrams show graphically the characteristics of the customers,

either shoppers or buyers, of particular types of retail stores.

## Conclusions

The tree diagram should be useful to the retail marketing manager in

identifying major market segments for women's apparel. Certainly the fact

that there are differences in the tree diagrams of buyers and shoppers of

similar types of stores can lead to some understanding of the differences

between those who actually buy and those who are lured into, but do not

buy, in a store.

Interestingly the three different types of store shoppers are all

initially split on the basis of the number of stores shopped. Certainly

the department store manager should find the fact that 58.4 percent of

his shoppers comparison shop (two or more stores) and find newspapers

helpful in making purchase decisions useful in his evaluation of the

media. The additional recognition that most of those shoppers (55.9

percent) find shopping for their own clothing enjoyable should be a

valuable contribution in determining the content of the advertising

message. Similarly, the Sear's, Ward's, or Penney's retailer should be

interested in the fact that the best predictor of his buyers is customer

use of sales clerks, and that 75.9 percent of his market makes limited or

no use of the sales person in his purchase decision making. On the basis

of these findings the retailer could decide to hire and train sales clerks,

more for the order-taking function than for the order-getting function,

and serious questions can be raised about the viability of paying commissions

to sales clerks based on orders taken. Other analyses concerning sales

force usage, advertising strategy, and product "extras" can be gleaned

from the results of this study.

The relatively high $R^2$, when all the variables were used in the

initial MCA analysis, lends support to the behavioral construct of Howard

and Sheth. The greater predictive power of the predispositional and be-

havioral characteristics and the relative nonimportance of standard demo-

graphic characteristics is indicative of cross-classification analyses that

use these demographic dimensions as the primary basis for market segmentation.
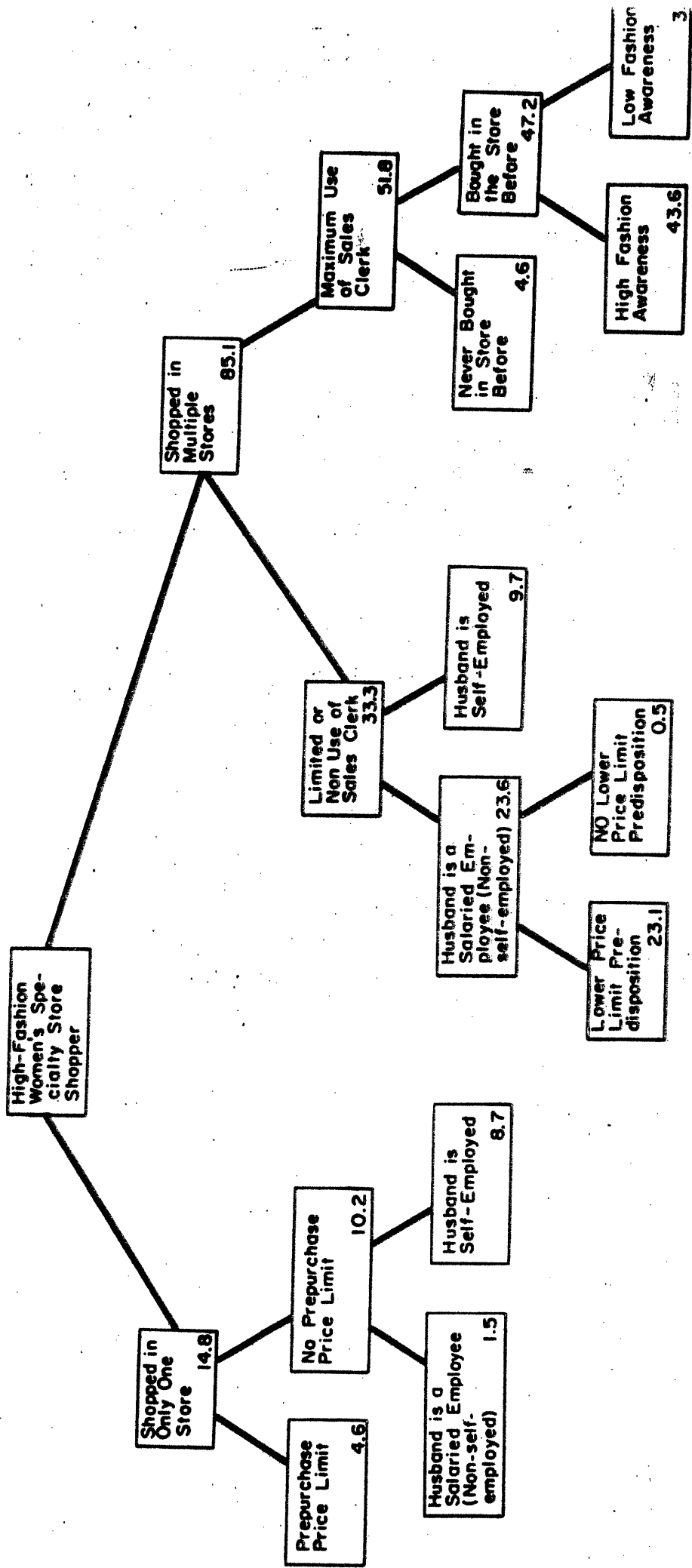
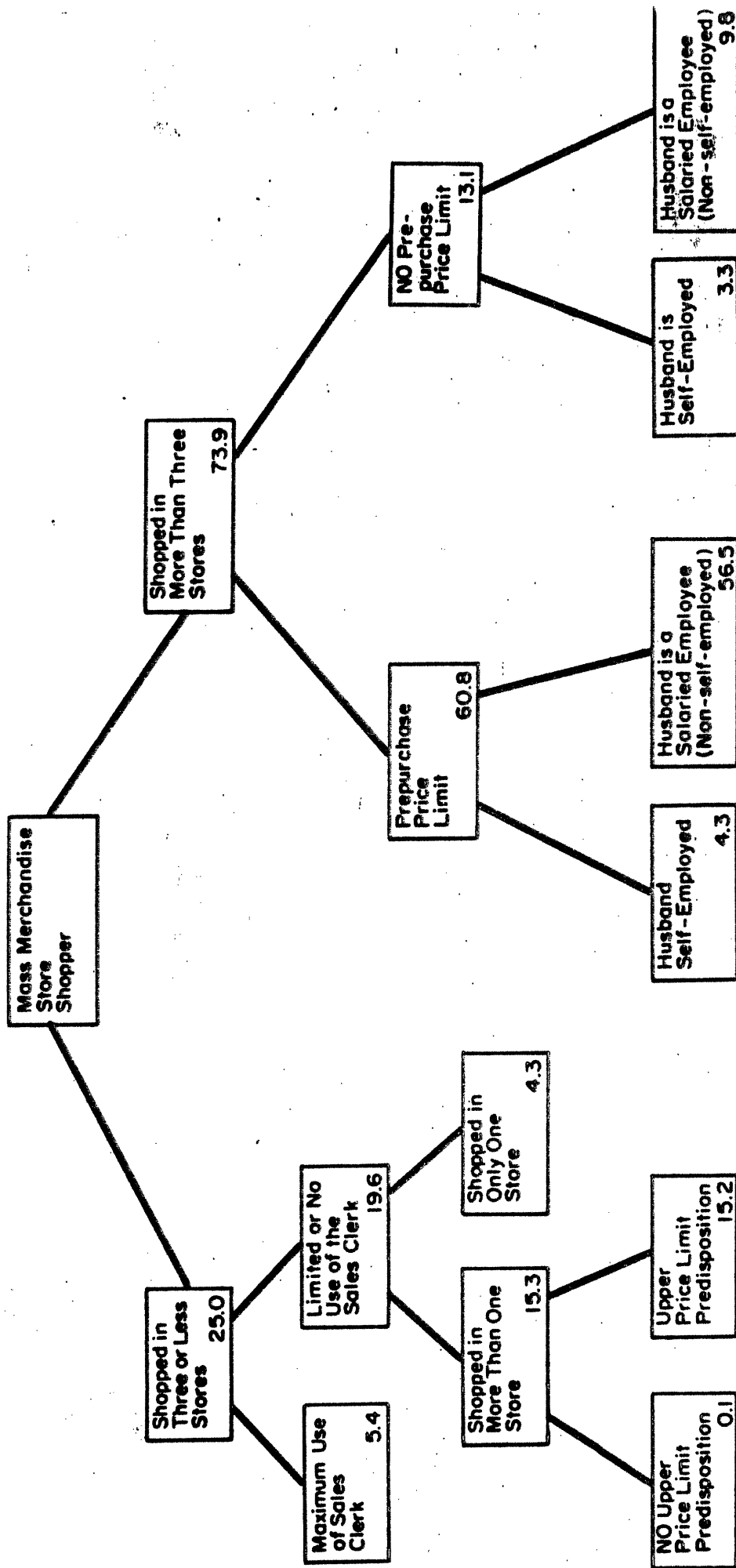Fig. 3. Aid tree for high-fashion women's specialty store shopper.

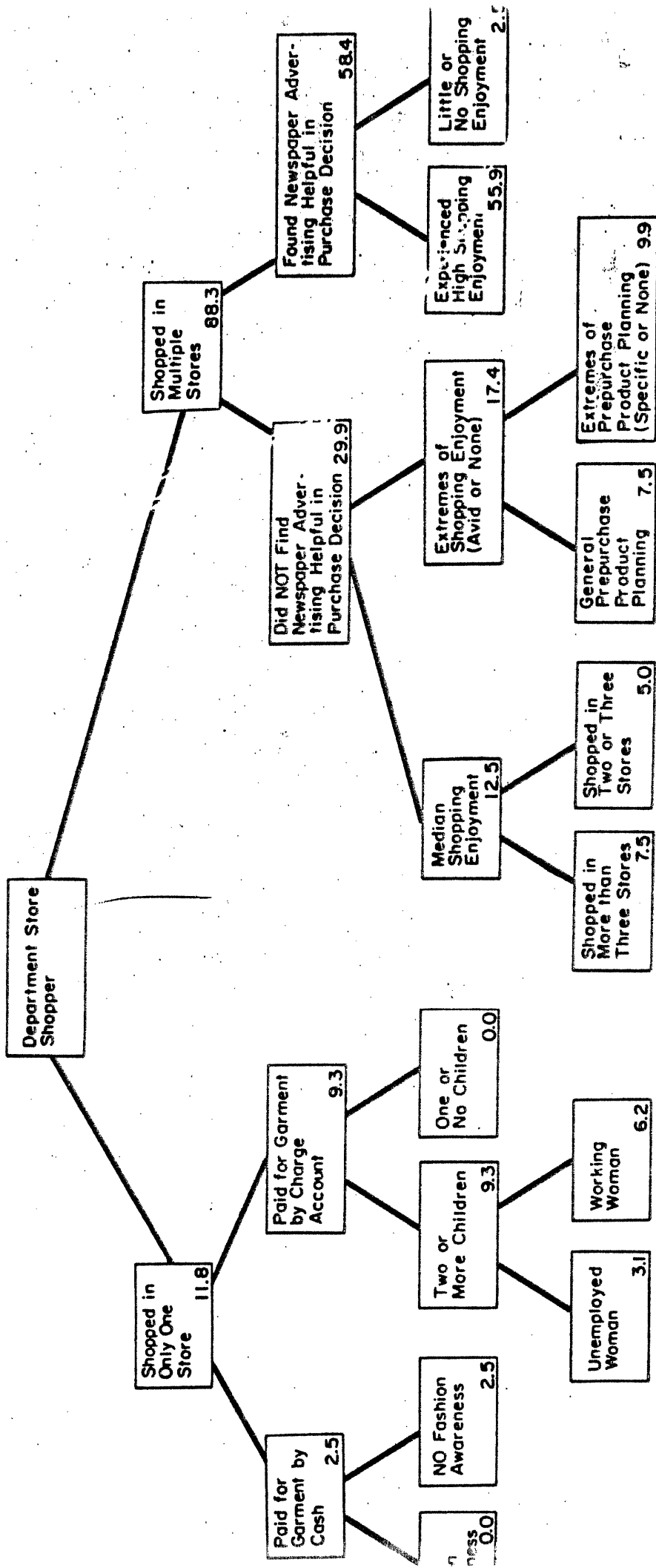Fig. 4. Aid tree for mass merchandise store shopper.
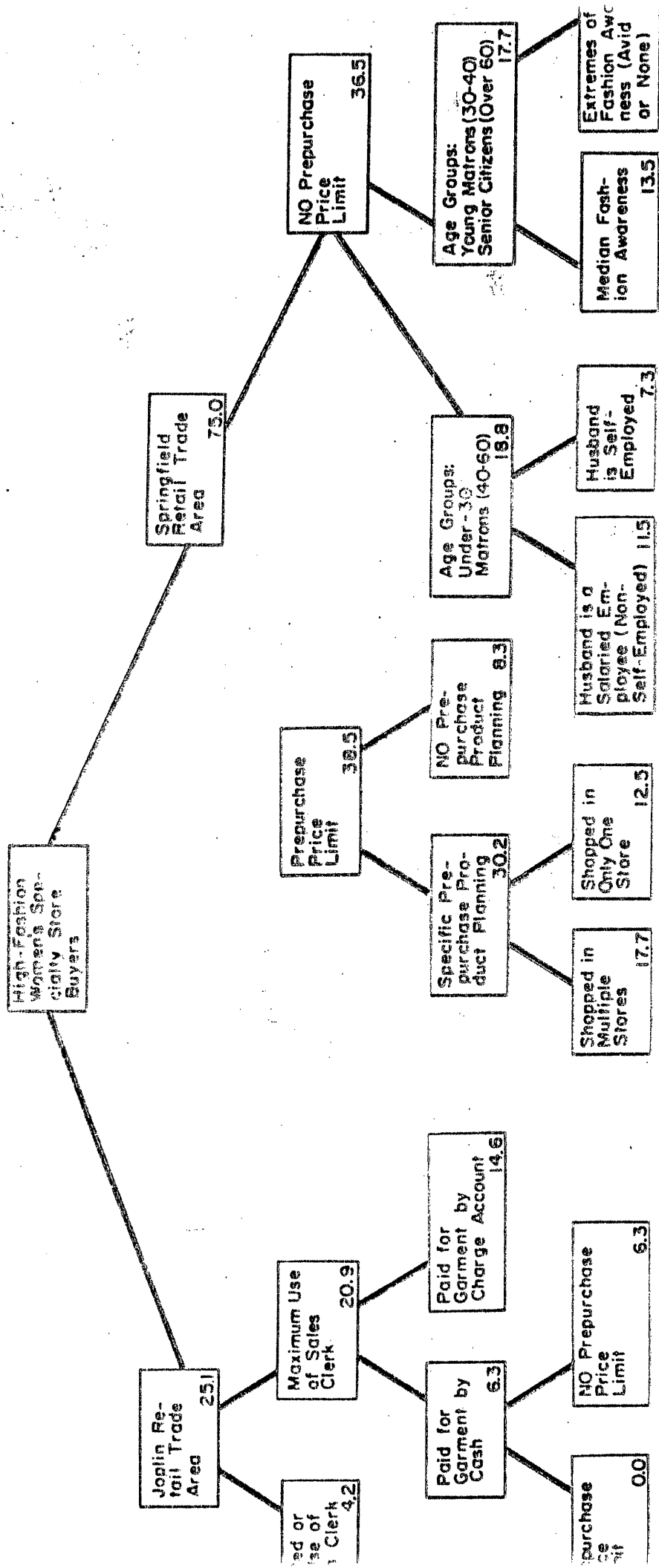
Fig. 5. Aid tree for department store shopper.

Fig. 6. Aid tree for high-fashion women's specialty store buyers.
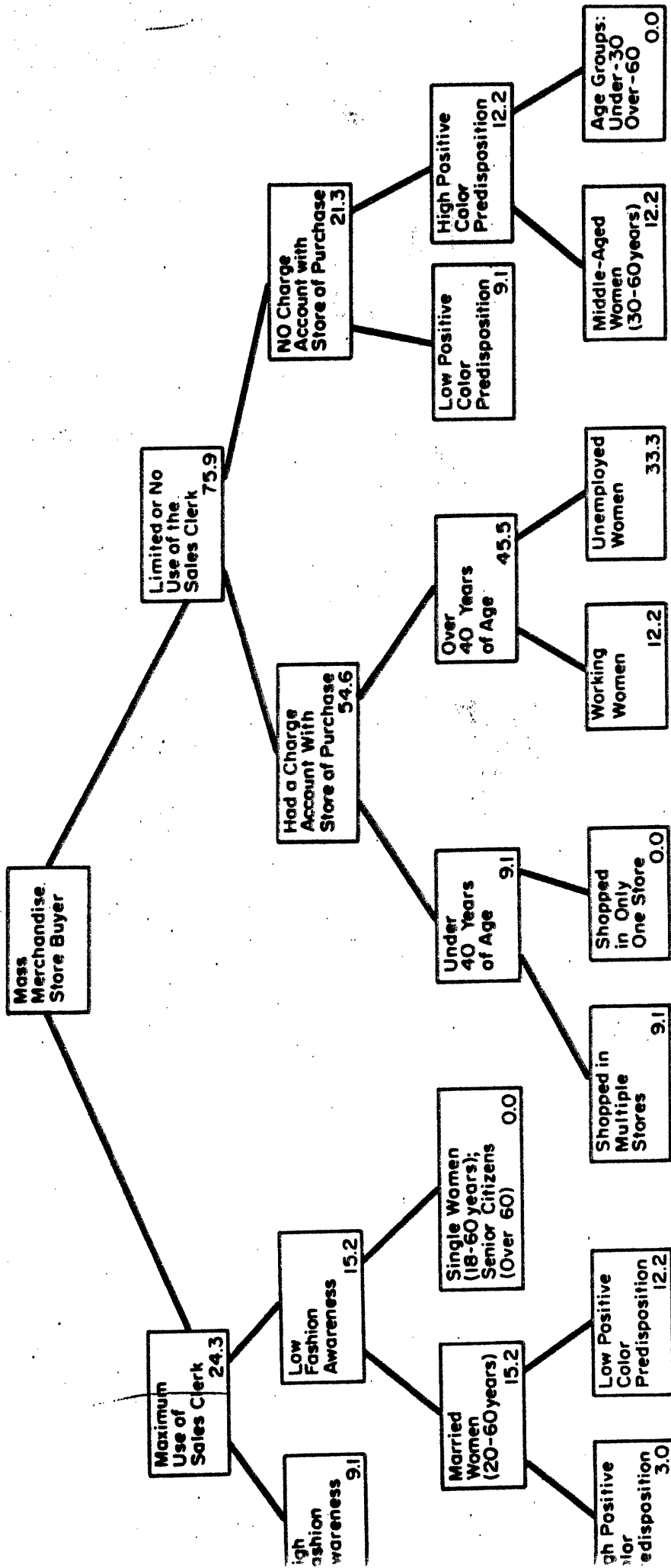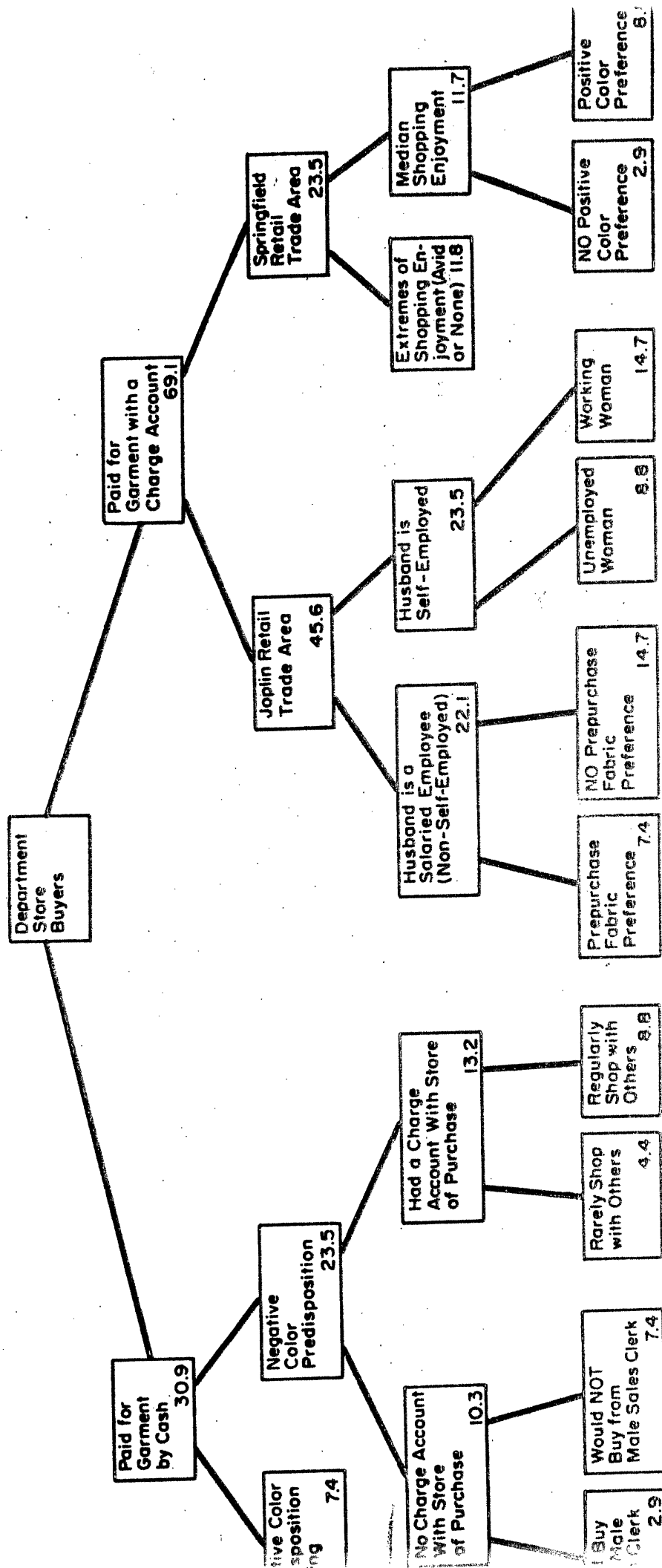
Fig. 7. Aid tree for mass merchandise store buyer.

Fig. 8. Aid tree for department store buyers.