CONSUMER SEGMENTS FOR ENVIRONMENTALLY MARKETED WOODEN HOUSEHOLD FURNITURE

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ABSTRACT

The environment is increasingly becoming an important issue for marketers in all areas of business. The wood products industry is especially vulnerable to this trend given its reliance on the natural environment as a source of raw materials. However, little attention has actually been paid to how noneconomic buying criteria, like the environment, are evaluated by consumers and for what segments of consumers the environment is an important purchase consideration. In light of these factors, a study was conducted in the fall of 1994 to determine whether a market segment for environmentally marketed wooden household furniture exists and to profile this market segment based on demographic, socioeconomic, and psychographic variables. Two identifiable consumer segments for environmentally marketed wooden household furniture were found representing approximately 39% of the study's 1,410 respondents. Consumers in the first segment are concerned about the environmental impacts of the products they purchase, but they are also very price-conscious. They can be described as Democrats, moderately educated, with a moderate income level, and concerned about the quality of the environment. Consumers in the second segment are also concerned about environmental product attributes, but they are the least price-sensitive segment. They can be described as Democrats, members of an environmental organization, and environmentally concerned. They participate in many environmental activities, are highly educated, and have a high income level. Results of this study may be useful to academic researchers, policymakers, and the wood products industry to allow them to segment their consumers and promote and position their products in these segments.

Keywords: Green marketing, market segmentation.

INTRODUCTION

Public concern over the environment is rising, and marketers have begun to recognize both the need and the value of environmental marketing (Sheth and Parvatiyar 1995). For instance, recent public opinion polls indicate a modest consumer preference for products that are perceived to be more environmentally benign; further, it appears that consumers say they are willing to pay somewhat higher prices for such products (Chase 1991). Companies involved in green marketing have too often turned their attention towards the general consuming public believing that the general consumer, as a market segment for green products, is a particularly large and profitable one (Mintu-Wimsatt and Bradford 1995).

The wood products industry in general has a tremendous potential to be affected by consumer concerns about the environment. As a major segment of the wood products industry,

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the wood furniture industry may serve as a barometer to monitor this issue. Forbes et al. (1993) estimated wood use in the furniture segment at over 2.4 billion board feet of hardwood lumber and at over 839 million board feet of softwood lumber in 1990. As furniture consumers have become increasingly concerned about the fate of tropical rainforests, they have begun to question furniture retailers regarding the source of all wood used in furniture construction and whether this wood came from a sustainably managed forest (Knight 1993). According to Sloan (1990), some furniture makers and retailers are feeling consumer pressure regarding their use and sale of tropical hardwoods; and some retailers, such as Conran's Habitat, will not sell furniture made of endangered wood species. Although the connection between environmental marketing and furniture consumption can be seen most clearly when we consider tropical wood species, it may also be a consideration for other types of wood used in furniture manufacturing. For instance, Winterhalter (1994) found that "furniture materials should originate from a sustainably managed forest" according to consumers in prompted questioning about the important criteria they use when selecting furniture. Although this type of material origin information has not been previously available to consumers, it has the potential to become an important selling point in the future.

A 1990 Gallup poll reports that 76% of Americans consider themselves environmentalists (Fisher 1990); however, some contend that a much smaller segment of consumers actually exists for environmentally marketed products. Also, when we consider environmentally marketed household furniture, the latent market segment may become even smaller. Therefore, the purpose of this paper is to help marketing managers identify potential consumer segments for environmentally marketed wooden household furniture. An overriding reason for identifying these market segments is that proper identification of these customer groups is important if managers are to adopt competitive strategies that include product positioning, advertising and promotional strategies, and new product offerings.

RESEARCH OBJECTIVES

Based on the work by Smith (1956), market segmentation is considered one of the most fundamental concepts in marketing. Market segmentation is based on the idea that consumers will have differing demand elasticities to the marketing variables of a firm—in other words, they may react differently to changes in price, new product offerings, advertising themes, or promotional offers. Market segmentation recognizes that no single market is homogeneous and that there is not an "average" consumer (Dickson and Ginter 1987). Thus there is a need to identify consumer differences and group consumers in such a way that a better understanding of the market under consideration emerges. Besides being one of the major methods of operationalizing the marketing concept, segmentation requires an adjustment of marketing efforts to accommodate the differences in consumer or user requirements (Smith 1956).

The primary objectives of this research are: (1) to determine whether a market segment for environmentally marketed wooden household furniture exists; (2) if so, to explain or profile this market segment based on demographic, socioeconomic, and psychographic variables; and (3) to determine if these variables can be used to further identify this segment.

LITERATURE REVIEW

Environmental or green marketing

After declining somewhat in the 1980s, consumer environmental concerns have resurfaced in the early 1990s. Numerous environmental events and disasters in the late 1980s have alerted consumers to the consequences of industrialization and their own consumption decisions. For instance, media coverage of the Valdez oil spill, loss of endangered species and biodiversity, global warming, the Chernobyl nuclear accident, the chemical disaster in Bhopal, India, and the solid waste

disposal issue are just a few of the images that have been brought before the public. As news coverage of these events has pulled the environment into the spotlight, regulatory pressures on industry have increased, and consumer demand for more environmentally benign or "friendly" products has grown.

Consumer environmental concerns have shaped a trend called "environmental consumerism," which has been defined as individuals looking to protect themselves and their world through the power of their purchasing decisions (Ottman 1992). Consumers, it is suggested, are voicing their concerns in the marketplace by evaluating products not only on performance and price, but also on the environmental responsibility of manufacturers. According to Ottman (1992), value now includes the environmental soundness of product and package.

Corporate environmentalism, which includes environmental marketing, is defined by Banerjee (1992) as an organization-wide recognition of the legitimacy and importance of the biophysical environment in the formulation of organization strategy. When pursued effectively, corporate environmentalism can lead to customer satisfaction and goodwill, enhanced corporate and brand image, increased market share and profitability, and access to new market segments.

The environmentally concerned consumer

A great deal of research has been conducted on the environmentally concerned consumer, dating back to the early 1970s. Marketing researchers have used demographic, socioeconomic, cultural, and personality variables, as well as attitudes, to identify the environmentally concerned consumer (Cornwell and Schwepker 1995). Research in this area has been plagued with mixed results and inconsistent measures (Van Liere and Dunlap 1981; Heberiein 1981) and is therefore at times inconclusive.

Because of the great number of studies in this area, a complete review of the literature would not be practical in this article. Interested readers should seek out Cornwell and Schwepker (1995), Van Liere and Dunlap (1980, 1981), or Antil (1984) for a more thorough review of the literature. However, this section will give a brief overview of some of the major findings.

Demographic variables such as income, education, and age have been found to be related to environmental concern in some studies but not related in others (Picket et. al 1995). Also, contradictory findings emerge with respect to the direction of the relationships uncovered (Antil 1984). Some conclude that the relationship between demographic characteristics and environmental concern is still poorly understood (Samdahl and Roberson 1989), others that demographics offer little to the accurate profile of these groups (Picket et al. 1995). Some research suggests that the environmentally concerned consumer tends to be white, urban, and better educated, with higher income, higher occupational status, and higher socioeconomic status (Anderson et al. 1974; Murphy 1978; Tognacci et al. 1972). Also, Van Liere and Dunlap (1980) add that younger, well-educated, and politically liberal persons are more concerned about the environment.

Cornwell and Schwepker (1995) suggest that cultural variables, like social responsibility (Anderson and Cunningham 1972; Webster 1975), and/or personality variables, such as locus of control (Henion and Wilson 1976) or alienation (Balderjahn 1988; Crosby et al. 1981), and/or environmental attitudes (Kinnear et al. 1974; Balderjahn 1988; Crosby et al. 1981) may be better predictors of environmental concern than demographic variables. However, these variables are not always actionable from both a public policy perspective and an industrial perspective (Picket et al. 1995). For this reason, Picket et al. (1995) suggest that more direct measures like environmental concern, environmental knowledge, and environmental behaviors may be more salient means of segmentation and may result in improved marketing strategies.

According to a review of the literature by Antil (1984), research in this area has been plagued by a number of problems. First, the

sample size in many of the studies reviewed were relatively small. For the sixteen studies reviewed, the average sample size was 336, with only 4 studies having more than 500 respondents. A more serious problem was the use of convenience samples. Of the sixteen studies reviewed by Antil (1984), seven surveyed individuals in one city, two surveyed a larger regional area, three surveyed individuals statewide, and three used respondents of only one gender (women). Only one study used a national sample (Kinnear et al. 1974), and this study was conducted in Canada. More recent research in this area has also used relatively small samples from geographically limited areas (Picket et al. 1995; Ellen et al. 1991).

Based on these findings and suggestions, this study incorporates environmental knowledge, environmental concern, environmental activities, and selected demographic variables to profile the consumer segments for environmentally marketed wooden household furniture. It also uses a national sample to draw respondents, and samples a much larger number of respondents (n = 1,410) than previous studies in the area.

Household furniture industry

Total consumer spending for household furniture (including bedding) was up 7% from 1993 to $45.4 billion in 1994, with a predicted increase to $47.8 billion in 1995, and $49.6 billion in 1996 (Anonymous 1995a). This slowed growth in the industry can be attributed to rising interest rates, slowed housing starts, and slower growth in the U.S. economy. The industry can be segmented into the following groups: wood furniture, upholstered furniture, metal furniture, wood TV and radio cabinets, and wood household furniture not elsewhere classified. Wood household furniture is by far the largest segment within the industry, in terms of value added by manufacturing (Sinclair 1992). This segment had total value-added in manufacturing of almost $4.4 billion in 1990 (Kingslien and Greber 1993).

The purchase of household furniture can be affected by product attributes such as style and design, comfort, construction, overall appearance, quality, and relative value. For instance, Shaver (1995) reports that quality is the most important attribute consumers require in furniture products, followed by comfort, durability, workmanship, appearance, materials, value, price, style, and brand name. Bowling (1994) found price and quality to be the two most important reasons consumers give for their most recent furniture purchase. Finally, Winterhalter (1994) found that affluent respondents rated, in order of importance, finish, appropriateness of design, solid wood construction, and materials originating from a sustainably managed forest as important attributes for selecting furniture.

However, the furniture buying process can also be affected by several other important factors. Bennington (1985) explains that the need to buy furniture is not uniform throughout a person's life. He suggests that there are seven stages when people are most likely to buy furniture: when they are young, single people on their own; when they are newly married; when children arrive; when the family economic status improves; when the children become teenagers; when people retire; and when they separate, divorce or become widowed. Shaver (1995) adds three additional categories to this list: new movers or new homeowners; new grandparents; and parents aged 35 and over with children under age 6 (who have been shown to spend over twice what the typical household spends on furniture). Sinclair (1992) explains that disposable personal income and interest rates have a major impact on furniture sales because most furniture is sold on credit.

The demographics of the population and the resulting pattern of household formation again influence the sale of household furniture. Sinclair (1992) states that the household formation rate has exceeded the rate of increase of the total population because the average household size has been declining. This has resulted in an increased demand for housing and furniture above that expected by the increase in population alone.

As reported by *Furniture Today,* annual

household furniture expenditures vary greatly depending on the age group of the head of the household. In 1993, 25- to 55-year-olds accounted for 73% of all furniture purchases, 67% of all consumer spending, and 59% of all households. Twenty-five to 34-year-olds and 35- to 44-year-old consumers (the two segments that make up most of the baby boom generation—now aged 30 to 50), accounted for 50% of all furniture spending and 45% of all consumer spending (Anderson 1995). Two factors primarily explain why baby boomers spend so much on furniture (Shaver 1993). First, there are so many of them—76 million. Also, they are now immersed in life stages such as marrying, having children, and buying homes that tend to trigger furniture purchases. It seems that most baby boomers are now homeowners who outbuy renters by 1.7 to 1 on furniture purchases (Shaver 1993). Also, *Furniture Today* reports that homeowners are almost three times as likely to say they are interested in home furnishings or home decorating as are renters (Anonymous 1995b).

There is some evidence to suggest that consumer environmental concerns may have an impact on the wood furniture industry. Winterhalter (1994) found that 93% of her respondents wanted to know that the wood used in their furniture originated from sustainably managed forests. Cutler (1993) reports that furniture manufacturers and retailers are becoming watchful of increasing public sensitivity to environmental issues because they are concerned that action on the part of consumers could affect their business. In particular, industry leaders are monitoring the growing worldwide efforts to slow tropical deforestation and prohibit the use of threatened woods.

METHODOLOGY

To investigate consumers' perceived importance of wooden furniture attributes, in particular environmental concerns, a nationwide survey of single-family homeowners was conducted in the fall of 1994. The following section briefly discusses the research instrument used, the sample frame, data collection techniques, study bias, and the data analysis techniques employed for data reduction, customer segmentation, and segment profiling.

Research instrument

A list of key furniture attributes was developed through secondary sources including trade press articles, and the marketing and forest products marketing literature (Sinclair et al. 1990; Stureson and Sinclair 1991; Bowling 1994; Shaver 1995). Because only one study was found that looked specifically at wooden furniture attributes (Winterhalter 1994), these were largely developed by the researchers. To assess whether the environment was a consideration in furniture purchases, the following attributes were included: overall environmental impact, certification of environmental friendliness, origin of wood (tropical vs. temperate), and wood from a sustainably managed forest. In total, respondents were asked to evaluate the importance of 24 furniture attributes (Fig. 1). Although not exhaustive, this list of 24 attributes serves as an exploratory means of examining furniture attribute importance. Respondents were asked to rate the importance of these attributes when selecting a piece of furniture to buy on a five-point scale ranging from 1 = not at all important, to 3 = important, to 5 = extremely important. This measure of attribute importance was incorporated into a questionnaire that also included demographic, socioeconomic, and psychographic measures.

The demographic and socioeconomic variables examined as independent variables or predictors of environmental considerations in furniture purchasing include: age in years, gender of respondent, educational level, income level, membership in an environmental organization, political party affiliation (Democrat, Republican, and independent), and land ownership (other than the land of primary residence). The psychographic variables include: environmental knowledge,[1] a nine-item mea-

[1] In previous academic studies, assessing an individual's actual knowledge about environmental issues has proved

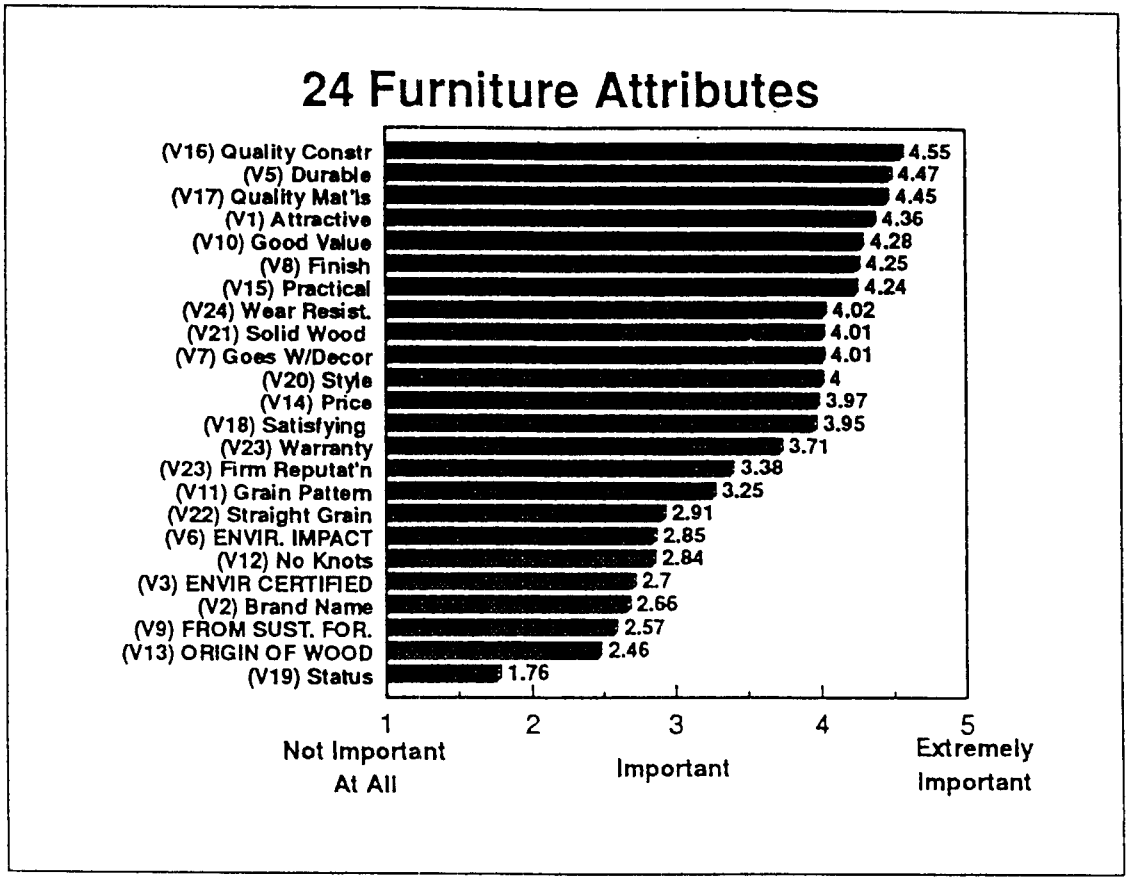

FIG. 1. Importance of furniture characteristics in the selection of a piece of furniture to buy.

sure of respondents' self-assessed knowledge on several environmental issues; environmental activities,[2] a ten-item measure of respondents' participation in environmentally relevant behaviors; and environmental concern, a composite measure of concern for the environment as compared to concern for eight other current national issues (see Nord and Luloff 1992).

The research instrument was thoroughly pretested to check for biased, misleading, or confusing questions and to verify the quality and quantity of information received (Dillman 1978). Pretests included homeowners, potential users of the data, and research colleagues. The most important group from which a pretest evaluation was sought included those individuals who were ultimately surveyed, homeowners. After administering the questionnaire to fifteen local homeowners, several changes were made to reflect needed simpli-

problematic. Thus following the work of Bohlen et. al. (1983), it was decided to incorporate a self-reported perception of knowledge about the following nine well-reported environmental concerns: sustainable forestry; recycling; water pollution; air pollution; global warming; tropical deforestation; loss of endangered species; loss of old growth forests; and wood products certification programs.

[2] As per the work of Seshan (1994) and Luloff et. al. (1993), environmental behavior was measured by respondents indicating how often ("have never done" to "do often") they participate in such activities as recycling, attending a meeting or hearing about the environment, contributing time or money to an environmental organization, voting based on environmental issues, reading an environmental magazine, etc.

fication, instruction clarity, and questionnaire length. The final instrument contained approximately 120 items.

Sample frame

The sample used in this study consisted of 3,500 U.S. homeowners as obtained from Best Mailing Lists, Inc. a national mailing list (and sampling) service provider. Because homeowners typically purchase more furniture than renters (Shaver 1993), it is more likely that homeowners would have made a furniture purchase in the past year. Best provided homeowner names and addresses on a random, nth name basis with every single-family, owner-occupied U.S. household having an equal and known chance of being selected (Schaeffer et al. 1986).

Data collection

Survey techniques developed by Dillman (1978) were used to gather data from the sample respondents. In accordance with these techniques, an initial mailing of the questionnaire was made in September 1994, followed by a post-survey reminder postcard one week later. A second questionnaire mailing was made one month after the first mailing to those who had not yet responded, in order to increase the number of respondents. The mailings were addressed to both the male and female heads of household.

Of the 3,500 questionnaires mailed, 1,410 were included in the analysis. Thirty-three questionnaires were undeliverable, incomplete or otherwise unusable, or the addressee was deceased. This resulted in an adjusted response rate of 41%.

Study bias

A two-part nonresponse bias check was performed to determine whether survey respondents differed from nonrespondents (Churchill 1987). First, a random sample of 50 nonresponding households were contacted by telephone and asked to respond to a reduced set of questions from the questionnaire. Their responses on these items were compared to the responses of the original respondents by using a one-way analysis of variance (ANOVA) statistical test. These tests indicated that no statistically significant differences existed between respondents and nonrespondents on this reduced set of items.

The second method to assess nonresponse bias compared those who responded to the initial mailing (early respondents) to those who responded as a result of subsequent follow-up efforts (late respondents) (Fowler 1984). Fowler (1984) suggests this method based on the assumption that respondents who respond to follow-up appeals are more like nonrespondents. In these tests, the early respondents (approximately 15%) were compared to those who responded to follow-up efforts (approximately 40%) on five demographic variables. Using a one-way ANOVA statistical test (0.01 level of significance), no significant differences between groups of respondents were found. In addition, fifteen psychographic measures were compared across groups, and again no significant differences between the two groups were found.

Respondent profile

Demographics.—Men (59%) outnumbered women (40%) in the sample. Most respondents were married (89%), 7.3% were divorced or widowed, and 3.5% were single. The median age of the sample was 47. The average number of children was 2.5. Most respondents (34.2%) had some college education, 19% had received a college degree, and 13.1% reported receiving a graduate degree. In the income category, the majority of respondents were in three categories: $20,000 to $39,999, $40,000 to 59,999, and $60,000 to $79,999. Almost a third of respondents (32%) reported owning land, and the average amount owned was 13 acres. Finally, 12% of respondents indicated they belonged to an organization whose prime mission was to protect the environment.

Direct comparisons between this demographic profile and population characteristics are difficult, given that the sample was restricted to single-family homeowners. Accordingly,

a comparison with the 1990 Census of Population (U.S. Bureau of the Census 1992) figures indicates that the sample includes a disproportionately larger number of married respondents (sample 89%, population 55%), a larger number of male respondents (sample 59%, population 49%), a higher median age (sample 47, population 32), a higher education level (sample 40.4% with bachelor's degree or higher, population 20.3%), a larger number of Caucasian respondents (sample 94%, population 76%), and a slightly larger number of urban respondents (sample 70%, population 64%). It is important to remember that inferences in this study are made about the sample and not about the U.S. population as a whole. In other words, study inferences are made to approximately 51 million single-family homeowners in the U.S., which are shown to include an average of 2.75 persons per household (U.S. Bureau of Census 1992). This encompasses 140 million Americans or over half of the U.S. population.

Furniture purchases.—Almost half of the respondents (45.3%) reported having made a furniture purchase in the past year, and 30.4% reported they were planning a purchase in the next year. A full-line furniture store, or one that carries all types of furniture, was where most furniture purchases were made (34.2%), followed by a department store, a discount store, and a furniture gallery. Living room furniture was the most frequently purchased type (38.5%), followed by office furniture, adult bedroom furniture, and dining room furniture. Wood was the primary material from which furniture purchased in the last year was made (50.5%) followed by upholstery, metal, bedding material, and plastic. The wood category included temperate and tropical wood, composite panels, veneers, and wood for which respondents did not know the species or construction.

RESULTS

Furniture attribute importance

Figure 1 shows the mean importance (ratings) of the 24 furniture attributes by our 1,410 respondents. Quality construction, durability, and quality materials were the 3 most important attributes for single-family homeowners when selecting a piece of furniture to purchase. The 4 environmental attributes are rated in the bottom quartile by single-family homeowners as a whole. These 4 environmental attributes, ranked 18th, 20th, 22nd, and 23rd out of the 24 furniture attributes, suggesting that, by themselves, they are relatively unimportant to our study respondents in their furniture buying decision. Further analysis provides the relative importance of the 24 characteristics, and in particular the 4 environmental attributes, in terms of their ability to describe a reduced set of factors and to classify consumer groups or segments according to these underlying dimensions or factors.

Data analysis

Factor analysis, cluster analysis, and one-way ANOVA were used for data reduction and to develop and describe consumer segments for wooden household furniture purchases as graphically depicted in Fig. 2. The multivariate statistical techniques, factor analysis, and cluster analysis are briefly discussed in the following sections.

Factor analysis.—Factor analysis refers to a variety of statistical techniques whose common objective is to represent a set of variables in terms of a smaller number of hypothetical variables, in essence data reduction. It is based on the fundamental assumption that some underlying factors, which are smaller in number than the number of observed variables, are responsible for the covariation among the observed variables (Kim and Mueller 1978). It can also be used for confirmatory purposes by determining if certain variables load on predefined "hypothetical factors" (Kuhn and Jackson 1989).

A successful factor analysis explains the observed correlations using as few factors as possible, so as much simplification as possible occurs that is meaningful or interpretable (through rotation) (Norusis 1994). Norusis also explains that scores for each factor can be computed

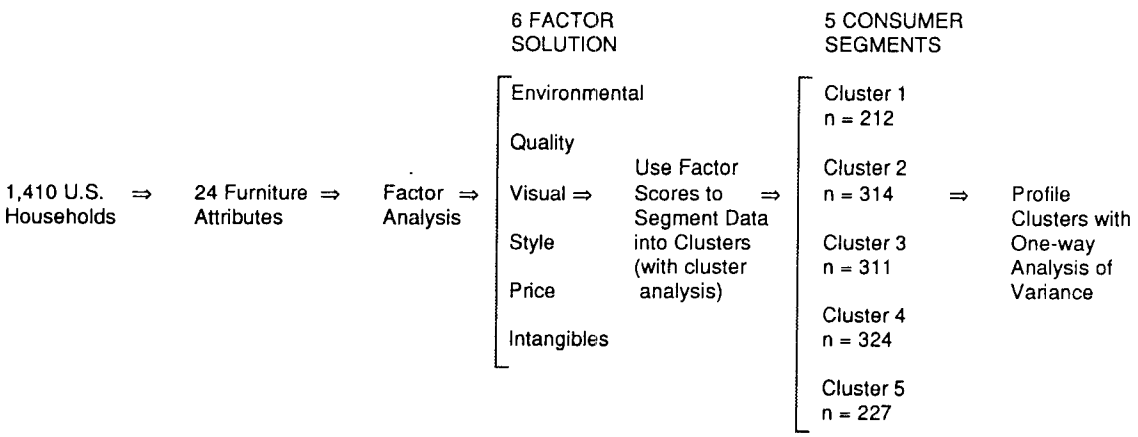

FIG. 2. Research methods.

and then used in a variety of other analyses (Norusis 1994). In this case, the factor scores will be used in cluster analysis to segment individuals on factor scores.

The correlation matrix for the 24 furniture attributes is shown in Table 1 (Pearson product-moment correlations). One of the goals of factor analysis is to obtain factors that help explain these correlations; thus the variables must be related to each other for the factor model to be appropriate (Norusis 1994). Factor analysis was deemed an appropriate technique since examination of the correlation matrix suggested relationships between variables. The Bartlett's test of sphericity can be used to test the hypothesis that the correlation matrix is an identity matrix. The test rejected the hypothesis that the matrix was an identity matrix ($p < 0.0000$). Also, the Kaiser-Meyer-Olkin measure of sampling adequacy (0.86) was within the range considered acceptable by Norusis (1994) and Stewart (1981) and characterized as "meritorious" by Kaiser (1974).

The goal of factor extraction is to determine the relevant number of factors. In this study, principal component (factor) analysis was used to reduce the 24 furniture attributes to a smaller number of underlying dimensions or factors. A 6-factor solution was supported by a scree test and an examination of factor eigenvalues (Norusis 1994; Stevens 1986). Table 2 provides the resulting factor loadings after Varimax rotation.

There are several methods for estimating factor score coefficients (Norusis 1994). Each method has different properties and results in different scores (Tucker 1971; Harman 1967). However, if principal components extraction is used, which it is in this analysis, all methods result in the same factor scores, which are not estimated but are exact (Norusis 1994).

To identify the factors, it is necessary to group the variables that have large loadings for the same factors. Hair et al. (1992) report that factor loadings with an absolute value greater than 0.30 can be considered significant, while Stevens (1986) suggests that only loadings with an absolute value greater than 0.40 have practical significance. In keeping with Stevens' more conservative recommendation, 4 variables—company reputation, satisfying to own, wear, and finish—were excluded from further analyses due to their low loadings on all 6 factors (V4, V8, V18, V24). The remaining 20 variables were assigned to the factor on which they had the greatest loading, and the 6 factors were named based on these loadings. The 6 factors were named: environmental, quality, visual, style, price, and intangibles. Table 2 shows the resulting factor structure and illustrates the strong discriminating power of the 4 environmental furniture attributes.

Cluster analysis.—Cluster analysis is a term applied to a group of empirical techniques used for classification of objects without prior assumptions about the population (Punj and Stewart 1983). Cluster analysis attempts to identify and classify objects or variables so that each object is very similar to others in the cluster. Objects within clusters should exhibit high internal homogeneity and high external heterogeneity with those outside their cluster (Hair et al. 1992). In this case, factor scores on the furniture attributes were saved, and then cluster analysis was used to segment individuals on these scores. Use of factor scores to do this procedure rather than surrogate variables representing the factors has the advantage of representing a composite of all variables loading on that dimension (Hair et al. 1992).

In cluster analysis there are many methods available for cluster formation. The selection of a method to use depends not only on the characteristics of the various methods but also on the data set to be analyzed (Norusis 1988). Because the number of cases in this study is relatively large (n = 1410), all available clustering techniques were not equally feasible. The procedure used to cluster consumers on their factor scores when the number of cases is large is based on the *nearest centroid sorting* method (Anderberg 1973). This procedure assigns a case to the cluster for which the distance between the case and the center of the cluster (centroid) is smallest.

Unlike theoretical statistics, cluster analysis does not provide precise rules for choosing a solution (Dess and Davis 1984). "In the final analysis, however, it is probably best to compute solutions for several different numbers of clusters (e.g. two, three, four, etc.) and then to decide among the alternative solutions based upon a priori criteria, practical judgment, common sense, or theoretical foundations" (Hair et al. 1992). As Bush and Sinclair (1991) suggest, the choice of an appropriate solution must be based on less rigid guidelines and the interpretability of the results. In this study, three, four, five, and six cluster solutions were all considered. A five-cluster solution was cho-

TABLE 1. *Correlation[1] matrix of 24 furniture attributes.*

Variable Number	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24
V1		−0.13																						
V2	0.03		−0.16																					
V3	0.20	0.57		−0.19																				
V4	0.29	0.09	0.08		−0.18																			
V5	0.06	0.18	0.71	0.26		−0.11																		
V6	0.45	0.23	0.07	0.24	0.17		−0.09																	
V7	0.38	0.21	0.14	0.25	0.24	0.08		−0.36																
V8	0.01	0.18	0.70	0.17	0.09	0.62	0.08		−0.08															
V9	0.31	0.08	0.06	0.15	0.35	0.10	0.25	0.25		−0.04														
V10	0.23	0.29	0.11	0.22	0.18	0.11	0.23	0.40	0.19		−0.13													
V11	0.14	0.25	0.08	0.21	0.10	0.08	0.18	0.29	0.10	0.10		−0.47												
V12	0.03	0.25	0.61	0.20	0.08	0.50	0.07	0.12	0.59	0.03	0.22		−0.17											
V13	0.17	0.02	0.01	0.08	0.22	0.03	0.10	0.13	0.00	0.37	0.01	0.09		−0.00										
V14	0.44	0.07	0.11	0.17	0.40	0.14	0.22	0.21	0.08	0.38	0.15	0.08	0.11		−0.21									
V15	0.36	0.17	0.11	0.29	0.53	0.14	0.25	0.37	0.12	0.38	0.24	0.14	0.11	0.15		−0.34								
V16	0.44	0.14	0.10	0.23	0.45	0.12	0.23	0.34	0.10	0.30	0.22	0.15	0.13	0.23	0.37		−0.60							
V17	0.42	0.24	0.16	0.30	0.30	0.16	0.27	0.24	0.12	0.31	0.24	0.13	0.15	0.14	0.38	0.25		−0.27						
V18	0.04	0.30	0.11	0.21	−0.06	0.14	0.05	0.07	0.07	0.02	0.19	0.15	0.18	0.10	0.00	−0.01	0.01		−0.19					
V19	0.50	0.23	0.09	0.25	0.25	0.11	0.51	0.40	0.06	0.26	0.30	0.18	0.10	0.12	0.27	0.28	0.25	0.33		−0.13				
V20	0.20	0.17	0.14	0.20	0.27	0.04	0.15	0.43	0.08	0.16	0.32	0.27	0.17	0.06	0.17	0.36	0.34	0.18	0.07		−0.21			
V21	0.15	0.29	0.08	0.24	0.14	0.09	0.17	0.30	0.13	0.12	0.57	0.77	0.20	0.07	0.10	0.17	0.17	0.16	0.17	0.19		−0.30		
V22	0.16	0.34	0.23	0.41	0.23	0.25	0.22	0.26	0.19	0.21	0.19	0.18	0.21	0.15	0.20	0.28	0.25	0.23	0.12	0.14	0.18		−0.21	
V23	0.21	0.17	0.13	0.26	0.30	0.15	0.20	0.41	0.15	0.26	0.42	0.32	0.18	0.17	0.24	0.33	0.30	0.21	0.08	0.24	0.35	0.36		−0.30
V24																								

Kaiser-Meyer-Olkin Measure of Sampling Accuracy = 0.8588
Bartlett Test of Sphericity = 12,258.69, Significance = 0.0000

[1] Pearson product-moment correlations.

TABLE 2. *Factor structure and submeasure structure after varimax rotation.*

Variable	Factor 1 "Environmental"	Factor 2 "Quality"	Factor 3 "Visual"	Factor 4 "Style"	Factor 5 "Price"	Factor 6 "Intangibles"
			Factor loadings[1]			
V6 Environmental Impact	**0.82**	0.05	0.01	0.05	0.11	0.13
V3 Cert. of Env. Friendliness	**0.89**	0.08	0.05	0.04	0.02	0.06
V9 Sustainably Managed Forest	**0.85**	0.08	0.12	−0.02	0.01	0.03
V13 Origin of Wood	**0.73**	0.09	0.20	−0.00	−0.02	0.17
V5 Durable	0.03	**0.65**	0.02	0.09	0.35	−0.01
V16 Quality Construction	0.05	**0.79**	0.05	0.17	0.16	0.06
V17 Quality Materials	0.04	**0.71**	0.05	0.21	0.21	0.04
V21 Solid Wood	0.04	**0.60**	0.34	0.10	−0.17	0.05
V11 Grain pattern	0.08	0.20	**0.69**	0.25	−0.07	0.16
V12 No Knots	0.03	0.01	**0.85**	0.07	0.10	0.09
V22 Straight Grain	0.03	0.07	**0.87**	0.06	0.08	0.14
V1 Attractive	−0.02	0.27	0.04	**0.72**	0.24	0.01
V7 Goes with Existing Decor	0.02	0.08	0.13	**0.75**	0.05	0.09
V20 Style	0.05	0.12	0.14	**0.79**	0.06	0.09
V10 Good Value	0.00	0.26	0.06	0.22	**0.67**	0.04
V14 Price	−0.03	0.04	0.09	0.00	**0.77**	0.00
V15 Practical	0.08	0.34	−0.01	0.32	**0.50**	−0.00
V2 Brand Name	0.12	0.13	0.19	0.15	−0.08	**0.73**
V19 Status	0.05	−0.14	0.11	0.06	−0.00	**0.73**
V23 Warranty	0.18	0.35	0.11	0.01	0.19	**0.50**
Factor Eigenvalue	5.79	2.82	2.09	1.41	1.15	1.03
Percent of Variance	24.1	11.7	8.7	5.9	4.8	4.3

[1] Bold type indicates the variables used to form the factor sub-measure.

sen because this number of clusters was the smallest that adequately differentiated the consumer segments (See Table 3).

Consumer segments

Table 3 provides the results for the cluster analysis of the six-factor solution. Instead of providing the numerical final cluster centers, a qualitative ranking or description is given for each cluster on each factor. In addition to these explanatory rankings, the clusters are each named based on these rankings, and the sample size for each cluster is given. For instance, Cluster 1 (n = 212; 212/1410 = 0.15 or 15% or respondents) ranks highest on the quality factor and low or moderate on every other factor and is thus named "Quality Conscious." Cluster 2 (n = 314; 23%) ranks highest on the environmental factor, highest on the price factor, and highest on the intangibles factor, which includes brand name, status, and warranty. This cluster is named "Environmentally Conscious but Price-Sensitive." Cluster 3 (n = 311; 22%) is both the most visually oriented and most style-conscious and thus this cluster is named "Style or Visually Oriented." Cluster 4 (n = 324; 23%) is the most difficult to describe; we labeled it "Low Quality" because it ranks the lowest on the factor we defined as quality. Cluster 5 (n = 227; 16%) ranks second on the environmental factor, the quality factor, the style factor, and the intangibles factor, but lowest on the price factor. We named this cluster "Environmentally Concerned but not Price-Sensitive."

Thus from Table 3 we have determined that Clusters 2 and 5 are the most likely segments for environmentally marketed wooden furniture. Potential furniture buyers in Cluster 2 can be described as very price-sensitive, environmentally conscious consumers who seek brands with high status and good warranties. Cluster

TABLE 3. *Cluster analysis results for the 6 factors.*

Factors	Cluster 1 "Quality Conscious" n = 212	Cluster 2 "Environmentally Conscious but Price-Sensitive" n = 314	Cluster 3 "Style or Visually Oriented" n = 311	Cluster 4 "Not Quality Conscious" n = 324	Cluster 5 "Environmentally Conscious but not Price-Sensitive" n = 227
Factor 1 "Environmental"	Moderate	Most Env. Concerned	Least Env. Concerned	Moderate	Env. Concerned
Factor 2 "Quality"	Most Quality Conscious	Low	Moderate	Least Quality Conscious	Quality Conscious
Factor 3 "Visual"	Low	Visually Oriented	Most Visually Oriented	Moderate	Lowest
Factor 4 "Style"	Lowest	Moderate	Most Style Conscious	Moderate	Style-Conscious
Factor 5 "Price"	Moderate	Most Price Conscious	Price Conscious	Moderate	Least Price Conscious
Factor 6 "Intangibles"	Low	Highest	Lowest	Moderate	High

5 respondents ranked the second highest on quality and style and the lowest on visual and price. This segment may be portrayed as quality and style conscious, price-insensitive environmentally aware consumers.

Cluster profiles

In order to develop a profile of the five clusters, Kruskal-Wallis (Chi-square) one-way analysis of variance (ANOVA) statistical tests were run on the demographic, socioeconomic, and psychographic variables (Table 4). This non-parametric test was used because many of the variables are ordinal (nonmetric) data and not interval or metric. Democratic party affiliation, education level, income level, environmental concern, environmental activities, and membership in an environmental organization were found to be significant at the 0.05 level. Age, gender, land ownership, Republican and independent party affiliation, and environmental knowledge were not found to be significant. However, although some of the variables are found to be significant across the five clusters, they do not all behave as expected or as the literature predicts. For instance, although education is statistically significant, Clusters 1 and 2 differ from 5, we might also expect cluster 2 to have a higher education level and differ from clusters 1, 3, and 4. In other words, according to these results environmentally concerned furniture consumers are not all more highly educated than other segments of consumers as the literature suggests.

Because of our interest in the market segments for environmentally marketed household furniture products, we will use these results to describe the most likely segments for these products, Clusters 2 and 5. Cluster 5 which we have named "Environmentally Conscious but not Price-Sensitive" is the most likely segment for environmentally marketed wooden furniture. This cluster can be described as being members of the Democratic party, having the highest education level (college graduate or more) and highest income level ($60,000 or more), being more concerned about the quality of the environment than several other current issues, participating in many environmentally related behaviors, and being members of an environmental organization. Cluster 2 which we have named "Environmentally Conscious but Price-Sensitive"; is also a potential market segment for environmentally marketed household furniture. This cluster can be described as being members of the Democratic party, having a moderate education level (some college) and moderate income level ($40,000 to $59,999), being more concerned about the quality of the environment than many other current issues, and partici-

TABLE 4. *Consumer segments compared on selected characteristics.*

	Cluster name and number						
	"Quality Conscious" 1	"Env. Conscious but Price Sensitive" 2	"Style or Visually Oriented" 3	"Not Quality Conscious" 4	"Env. Conscious but not Price-Sensitive" 5		
Characteristic	Mean or Percentage of Cluster (Proportion)					Chi-Square[1]	Significance
Democrat	0.29†	0.36	0.24	0.30	0.32	11.00[2]	0.0265
Education Level	3.3	3.3	3.6	3.5	3.7	22.06[3]	0.0002
Income Level	2.9	3.3	3.6	3.4	3.9	40.40[4]	0.0000
Environmental Concern[a]	1.0	1.0	0.93	1.0	1.1	41.52[5]	0.0000
Environmental Activities[b]	26.4	26.1	23.5	24.7	26.9	45.64[6]	0.0000
Environmental Member	0.15†	0.12	0.08	0.14	0.15	9.51[7]	0.0496
Age	48.9	50.3	48.7	48.3	49.2	5.03	0.2842
Gender	0.39†	0.43	0.40	0.38	0.38	2.25	0.6902
Own Land	0.33†	0.32	0.30	0.31	0.37	3.04	0.5518
Republican	0.45†	0.43	0.54	0.47	0.52	9.15	0.0575
Independent	0.20†	0.17	0.17	0.22	0.14	6.46	0.1671
Environmental Knowledge[c]	26.2	26.9	26.2	25.7	26.9	7.49	0.1121

[1] A Kruskal-Wallis one-way analysis of variance (ANOVA) technique was used to test the hypothesis of no difference between the clusters.
† Percentage of Cluster (proportion).
[a] A composite measure of concern for the environment as compared to concern for nine other current issues, ranging from 0 to 3.0.
[b] A ten-item measure of respondents' participation in environmentally relevant behaviors, ranging from 10 to 50.
[c] A nine item measure of respondents' self-assessed knowledge on environmental issues, ranging from 9 to 45.
[2] Cluster 2 differs from 3.
[3] Cluster 1 differs from Cluster 5; and Cluster 2 differs from Cluster 5.
[4] Cluster 1 differs from 3 and 5; Cluster 5 differs from 2 and 4.
[5] Cluster 3 differs from 1, 2, 4, and 5.
[6] Cluster 1 differs from 3 and 4; Cluster 2 differs from 3; and Cluster 5 differs from 3 and 4.
[7] Cluster 3 differs from 1, 2, 4, and 5.

pating in many environmentally related behaviors.

CONCLUSIONS

Of the 24 furniture attributes measured in this study, the 4 dealing with environmental impact were rated as 18th, 20th, 22nd, and 23rd in importance. Clearly, environmental concerns are not the primary criteria in the furniture purchase decision. However, the multivariate analysis discriminates two groups of consumers on environmental factors suggesting that, all things being equal, some consumers will consider impact on the environment in their furniture purchases.

The research presented here suggests the existence of two identifiable consumer segments for environmentally marketed wooden household furniture representing approximately 39% of respondents. The first of these segments, Cluster 2, is relatively concerned about the environmental impact of the products they purchase, but these consumers are also concerned about other intangible attributes, such as the brand name, the status of owning an item, and product warranties. This segment, the most price-conscious of all five consumer segments, is probably not going to pay a price premium for environmental attributes. Their major concern is getting good value for their money. Thus, 23% of sample respondents or nearly 31 million Americans may seek out environmentally friendly wooden furniture with assurances of minimal forest impact at a low price. This cluster can be described by the ANOVA (relative to the other 4 segments) as Democrats, moderately educated, with a moderate income level, concerned about the quality of the environment, and participating in environmental activities.

Cluster 5 is also relatively concerned about environmental and other intangible attributes of the furniture products they purchase, but they are also quality-and style-conscious,

However, unlike Cluster 2, this segment of consumer is the least price-sensitive. Thus they may be willing to pay a price premium to receive environmental performance, but they are not likely to exchange environmental performance for other important furniture attributes. Thus, 16% of sample respondents, an additional 22 million U.S. consumers, may seek out environmentally friendly wooden furniture made with the highest quality materials and construction methods in attractive styles that match their high-end decor. Compared to the other four market segments, this cluster can also be described as highly educated, high income Democrats, members of an environmental organization, environmentally concerned, and participating in many environmental activities.

This research seems to confirm earlier studies (Anderson et al. 1974; Murphy 1978; Tognacci et al. 1972; Van Liere and Dunlap 1980) that suggest that some demographic variables are useful tools for segmenting the environmentally concerned consumer. In other words, environmentally concerned consumers tend to be better educated, with a moderate to high income level, members of the Democratic party who are politically liberal. This study also supports previous research (Balderjahn 1988; Crosby et al. 1981) that has found that stated environmental concerns or attitudes may be a further way of identifying these consumers. Finally, this study found that those who are environmentally active overall are also likely to be environmentally motivated consumers.

However, we would like to caution the reader that behavior does not always follow the attitudes or responses depicted by respondents to mail questionnaires. The relationship between individuals' stated attitudes and their behavior has long been viewed with care and has been well documented in the literature (O'Riordan 1976; Eagly 1992; Wicker 1969). What people say versus what they do (purchase) can be quite different things. Due to the difficulties of relating attitudes to behavior, this study should be viewed as preliminary, as adding to the evidence. Further work studying the actual purchase behavior on environmental or "green" factors is recommended.

Managerial implications

Environmental concern is not a recent phenomenon; what appears to be new is that environmentally concerned individuals say they may be willing to modify their buying behavior to improve the environment. Our data appear to support this premise. Higher margins may reward those firms that address these consumer needs. However, simply developing environmentally sound products is not a sufficient means to serve the 'green' market segment (Picket et al. 1995). Effective positioning and communications strategies also need to be employed. Proper market segmentation is the first step because environmentally concerned consumers do not include the whole market for a product nor are they homogeneous (i.e., different target marketing strategies will be necessary for Clusters 2 and 5).

According to Kotler and Armstrong (1996), characteristics for effective market segmentation include: (1) measurability—the size, purchasing power, and profiles of the segments can be measured; (2) accessibility—the market segments can be effectively reached and served; (3) substantiality—the market segments are large or profitable enough to serve; and (4) actionability—effective programs can be designed for attracting and serving the segment. We should consider each of these segments separately to determine if they adequately meet these criteria. Cluster 2 is obviously large enough, 31 million Americans; however, given their moderate income, there is some question of their purchasing power. Also, we question whether the profile given by the results will allow marketers to properly access this segment. It is also questionable whether this segment would be a profitable segment to serve given that they are the most price-conscious and are probably not going to pay a price premium for environmental attributes. It may also be difficult to design effective marketing programs to attract and reach this segment.

Although Cluster 2 may not be a difficult

market segment to reach and serve, Cluster 5 appears to be an addressable market segment. Cluster 5 is a large enough segment, 22 million U.S. consumers. The results from this study give a better profile of this segment, so it can be effectively reached and served. Also, given that this segment is the least price-sensitive and has a high income level, this segment is potentially profitable enough to serve. Finally, given the profile of this segment, effective programs can be designed for attracting and serving its members. For instance, members of this segment are most likely members of environmental organizations and environmentally active. Thus, marketers could buy mailing lists of these groups (e.g. Green Peace, Sierra Club, Audubon), or mailing lists from other companies who market to this segment (e.g. Smith and Hawken, Earth Care, Real Goods, Seventh Generation), as a method of reaching them. Then advertising and promotional appeals can be based on their concern for the environment.

For those furniture manufacturers who are interested in developing and marketing environmentally friendly furniture products, it appears there are consumer segments that will respond to this type of marketing strategy. For instance, Cluster 2 is the most price-sensitive of all segments in our study and Cluster 5 is the least price-sensitive. Although these segments may be reached through similar advertising venues (i.e. environmental magazines such as *Utne Reader* or *Sierra*), they will not react to the same sorts of appeals nor buy the same products. Cluster 2 respondents may seek products that are environmentally friendly but are not more expensive than existing products. Perhaps a furniture product incorporating and promoting low grade, underutilized forest resources [i.e. glue-laminated (glulam) lumber, laminated veneer lumber (LVL), particleboard, and other engineered composite wood products] would appeal to this price-conscious consumer segment.

Cluster 5 respondents appear willing to pay more for high end, environmentally marketed products that are also of the highest quality and appropriately styled. These consumers may be more responsive to a high-end certified (from sustainably managed forests) solid wood furniture product. These segments have a moderate to high level of education, so marketers can feel confident in including more complicated ecological information about their products.

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