

# **SOCIAL INVOLVEMENT VERSUS FUNCTIONAL ATTRIBUTES – CONJOINT CHOICE**

**André Carlos Martins Menck, Ph.D.**

Faculdade de Gestão e Negócios  
Universidade Federal de Uberlândia

## **SUMMARY**

1. INTRODUCTION
2. THEORETICAL FRAMEWORK
3. AN ANALYTICAL MODEL OF SOCIAL INVOLVEMENT AFFECTING CHOICE
4. METHOD
5. RESULTS
6. DISCUSSION AND CONCLUSION

## **ABSTRACT**

Recent literature has been emphasizing the possible antagonism among acting in socially responsible manner—including with respect to environmental protection—and the generation of value for shareholders. For example, “the leaders of a chemical company may believe that investing heavily in the reduction of greenhouse gases can be the right thing to do, but if their competitors refuse to join its efforts, it can end up mining its own competitiveness without obtaining a significant reduction of the greenhouse emissions in the industry” (MARTIN, 2002). However, such concern about actions of environmental protection and profitability is not new. Even though acting in an environmentally concerned way may lead to gains in productivity—as engaging in industrial residues control or in process review—there is a clear limit beyond which environmentally directed actions (as any socially responsible actions) become not cost-effective. This paper leads with the other side of the equation, the demand side. It seeks to determine the value consumers ascribe to socially concerned products and firms.

Several studies have been done in this venue. However they present two kinds of limitations. First, their results are either category or industry-specific or are divergent across studies. Second—and most importantly—such are attitudinal studies. This research faces the quest by using choice conjoint tasks, thus avoiding measures of “intent”. Moreover, this research analyses the value consumers ascribe to corporate social involvement through parameter cross-elasticities. In each of the 593 valid questionnaires of the survey, respondents faced sixteen tasks to choose among three alternatives. A  $3 \times 2 \times 2 \times 2^{15}$  design in each of four product categories assesses two levels of social involvement and of corporate expertise in the between-subject part of the design and the manipulation of price and four functional attributes in the within-subject part.

The analysis uses logistic models, assuming a two-phased consumer decision process—alternative consideration followed by choice conditioned to the inclusion of the alternative in the consideration set.

Results reveal large cross-elasticities between the level of social involvement and the functional attributes, in both consideration and choice phases. This is observed consistently across the four product and service categories in the study. The magnitude of the effect of being socially responsible is similar to other important functional attributes. This supports the hypotheses that investments in socially responsible activities, including environmental protection act as a competitive factor similar to having excellency in functional attributes. As a result, the demand effects of environmental protection can be considered cost-effective.

### **Key-words:**

environmental protection engagement; corporate social responsibility; logit choice models; cross-elasticities.

## 1. INTRODUCTION

Recent literature has been emphasizing the possible antagonism among acting in socially responsible manner—including with respect to environmental protection—and the generation of value for shareholders. For example, “the leaders of a chemical company may believe that investing heavily in the reduction of greenhouse gases can be the right thing to do, but if their competitors refuse to join its efforts, it can end up mining its own competitiveness without obtaining a significant reduction of the greenhouse emissions in the industry” (MARTIN, 2002). However, such concern about actions of environmental protection and profitability is not new. Managers are constantly faced with having to decide whether and up to what extent they should invest in environmentally responsible actions (such as a biodegradable packaging), including environmentally responsible actions of their organizations (such as the adoption of energy conservation measures in a store). A lack of investment may represent hard to overcome threats to the image, hard to recover losses of markets, reduction of support by stakeholders and consequently the eventual death of the organization (WOOD, 1991). In the other extreme, an over investment in environmental actions can well be a cause of reduced competitiveness, given higher incurred costs. In fact, this is a reason for explicit and growing concern (LEVIN, 1993). As the executives who face the decision point out, there is “a fundamental decision, to be ahead or behind the competition; it is a hard decision: to be ahead may mean higher costs of production, leaving the firm vulnerable to the competitors” (WALLEY & WHITEHEAD, 1994), as opposed to gaining competitive advantage.

The term “green marketing” has been used in the academic and managerial literature with a very broad meaning. In this paper I try to keep the generality of the term, being at the same time more precise by adopting it as to encompass any kind of action which involves, a higher level of environmental protection or concerns than usually practiced, and that can be used to enhance the likelihood that a consumer will choose a particular brand or product. In the object of my main focus, retailing, “green marketing” can be viewed as including, measures that involve different aspects of the retail mix. Examples are making the store itself more friendly to the environment (such as by using non-CFC refrigerating equipment), or by selling, “green” products (such as clothes made with environmentally harmless dyeing process), or providing the store’s services paying attention to the environment (such as providing plastic or paper bags, or buying back beer cans), thus involving several traditional elements of the retail mix (as in LEVY & WEITZ, 1995) – such as store design, merchandise assortment, and services – or other elements destined to bolster relations with the customer, like when participating in a conservation effort (such as by installing recycling bins, or sponsoring a clean-up party).

Under a strategic perspective, there are two different situations for which the decision problem of adopting “green actions” has a natural solution. The most obvious of them occurs when the environmentally protective investment results in a direct or indirect reduction of costs. Turning off the lights of a store at night for energy conservation saves money from the utility bill, and can additionally be used as an argument for good image. Furthermore, attempts to control pollution sources or to save energy induce actions of re-engineering of the technology and re-studies of processes that may well contribute to lower costs and to improve quality (PORTER, 1991). Such cases direct the problem to the area of production management.

The other kind of situation refers to the case in which a specific group of consumers highly sensitive to environmental matters is targeted by some product program. These consumers may be willing to pay more for the environment friendly products – e.g., “ecotourists” reported they will pay up to 8.5% more for environment friendly “eco-hotels”, or ecotels (RUSHMORE, 1993), and companies like Radisson are already offering premium priced “green suites” (WOLFF, 1994). Market segmentation is the framework to study these

cases and to point out how far these markets are worth exploring – Body Shop, an example of a retailer adopting a market concentration strategy, after a period of big growth is reported to be facing increased competition in the US market and found the UK market nearly saturated (CONLIN, 1994).

However, there are many cases in which the decisions on if and how much to spend on green marketing do not fall into these two situations. For instance, the retailing discounter Walmart invested an additional \$6 per square-foot in a new store, and has expectations of recovering only part of this investment by cost reductions (WIEFFERING, 1993). Furthermore, environmental consciousness does not necessarily translate into a higher likelihood of consumers putting more effort in selecting a green product or a green service provider (e.g., WATKINS, 1994). Even though a profile of the American consumer in 1991 indicated that only 28% of the population were environmentally indifferent and would buy green products only if they were perceived as the best price or quality option, the majority of the population have explicit concerns for the environment (SCHWARTZ & MILLER, 1991). Therefore, in between the adoption of measures that reduce costs and the exploration of a specific market segment of consumers willing to pay at least for cost increases, there is an apparently large number of decisions that involve a cost-benefit consideration and that are backed by a relevant portion of the total market.

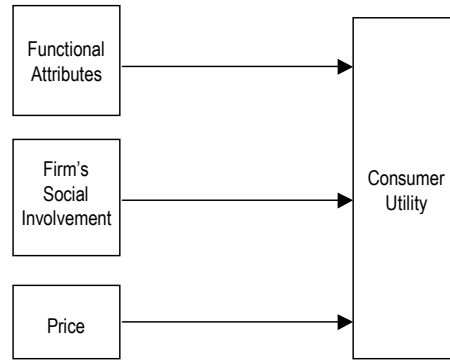
This paper focuses on the demand effects of actions of social involvement, including environment protection actions. Here, environment protection actions are assumed to be a special case of a broader category of social involvement actions (MENCK, 1995). The approach here is to evaluate the effects of a firm's involvement in environmental protection and other kinds of social engagement on consumer behavior. In order to achieve it, first a framework model of the effects of social involvement on consumer utility is presented. Next, an analytical model of social involvement affecting choice is developed, and the study's hypotheses are offered. The model is developed to capture the effects of social involvement both on the consideration and choice phases of the consumer decision process. The method section presents a conjoint choice in four product categories capable of capturing the main effects relevant to this research. The results section brings up the data analysis. Finally, a discussion section comments the managerial implications and research limitations, to conclude the paper.

## 2. THEORETICAL FRAMEWORK

A framework to depict the effects of social involvement on consumer utility formation has been devised by Menck (1998). A simplified framework is presented in Figure 1. It basically suggests is that the firm's social involvement affects directly the utility of a product for a consumer. Consumer utility accrues directly from the product or service's functional attributes, its symbolic social value, and—negatively—its price.

Consumers' utility reflects the value consumers ascribe to the social action *per se*. Such value arises because they feel good about buying a product or service that is contributing to society, because society has enculturated its importance in the individual, or because of the symbolic social value it has (SETH et al., 1991). In any case, this means that the social involvement of a firm can be regarded as an additional attribute of the firm's product or service (of course, this notion extends to actions of social involvement directly linked to the product or service's brand). That is, social involvement acts as a separate attribute of the product or service, adding to the utility of its functional attributes. Support for this effect is provided by the product's symbolic and social value literature (e.g., McCRACKEN, 1986). Moreover, previous research (BROWN & DACIN, 1997) has found that a firm's social involvement affects the products' overall evaluation.

Figure 1: Consumer Utility Formation in the Presence of Firm's Social Involvement



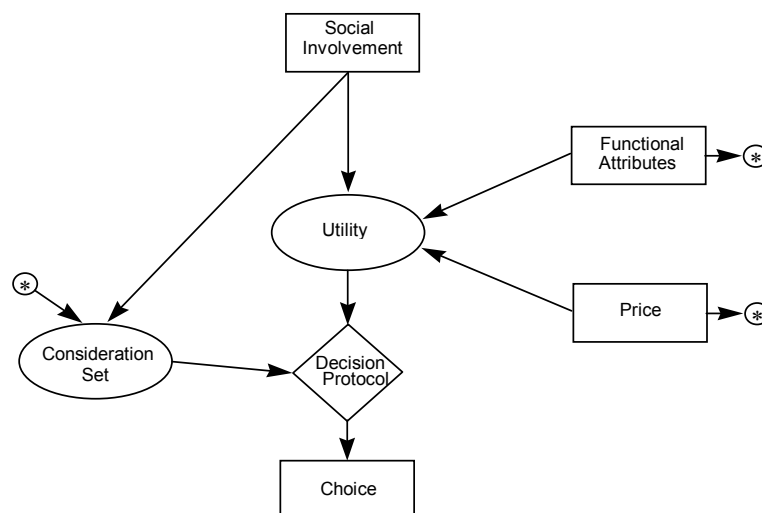
### 3. AN ANALYTICAL MODEL OF SOCIAL INVOLVEMENT AFFECTING CHOICE

This paper deals with the effects that any action of social involvement—including actions of environmental protection—may have on the firm's competitive performance. In particular, it is concerned with the effects on the stakeholder consumer, to the extent that actions of social involvement represent value for consumers who control resources on which the firm depends. Therefore, actions of social involvement can affect the value that consumers assign to the firm's products. The literature indicates that social involvement may directly affect the utility of a product or service for a consumer. This direct effect of social involvement on utility is in addition to the utility accrued from the product's functional value.

However, an effect of a noncompensatory nature can also be present. One way by which this can occur is when consumers require a certain minimum level of social involvement by the firm in order even to consider buying a product, that is, to include the product in his/her consideration set. Consumers tend to restrict the amount of time and energy they devote to decision-making. Specifically, due to the short-term memory restricted capacity, only a few brands are likely to come to the consumer's mind when a purchase is in order (WILKIE, 1994). A consideration or evoked set is formed in consumers' minds (WILKIE, 1994). Any effect that a firm's social involvement may have on the consumer's utility has to show up in his/her choice behavior. A model of choice behavior, which captures the proposed effects of social involvement on consideration set formation and on choice is presented in Figure 2.

**Figure 2**

A Model of the Effects of Social Involvement on Consumer Consideration and Choice



In this model, observed variables are in boxes, and unobserved or latent variables are in ellipses. The utility and the consideration set are latent variables, i.e., they depend on how consumers perceive them. Therefore, they cannot be observed, only inferred (through choice). In this model, the product or service's price and functional attributes, as well as the actions of social involvement, plus the choice behavior constitute the observables.

Adopting a random utility choice model, the potential aspects that may be affected by social involvement can be investigated. In this framework, the decision protocol reflecting the decision rule being adopted by the individual to make her/his choice and can be portrayed as

$$\begin{matrix} \text{decision} \\ \text{protocol} \end{matrix} \left[ U_i = \alpha_i + f(X_i|\beta) + \varepsilon_i \right]_{i \in C} \quad (1)$$

where  $U_i$  is the alternative  $i$ 's utility for an individual  $n$ , within a set  $C$  of alternatives being considered by this individual;

$\alpha_i$  is an alternative-specific constant;

$X_i$  is a vector of the alternative's attributes,

$\beta$  is a vector of weights reflecting the sensitivity of the individual to the attributes; and

$\varepsilon_i$  is a random error term denoting unobserved effects, measurement errors, etc.

In this model, constraints of diverse kinds (such as physical accessibility of or psychological restrictions to an alternative) shape a consideration set  $C$  for an individual. Then, the individual assesses the utility of the alternatives  $i$  which s/he considers choosing and uses some decision protocol to make a choice. Choice behavior can be affected in one or more of the three instances (decision protocol definition, choice set formation, and utility composition).

**Decision Protocol:** The decision protocol usually assumed in choice modeling is utility maximization. However, consumers may differ in the way they make their choices. Information gathering costs and other limitations, and varying processing abilities affect the way choice decisions are made. Hence, consumers may adopt rules other than utility maximization, such as dominance, satisfaction, and even random choice (GOPINATH, 1995). It is possible that social involvement affects the adoption of a specific decision protocol over another one. However, the selection of the decision protocol is probably more susceptible to the effects of personal constraints, such as those related to information acquisition and processing capability, than by characteristics of the alternatives, such as social involvement. Therefore, this study assumes utility maximization as the decision protocol.

**Consideration set:** Actions of social involvement may affect the consideration set formation. It is possible that an individual considers purchasing a product or service only if a firm with at least some level of social involvement markets it. This way, the lack of social involvement may constrain a consumer's consideration set. Consumers may have thresholds below which they do not consider buying a product (e.g., SWAIT & BEN-AKIVA, 1987). Hence,

**H1:** In the presence of a firm's actions of social involvement the probability the firm's products are included in the consumer's consideration set is higher.

**Utility Composition:** Social involvement can affect the consumer's utility in a compensatory scheme. Consumers may regard social involvement as a source of utility *per se*. They may value the firm's social involvement in addition to the functional attributes of the product. Social involvement acts as a separate attribute of the product or service, adding to the utility of its functional attributes. Support for this effect is provided by the product's symbolic and social value literature, as reviewed above. Hence,

**H2:** In the presence of a firm's actions of social involvement the probability the firm's products are chosen is higher.

One appropriate analytical tool for categorical data such as choice is the logit model. It models individual behavior and belongs to the class of models known as random utility models. The individual is assumed to always make the choice that maximizes her/his utility. However, the individual's utility is a latent, unobservable variable. The observer's

observational deficiency leads to apparent inconsistencies in the observed choice behavior. These inconsistencies can be credited to nonobserved attributes, consumer heterogeneity, measurement errors, and functional specification (MANSKI, 1977). Therefore, the observer can regard utility as a random variable. Specific assumptions about the probability distribution of the random component of the utility lead to the logit model.

From the random utility model's perspective, the probability that an individual  $n$  chooses an alternative  $i$  among a set of considered alternatives  $C_n$  is equal to the probability that the alternative's utility for this individual,  $U_{in}$ , is greater than or equal the utilities of all other alternatives  $j$  in the consideration set, or

$$Pr_n(i|C_n) = Pr_n(U_{in} \geq U_{jn}, \forall j \neq i; i, j \in C_n). \quad (2)$$

Assuming that the utility  $U_{jn}$  is composed of two independent components, an observable, deterministic term  $V_{jn}$ , and a random term  $\varepsilon_{jn}$ , the choice probability can be rewritten as

$$Pr_n(i|C_n) = Pr_n(V_{in} + \varepsilon_{in} \geq V_{jn} + \varepsilon_{jn}, \forall j \neq i; i, j \in C_n), \quad (3)$$

$$\text{or } Pr_n(i|C_n) = Pr_n(V_{in} - V_{jn} \geq \varepsilon_{jn} - \varepsilon_{in}, \forall j \neq i; i, j \in C_n). \quad (4)$$

Expression (4) shows that the individual's choice probability of an alternative  $i$  depends on the differences between the observable components of the alternative's utilities, and the joint probability distribution of the random components. Assuming that the random components of the utility are independently and identically Gumbel distributed with a scale parameter  $\mu$ , it can be shown to be the multinomial logit model.

To grant computational tractability to the MNL the deterministic component  $V_{in}$  of the utility is assumed to have a functional form linear in the parameters. This assumption follows Lancaster's (1966) view of products as bundles of characteristics contributing to their utility.

Given these assumptions, the logit models can be used to estimate both the inclusion of the alternative in the consideration set and choice.

The inclusion of an alternative in the consideration set can be treated as a binomial variable logistically dependent on the functional attributes, price, firm's expertise, and social involvement. The probability of inclusion of a product or service in the consideration set of individual  $n$  is given by

$$Pr_n(i=1) = Pr_n(U_{1n} \geq U_{0n}), \quad U_{in} = \alpha + \pi P_{in} + \beta Z_{in} + \delta SI_{in} + \varepsilon_{in}, \quad i = 0, 1 \quad (5)$$

$$i = \begin{cases} 1, & \text{if the product/service is not excluded from being considered} \\ 0, & \text{otherwise} \end{cases}$$

where:  $\alpha$  is an attribute-independent constant,

$P_{in}$  is the price of the product/service,

$Z_{in}$  is a vector of the functional attributes of the product/service,

$SI_{in}$  is the social involvement of the product/service, as perceived by  $n$ ,

$\pi$  is the price-sensitivity parameter,

$\beta$  is a vector of weights for the functional attributes,

$\delta$  is the importance weight for the perceived social involvement, and

$\varepsilon_{in}$  is a random term.

Hypothesis H1 predicts the significance of  $\delta$ , the weight parameter for social involvement.

Choice, given the consideration set indicated by the respondent, can be modeled as MNL. The probability that alternative  $i$  is chosen by consumer  $n$  is given by

$$Pr_n(i | C_n) = Pr_n(U_{in} \geq U_{jn}, \forall j \neq i; i, j \in C_n), \quad U_{in} = \alpha_i + \pi P_{in} + \beta Z_{in} + \delta SI_{in} + \varepsilon_{in} \quad (6)$$

Hypothesis H2 posits a significant positive parameter for social involvement ( $\delta$ ).

#### 4. METHOD

The data were collected via a mail survey. The questionnaire comprised a series of conjoint stated choice tasks. Respondents faced sixteen choice scenarios in a single product

category. In each scenario, they were prompted to make a choice from a set of three existing brands. Each choice task represented a scenario unique in the levels of the product's price and four functional attributes.

Airlines, computers, health care plans, and mattresses were the four out of twenty-five product categories selected after pretests. The pretests selected categories where existing brands would not have strong *a priori* social involvement and expertise image differences. In each category, three brands were picked such that *a)* they should not significantly differ in terms of their existing social involvement and expertise images; *b)* they should be similarly rated by expert consumer evaluation sources; and *c)* their market shares should be similar.

**Sampling details:** The data collection was accomplished via a mail survey with conjoint choice tasks. Each questionnaire dealt with one of the four selected categories. A total of 5,800 questionnaires were mailed to a random sample of households in Central and North Florida. The number of respondents was 660 (response rate of 11.4%). Of the returned questionnaires, 593 were usable (21 arrived late, and 36 were discarded due to multiple choices made), 165 corresponding to airlines, 124 to computers, 153 to health care plans, and 151 to mattresses.

**Questionnaire structure:** The questionnaire presented the social involvement profiles of three choice alternatives (brands). Respondents were asked to state their choices and considered alternatives under different attributes' scenarios. Manipulation check for social involvement was performed. The questionnaire also got information on demographics and personal values.

**Company profiles:** The manipulation of the level of social involvement was between-subjects. Respondents were told that an independent publication rated the companies. Social involvement was presented as "the company's activities to protect the environment, donate money to charities, have employees volunteer for community programs," plus some category-specific type of social involvement, such as "donating transportation to needy people requiring travel for medical reasons" (in the airline category). Each of the three companies were rated either as "the company is average" (manipulation for low), or "the company is exceptionally good" (for high). To grant realism, the three alternatives were real companies, similar in size and overall quality (as rated by the *Consumer Reports* magazine). To avoid undesirable effects related to different company's technical expertise level, this variable was controlled by manipulation in a similar fashion. Of the sixty-four possible combinations of the three companies described as high or low in social involvement and expertise, eight are enough to contrast the main effect of brand and the two variables of interest, using a fractional factorial design (HAHN & SHAPIRO, 1966). From the eight potential sets, each respondent was presented with a single set of three firms' profiles. In each category, this corresponds to a 3x2x2 between-subject design (three brands, two levels of social involvement, and two levels of expertise). Of the usable questionnaires, the cell with the largest number of questionnaires had  $n=31$  elements (in one of the airlines questionnaire versions), and the one with the smallest had  $n=10$  (in one of the computer versions).

**Choice tasks:** In the questionnaire, the choice tasks or scenarios were presented after the companies' profiles. Across scenarios, the three alternatives varied in terms of two levels of price and four functional attributes. Dollar figures of the prices had one of two values, fifteen to twenty percent apart. The two levels of the functional attributes were "just meets industry standards" (manipulations for low), and "much better than industry standards" (high).

With three firms varying in two levels of price and four functional attributes, the choice tasks represented a  $2^{15}$  within-subject design. A fractional factorial design with sixteen contrasts can estimate the main effect of price and the functional attributes varying across the three brands (Hahn and Shapiro 1966). Since the within-subject design is embedded in the between-subject design, the full design in each category is  $3 \times 2 \times 2 \times 2^{15}$ . Interactions among the variables inside the within and between-subject designs cannot be assessed with the design selected, but the parameters of the interaction terms between variables in each of the designs can be estimated (e.g., between social involvement and the functional attributes).

**Measures:** The dependent variable for the consideration set formation model is the stated consideration or non-consideration of each of the alternatives. For the choice model, the dependent variable is the stated choice among the three alternatives and the “none” option.

The explanatory variables social involvement, price, and functional attributes are the manipulated variables (plus company’s technical expertise). The social involvement manipulations were checked through four and six-item scales developed in the pretest, measured on 7-point scales anchored by strongly disagree—strongly agree. The four items measuring perceived social involvement have adequate internal reliability (Cronbach’s  $\alpha$  ranging from 0.85 to 0.88 across the four categories). The six-item scale for technical expertise also has adequate internal reliability in all four categories (Cronbach’s  $\alpha$  ranging from 0.87 to 0.94).

## 5. RESULTS

### 5.1 Consideration Set Model Estimation

The consideration of an alternative can be treated as a binomial variable—an alternative is either considered or not considered. Furthermore, in the choice setting employed in this research, the consideration of each of the three alternatives can be treated as a separate decision (this involves assuming that the consideration decision for a product is independent over preferences for other alternatives, what may not be realistic, but leads to consistent, though inefficient parameter estimates). Assuming consideration decisions to be independent across choice scenarios has similar effects on the parameter estimates.

In this research, the decision of the inclusion of a brand in (or, alternatively, the exclusion of a brand from) the consideration set is a function of its utility to the consumer. To assess the role of the variables of interest, the utility is modeled as a linear function of price, the four investigated functional attributes, the firm’s social involvement (SI, hereafter) and expertise (E, hereafter). In addition, to check whether they play a role in the consideration set formation, all the interaction terms of social involvement and expertise with the attributes were introduced in the initial estimation.

Given that the effects may differ across brands, a different set of parameters is estimated for each brand. That is, the initial, most complete consideration set formation model allows a different set of parameter estimates for each brand.

However, this full model can be simplified to some extent by testing the parameter equality across brands for each of the variables in the model. The proper test for this—and subsequent—parameter constraint is the likelihood ratio test. It compares full models that allow individual sets of parameters for each brand with the nested models in which parameter equality across brands has been imposed. The likelihood ratio test-statistic is given by twice the difference between the log-likelihoods of the restricted and full models, and is asymptotically chi-squared distributed with as many degrees of freedom as the number of constraints imposed on the parameters.

After several empirically supported simplifications of the same sort (parameter equality across brands and exclusion of nonsignificant interaction terms supported by log-likelihood and  $\chi^2$  tests) on the most complete model, the models estimated for the four categories are presented on Table 1. Price and all functional attributes have highly significant parameters (except for the “leg room” attribute in airlines, which is marginally significant). Hence, all have a role in determining the consideration probability of a brand. As one can expect, price has a negative effect and functional attributes have a positive effect on consideration. The fact that all except one of the parameters have highly significant estimates ensures that the attributes selected for this research play a role in the consideration set formation. However, this should not be overstated, given the large sample size (a high number of cases was generated, as each respondent made the decision 48 times—for 3 brands across 16 scenarios).



**Table 1: Consideration Set Formation Models**

Variable	Category			
	airlines	computers	health plans	mattresses
consideration constant	1.72***	1.81***	1.51***	1.77***
Brand A	0.24***	0.29***	0.21***	0.09
Brand B	0.09	0.00	0.17**	-0.04
Brand C	0	0	0	0
Price	-0.36***	-0.09**	-0.16***	-0.24***
Attribute 1	0.05*	0.29***	0.22***	0.22***
Attribute 2	0.15***	0.50***	0.27***	0.34***
Attribute 3	0.21***	0.38***	0.52***	0.38***
Attribute 4	0.40***	0.19***	0.22***	0.25***
expertise for brand A	0.24***	0.24***	0.33***	0.45***
expertise for brand B	0.24***	0.40***	0.18***	0.22***
expertise for brand C	0.36***	0.12*	0.38***	0.52***
Social involvement for brand A	0.08	0.49***	0.29***	0.39***
Social involvement for brand B	0.18***	0.29***	0.17***	0.33***
Social involvement for brand C	0.13**	0.10	0.37***	0.20***
<b>McFadden's <math>\rho^2</math> (AIC)</b>	<b>0.393</b>	<b>0.427</b>	<b>0.380</b>	<b>0.384</b>
<b>number of decision sets</b>	<b>7764</b>	<b>6018</b>	<b>7368</b>	<b>7218</b>

\*\*\*p&lt;0.01

\*\*p&lt;0.05

\*p&lt;0.10

Technical expertise affects the consideration of a brand in the same direction and similar magnitude as the functional attributes. Unlike the functional attributes, the effects of expertise may vary across brands. In fact, the parameter equality across brands can be rejected for computers (likelihood ratio test-statistic of 9.4, compared to  $\chi^2_{0.05}(2 \text{ d.f.}) = 5.99$ ), health plans (test-statistic of 7.2), and mattresses (14.0), although not for airlines (3.4).

The effect of social involvement on consideration set formation is also positive for all the brands. Most importantly, the parameters are of similar magnitude as the functional attributes and expertise. The effect is significant in all cases, except for one of the brands in two of the categories. As with expertise, the social involvement parameter equality across brands is rejected for some categories—computers (likelihood ratio test-statistic of 17.1, compared to  $\chi^2_{0.05}(2 \text{ d.f.}) = 5.99$ ), and health plans (test-statistic of 7.1)—and not for others—airlines (1.5), and mattresses (5.2).

## 5.2 Choice Model Estimation

Empirical choice modeling work to date has assumed that the choice decisions are independently made across scenarios. This produces consistent, though inefficient parameter estimates. That is, the standard errors of the parameters may be underestimated, hence, their t-statistics can be inflated.

As stated above, an individual's choice probability of a brand is assumed to be a function of the utility accrued by the brand relative to the utility accrued by each of the other alternatives. The alternatives include the three brands, plus a "none of the alternatives" option. The utility is modeled as a function of price, four functional attributes, expertise, social involvement, the interaction terms of expertise and social involvement with price and the attributes, and the interaction terms of social involvement with the individual's personal values. The intercepts correspond to the alternative-specific constants for the three brands ("none of the alternatives" is the baseline). In order to avoid biased estimates of the utility function parameters (SWAIT & BEN-AKIVA, 1987), the individual's choice of a brand is modeled conditional on the brand's inclusion in the self-reported consideration set, assuming that the self-reported is the "true" choice set. That is, in each choice scenario, only the alternatives stated to have been considered by the respondent are included in the log-likelihood function constructed for the estimation of the parameters.

The full model has parameters that are specific to the three brands for each of the variables of interest. As before, such model can be simplified by examining the empirical question of whether the parameter estimates are equal across brands. This has been verified for each variable or set of variables.

Beginning with the interaction terms, the hypothesis of equality across brands of the interaction terms of social involvement and expertise with price and the attributes were tested. In all four investigated categories, it could not be rejected at the 5% confidence level. The test-statistics comparing the full model with the one constrained for the equalities are 24.9, 17.7, 30.8, and 26.9, all under the critical  $\chi^2_{0.05}(20 \text{ d.f.}) = 31.4$ . Therefore, all subsequent analysis is presented assuming an average “generic” brand for these interaction terms. On the other hand, parameter equality across brands is rejected in all four categories when imposed simultaneously on the parameters of price and attributes. Constraining the ten parameters reduces the log-likelihoods such that test-statistics of 29.3, 35.9, 40.1, and 28.3 are generated; all are significant when compared to  $\chi^2_{0.05}(10 \text{ d.f.}) = 18.3$ . Hence, brand-specific parameters of price and attributes are retained in the models estimated next.

Expertise is a variable that affects choice in a homogeneous way across brands. The equality of the parameters across brands cannot be rejected in all four categories. The test-statistics are 1.1, 0.8, 1.8, and 1.0 respectively, compared to  $\chi^2_{0.05}(2 \text{ d.f.}) = 5.99$ . The same is not true for social involvement. The equality of the parameters across brands cannot be rejected for airlines (test-statistic of 2.6, compared to the critical value of  $\chi^2_{0.05}(2 \text{ d.f.}) = 5.99$ ) and computers (test-statistic of 2.7) but is rejected for health plans (15.9) and mattresses (10.5). Given that the effect of social involvement is brand-dependent in some cases, the parameters for this variable and expertise are reported for each brand in the models below.

Table 2 presents the models estimated taking into consideration the empirical support for the equality across brands for some variables.

The estimated models involve choices made among four alternatives. One basic assumption to estimate the multinomial logit model is that the random components of the utility function are independently and identically distributed, which leads to the Independence of Irrelevant Alternatives (IIA) property of the model. Since more than two alternatives are present in the model, it is important to check whether this property holds. This can be done with the Hausman-McFadden test (McFADDEN, 1987). Violations of the IIA property occur if two or more alternatives share common unobserved characteristics not specified in the model. The Hausman-McFadden test checks the impact of the omission of cross-effects on characteristics of alternatives excluded from the choice set. In all four categories, this test reveals that IIA cannot be rejected for the exclusion of each of the alternatives or any grouping of the alternatives ( $p > 0.5$  in all tests).

The estimated models in the four categories have McFadden’s  $\rho^2$  (AIC) varying from 0.31 (computers) to 0.44 (airlines), which are in the reasonable-to-good range (Intelligent Marketing Systems, Inc., 1994).

The alternative-specific constants (ASCs) for the three brands (“none of the alternatives” is the baseline) are all positive and significant, in all four categories (here, statistical tests are significant at the 5% level). This indicates simply that the probability of choosing each of the alternatives is greater than the probability of not choosing any alternative, all else being equal. Moreover, there is no big variation in the size of the alternative-specific constants across the three brands of each category, indicating that the probability of choice of the alternatives does not differ by much in each of the categories, all else being equal. Even so, only in the airline category the equality of the alternative-specific constants cannot be rejected (the likelihood ratio test-statistics are 0.6, 9.6, 12.7, and 10.4, compared to  $\chi^2_{0.05}(2 \text{ d.f.}) = 5.99$ ).

Price and functional attribute parameters are mostly significant and all in the expected direction. So, in all categories and for all three brands the price decreases and the functional attributes increase the utility and, hence, the probability of choice, as one would expect.

**Table 2: Choice Models**

Variable	Category			
	Airlines	computers	health plans	mattresses
ASC brand A	2.40 <sup>***</sup>	1.29 <sup>***</sup>	1.82 <sup>***</sup>	1.59 <sup>***</sup>
ASC brand B	2.39 <sup>***</sup>	1.44 <sup>***</sup>	1.61 <sup>***</sup>	1.37 <sup>***</sup>
ASC brand C	2.44 <sup>***</sup>	1.18 <sup>***</sup>	1.55 <sup>***</sup>	1.60 <sup>***</sup>
ASC "none of the alternatives"	0	0	0	0
Price for brand A	-0.85 <sup>***</sup>	-0.12 <sup>*</sup>	-0.23 <sup>***</sup>	-0.29 <sup>***</sup>
Price for brand B	-0.99 <sup>***</sup>	-0.50 <sup>***</sup>	-0.51 <sup>***</sup>	-0.64 <sup>***</sup>
Price for brand C	-0.92 <sup>***</sup>	-0.46 <sup>***</sup>	-0.48 <sup>***</sup>	-0.51 <sup>***</sup>
Attribute 1 for brand A	0.37 <sup>***</sup>	0.43 <sup>***</sup>	0.60 <sup>***</sup>	0.36 <sup>***</sup>
Attribute 1 for brand B	0.42 <sup>***</sup>	0.30 <sup>***</sup>	0.50 <sup>***</sup>	0.51 <sup>***</sup>
attribute 1 for brand C	0.03	0.44 <sup>***</sup>	0.31 <sup>***</sup>	0.36 <sup>***</sup>
Attribute 2 for brand A	0.38 <sup>***</sup>	0.64 <sup>***</sup>	0.32 <sup>***</sup>	0.45 <sup>***</sup>
Attribute 2 for brand B	0.42 <sup>***</sup>	0.54 <sup>***</sup>	0.20 <sup>***</sup>	0.42 <sup>***</sup>
attribute 2 for brand C	0.27 <sup>***</sup>	0.76 <sup>***</sup>	0.40 <sup>***</sup>	0.47 <sup>***</sup>
Attribute 3 for brand A	0.12 <sup>**</sup>	0.35 <sup>***</sup>	0.74 <sup>***</sup>	0.53 <sup>***</sup>
Attribute 3 for brand B	0.13 <sup>***</sup>	0.29 <sup>***</sup>	0.69 <sup>***</sup>	0.45 <sup>***</sup>
attribute 3 for brand C	0.26 <sup>***</sup>	0.36 <sup>***</sup>	0.61 <sup>***</sup>	0.47 <sup>***</sup>
Attribute 4 for brand A	0.76 <sup>***</sup>	0.70 <sup>***</sup>	0.71 <sup>***</sup>	0.61 <sup>***</sup>
Attribute 4 for brand B	0.77 <sup>***</sup>	0.46 <sup>***</sup>	0.46 <sup>***</sup>	0.52 <sup>***</sup>
attribute 4 for brand C	0.65 <sup>***</sup>	0.51 <sup>***</sup>	0.48 <sup>***</sup>	0.39 <sup>***</sup>
Expertise for brand A	0.58 <sup>***</sup>	0.57 <sup>***</sup>	0.51 <sup>***</sup>	0.69 <sup>***</sup>
Expertise for brand B	0.63 <sup>***</sup>	0.54 <sup>***</sup>	0.51 <sup>***</sup>	0.65 <sup>***</sup>
Expertise for brand C	0.54 <sup>***</sup>	0.62 <sup>***</sup>	0.61 <sup>***</sup>	0.73 <sup>***</sup>
social involvement for brand A	0.42 <sup>***</sup>	0.24 <sup>***</sup>	0.14 <sup>**</sup>	0.33 <sup>***</sup>
social involvement for brand B	0.29 <sup>***</sup>	0.38 <sup>***</sup>	0.45 <sup>***</sup>	0.52 <sup>***</sup>
social involvement for brand C	0.32 <sup>***</sup>	0.29 <sup>***</sup>	0.38 <sup>***</sup>	0.26 <sup>***</sup>
<b>McFadden's <math>\rho^2</math> (AIC)</b>	<b>0.443</b>	<b>0.309</b>	<b>0.348</b>	<b>0.335</b>
<b>number of choice sets</b>	<b>2581</b>	<b>1978</b>	<b>2414</b>	<b>2368</b>

\*\*\* p<0.01      \*\* p<0.05      \* p<0.10

A similar finding is true for expertise and social involvement. For all brands in the categories in the study, having a high level of these characteristics increases the brand's choice probability. Within each category, the magnitude of the effect for being "exceptionally good" on social involvement (as opposed to "average") is similar to being "much better than industry standards" (as opposed to "just meets standards") on the functional attributes. In comparing the effect-size of social involvement with price, one finds that their magnitudes are also similar across brands, in three of the categories. The exception is the airline category, in which the negative effect of price on the utility is about twice as large as the positive effect of social involvement. This result may be due to the fact that among the categories in this study, airlines is the one with the lowest prices.

A direct comparison between the effect-size of social involvement and expertise indicates that some difference exists between the two. For all but one brand in the four categories, the importance weight of expertise is significantly greater than social involvement. In fact, across brands in all categories, the average ratio between the parameter estimates of expertise and social involvement is close to two, suggesting that the effect of being socially involved is about half of that of being an expert in the industry.

## 6. DISCUSSION

The pretests succeeded in selecting real companies with *prior* images that do not seem to influence the results in any decisive way. The respondents were aware of the companies but did not carry *a priori* strong beliefs about the constructs of interest. A evidence of this is

given by the manipulation checks, which assure that the beliefs about social involvement and expertise were in fact shaped by the treatments, not by *prior* knowledge about the companies. This is an indication that even in the event of some self-selection—plausible in light of the low response rate—it should not have biased the results with respect to the variables of interest. Moreover, the selected companies are homogeneous enough—in terms of characteristics left out of the model—such that no evidence of violation of the IIA property could be found in any of the four categories investigated.

One aspect evidenced by the results is that they show high consistency across four different categories for the main effects of interest in this research. The categories studied include two products and two services. In both cases, the price involved in the decision varied by a factor of almost ten, ranging from hundreds to thousands of dollars. Moreover, one of the product categories (computers) has a higher service component than the other (mattresses), and the service categories differ in terms of tangibility (health plans are less tangible than airline trips). Nevertheless, the main effects of price, functional attributes, social involvement, and expertise are significant and have the same sign across all categories, both in the consideration set formation and in the choice models. In the consideration models, the main effects of price and attributes are significant and in the direction one would expect. Expertise and social involvement are significant for most of the brands in the four categories. They are all in the expected direction. In the choice models, the main effects of price, attributes, expertise, and social involvement are also all highly significant, in the expected direction. The results individual to each of the two decision phases are detailed next.

### 6.1 Consideration Set Formation Decisions

The first hypothesis, with respect to the effect of social involvement on the consideration set formation, posits a main effect of social involvement on the inclusion of a product in the consideration set (H1). This hypothesis is supported by the data. When the companies are reported as being exceptionally good in activities denoting social involvement, their probability of being considered is higher than when they are reported as just average. This is true for an average consumer, across all brands in the categories. Among twelve cases, only two of the brands have nonsignificant parameter estimates for social involvement, which may denote brand idiosyncrasies. As a matter of fact, the two exceptions, Northwest airlines and Micron computers, have in common having the smallest market shares in their categories, at least in the area where the sample was collected. Although this is weak evidence, it may be that the consideration of brands with lower market presence is in fact less sensitive to social involvement. One possibility is that consumers simply do not demand excellence in social involvement from companies with relatively smaller market presence. Another explanation could be that when consumers have less experience with and knowledge about a brand, there are fewer negative past experiences and less negative information to be overcome by high social involvement. However, further research would be needed not only to assure that market presence moderates the effect of social involvement on brand consideration but also to investigate the mechanism by which this may happen.

It is a quite important result for this research's purposes that the effect size of a firm acting to preserve the environment and be socially responsible is of similar magnitude of a recognized overall technical expertise, and also of four important functional attributes. This means that the consumer decision of considering a brand for purchasing equally depends on important functional attributes' performance and on the firm acting with social responsibility. In the same way, acting with social responsibility and environmental concern is as important as the perceived technical expertise in deciding which brand to consider.

Further comparing the cross-elasticities with the main effect of price, the results in all the four different categories indicate that when the comparison is with price, consumers place half

of importance on the firm being socially responsible as they do on a 15 to 20% of price change.

## 6.2 Choice Decisions

The main concern of this study is the effect size of the main effects of actions of social involvement on choice. Hypothesis H2 is the choice counterpart of H1 in consideration set formation. It predicts a main effect of social involvement

A significant main effect of excellence in social involvement, contrasted to an average posture, supports H2 for each of the three brands in all four categories in this study. Moreover, with the treatments utilized in this research, the effect-size of social involvement is not just residual but reaches about half of the magnitude of the effect of technical expertise, a variable usually more regarded in managerial considerations. The size of the effect is also comparable to the average effect of being “much better than industry standards” in the functional attributes used in the study. It must be kept in mind, though, that while “excellence” in social involvement and expertise are treated in this research as information provided by an independent source, being “much better than industry standards” on the functional attributes is credited to company-reported information. This difference in treatment may have weakened the relative importance of the functional attributes.

The importance of social involvement, as treated in this study, is also comparable to the importance of a fifteen-to-twenty percent decrease in price, for all brands in three of the categories. The exception is the airline category, where the main effect of price is twice as large as that of social involvement. One possible explanation could be that the price elasticity of social involvement is smaller the smaller the prices in the product or service category involved. However, as other factors may be acting to differentiate the categories, further research is needed to address the issue. Even though these findings are not intended to claim a dollar-value for social involvement, given the specificity of the two-level manipulation employed, they serve as a first approximation for that figure, at least in situations that resemble the treatments used here.

In sum, the hypothesis about choice received strong support from the data. Social involvement does have a main effect on a product or service’s choice probability. Moreover, the magnitude of the effect of excellence in social involvement on choice behavior can be comparable to the effect of relevant functional attribute performance reported by the company as “much better than industry standards.” In addition, for the categories in this research, the main effect of social involvement offsets from approximately half to the full utility decrease from a 15 to 20% price increase.

## 6.3 Managerial Implications

Managers have been making decisions on whether or not to become socially involved. Investment in socially oriented actions has to be weighed against their effects on business performance and competitiveness, even when managers are altruistically inclined to sponsor social causes. Social investments have been economically justified in terms of their positive effects on the workforce and on funding sources, but such justifications have limits. Moreover, in a number of cases there has been a conscious effort to communicate firms’ social involvement beyond the workforce and funding pools. Firms’ existing and potential consumers are particularly targeted by communication efforts. However, the literature lacks a better understanding of whether and to what extent consumers are willing to pay for the firms’ social involvement. This research indicates that social involvement can have a substantial influence on consumer behavior.

The issue of how substantial it is relates to the specific manipulation levels utilized in the survey. Perfect awareness of social involvement is not always attained in the real world. Even

less likely would be having such information backed by an independent source. However, the strength of the effect registered under such an ideal scenario indicates that the influence of social involvement on consumer behavior may be more than just marginal.

The effect of social involvement is significant both on consideration set formation and choice. This has strategic implications. Consumers probably have thresholds of social involvement level, below which they do not even consider an alternative. The average effect of these thresholds across respondents leads to the importance weight estimated in the consideration model. Therefore, firms may engage in social actions in order to stay above the threshold level of a certain number of consumers. On the other hand, choice is affected, and social involvement can be regarded as another attribute that adds utility to the product or service in the same fashion as other functional attributes do. Therefore, it can be offered as a product or service differential. The probability of choice increases when firms engage in social actions. Moreover, this seems to be true across a number of categories, even though there is some evidence that the dollar-value of social involvement may vary across categories. These results provide economic justification to engage in social actions, including environmental protection.

In sum, the results of this research provide economic justification for social involvement. The effect of social involvement can be substantial if compared with other attributes. Moreover, the effect seems to be present in a variety of product and service categories.

#### 6.4 Limitations of the Study and Future Research

This research supported the formulated hypotheses. Moreover, given the manipulations that were used, the effect size of a firm engaging in social actions such as environmental protection showed up to be quite relevant both in the consideration and the choice phases of consumers decision process. However, future research should address some aspects not covered in this research.

First, this research assumes that actions of environmental protection are relevant for being socially desirable. No differentiation was made between actions of environmental protection and other socially responsible behaviors at large. In fact, a socially responsible firm was introduced as a being “exceptionally good” in “activities to protect the environment, donate money to charities, have employees volunteer for community programs” etc. Future research will have to disentangle environmental protection from other socially responsible behaviors to access its individual role in the consumer choice decision process.

Second, the results are valid for the specific manipulations used in this research. The effect-size of the main effect of social involvement is very high when compared with the main effects of other more traditional variables, such as the technical expertise of the provider and the important functional attributes of the products. Nonetheless, only two levels of price and the functional attributes were used to differentiate the alternatives. Price differences used were in the 15-20% range. Functional attributes could either “just meet industry standards” or be “much better than industry standards”. More focused studies could test for manipulations assuming a larger number of levels, in spite the added complexity, to better mimic the real world.

Finally, even though four different product categories were tested for, covering widely differing goods (personal computers and mattresses) and services (airline transportation and health insurance), the results pertain to these categories. It is promising, though, that the results are quite consistent across such different product categories.

#### 6.5 Conclusion

This research contributes to the knowledge of marketing by exploring the ways by which consumers value social involvement in their choice process. The findings support a consumer

based economic motivation for firms to become socially involved. Hence, the findings justify the use of social involvement as a marketing strategy tool.

Moreover, this research shows that the effects of social involvement are relevant both in the consideration set formation and in the choice phases of the consumer decision process. This suggests distinct ways by which social involvement may be strategically valuable. First, social involvement can be used to expand the potential consumer base for a product or service, by increasing the probability of consumers considering it. For a level of social involvement perceived as sufficiently high, its importance for consideration set formation can be of the same magnitude as being “much better than industry standards” in each of a number of functional attributes, or of a considerable lesser price. Second, social involvement can be used as added value to increase choice probability among alternatives that make the consideration set. As in the consideration set formation, the relative importance of social involvement for choice can also be substantial when compared to that of price and other functional attributes. Specifically, social involvement was found to have an additional effect of reducing the importance weight attributed to price. That is, the dollar-value of social involvement surpasses its main effect, because it also decreases price sensitivity.

## REFERENCES

- BROWN, T.J. & DACIN, P.A. “The Company and the Product: Corporate Associations and Consumer Product Responses”. *Journal of Marketing*, Vol. 61 (Jan), 1997, p.68-84.
- CONLIN, J. “Survival of the Fittest”. *Working Woman*, V. 19 (February), 1994, p.28-31
- GOPINATH, D. “Modeling Heterogeneity in Discrete Choice Processes: Application to Travel Demand”. Doctoral Dissertation at the Department of Civil and Environmental Engineering of the Massachusetts Institute of Technology, 1995.
- HAHN, G. & SHAPIRO, S. “A Catalog and Computer Program for Use with Symmetric and Asymmetric Fractional Factorial Experiments”. Presented at the *1966 Annual Convention of the American Statistical Association*, Los Angeles, CA, in August 15, 1966.
- LANCASTER, K. “A New Approach to Consumer Theory”. *Journal of Political Economics*, Vol. 74, 1966, p.132-157
- LEVIN, Gary. “Green Marketing Gets Cautious”. *Advertising Age*, V. 64 (28), 4, 1993.
- LEVY, M. & WEITZ, B. *Retailing Management*. 2nd ed., Chicago, IL: Irwin, 1995.
- MARTIN, Roger. Harvard Business Review. April, 2002.
- MANSKI, C. “The Structure of Random Utility Models”. *Theory and Decision*, Vol. 8, 1977, p.229-254
- McCRACKEN, G. “Culture and Consumption: A Theoretical Account of the Structure and Movement of the Cultural Meaning of Consumer Goods”. *Journal of Consumer Research*, Vol. 13 (Jun), 1986, p.71-84.
- McFADDEN, D. “The Choice Theory Approach to Market Research”. *Marketing Science*, Vol. 5 (4), 1986, p. 275-297
- MENCK, A.C.M. “A Marketing Strategy Approach to the Green Marketing (and Social Responsibility) Issue”. *Anais do III Encontro Nacional sobre Gestão Empresarial e Meio Ambiente*. São Paulo: FGV, 20-21/ nov/ 1995.
- MENCK, A.C.M. “A Model of the Effects of a Firm’s Social Involvement on the Consumer Utility Formation”. *Anais do XXII ENANPAD*. Foz do Iguaçu, PR: ANPAD, 27-30/set/1998.
- PORTER, M.. “America’s Green Strategy.” *Scientific American*, V.254(April), 96, 1991.
- RUSHMORE, S. “Beyond Recycling: The Ecotel”. *Lodging Hospitality*. Vol. 49 (August), 1993, p.20.
- SCHWARTZ, J. & MILLER, T. The Earth’s Best Friends”. *American Demographics*, V. 13 (Feb), 1991, p.26-35.
- SHETH, J., NEWMAN, B. & GROSS, B. *Consumption Values and Market Choices: Theory and Applications*. Cincinnati, OH: South-Western, 1991.
- SWAIT, J. & BEM-AKIVA, M. “Incorporating Random Constraints in Discrete Models of Choice Set Generation”. *Transportation Research 21B*, V.2, 1987, p.91-102
- WALLEY, Noah & WHITEHEAD, Bradley. “Plantar Árvores Não É Brincadeira, É Um Negócio Sério”. *Revista Exame*, V. 26 (23), 1994, 59-62.
- WIEFFERING, E. “Walmart Turns Green in Kansas”. *American Demographics*, V. 15(Dec), 1993, p.23.
- WILKIE, W.L. *Consumer Behavior*, New York, NY: John Wiley & Sons, 1994, 614 p.
- WOLFF, C. “Living With the New Amenity”. *Lodging Hospitality*, V. 50 (April), 1994, p.65-8
- WOOD, Donna J. “Social Issues in Management: Theory and Research in Corporate Social Performance”. *Journal of Management*, Vol. 17 (2), 1991, 383-406.