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DEVELOPING AND VALIDATING A NEW SCALE FOR IDENTIFYING GREEN CONSUMERS IN THE MARKETPLACE

Key Words

Green Consumer; Green (Environmental) Marketing; Sustainable Competitive Advantage; Classification of Green Consumers; Hierarchical Cluster Analysis; Scale Unidimensionality; Convergent and Discriminant Validity.

Abstract

This study aimed at developing and validating a new scale for identifying green consumers in the marketplace. The study was divided into three stages. In the first stage, an exploratory study using the focus group technique, was used to develop those items to be included in the scale. Five focus group sessions were held in both Cairo and Alexandria and 58 statements were developed. In the second stage, an initial categorization was carried out on those statements reducing them to only 42. Using forty customers, a sorting task was utilized. Data from this sorting task was then subjected to a hierarchical cluster analysis which resulted in two different solutions. Seven items were eliminated from any further consideration based on the results of this analysis, leaving only 35 statements. By balancing some criteria those statements were again reduced to 26 items to be used in the final stage. In the last stage, a self-administered survey was conducted using 1,230 customers living in both Cairo and Alexandria. The two solutions provided by the exploratory hierarchical cluster analysis were subject to confirmatory factor analysis. None of the two solutions was confirmed. An exploratory factor analysis was performed on the survey data which resulted in the elimination of 2 items. The remaining 24 items were loaded in three factors which explain around 93.87% of the variance. Using LISREL VIII the remaining statements were subject to further analyses to test the reliability, unidimensionality, and validity of the scale. The final scale contained only 20 items and proved to be reliable, unidimensional and valid. Some implications of this scale were finally cited.

Introduction

Today the globe is suffering from many ecological problems which is a key area of concern for the global community in the 21st century (Ottman, 1993). The increased worldwide awareness of the environmental degradation process has led firms to potentially see the environmental factor as being the biggest business issue in the 1990s (Kirpatrick, 1990), especially due to the growth of the number of "green consumers" in the market (Donation and Fitzgerald, 1992). Consequently, all levels of society are becoming more and more involved in various environmental issues (Ulhoi, Madsen and Hildebrant, 1996).

Such involvement is reflected in increased competition, and the demand for firms to achieve better environmental performance, new ways of formulating strategies (Azzone *et al.*, 1997) has given the environment a key role in marketing and management strategies (Hart, 1995; Shrivastava, 1994). Firms now view environment as an opportunity rather than a threat and even recognize it as a source of competitive advantages (Florida, 1996; Shrivastava, 1995; and Ulhoi, 1995). The market's growing concern for the environment has prompted firms to position themselves in the market as environmentally responsible organizations (Jay, 1990).

Although environmental factors will be an issue of critical importance on the agenda of the marketing academy for the coming century (Kilbourne and Beckman, 1998), there is still no consensus among authors as what the definition of "green marketing" really is (Camino, Vigaray, and Ayala, 2001).

The concept was first introduced by Henion and Kinnear (1976), following a workshop on "Ecological Marketing", which was held by the American Marketing Association (AMA) in 1975. Later on, the concept was revisited and discussed thoroughly by many writers (Charter, 19992; Coddington, 1993; Ottman, 1993; and Peattie, 1995). The concept of "green marketing" was defined from different perspectives. From those perspectives is the emphasis placed on satisfying consumers' needs with minimal impact on the natural environment (Polonsky, 1994), saving natural resources in the production and consumption processes (Porter, 1991; Ottman, 1995; and Prakash, 2002), creating communication that reflects commitment to the environment (Kangun, Carlson and Grove, 1991), setting prices that make consumers aware that they are paying more in order to ensure a safe environment (Jay, 1990), reducing

pollution and saving resources in transporting products to market (Bohlen, Diamantopolous, and Schlegelmilch, 1993), reusing recycled products, and reducing waste (Charter, 1992; Grove *et al.*, 1996; Kawamura, 2000; and Camino, De Juan Vigary and Ayala, 2001).

In addition, some authors view the concept of "green marketing" as a strategic link between the company and its markets in a social context, and as a tool for creating sustainable competitive advantage (Friedman, 1970; Peattie, 1995; 1999; Wood and Jones, 1995; Pujari and Wright, 1996; Hart and Ahuja, 1997; Hoffman, 1997; Banerjee, 1999; Carrol, 1999; Wehrmeyer, 1999; Kotler, 2000; Ottman, 2000; Karna, Hansen and Juslin, 2003; and Palazzi and Starcher, 2006).

Consumer concern about the environment has steadily increased over the past two decades and they have become more sophisticated, requiring clear information about how the selection of one product over the other will benefit the environment (Osterhus, 1997; Ottman, 1998 and Phillips, 1999).

Two attempts have been made to identify and classify green consumers into different groups based on their environmental behavior and attitudes. In the first attempt, Roper Starch Worldwide segmented the

green consumer market into several shades of green. They ranged from a 15% core of educated, upscale individuals who said they are willing to pay a premium or forgo certain conveniences to ensure a cleaner environment, to 37% of the public who are doggedly non-environmentalists, characterized more by indifference than by anti-environmentalist leanings. Environmental behavior varies significantly between these shades; the deepest are the "True-Blue Greens", which Roper identified as the active environmentalists. In the middle are the "Sprouts", characterized as the swing segment, followed by the non-active environmentalists, namely the "Grouser". Finally, the "Basic Browns" which represent a considerable departure from the "True-Blue Greens" (Ottman, 2003a).

In the second attempt, Ottman (2003a) identified three groups of consumers in the same context; namely: "Plant Passionate", "Health Fanatics", and "Animal Lovers". "Plants Passionate" want to protect wildlife and keep the environment pristine for recreational purposes. They focus on issues relating to land, air, and water. They recycle bottles and cans, avoid over-packaged products, clean up bays and rivers, and boycott tropical hardwoods. "Health Fanatics" focus on the health consequences of environmental problems. They worry

about getting cancer from too much exposure to the sun, genetic defects from radiation and toxic waste, and the long-term impact on their children's health due to pesticides on fruits and vegetables. "Health Fanatics" frequent natural-food stores, buy bottled water, and eat organic foods. Finally, "Animal Lovers" protect animal rights. They boycott tuna and fur, and among their favorite causes are manatees and spotted owls. "Animal Lovers" check to see if the products are 'cruelty-free', and are most likely to be vegetarians.

Although the concept of the "green consumer" has been the focus of many recent books, research projects, and corporate reports, it still remains an ambiguous subject. Just what is a "green consumer"? Is the "green consumer" willing to pay a premium for more environmentally sound products, and if so, how much more? What are the main characteristics that distinguish "green consumers" from non-green consumers? How can those "green consumers" be identified? A tiny bit of rather unsatisfactory research has attempted to identify those customers and segment the market based on customers' attitudes and behaviors towards important environmental issues. Such segmentation is very vital for targeting green customers. Ottman (2003b) believed that the green consumer pie can be divided

up based on some specific areas of environmental interest and lifestyle orientation. Such segmentation would require the existence of a valid and reliable scale by which those customers can be initially identified in the marketplace.

The purpose of this study is to systematically develop an attitudinal and behavioral measurement instrument which can be used to identify "green consumers" in the marketplace. The development of such an instrument will facilitate: (1) tracking changes in customers' attitudes towards those environmental issues related to the marketing of goods and services; (2) diagnosing the difference between customers' attitudes toward such issues and their actual purchase behavior; and (3) helping marketers segment that market.

Research Methodology

A multi-method, iterative process is used to develop the research instrument and to refine it with the goal of obtaining a concise and valid scale that would be applicable to a broad spectrum of green product shopping experiences.

This process involved three steps: (1) conducting a number of focus group sessions to identify those attributes important to green consumers; (2) performing a sorting task resulting

in hierarchical clustering of items related to customer's behavior and attitudes toward green marketing issues; and (3) running a field survey to validate the final instrument.

Phase One: Focus Group Research

In phase one, the focus group technique was used to generate those statements that could be included in the scale. Five different group sessions were conducted, and each session took between 90 and 120 minutes. Most of the focus group experts believe conducting four focus group sessions is an adequate number for exploratory research (Hess, 1968).

Since the objective of the study is to create a valid and reliable scale that can be used to identify green consumers and differentiate them from non-green consumers, both types of consumers were covered in the sessions. Two group sessions were gathered from MBA students who exhibited some concerns for environment, and the remaining group sessions were conducted at different places in two major cities in Egypt (Cairo and Alexandria). In those sessions a mix of people from different social strata and different occupational backgrounds were included representing the two types of consumers. Participants in all sessions were diverse with

respect to the degree of environmental awareness, and their purchasing behavior related to green products, age, sex, occupations, and life style.

The moderator guide was based on the limited available information cited about the characteristics of green consumers in the literature. More specifically, it contained questions about participants' typical experiences when buying organic products, reading product label information related to the environment, participating in social events and engaging in political life, and exerting some efforts to make others aware of some environmental issues. Later on, all sessions' transcripts were systematically analyzed to categorize and label attributes of consumer attitudes and behaviors towards green marketing issues. The focus groups were critical to increase the probability of producing valid measures (Churchill 1979; Aldenderfer and Blashfield 1984).

Phase Two: Structured Conceptualization

A consumer attitude towards green issues in the field of marketing is relatively a new area and the dimensions of the concept are imperfectly defined and understood. While researchers typically move directly from exploratory research (using focus group sessions) to development of

questionnaires, the researchers felt that the items utilized on the questionnaire would provide better coverage of the concept if an intermediate step was undertaken to improve conceptualization. Understanding how green consumers (rather than researchers) conceptualize and categorize their actual experiences improves the validity of the resulting scale. Also, investigating items and constructs in two studies with different methodologies results in a multi-method investigation, thus increasing the confidence in the research findings. Trochim and Linton (1986) refer to this process as "structured conceptualization".

The second phase of the study involved utilizing data from focus groups and carefully culling every statement related to consumer attitudes and behaviors toward green marketing issues from the transcripts. 58 statements were developed from the focus groups transcripts. To synthesize previous findings and writings in the literature regarding green consumers with information extracted from focus group sessions, the researchers performed an initial categorization of statements representing several dimensions of interest. This categorization facilitated the choice of 42 items to adequately cover the wide varieties of issues identified as important to consumers during focus groups sessions.

A sorting task was then utilized in order to understand how green consumers conceptualize and categorize their own experiences. 40 different people than those who participated in the focus group sessions and who were having some experiences with buying green products sorted 42 cards into piles of similar cards, each of which contained one of the statements that had been chosen from the focus groups transcripts. The task was appropriate for determining conceptual categories because judgments of similarities are central to the process of categorization.

In the next stage, the data from the sorting task was entered into a group of similarity matrix (entries in the matrix show how often a particular pair of items were sorted together with the maximum entry being 40, the number of subjects). The data was then submitted to hierarchical cluster analysis using SPSS version 12, which uses non-metric multi-dimensional scaling to transform data into a two-dimensional proximity matrix (Kruskal and Wish, 1978). Multi-dimensional scaling takes the group similarity matrix and develops a map wherein each statement is a point on the map, and statements placed together by more people are closer to each other on the map. Then, hierarchical cluster analysis takes the proximity matrix and partitions the

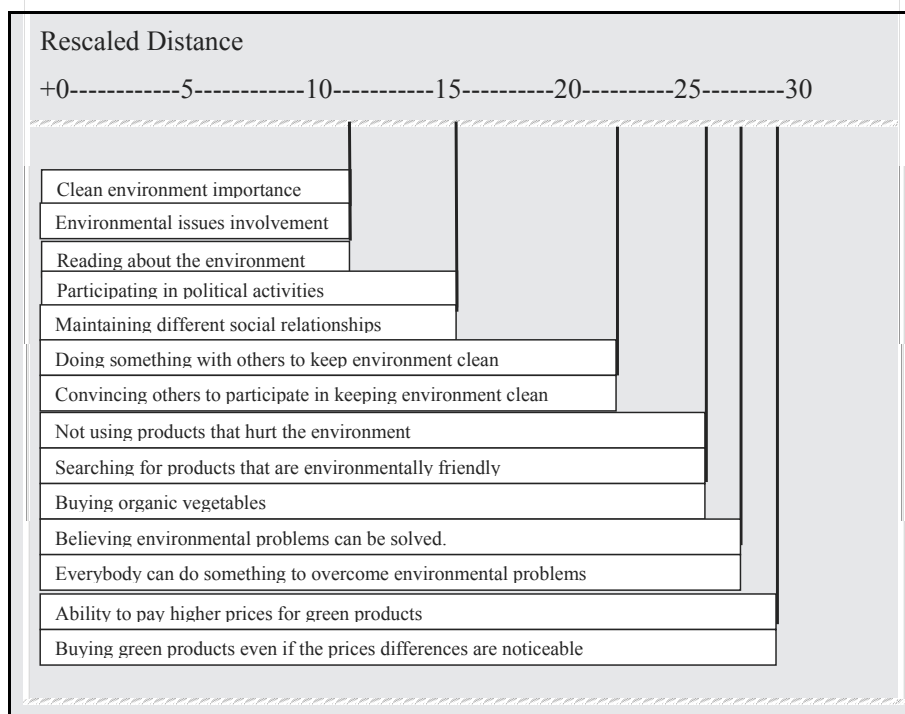


Figure (1)
A portion of the dendrogram produced by hierarchal cluster analysis

map into groups or clusters of statements (Trochim, 1989), which were represented on a dendrogram (Gordon, 1999). A portion of this dendrogram is represented in figure (1).

Cluster analysis is both analytically and conceptually appropriate for creating groups of concepts, as the technique is most frequently utilized as a classification tool (Aldenderfer and Blashfield, 1984; and Gordon, 1999).

Two solutions were generated using both Ward's minimum variance, and the centriod method. Comparing

the two solutions creates more confidence in the classification of the statements based on their similarities (Gordon, 1999). For both methods, 2 outliers, and 5 negatively worded statements (that largely clustered together in a "negatives" cluster) were removed from any further consideration, leaving 35 statements. The centric method results in only 4 clusters solution, with the clusters composed of the relative importance of environmental issues to the person, creating and maintaining broad social relationships with others, purchasing behavior regarding green products, and

believing in the ability to remedy all environmental problems. On the other hand, the Ward's minimum variance method solution breaks down the relative importance of environmental issues into 3 smaller clusters including, degree of the person involvement with environmental issues, behaving to keep the environment clean, and convincing others to protect environment from any harm. Also, the purchasing behavior cluster was broken down into 3 smaller clusters including, willingness to pay higher prices for green products, reading labels inside stores, and buying organic and environmentally friendly products. This makes the final number of clusters 8 according to this method.

Each cluster can be viewed as a measurement construct with the individual statements suggesting operationalizations of measures within constructs (Davis, 1989; Trochim, 1989). Collectively, the cluster solutions suggest that items should be chosen from among the 35 to allow adequate coverage of up to seven possible clusters: importance of environmental issues to the person (including the individual's level of involvement with environmental issues, behaving to keep the environment clean, and convincing others to protect the environment), creating and maintaining broad social relationships with others, and purchasing behavior (including the

willingness to pay higher prices for green products, reading products labels inside the stores, and buying organic and environmentally friendly products). Items were finally selected for the survey stage by balancing three criteria: (1) providing sufficient coverage of all dimensions identified by the result of the cluster analyses; (2) avoiding redundancy; and (3) excluding items that appeared to be close to two different clusters. Ultimately, 26 statements were chosen based on the above criteria for further data collection and analysis. Table (1) show the final items selected for the survey stage distributed across those clusters produced by either the centric method or by the Ward's minimum variance method.

Phase 3: The Survey Study

The third phase of data collection involved a self-administered survey in both the cities of Cairo and Alexandria. People were intercepted in many public places in both cities and asked to participate in the survey. The survey lasted around 7 months. During this period, a total of 1,230 respondents were willing to participate in the study; 734 were from Cairo and 496 from Alexandria. To qualify for participation in the survey people were asked if they were familiar with some major environmental problems, and if they were familiar with some organic

Table 1
Final Selected Items for the Survey Phase

Cluster according to the centroid method	Clusters according to Ward's minimum variance method	Items selected
Relative importance of environmental issues to the individual	Involvement with environmental issues	• Having a clean environment is vital for our existence and survival. • Having a clean environment is important for us and for our next generation. • I am worried about all environmental problems. • I pay attention to what is written about environmental problems. • I become worried when I read or hear about environmental pollution.
	Behaving to keep environment clean	• I try to do anything that keeps our environment clean and healthy. • I am willing to exert any effort required to maintain our environment clean and healthy. • I try to convince my friends that keeping our environment clean and safe is very important.
	Convincing others to keep the environment clean	• When I sit with my friends, I like to talk about environmental problems. • I try to convince my friends not to use those products that hurt our environment. • I like to talk about the benefits of buying green products.
Creating and maintaining social relationship with others		• Successful people should have a network of relationship with others. • It is important that everybody participates in the political affairs within his society. • Keeping in touch with others is a very important activity for me.
Purchasing behavior	Willingness to pay higher prices for green products	• I am willing to pay a higher price for green products. • I prefer environmentally friendly products even if their prices are higher. • Buying environmentally friendly products means paying higher prices.
	Reading product labels	• I read product labels to know how friendly they are to our environment. • Reading product labels is important to avoid products that hurt our environment
	Buying environmentally friendly products	• I try to stay away from products that hurt our environment. • I search for products that are environmentally friendly. • I only buy organic vegetables and fruits when they are available. • I only buy those products that have "Environmentally Friendly" label.
Believing in the ability to remedy environmental problems.		• I think everybody can do something to keep our environment clean. • It is possible to handle the polluted environment and solve its problems. • Government should encourage researches that aim at finding remedies to environmental problems.

or environmentally friendly products. Only those people who exhibit a high degree of familiarity with environmental problems and cite some environmentally friendly products were allowed to participate in the survey.

Respondents answered a series of 26 statements that were derived from the second phase of the study using 5-point scales ranging from 1, "strongly disagree" to 5, "strongly agree."

Using confirmatory factor analysis, the eight -and four-dimension solutions suggested by hierarchical clustering were tested, but none of them was satisfactory. Both solutions were suffering from inadequate discriminant validity. Correlations of some of those dimensions under the two solutions were very high ranging from 0.88 to 0.94 with most exceeding 0.90.

Because neither of the solutions suggested by hierarchical clustering was satisfactory, exploratory factor analysis, a useful preliminary technique for suggesting dimensions was utilized (Gerbing and Andreson, 1988; and Gerbing and Hamilton, 1996). Exploratory factor analysis, using principle component with Varimax rotation, was performed on the 26 statements selected at the end of the exploratory phase. Items were retained if they loaded 0.50 or more on a factor, did not load more than 0.50 on two factors, and if the reliability

analysis indicated an item-to-item total correlations of more than 0.40 (Hair, Anderson, Tatham and Black, 1998). Only 2 items were eliminated because they were not loaded on any factor. 24 items were retained according to the result of the exploratory factor analysis; the items loaded on three factors, and accounted for 93.87 percent of the total variance. Table (2) shows the results of this analysis.

As indicated in table (2) the three factors produced by the exploratory factor analysis were relative importance of environmental issues, developing and maintaining relationship with others, and purchase behavior.

The 24 items were then submitted to confirmatory factor analysis in LISREL VIII with the goal of investigating unidimensionality (Gerbing and Anderson, 1988; and Anderson and Gerbing, 1988). Hattie (1985) has written the following on the topic of unidimensionality:

"That a set of items forming an instrument all measure just one thing in common is a most critical and basic assumption of measurement theory"(p.49).

The constraint imposed by unidimensionality in confirmatory factor analysis tends to result in the reduction of the number of items that appear in the final scale, purifying the scale beyond the standard required by explora-

Table 2
Items Retained Based on Exploratory Factor Analysis Using
Principle Component with Varimax Rotation

Item	Relative im- portance of environmen- tal issues	Creating & maintaining social rela- tionships	Purchase behavior	commun- ality
Relative importance of environmental issues				
Having a clean environment is vital for our existence and survival.	0.78	0.07	0.15	0.64
Having a clean environment is important for us and for our next generation.	0.69	0.14	0.11	0.51
I am worried about all environmental problems.	0.81	0.21	0.19	0.74
I pay attention to what is written about environmental problems.	0.76	0.31	0.34	0.79
I become worried when I read or hear about environmental pollution.	0.80	0.29	0.16	0.76
I try to do anything that keeps our environment clean and healthy.	0.77	0.28	0.19	0.71
I am willing to exert any effort required to maintain our environment clean and healthy.	0.64	0.31	0.37	0.65
I try to convince my friends that keeping our environment clean and healthy is very important.	0.65	0.44	0.34	0.74
When I sit with my friends, I like to talk about environmental problems	0.76	0.21	0.26	0.69
I try to convince my friends not to use products that hurt our environment.	0.83	0.35	0.39	0.97
I think everybody can do something to keep our environment clean	0.71	0.21	0.33	0.66
It is possible to handle polluted environment and solve its problems.	0.63	0.11	0.29	0.50
Creating & maintaining social relationships				
Successful people should have a network of relationship with others.	0.36	0.77	0.34	0.82
Everybody should participate in the political affairs in his society.	0.11	0.69	0.08	0.50
Keeping in touch with others is a very important activity for me.	0.20	0.66	0.22	0.53
Purchasing behavior				
I am willing to a pay higher price for green products.	0.15	0.21	0.64	0.49
I prefer environmentally friendly products even if their prices are high.	0.23	0.21	0.68	0.57
Buying environmentally friendly products means paying higher prices.	0.11	0.34	0.73	0.60
I read the product labels to know how friendly they are to our environment.	0.28	0.24	0.59	0.49
Reading product labels is important to avoid products that hurt our environment.	0.19	0.34	0.60	0.52
I try to stay away from products that hurt our environment.	0.31	0.28	0.58	0.52
I search for products that are environmentally friendly.	0.34	0.36	0.73	0.78
I only buy organic vegetables and fruits when they are available.	0.30	0.29	0.66	0.62
I only buy those products that have "Environmentally Friendly" label.	0.41	0.38	0.54	0.61
Eigen Value	7.49	2.78	4.85	
Percent of variance extracted	46.50	17.26	30.11	

Table 3
The Results of Testing Scale Reliability, Convergent Validity and Unidimensionality Using
Confirmatory Factor Analysis in Lisrel Viii

Item description	Mean N = 1230 Max = 5	Standard- dized Loadings
Relative importance of environmental issues Cronbach's α = 0.88		
Having a clean environment is vital for our existence and survival.	3.8	0.75
Having a clean environment is important for us and for our next generation.	4.1	0.73
I am worried about all environmental problems.	4.2	0.78
I pay attention to what is written about environmental problems.	3.9	0.70
I try to do anything that keeps our environment clean and healthy.	4.2	0.72
When I sit with my friends, I like to talk about environmental problems	3.6	0.66
I try to convince my friends not to use products that hurt our environment.	3.8	0.86
I think everybody can do something to keep our environment clean	4.1	0.88
It is possible to handle polluted environment and solve its problems.	3.4	0.64
Average variance extracted		0.58
Creating & maintaining social relationships Cronbach's α = 0.84		
Successful people should have a network of relationship with others.	4.2	0.59
It is important that everybody should participate in the political affairs in his society.	3.5	0.79
Keeping in touch with others is a very important activity for me.	3.6	0.56
Average variance extracted		0.42
Purchasing behavior Cronbach's α = 0.81		
I am willing to a pay higher price for green products.	3.3	0.89
I prefer environmentally friendly products even if their prices are higher.	3.2	0.58
I know that buying environmentally friendly products means paying higher prices.	4.4	0.73
Reading product labels is very important to avoid products that hurt our environment.	4.1	0.79
I try to stay away from those products that hurt our environment.	3..7	0.81
I search for products that are environmentally friendly.	3.9	0.92
I only buy organic vegetables and fruits when they are available.	4.3	0.66
I only buy those products that have "Environmentally Friendly" label.	4.6	0.87
Construct reliability fit statistics		0.82
Average variance extracted		0.62
Fit statistics		
χ^2		232
Goodness of Fit Index (GFI)		0.96
Adjusted goodness of fit index (AGFI).		0.94
Comparative Fit Index (CFI)		0.99
Root Mean Square Residual (RMR)		0.02

tory factor analysis, coefficient alpha, and item-to-item correlations (Gerbing and Anderson, 1988).

Unweighted Least Square (ULS) was used as an estimation technique, and for investigating standardized residuals. Three items under the relative importance of environmental issues produced large standardized residuals with items from multiple latent constructs, indicating that the items did not satisfy the conditions imposed by unidimensionality, and these items were eliminated from further consideration in the scale (Anderson and Gerbing, 1988).

One purchasing behavior item produced large standardized residuals with a latent construct and was deleted from any further investigation. The final 20 items possessed construct reliabilities, average variance extracted (Fornell and Larcker, 1981),

and Cronbach's alphas that exceed commonly cited standards for assessing reliability and unidimensionality (Bagozzi and Yi, 1988; and Hair, Anderson, Tatham and Black, 1998). The final results of this analysis are reported in table (3).

Table (4) shows the correlation between latent factors, standard errors, and t-values. Also, a comparison between the χ^2 values for a measurement model that constrains their correlation to equal one to a measurement model without this constraint was made (Bagozzi and Philips, 1982; and Jöreskog, 1971). A χ^2 difference test was performed for all pairs of factors in the final scale, and in all cases resulted in significant difference. Thus it could be concluded that the scale measures three distinct constructs indicating again that the final scale possesses a high degree of discriminant validity.

Table 4
Correlations between Green Consumer Scale Constructs, standard errors, and t-values*

	Relative impor- tance of environ- mental issues	Creating & maintaining so- cial relationships	Purchase behavior
Relative importance of environmental issues	1.00		
Creating & maintaining social relationships	0.76 (0.02) 37.61	1.00	
Purchase behavior	0.61 (0.03) 24.17	0.67 (0.02) 44.65	1.00

* All correlations were significant at $P < 0.01$.

In summary, the 20 items remaining in the final scale were reliable, valid, and unidimensional. Those items on the final scale explain around 71 percent of the variance in green consumer attitudes toward environmental issues and green buying behavior.

Conclusion and Implications

This research aimed at developing and validating a new scale for measuring consumer attitudes towards green marketing issues. To achieve this objective, the study was divided into three stages. In stage number one, focus group sessions were conducted to identify those attributes which are important to green consumers, and to generate those statements forming the primitive scale. 58 statements were developed and reduced later on based on an initial classification made by the researcher into 42 statements believed to cover the wide variety of issues cited as important by those consumers who participated in focus group sessions.

In the second stage, a sorting task was performed by 40 respondents who were highly scrutinized and selected to represent true green consumers in the marketplace. Data from the sorting task was then submitted to hierarchical cluster analysis. This analysis resulted in two different solutions. The first solution was generated by using the centric method and showed four

clusters. The second solution was generated by using Ward's minimum variance method and produced 8 clusters. Seven items were eliminated from the initial scale based on the results of this analysis, leaving 35 statements. Those were further reduced using some criteria set by the researcher into only 26 statements to be used in the final stage of the study.

The third stage of the study included a survey of 1,230 customers living in the cities of Cairo and Alexandria. Respondents were selected based on their degree of familiarity with major environmental problems and with those green products that already exist in Egyptian market. Data generated from this survey was used to investigate the two solutions produced by the hierarchical analysis in the second stage. None of those solutions were confirmed using confirmatory factor analysis. Accordingly, exploratory factor analysis was used and produced three main factors which explain around 73.8 percent of the variance. Twenty-four items out of twenty-six were loaded satisfactorily on those three factors.

To investigate the scale unidimensionality and its convergent validity confirmatory factor analysis LISREL VIII was used. Unweighted Least Square method was used to investigate the standardized residuals which

resulted in the elimination of four statements from the scale because they were producing large standardized residuals with items from multiple latent constructs. These indicated that the remaining 20 items were reliable, unidimensional, and possess a high degree of convergent validity. Those final statements were subject for investigation by the scale discriminant validity. Such investigation showed that the final scale possesses a high degree of discriminant validity,

This scale could be used by marketers to identify green consumers in their markets, and enable them to design a successful competitive positioning strategy. Also, following the identification of those green consumers, marketers would be able to build a database covering the demographic characteristics of those customers and their lifestyles. Such a database would be important in selecting and designing both segmentation and targeting strategies for their green products.

Competition among those companies producing and marketing green products should focus on some pedestals that appeared to be important to green consumers according to the results of this study. Mainly, pricing and labeling green products were very important in this respect. The scale showed that green consumers are will-

ing to pay premium prices for green products. But to what extent can the green consumers accept the price difference between green product and its matching non-green product? Companies marketing green products should perform further studies to answer this question. The study showed also that product labeling is very important to green consumers. Green products' labels should focus on how the product usage and its package disposal will contribute to maintaining our environment clean and healthy.

The new scale indicated that green consumers are socially active in their societies. They are prone to develop and maintain a network of relationships with others, and to participate in the political life. Such results could be important to the design and implementation of the company's marketing communication strategy. Green consumers could be used as opinion leaders who will be willing to spread favorable word-of-mouth about the company's green products. This might be especially important when the company is introducing a new green product to the market. Favorable word-of-mouth about the new product would accelerate its diffusion into the marketplace. Also, favorable word-of-mouth could be used as a means for building and enhancing the company's image in the society.

Study Limitations and Suggested Future Research

Two other types of validity were not investigated in this study. The predictive validity of the scale was not tested. The ability of the scale to discern green consumers from non-green consumers should be examined in the future. Also, the nomological validity of the scale was not examined in this study. The lack of rigor and previously tested similar constructs to those making up the new scale preclude such type of investigation to some degree. Of course, the establishment of the constructs validity would necessitate such type of investigation. These two shortcomings of the new scale suggest that researchers in the future might focus on establishing both types validity. Moreover, the whole suggested scale should be subject for further scrutiny in the future. Further investigations of the scale reliability and validity should be made in more future research.

Although some attempts have been made to synthesize previous research findings with focus groups data either in forming the moderator guide or when the initial categorization of the data derived from focus groups transcripts was made by the researcher, more emphasis on this point might be important in future research.

Also, a cross-cultural examination of the scale should be made in future research. Paying attention to our environmental problems, and being green in the consumption process is affected -to a large degree- by societal cultures. Therefore, a cross-cultural examination of the scale might be very useful.

Finally, future research should focus on identifying those demographics and psychographic characteristics of green consumers. Such identification will support the process of carrying out market segmentation, product positioning, and promotional strategies by those companies producing green products.

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الملخص

تنمية مقياس جديد للتعرف على المستهلكين الخضر في السوق وقياس درجة صدقه وثباته

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هدفت الدراسة إلى القيام بتنمية مقياس جديد بغرض التعرف على المستهلكين الخضر في السوق، وكذلك القيام باختبارات الصدق والثبات المتعلقة به. وقد أجريت الدراسة وفقاً لثلاث مراحل أساسية. ففي المرحلة الأولى، تم تنمية العبارات الخاصة بالمقياس وفقاً لنتائج المقابلات الجماعية التي أجريت في مدينتي القاهرة والإسكندرية. أما المرحلة الثانية من الدراسة فقد هدفت إلى خلق مجموعات للعبارات التي تعكس مفاهيم مختلفة في مجال الاستهلاك البيئي. وقد استخدم في هذا الصدد أسلوب تحليل المجموعات المتدرج. أما المرحلة الثالثة فقد انطوت على تحليل تلك البيانات المتحصل عليها نتيجة القيام بدراسة مسحية شاملة على عينة من المستهلكين قوامها ١٢٣٠ مفردة. وقد تم استخدام عدد من الأساليب الإحصائية وذلك بهدف فحص العبارات الخاصة بالمقياس، وتكوين المجموعات التي تعكس تلك المفاهيم التي ينطوي المقياس على قياسها في المستهلكين الخضر، وكذلك إجراء اختبارات الثبات والصدق المتعلقة بالمقياس. وقد أظهرت نتائج التحليل احتواء المقياس لثلاثة مفاهيم أساسية للمستهلكين الخضر، كما أظهرت تمتع المقياس بدرجة عالية من الثبات والصدق. ويفيد هذا المقياس في تطبيق عدد من الإستراتيجيات التسويقية، وذلك في مجالات تقسيم السوق لقطاعات، وتحديد المركز الذهني للمنتجات الخضراء، والترويج لهذه المنتجات.

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