

EXPLORATORY STUDY ON THE MARKET POTENTIAL OF ENVIRONMENTAL
FRIENDLY PRODUCTS - A CASE STUDY ON LIQUID DETERGENTS

by

AU TSANG PUI

區增培

WONG KIN HONG, JOSEPH

黃建康

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APPROVAL

Name: AU TSANG PUI

WONG KIN HONG, JOSEPH

Degree: Master of Business Administration

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ABSTRACT

"Green Marketing" is a hot button among the marketers, and everyone is trying to adopt the concept to their products. In our case study, we are trying to find out the market potential of "Green Marketing" of liquid detergents.

The findings show that the concept of green marketing in liquid detergent is not very workable nowadays in Hong Kong, as people would consider other attributes such as cleansing power and skin protection function first before environmental friendly attributes. However, the findings find that the concept "Environmental Protection" is widely shared among the public in Hong Kong, especially the youths. People will stop buying things which are not environmental friendly in other product categories. Hence, the concept of "Green Marketing" should become much more popular when the general public receives more information about environmental protection and when the youths grow up.

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CHAPTER I

INTRODUCTION

The Concept of Marketing

The meaning of marketing is changing as the competition among business is increasing. In the past, when traced back to early 1970s, marketing was production-oriented which meant that "a good product will sell itself"¹. At that time, the demand was greater than the supply. As a result, the business at that time could sell everything they produced, there was no need for them to worry about consumers. Later on, as both social and technical environments changed rapidly and as competition began to intensify, growing number of business discovered that they and their competitors possessed more production capacity than the market could absorb. Consequently, consumer needs and wants began to assume an all-importance, as the search for ways in order to gain competitive advantage intensified, and marketing was then turned into "consumer-oriented".

¹ Fullerton, Ronald A., "How Modern is Modern Marketing? Marketing Evolution and The Myth of the Production Era," *Journal of Marketing*, Vol. 52, p.108-125.

With all these changes, it is important for the businessmen to identify the consumer needs or trends and then grasp them. It is because by grasping such new needs or trends, the company can gain a preemptive strike and will most likely be the winner in the market.

Green Movement

Since the 1980s and into the early 1990s, consumers had formidable input through the media about what constituted environmentally sound behaviour. People started to be concerned about the environment around them, about the natural resources, and about the survival of their own and their next generation. With increasing awareness of a looming environmental crisis, the idea of "rational consumption" - buying what is really needed - has been promoted by environmentalists. The rationale is to minimize damage to the earth so that the crisis of overproduction and overconsumption can be cured. Actually, this is the basic concept of "Green Consumption".

Marketers, ever alert to these trends and fads, have been quick to pick up on environment concerns and to tailor product offerings to be more environmentally palatable. This strategy, which leads to greater consumption of the more palatable alternatives, unfolds in one of two ways. First, companies can and do find ways to make their offerings having less deleterious impact on the environment. Second, companies create ways to reposition

their offerings by playing up some attributes and minimizing other attributes of the offerings. Both methods seek to create an image of environmental friendliness for the companies which produce environmentally benign products to the end of solving the environmental crisis. These are the basic ideas of "Green Marketing"².

Green Marketing

Green marketing is a style of marketing which has arisen in response to the increasing concern about the state of the global environment and the life it contains, including human life. Many finite resources are being used at rates that cannot be sustained indefinitely, and the capacity of many parts of the physical environment to absorb the effects of human activity is being saturated, or even exceeded. There is also a growing awareness that, despite advances in technology and in marketing, the potential for increasing the quality for society as a whole is not being fulfilled. There is increasing pressure on all types of organisations to improve their environmental performance.

Marketers' Response

Encountered with the green consumption trends and social pressure, the marketers responded quickly. As reported by the Marketing Intelligence Service Ltd., there is a rapid increase in the number of green products since

² Peattie, Ken, *Green Marketing*, Pitman 1992.

1985, with annual increase in green introductions more than 100%³. Environmental friendly, ozone friendly, photodegradable, biodegradable, recyclable, all natural ingredients, etc are vague labels showing up in the advertisements and on the product packaging.

By adopting an assertive approach in green marketing, the environmental first mover, with good strategic marketing, will be able to maintain its image as a sincere environmental activist and this image may provide the basis for a sustainable competitive advantage. Moreover, a firm may avoid scrutiny and regulation by doing more than is required.

In late 1980s, there is a new product concept developed under the green wave, it is the concept of "Clear/Transparent"⁴. Marketers are betting that customers will equate clear products with things that are pure and good for them and the environment. From gasoline to soda, from mouthwash to mascara, clear is present. Generally speaking, the initial performance of this clear concept works quite well, for example, Palomlive Sensitive Skin clear dish washing liquid has gained an impressive 5 percent market share in the dish washing-detergent industry. The marketers are already preparing for a second

³ Klein, Easy, "The Selling of the Green," *D & B Reports*, Vol. 38, p.30-31.

⁴ Miller, Miller and Karen Springen, "Clear and Cashing In," *Newsweek*, February 15, 1993, p.39.

wave of transparent products.

Consumers' Response

In early 1990s, several studies were conducted in the U.S.A.⁵, the results showed that most of the respondents are personally willing to change their behaviour and buying habits in order to ensure a cleaner world. They would accept cost increase for environmental friendly products which are less-polluting. When they are purchasing those green products, they will consider the factors like: biodegradability, recyclability, protection process, etc which are all related to environment protection or friendly.

Besides, based on their personal values and purchasing behaviour, it is easy to segment or classify the consumers into different segments. According to the study by Roper Organisation⁶, the US consumer can be divided into five distinct shades of environmental commitment and buying behaviour:

i. True-Blue Greens

they are the most affluent and most involved in pro-environment practices;

⁵ Ottman, Jacquelyn A. *Green Marketing: Challenges & Opportunities for the New Marketing Age*. NTC Business Book, 1993.

⁶ Hume, Scott, "What Separate True Blues From Basic Browns," *Advertising Age*, Vol.62, p.GR4.

- ii. Greenback Greens
they are the youngest group and the biggest environment spenders;
- iii. Sprouts
a swing group which display both pro and con attitudes about the environment;
- iv. Grouzers
they are not very involved in environmental activities, mainly because they say others are not either;
- v. Basic Brown
they do not believe individual can make a difference in improving the environment, and they are not interested in making an effort.

In fact, many studies have used consumer attitudes and values to classify the consumers into various segments of environmental commitment and buying behaviour. (FIND/SVP, J.Walter Thompson and Green Market Alert).⁷ However, while demographics have been used by researchers in determining ecologically conscious behaviour, the results have not been consistent. Certain studies have found significant relationships between ecological consciousness and

⁷ Coddington, Walter, *Environmental Marketing : Positive Strategies for reaching the Green Consumer*, McGraw Hill 1993, Ch.5.

demographics. (e.g. Anderson and Cunningham 1972) while others found that demographics had little or no effect on environmental behaviour. Therefore, it seems that it would be more meaningful and effective to segment green consumers by their values and attitudes.

However, some marketers also worry that "preferring to buy green does not mean consumer will actually buy green"⁸. The marketers think that people say what they are expected to say, but not what they can afford to do (demand characteristics). In some cases, the economic interest outweighs the environment interest, especially during the recession period.

Objective of Study

Nowadays, in Hong Kong, the concept of "Green Consumption" is also widely shared among the marketers and the general public, which is a hot button in Hong Kong. Many products start to emphasize on attributes like: "biodegradable", "ozone friendly", "recyclable", "reusable", "durable", etc.

However, there are still many questions left to the marketers. Some of them are:

- i. "Which attributes are important and meaningful

⁸ Hume, Scott. "Consumer Double Talk Makes Companies Wary," *Advertising Age*, Vol.62, p.GR4.

enough that the consumers will perceive as environmental friendly?";

- ii. "Which groups of consumers are more environmentally concerned?";
- iii. "Whether the economic interest will outweigh the environment interest?";
- iv. "Whether the concept of "Green Consumption" is powerful enough to affect the purchasing decision of the consumers?".

There is still no definite answer. Besides, the "Clear" concept is rather new or even unknown to the general public in Hong Kong, and the market potential or successfulness of this concept is also questionable.

Scope of Analysis

In the research, we tried to explore some of these answers mentioned. Liquid detergent was chosen as the specimen in the research, as it is the product category that the general public is most familiar with. Besides, there is little differentiation between different brands, which reduced the difficulty and complexity of the investigation. Most importantly, it produces the most common domestic wastage that affected the environment greatly.

In this research, the target sample consisted of housewives in Hong Kong. It is because nearly all of them are both buyers and users of liquid detergents. They have much experience in choosing and consuming the product. Besides, the method of conjoint analysis was used in order to mimic the real trade-off situation in purchasing, and to get a more accurate and reliable result.

Objective .

The research was divided into two sections as followed:

Section I

The objective was to investigate the personal values and behaviour that the general public think an environmentally concerned people should possess. By applying the result, it would be easier to classify the target respondents into different segments according to their attitudes toward environmental issues.

Section II

This is the core part of this research and the main objectives are:

- i. to investigate the market potential of environmental friendly products;
- ii. to investigate the market potential of "Transparent/Clear" products.

The specific objectives of the conjoint analysis are:

- i. to study the general consumer behaviour of liquid detergent, to see which attributes would give consumers the greatest utility, especially the environment-related attributes;
- ii. to investigate the market potential of environmental friendly products;
- iii. to investigate the market potential of "Transparent/Clear" products.
- iv. to see if there is any relation between environmental concern behaviour and attitudes toward environmental issues;
- v. to see if there is any relation between environmental concern behaviour and age;
- vi. to see if there is any relation between environmental concern behaviour and educational level;
- vii. to see if there is any relation between environmental concern behaviour and family monthly income.

viii. to see if there is any relation between environmental concern behaviour and other demographic variables.

CHAPTER 1:

LITERATURE REVIEW

The study is designed to investigate the relationship between environmental concern and behaviour. It is based on the theory that individuals with higher environmental concern will engage in more pro-environmental behaviour. The study will use a survey method to collect data on environmental concern, behaviour, and demographic variables. The data will be analysed using statistical methods to determine if there is a significant relationship between the variables. The study will also explore the role of demographic variables in explaining the relationship between environmental concern and behaviour.

In the study, a sample of respondents was selected to investigate the relationship between environmental concern and behaviour. The respondents were divided into groups based on their attitudes and behaviours towards environmental conservation. The objective is to see if there are any differences in the behaviour between different groups. Hence, this

CHAPTER II

LITERATURE REVIEW

The consumer's decision to purchase an item somewhat depends on the values as well as the attitudes he/she places on various attributes of the item before buying. Multiattribute analysis is hence, used to analyze these marketing variables that are either too isolated or too intangible to be evaluated easily. Conjoint analysis, a kind of multiattribute analysis using numerical ranking to determine attribute importance, measures the trade-off between those less important factors that the consumers usually forgo, and the essential ones. On the other hand, values can be used as a segmentation tool in marketing to study the buying behaviour of different people, which may provide invaluable information for formulating marketing plan and strategy.

In our study, conjoint analysis was conducted to investigate the buying decision of liquid detergent. The respondents were divided into groups based on their attitudes and behaviours toward environmental conservation. The objective is to see if there exists any difference in the behaviour between different groups. Hence, this

literature review will begin with conjoint analysis. After that, a brief summary of personal values in marketing will be given.

Conjoint Analysis

In order to measure the importance of different attributes contributing to the preference judgement of the liquid detergent of the consumers, we have to assume that an individual's preference for an object can be decomposed into preference scores for components or characteristics of the object. One of the most popular methods for this study is the conjoint analysis. The following is the literature review of the conjoint analysis.

Introduction

While conjoint methodology was discussed briefly in the working paper by Green and Rao (1969) and the book by Green and Carmone (1970), the first detailed consumer-oriented paper appeared in 1971 (Green and Rao). As Wilkie and Pessemier (1973) have observed, expectancy-value models draw upon a compositional or build-up approach in which the total utility for some multiattribute object is found as a weighted sum of the object's perceived attribute levels and associated value ratings, as separately judged by the respondents. In contrast, conjoint methodology is based on a decompositional approach, in which respondents react to a set of "total" profile descriptions. It is the job of the analyst to find a set of part worths for the individual

attributes that, given some type of composition rule, are most consistent with the respondents's overall preferences.

As stated in Green (1974), conjoint measurement provides a model in which consumer utilities for various aspects of multifactor stimuli can be estimated from the respondents' preference orderings of a set of factorially designed alternatives. Conjoint measurement models are decomposition models in the sense that utilities for individual attribute levels are estimated from data on total-object evaluations. In simple terms, the method is used to evaluate alternative products and provides information about the trade-offs among the product attributes.

Comparison with Other Multiattribute Models

The full-profile method of conjoint analysis works quite well for only a few attributes. Green (1984) indicated that industrial users of conjoint analysis have strained the methodology by using large numbers of attributes and levels, thus resulting in information overload experienced by the respondents. Three approaches have been proposed to handle this problem : 1) the self explication approach, 2) hybrid conjoint analysis and 3) Adaptive Conjoint Analysis (ACA).

All three methods involve some degree of self-explication, that is, direct elicitation of part-worth

functions from the respondents. These three approaches, along with the traditional conjoint analysis, can be thought of as alternative methods for preference structure measurement as shown below :

Alternative Approaches to Measuring Preference Structures
Preference Structure Measurement

- | | | |
|---------------------------------------|----------------------------------|---|
| 1) Compositional
(Self-Explicated) | 2) Decompositional
(Conjoint) | 3) Compositional/
Decompositional
(Hybrid, ACA) |
|---------------------------------------|----------------------------------|---|

In the self-explicated approach, the respondent first evaluates the levels of each attribute on a desirability scale. Then, attribute importance is usually measured by one of several direct methods, for example, by having respondents allocate the points of a constant sum scale to the various attributes in order to attribute importance. The self-explicated approach has the advantage that it is simple and the number of attributes can be great. However, respondents may lie on certain socially sensitive factors. Moreover, any redundancy in the attributes can lead to double counting.

Hybrid models (Green, Goldberg and Montemayor 1981) have been designed explicitly for task simplification in conjoint analysis. Hybrid uses self-explicated data to obtain a preliminary set of individualized part-worths for each respondent. In addition, each respondent provides full-profile evaluations for a limited number of stimulus

profiles, usually three to nine. The smaller number of profiles are drawn from a much larger master design. Market segment level adjustments to part worths are then estimated by relating, through multiple regression, the overall preferences for the full profiles to the self-explicated utilities. In fact, as stated in Green (1984), the central notion of hybrid modelling is to combine the simplicity of self-explicated approach with the greater generality of conjoint models to develop multiattribute utility functions that retain individual differences.

Adaptive Conjoint Analysis (ACA) is a computer software that collects data in an interactive mode. It is similar to the hybrid model.

All these methods are compared with traditional conjoint analysis in several studies. For example, Wright and Kriewall (1980) and Leigh, MacKay and Summers (1984) report higher predictive validity for the self-explication approach than the full-profile conjoint analysis. In fact, Green and Srinivasan (1990) recommend the use of full profile conjoint analysis if the number of attributes is small (six or fewer). When the number of attributes is 10 or more, the self-explication or hybrid methods are likely to be more appropriate.

Conjoint Analysis in Detail

Green and Srinivasan (1978) listed six steps involved

in conjoint analysis. They are :

- i. Selection of a model of preference;
- ii. Data collection method;
- iii. Stimulus set construction for the full-profile method;
- iv. Stimulus presentation;
- v. Measurement scale for the dependent variable;
- vi. Estimation method.

For the preference model, there are mainly three types: 1) part worth model, where preference is assumed to be an additive function of the values (worths) of its components (attribute levels); 2) vector model, where a continuous function is used to represent the influences of attributes on preference; 3) ideal-point model, where preference is based on the difference between actual level of the attributes and the ideal level.

After selecting the preference model, Green and Srinivasan (1978) presented two basic data collection methods, namely the two-factor-at-a-time procedure and the full-profile approach. In the first approach, the respondent is asked to rank the various combinations of each pair of factor levels from the most preferred to least preferred; while the latter approach utilizes the complete set of factors.

The two-factor-at-a-time procedure is simple to apply

and reduces information overload on the part of the respondent. However, it displays a number of limitations: 1) By decomposing the overall set of factors to two-at-a-time combinations, there is some sacrifice in realism. 2) With six factors, each at four levels, each respondent has to fill out 15 tables, each consisting of 16 cells. Even with partially balanced incomplete block designs (Green 1974), the number of required judgements is still quite high. 3) There is some tendency for respondents either to forget where they are in the table or to adopt paternized types of responses, such as always attending to variations in one factor before considering the other. (Johnson 1976).

The third step is the most difficult part. The researchers must determine the number of stimuli, the range of the attribute variation and interattribute correlation, and how the stimuli should be constructed. This will be discussed in later sections.

The remaining three steps will be discussed first. Green and Srinivasan (1978) stated that stimuli presentation can be in the form of 1) verbal description (cue stimulus card), 2) paragraph description or 3) pictorial representation. For the measurement scale, the respondent can either rank (nonmetric) or rate (metric) the various alternatives. Lastly, various estimation methods had been discussed, some of them are LINMAP, Ordinary Least Squares regression (OLS) and LOGIT.

Commercial Use of Conjoint Analysis

Cattin and Wittink (1982 & 1989) had conducted two surveys of the commercial usage of the conjoint methodology. The 1989 results were based on the responses of 66 research firms and scholars in US. The results were as follows :

- i. Totally 1,062 projects involving conjoint analysis were conducted from 1981 to 1985.
- ii. Frequency of usage of conjoint analysis by product category : a majority of the applications involve consumer goods.
- iii. Project Purpose : about 47% of the project is used for new product/concept identification. Other major purposes include competitive analysis, pricing, and market segmentation.
- iv. Means of Data Collection : usually the data is collected by personal interview.
- v. Model Specification : the most common model is part worth model for its flexibility.
- vi. Stimulus Construction : a majority of the applications involve full-profile approach.

- vii. Stimuli Presentation : the most common methods are the verbal and paragraph descriptions.
- viii Response Scale : the preference rating scale approach is used slightly more than the rank order.
- ix. Estimation Method : The most popular procedure is Least Squares method.

Stimulus Set Construction

The main problem encountered in conjoint analysis is the large number of multiattribute profiles if a full factorial design is used. For example, in a research involving 5 attributes, each with three levels, the total number of combinations is $3^5 = 243$. The problem of ranking 243 objects is by no means easily resolved. Green (1974) proposed a set of procedures - orthogonal arrays and incomplete block designs - to reduce significantly the number of combinations while retaining other desirable feature of balanced experimental designs.

In fractional factorial designs, one willingly trades off the measurement of all possible interaction effects in order to obtain a smaller number of replicates. By using this class of designs, one assumes that all higher-order interaction (three-factor and beyond) are negligible. In fact, fractions of full factorial designs that allow for estimating all the main effects of the variables are

referred to as "orthogonal arrays". Addelman (1962) gave orthogonal arrays of 8, 9, 16, 18 and 25 profiles and showed, for example, that one could use either 16 or 18 profiles for a 2^5 study. Moreover, Addelman had discussed the construction of main effect plans for both symmetrical and asymmetrical factorial experiments.

However, Green and Srinivasan (1978) argued that substantial environmental correlations between the attributes may exist. Orthogonalizing inherently nonorthogonal attributes is likely to produce stimuli which are not representative of the environment familiar to the subjects. Green and Srinivasan suggested that subjects may respond unnaturally to nonrepresentative stimuli. Therefore, Steckel, DeSarbo and Mahajan (1991) presented a new methodology utilizing combinatorial optimization procedures for creating modified fractional factorial designs that are as orthogonal as possible, which do not contain nonrepresentative stimulus profiles.

Limitations and Unsolved Problems

Cattin and Wittink (1982) presented several limitations and unsolved problems of conjoint analysis. For example, they stated that it is not straightforward to predict market share based on conjoint analysis, because 1) the models are based on preference and not on actual behaviour; 2) there are likely to be attributes not considered in the research that have much influence in the

market; 3) the effect of mass communications and distribution efforts is not considered; 4) differences between perceptions and physical features have to be included; 5) new products take time to develop and the competition situation as well as the customer preference may have changed greatly during the period.

Cattin and Wittink also stated that the following problems require attention : how to handle large number of (more than 8) attributes; how to deal with multiple decision makers and how to detect nonlinearities in preference models.

Cattin and Wittink concluded that if the hypothetical objects differ dramatically from the actual objects in the market, the task will be more demanding and the preference judgement may not be representative of the actual behaviour of the individual. Moreover, interviewees will differ on the degree to which they are devoted to providing accurate answers. Furthermore, the insight provided by the research may be improved by explicitly incorporating perceptual dimensions. Lastly, they concluded that brand names may capture a number of aspects that may be covered separately by other attributes. Similarly, price may be an indication of product quality. Therefore, brand name and price used as attributes are somewhat controversial in the conjoint study.

Values

Introduction

Values have been shown to be a powerful force in governing the behaviour of individuals in their daily life, which improved the use of values in marketing planning and strategy. In late 1960s, Rokeach's work (1968) has provided much of the impetus for research on values. Two kinds of values have been defined by Rokeach: terminal and instrumental values. Terminal values are concerned with preferred end-states of existence, and instrumental values are related to modes of behaviour which are instrumental in achieving these end-states. The interrelation between these two values is referred to as a value system. However, it has not led to the development of mechanisms for translating instrumental values into choices of objects to satisfy those values. From the point of marketing, more work needs to be done.

Later, based on the framework of Rokeach, Howard (1972) proposed an hierarchy evaluative structure which consisted of two levels, one headed by terminal values and the other headed by instrumental values (Howard 1977, p.94-163).

Terminal Values	Choice criteria for product class	Belief about product class	Attitude toward product class
Instrumental Values	Choice criteria for brand	Belief about brand	Attitude toward brand

Based on his approach, he defined that the choice criteria were generated by the values which could affect the belief and hence the attitudes toward a item. He found that 1) terminal values governed the choice criteria for products classes, while 2) instrumental values governed the choice criteria for brands. So, it is clear that the buying behaviour of an individual is greatly affected by his/her values.

While in late 1970s, Vison, Scott and Lamont (1977) had developed a similar model of consumers' values system. They suggested that values could be investigated at three mutually dependent and at least partially consistent levels of abstraction. These levels, arranged in a hierarchical network, are referred to as global or generalized personal values, domain-specific values, and evaluations of product attributes.

Global values (redefinition of terminal values), which are very centrally held and enduring beliefs, guiding actions, judgments across specific situations, and are of high salience in important decisions, evaluations and choices. Domain-specific values are the second level of values which reflects the belief that people acquire values through experience in specific situations or domains of activities. This intermediate value construct fills the gap between the traditional conception of closely held global values and the less closely held descriptive and

evaluative beliefs about product attributes. Evaluative belief is the third level of values which is less abstract and centrally held, and consists of descriptive and evaluative beliefs about the desirable attributes of product classes as well as specific brands.

In conclusion, the arguments of the two studies are very similar which show that the values of a person will affect his/her evaluative criteria, and evaluation greatly and hence will guide his/her choices and buying behaviour towards different product categories.

After years of modification and development, today there are two popular theoretical approaches used in marketing research, which can be regarded as complementary. They are: social adaptation theory and theories of cognitive representation. Both approaches are based on more or less the same value concept (Rosenberg and Fishbein 1956), and describing values as 1) concepts or beliefs; 2) about desirable end-states or behaviours; 3) that transcend specific situations; 4) guide selection or evaluation of behaviour and events; and 5) are ordered by relative importance. (Schwartz and Bilsky (1987))

Relations of Values with Environmental Behaviour

In fact, consumer attitudes and values have also been used in the past studies to predict energy conservation, recycling and ecologically-conscious purchasing and use of

products. Kassarian (1971) studied consumers' reaction towards a gasoline that reduced air pollution and found that there was a positive correlation between concern for air pollution and willingness to pay higher prices for it. Attitude toward air pollution was the most important variable in determining consumers' behaviour towards product. Kinnear and Taylor (1973) investigated attitudinal and behavioral dimensions of ecological concern and found them to have marked effects on brand perceptions for laundry products. Similarly, Balderjahn (1988) found that a positive attitude towards ecologically-conscious living resulted in ecologically-responsible buying and using of products, including the use of automobiles.

In conclusion, "why do some people make their consumption decisions differently than others?", values is one answer but not an adequate answer. Some consumers seem to have patterns that are expressed in their decision making that indicate something more fundamental guiding these decisions. Values provide an improved answer.

CHAPTER III

METHODOLOGY

Research Design

The research is divided into three parts. At the initial stage, exploratory and secondary research is conducted. Here, extensive literature review is conducted to collect relevant information in order to form the base and frame in structuring the questionnaire in later parts.

The other two parts are the descriptive research which are conducted to get a pool of information about the housewives who are the buyers of liquid detergents in Hong Kong. Using these approaches, the profile of the housewives in term of their purchasing habits and criteria, demographic, values and psychographics characteristics towards environmental protection can be derived.

Secondary Data Research

In part I, secondary data are collected from various literatures, journals and magazines. The main purpose is to find out relevant information about the green wave, green consumers and environmental protection, and subjects'

criteria in buying consumer products, the information is modified and used as the basis and frame in the structuring of the questionnaire in the later parts.

Primary Data Research

In Part II & III, the main objective is to figure out the profiles of the housewives, who are the buyers of liquid detergents, in different segments. The tools used in segmentation are their values, demographic and psychographic characteristics.

Part II

In the core part of the research, it is necessary to segment the respondents according to their values and behaviour toward environmental protection and see if there is any difference in their criteria in buying liquid detergents. In order to differentiate the respondents, they are asked a series of questions. However, due to the time limitation in carrying out survey in the street, it is not possible for us to ask too many questions in the questionnaire. In order to shorten the time while we can differentiate the respondents according to their values and behaviour towards environmental protection, part II is conducted separately to find out the most common values and behaviour in environmental protection which are then used in Part II to segment the respondents.

Sample design

The target sample is the housewives who are the buyers of liquid detergents. In the research, convenience sampling was used in the research due to the constraints on economic resources and time. Probability sampling was almost impossible in this case since a simple frame was not available. Consequently, self-administrated questionnaires were used to ask respondents in the following locations in order to reduce any biased attitude:

- i. Chuk Yuen North Estate
- ii. City One Shatin
- iii. Mei Lam Estate
- iv. Mei Foo Sun Chuen

Questionnaire design

In this part, 12 items about environmental protection were asked, which are chosen from pervious studies⁹. The 12 different items (see Appendix I) are related to values, behaviours and opinions about environmental protection and the respondents were asked to choose the five most important items that an environmental conscious people should posses.

⁹ Home, Scott. "Consumer Double Talk Makes Companies Wary," & "What Separate True Blues From Basic Brwon," *Advertising Age*, Vol.62, p.GR4.

Part III - Conjoint analysis

Introduction

The above mentioned primary and secondary sources of data are collected to distinguish the "green consumers" from others. With such a method, we can now collect data for the conjoint analysis to check if there is any difference in the consumer behaviour between those who cares more for the environment and those who do not. Conjoint analysis is used in order to mimic the real trade-off situation in purchasing. It is because the housewives, in real situation, need to face numerous brands with different combinations of attributes when they are buying liquid detergents. Hence, respondents were asked to evaluate alternative products and provide information about the trade-offs among the product attributes.

Sample design

The target sample consists of housewives who are buyers of liquid detergents. In the research, convenience sampling was used in the research due to the constraints on economic resources and time. Probability sampling was almost impossible in this case since the sample frame was not available. Consequently, self-administrated questionnaires are used to ask respondents in the following locations:

- i. Chuk Yuen North Estate

- ii. City One Shatin
- iii. Mei Lam Estate
- iv. Mei Foo Sun Chuen

Data collection

Each subject were first asked if they are responsible for purchasing liquid detergent for her family. If this was not so, the interview would not be continued. Only those target consumers would be required to conduct the study. The data was collected in 4 sites in order to access different segments of the community (different educational level and family monthly income).

Among the data collection methods, which are full-profile method and Trade-off procedure (2-factor-at-a-time method), full profile method is preferred. The is mainly due to its ability to measure overall preference judgements directly using behaviourally oriented constructs such as intentions to buy, likelihood of trial, chances of switching to a new brand, and so on. Moreover, as already stated in the Literature Review, the two-factor-at-a-time procedure displays a number of limitations, namely sacrifice in realism; large number of required judgements; and tendency for respondents either to forget where they are in the table or to adopt paternized types of responses, such as always attending to variations in one factor before considering the other. (Johnson 1976).

In simple terms, the full-profile conjoint data collection method will be to present to the subjects a number of profiles. Each profile contains a number of factors, with each factor be assigned a particular level. For example, in our experiment, colour of the detergent is a factor and there are 3 levels of colour — colourless, green and yellow. Each profile is a particular combination of the factors and the subjects are required to rank these profiles, from the most preferred to the least preferred. "Most preferred" means that the subject has the strongest intention to buy that combination, and vice versa. With all these rankings, a conjoint analysis program is able to decompose the ranking into the utility level diagram of each factor.

In addition to the ranking, each subject was required to answer the 5 questions chosen from Part II about environmental friendly aspects. Her answers would determine her attitudes toward environment conservation. Finally, at the end of the questionnaire, each subject was asked to provide some demographic data, including age, educational level and family monthly income.

However, in a consumer choice experiment, one is often plagued with two problems : 1) a multiplicity of factors that could be varied experimentally and 2) a subject's inability to handle large numbers of stimuli at any one sitting before boredom or fatigue takes over. To resolve

these problems, one must be particularly careful about the questionnaire.

Factorial experiment design

As stated in Literature Review, it is impossible to present all profiles to the subjects. For example, in a design with one factor of 4 levels, one factor of 3 levels and seven factors of 2 levels, there are $4 \times 3 \times 2^7 = 1,536$ distinct combinations. With orthogonal arrays, we can trade off the measurement of all possible interaction effects in order to obtain a smaller number of replicates. By using this class of designs, one assumes that all higher-order interactions are negligible. Therefore, these 1,536 combinations will be simplified to only 16 profiles such that the importance of each factor is still balanced. In fact, each level of one factor occurs with each level of another factor with proportional frequencies.

Actually, the first design of this study was just same as the above mentioned combinations of factors. ($4 \times 3 \times 2^7$) Originally, this research tried to examine nine attributes, and these attributes with their corresponding levels are as follows:

All of the profiles are for a 600 ml liquid detergent:

i. Colour

In the marketplace, the most common colours are yellow

and green. In addition to the concept of transparency, three colour (4 levels) were used : 1) YELLOW; 2) GREEN 3) BLUE; 4) COLOURLESS;

ii. Price

After checking the price of liquid detergent in the marketplace, it was found that the price can be grouped into three: \$3-5, \$7-9, \$13-14. In our design, 3 levels were used : 1) \$14; 2) \$8; 3) \$5;

iii. Ingredient A : Nature of Ingredients

2 levels were used: 1) NATURAL INGREDIENTS; and 2) ARTIFICIAL INGREDIENTS;

iv. Ingredient B : Biodegradability of Ingredients

2 levels were used: 1) BIODEGRADABLE; and 2) NON-BIODEGRADABLE;

v. Cleansing Power

2 levels were used: 1) STRONG; and 2) WEAK;

vi. Container & Package : Recyclability of Packaging Materials

2 levels were used: 1) RECYCLABLE; 2) NOT RECYCLABLE;

vii. Skin Protection Capability

2 levels were used: 1) HIGH SKIN-PROTECTION CAPABILITY; 2) LOW OR NO SKIN-PROTECTION CAPABILITY;

viii Manufacturing Process

2 levels were used: 1) ANTI-POLLUTION PRODUCTION PROCESS; 2) NOT ANTI-POLLUTION PROCESS;

ix. Amount of Foam

2 levels were used: 1) FOAMY (a lot); 2) FOAMLESS (little).

In designing the attributes, two levels are used in most cases. It is because it can reduce the amount and complexity of the information when the respondents are interpreting the cards. In addition, the two extreme levels can increase the contrast between the two levels and make it easier for the respondents to choose.

Most of these factors were chosen because they are the major attributes of a liquid detergent that vary among different brands. Moreover, certain environmental friendly factors were included, such as Ingredient A & B, Container & Package and Manufacturing process, due to particular objective of this study. For the levels, they were chosen to be as realistic and comprehensible as possible so that the study would not deviate too much from the actual buying situation of the target consumers and that the subjects could understand the questionnaire better. For example, for the factor 'Price', the three levels were exactly the same as those observed in a typical supermarket for a 600 ml liquid detergent. One special case was with the factor

"Colour", in which three of the four levels, (Green, Blue and Yellow), were the three most popular colours associated with liquid detergent. However, another colour - colourless - was added as the fourth level because one of the objectives of the study was to determine whether a colourless product is perceived by consumers as pure and "green" or not.

Asymmetric orthogonal arrays were then developed for this study and the design is :

Run	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10
1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	2	1	1	1	1	1	1
3	1	1	1	3	1	1	1	1	1	1
4	1	1	1	4	1	1	1	1	1	1
5	1	1	2	1	1	1	1	1	1	1
6	1	1	3	1	1	1	1	1	1	1
7	1	1	4	1	1	1	1	1	1	1
8	1	2	1	1	1	1	1	1	1	1
9	1	3	1	1	1	1	1	1	1	1
10	1	4	1	1	1	1	1	1	1	1
11	2	1	1	1	1	1	1	1	1	1
12	3	1	1	1	1	1	1	1	1	1
13	4	1	1	1	1	1	1	1	1	1
14	1	1	1	1	2	1	1	1	1	1
15	1	1	1	1	3	1	1	1	1	1
16	1	1	1	1	4	1	1	1	1	1
17	1	1	2	1	1	2	1	1	1	1
18	1	1	3	1	1	3	1	1	1	1
19	1	1	4	1	1	4	1	1	1	1
20	1	2	1	1	1	1	2	1	1	1
21	1	3	1	1	1	1	3	1	1	1
22	1	4	1	1	1	1	4	1	1	1
23	2	1	1	1	1	1	1	2	1	1
24	3	1	1	1	1	1	1	3	1	1
25	4	1	1	1	1	1	1	4	1	1
26	1	1	1	2	1	1	1	1	2	1
27	1	1	1	3	1	1	1	1	3	1
28	1	1	1	4	1	1	1	1	4	1
29	1	2	1	1	1	1	1	1	1	2
30	1	3	1	1	1	1	1	1	1	3
31	1	4	1	1	1	1	1	1	1	4
32	2	1	1	1	1	1	1	1	1	2
33	3	1	1	1	1	1	1	1	1	3
34	4	1	1	1	1	1	1	1	1	4
35	1	1	2	1	1	1	1	1	1	2
36	1	1	3	1	1	1	1	1	1	3
37	1	1	4	1	1	1	1	1	1	4
38	1	2	1	1	1	1	1	1	1	2
39	1	3	1	1	1	1	1	1	1	3
40	1	4	1	1	1	1	1	1	1	4
41	2	1	1	1	1	1	1	1	1	2
42	3	1	1	1	1	1	1	1	1	3
43	4	1	1	1	1	1	1	1	1	4
44	1	1	1	2	1	1	1	1	1	2
45	1	1	1	3	1	1	1	1	1	3
46	1	1	1	4	1	1	1	1	1	4
47	1	2	1	1	1	1	1	1	1	2
48	1	3	1	1	1	1	1	1	1	3
49	1	4	1	1	1	1	1	1	1	4
50	2	1	1	1	1	1	1	1	1	2
51	3	1	1	1	1	1	1	1	1	3
52	4	1	1	1	1	1	1	1	1	4
53	1	1	2	1	1	1	1	1	1	2
54	1	1	3	1	1	1	1	1	1	3
55	1	1	4	1	1	1	1	1	1	4
56	1	2	1	1	1	1	1	1	1	2
57	1	3	1	1	1	1	1	1	1	3
58	1	4	1	1	1	1	1	1	1	4
59	2	1	1	1	1	1	1	1	1	2
60	3	1	1	1	1	1	1	1	1	3
61	4	1	1	1	1	1	1	1	1	4
62	1	1	1	2	1	1	1	1	1	2
63	1	1	1	3	1	1	1	1	1	3
64	1	1	1	4	1	1	1	1	1	4
65	1	2	1	1	1	1	1	1	1	2
66	1	3	1	1	1	1	1	1	1	3
67	1	4	1	1	1	1	1	1	1	4
68	2	1	1	1	1	1	1	1	1	2
69	3	1	1	1	1	1	1	1	1	3
70	4	1	1	1	1	1	1	1	1	4
71	1	1	2	1	1	1	1	1	1	2
72	1	1	3	1	1	1	1	1	1	3
73	1	1	4	1	1	1	1	1	1	4
74	1	2	1	1	1	1	1	1	1	2
75	1	3	1	1	1	1	1	1	1	3
76	1	4	1	1	1	1	1	1	1	4
77	2	1	1	1	1	1	1	1	1	2
78	3	1	1	1	1	1	1	1	1	3
79	4	1	1	1	1	1	1	1	1	4
80	1	1	1	2	1	1	1	1	1	2
81	1	1	1	3	1	1	1	1	1	3
82	1	1	1	4	1	1	1	1	1	4
83	1	2	1	1	1	1	1	1	1	2
84	1	3	1	1	1	1	1	1	1	3
85	1	4	1	1	1	1	1	1	1	4
86	2	1	1	1	1	1	1	1	1	2
87	3	1	1	1	1	1	1	1	1	3
88	4	1	1	1	1	1	1	1	1	4
89	1	1	2	1	1	1	1	1	1	2
90	1	1	3	1	1	1	1	1	1	3
91	1	1	4	1	1	1	1	1	1	4
92	1	2	1	1	1	1	1	1	1	2
93	1	3	1	1	1	1	1	1	1	3
94	1	4	1	1	1	1	1	1	1	4
95	2	1	1	1	1	1	1	1	1	2
96	3	1	1	1	1	1	1	1	1	3
97	4	1	1	1	1	1	1	1	1	4
98	1	1	1	2	1	1	1	1	1	2
99	1	1	1	3	1	1	1	1	1	3
100	1	1	1	4	1	1	1	1	1	4

Combination	A	B	C	D	E	F	G	H	I
1	1	1	1	1	1	1	1	1	1
2	1	2	1	2	2	2	1	2	2
3	1	3	2	1	2	2	2	1	1
4	1	2	2	2	1	1	2	2	2
5	2	1	1	2	2	1	2	2	1
6	2	2	1	1	1	2	2	1	2
7	2	3	2	2	1	2	1	2	1
8	2	2	2	1	2	1	1	1	2
9	3	1	2	1	2	2	1	2	2
10	3	2	2	2	1	1	1	1	1
11	3	3	1	1	1	1	2	2	2
12	3	2	1	2	2	2	2	1	1
13	4	1	2	2	1	2	2	1	2
14	4	2	2	1	2	1	2	2	1
15	4	3	1	2	2	1	1	1	2
16	4	2	1	1	1	2	1	2	1

With the factors and levels defined as before, we had the following profiles :

Table 1 : Combinations of Factor Levels for the 16 Profile Cards

	Colour	Price	Ingredient A	Ingredient B	Cleansing Power	Package	Skin Protection	Production Process	Foam
1	yellow	\$ 14	Natural	Degradable	Strong	Recyclable	High	non-polluting	a lot
2	yellow	\$ 8	Natural	Nondegradable	Weak	nonrecyclable	High	polluting	little
3	yellow	\$ 5	Artificial	Degradable	Weak	nonrecyclable	Low	non-polluting	a lot
4	yellow	\$ 8	Artificial	Nondegradable	Strong	Recyclable	Low	polluting	little
5	Green	\$ 14	Natural	Nondegradable	Weak	Recyclable	Low	polluting	a lot
6	Green	\$ 8	Natural	Degradable	Strong	nonrecyclable	Low	non-polluting	little
7	Green	\$ 5	Artificial	Nondegradable	Strong	nonrecyclable	High	polluting	a lot
8	Green	\$ 8	Artificial	Degradable	Weak	Recyclable	High	non-polluting	little
9	Blue	\$ 14	Artificial	Degradable	Weak	nonrecyclable	High	polluting	little
10	Blue	\$ 8	Artificial	Nondegradable	Strong	Recyclable	High	non-polluting	a lot
11	Blue	\$ 5	Natural	Degradable	Strong	Recyclable	Low	polluting	little
12	Blue	\$ 8	Natural	Nondegradable	Weak	nonrecyclable	Low	non-polluting	a lot
13	colourless	\$ 14	Artificial	Nondegradable	Strong	nonrecyclable	Low	non-polluting	little
14	colourless	\$ 8	Artificial	Degradable	Weak	Recyclable	Low	polluting	a lot
15	colourless	\$ 5	Natural	Nondegradable	Weak	Recyclable	High	non-polluting	little
16	colourless	\$ 8	Natural	Degradable	Strong	nonrecyclable	High	polluting	a lot

The presentation of the profiles was mainly in the form of profile card with terse attribute-level descriptions (verbal description). In order to make the task more interesting to the respondents, to provide easier and less ambiguous ways of conveying information and to introduce more realism into the study, 16 bottles (physical objects) of liquid detergent were presented to the respondents together with profile cards. The sixteen bottles were of the same size. These bottles were used to convey the colour level information to the respondents.

Unfortunately, when this study was carried out, almost all out of the 10 subjects experienced medium to large degree of information overload and fatigue quickly took over. They were either unable and unwilling to rank the combinations - there were too many combinations for them to rank. They were unable to handle the large number of profiles (16), each with quite many factors (9). Moreover, one of the factors had as many as 4 levels. Consequently, the successful rate was very low or say "zero", i.e. for ten respondents, ten of them could not finish the questionnaire. Moreover, it was very inconvenient for us to find a place to place the sixteen bottles in the street, as most estate or gardens did not allow us to do so. Thus, simplification of the design is essential.

Incomplete block designs

To resolve the information overload problem, one

alternative is to adopt an incomplete block design. In such a case, not all the 9 factors are shown in the profile cards. If for example, only 4 factors at a time are shown in the cards, then for each 4 factors, only 8 profiles instead of 16 are enough. Unfortunately, the respondent will have to evaluate 18 sets of cards separately. Each set consists of 8 profile cards with each card containing only 4 out of the 9 factors. Therefore, the respondent will have to make $8 \times 18 = 144$ evaluative judgements. Though now only 4 factors and 8 profiles are ranked at a time, the respondent will have to make 18 times such ranking. Since the study was to be conducted in the streets, it was impossible to require each respondent to make 144 judgements, not to mention that respondents had to answer other questions about environmental aspects and demographics.

Hence, another alternative was adopted. This alternative was to study the most important factors or attributes only. Other factors were discarded. Moreover, certain factors would have fewer levels. The new factors and levels were :

		Code
i.	Colour	
	Level 1	YELLOW (0)
	Level 2	GREEN (1)
	Level 3	COLOURLESS (2)

ii. Price		
Level 1	\$14	(0)
Level 2	\$8	(1)
iii. Nature and Biodegradability of Ingredient		
Level 1	NATURAL and BIODEGRADABLE	(0)
Level 2	ARTIFICIAL and NON-BIODEGRADABLE	(1)
iv. Cleansing Power		
Level 1	STRONG	(0)
Level 2	WEAK	(1)
v. Skin Protection Capability		
Level 1	SKIN PROTECTION	(0)
Level 2	NO SKIN PROTECTION	(1)

As seen, only 5 factors were left. There were only 3 levels for the colour attribute because green and blue are very similar and so the blue colour was discarded. Moreover, the \$ 5 level in the price attribute was discarded because it was not popular and was only associated with the "No-frills" label distributed by a supermarket chain. In addition, the two ingredient factors were combined because natural ingredient is usually perceived by consumers to be biodegradable, though by nowadays technology, artificial products can also be biodegradable and there are also certain natural products which are hard to deteriorate. With such a perception, the two factors were blended together with two levels : Natural & Biodegradable; and Artificial & Non-biodegradable. Other factors, (manufacturing process and foam) were abandoned because they were usually neglected by consumers when they made purchasing decisions. The feelings over these two

factors were collected via the interviews with respondents during the previous study.

Now we had 5 factors, in which one factor had 3 levels and the rest had 2 levels per factor. To construct such a plan, one should firstly obtain the symmetrical orthogonal main-effect plan for 2^7 experiment which is shown as follow:

Combinations	<u>Factors</u>						
	X_1	X_2	X_1X_2	X_3	X_1X_3	X_2X_3	$X_1X_2X_3$
1	0	0	0	0	0	0	0
2	0	0	0	1	1	1	1
3	0	1	1	0	0	1	1
4	0	1	1	1	1	0	0
5	1	0	1	0	1	0	1
6	1	0	1	1	0	1	0
7	1	1	0	0	1	1	0
8	1	1	0	1	0	0	1

It is known that there exists an orthogonal main-effect plan for a 2^3 experiment in 4 runs, the runs for this plan being 000, 011, 101 and 110. Then by choosing three factors of the 2^7 plan whose factor representations are such that the generalized interaction of any two of the three factors is the third factor, three 2-level factors can be replaced by a 4-level factor according to the following scheme :

2-level factors		4-level factor
000	-->	0
011	-->	1
101	-->	2
110	-->	3

Then, the plan for 3×2^4 experiment was obtained by collapsing the 4-level factor to a 3-level factor according to the following scheme :

4-level factors		3-level factors
0	-->	0
1	-->	1
2	-->	2
3	-->	1

The plan for 3×2^4 was :

Combinations	A	B	C	D	E
1	0	0	0	0	0
2	0	1	1	1	1
3	1	0	0	1	1
4	1	1	1	0	0
5	2	0	1	0	1
6	2	1	0	1	0
7	1	0	1	1	0
8	1	1	0	0	1

We then had the following profiles :

Table 2 : Combinations of Factor Levels for the Eight Profile Cards

	Colour	Price	Clean Power	Skin Protection	Ingredient
1	Colourless	\$ 14	Strong	High	Natural
2	Colourless	\$ 8	Weak	Low	Artificial
3	Green	\$ 14	Strong	Low	Artificial
4	Green	\$ 8	Weak	High	Natural
5	Yellow	\$ 14	Weak	High	Artificial
6	Yellow	\$ 8	Strong	Low	Natural
7	Green	\$ 14	Weak	Low	Natural
8	Green	\$ 8	Strong	High	Artificial

Due to the previous experience that it is very difficult to handle physical products during the interview, 3R photographs showing the detergent bottles were used to convey the colour information to the respondents (see Appendix III). During the study, respondents were required to rank these 8 profiles from the most preferred to the least preferred. Then, respondents would answer the 5 questions about environmental issues and provide their demographic data. The 5 questions are dichromatic. A correct consumer scores one mark. Now, they could be segmented into several groups in accordance with the following 4 aspects :

Environmental Aspects

- 0-1 marks : Not Environmental Friendly
- 2-3 marks : Passive Green Supporter
- 4-5 marks : Active Green Enthusiast

Age

20 or Below
21 - 25
26 - 30
31 - 35
36 - 40
41 or Above

Educational Level

Primary School (P.1 - P.6)
Junior Secondary School (F.1 - F.3)
F.4 - F.5
Matriculation (F.6 - F.7)
Tertiary

Family Monthly Income

Below \$ 9,999
\$10,000 - \$14,999
\$15,000 - \$19,999
\$20,000 - \$24,999
Above \$25,000

(see Appendix II for questionnaire)

CHAPTER IV

RESULTS

Part II

Quantitative Results

The survey sample

Totally 100 questionnaires have been completed and collected. Among the 100 completed questionnaires, only 64 questionnaires (64%) are valid. It is because the targeted sample is the buyers of liquid detergents, the non-buyers are all screened out.

The sample was composed of 8 (12.5%) respondents with ages not more than 20, 10 (15.6%) from 21 to 25 years old, 16 (25.0%) from 26 to 30 years old, 20 (31.2%) from 31 to 35 years old, 6 (9.4%) from 36 to 40 years old and 4 (6.3%) more than 49 years old (see Appendix IV).

Their education background ranged from primary to tertiary education. They were clustered in two levels, 18 (28.1%) respondents with tertiary education and 22 (34.4%) F.4 to F.5, others fell into the remaining groups (see

Appendix V). Besides, the majority of their monthly family income, 34 respondents (53.1%), fell into the range between \$10,000 to \$19,999 (see Appendix VI).

The opinion of the respondents

The respondents were asked to choose the five most important opinions and behaviour, out of 12 items, that an environmental concern people should possess and behaves (see Appendix I).

After calculating the data and score (see Appendix VII), the five most important items are:

- i. use environmental protection bags (13.1%);
- ii. join paper recycling activities (15.0%);
- iii. environmental protection should start from individual even other people do not change their behaviour (10.0%);
- iv. to make good use of plastic bags, instead of throwing them away after used once (16.9%);
- v. to request the government to process the rubbish properly and to separate them into different categories (8.8%).

Then, these five items were used in the part III, as a tools in segmentation. They were used to segment the respondents into different groups according to their values and behaviours towards environmental protection.

Part III

Quantitative Results

The survey sample

There are totally 118 successful questionnaires completed. The target sample is the buyers of liquid detergents, the non-buyers were all screened out before completing the questionnaire.

The sample was composed of 4 (3.39%) respondents with ages not more than 20, 28 (23.73%) from 21 to 25 years old, 23 (19.49%) from 26 to 30 years old, 29 (24.58%) from 31 to 35 years old, 11 (9.32%) from 36 to 40 years old and 23 (19.49%) more than 49 years old (see Appendix VIII).

Their education background ranged from primary to tertiary education. They were clustered into two groups, 39 (33.05%) respondents with tertiary education and 50 (42.37%) F.1 to F.5, others fell into the remaining groups (see Appendix IX). The majority of their family income, 65 respondents (55.08%), fell into the range between \$10,000 to \$19,999 (see Appendix X).

The degree of participation in environmental protection activity and the extent in environmental concern was measured according to the scores of the respondents in section II of the questionnaire. After calculating the score, they were divided into three groups: 1) score 0-1 marks; 2) 2-3 marks; and 3) 4-5 marks. The scores of the respondents were clustered in the ranges between 2 - 3 marks, there are 82 (64.49%) people falling into this group.

Analytical Results

A FORTRAN computer program, called CONJOINT, is used to find the utility level for each respondent for all factor levels. It is a program based on the Ordinary Least Squares regression model for doing conjoint analysis. OLS regression offers a simple, yet robust method of deriving respondent utilities that is widely accepted as a methodology in the professional research field.

The tables and graphs in Appendix XVIII show the average utilities for each attribute level for all respondents and different segments and the relative importance of each attribute.

CHAPTER V

DISCUSSIONS AND INTERPRETATIONS

All Respondents

For all respondents, the most important attribute affecting their purchasing decision is the Cleansing Power (Importance : 43.57%), with the low cleansing power utility level being -2.58 (that of strong Cleansing power = 0). Even compare this level with other attribute levels, it can be seen that this is the most negative utility which means that weak cleansing power is most disliked by consumers (see Appendix XII).

The second and third most important attributes that affect purchase decision are the Skin Protection Capability (24.79%) and Ingredient (22.86%) respectively. Consumers prefer high skin protection capability and natural ingredient. From this figure, it can be deduced that consumers generally care for their benefits first before they care for the environment. Therefore, the best selling liquid detergent must have the strongest cleansing power. Then, the detergent should promise the consumers such benefits as skin protection. Only after this will the

consumers take into consideration the environmental factors such as natural ingredient.

It can be seen that the importance indices for Skin Protection and Ingredient are very close. For other segments, these two figures are still very close. The reason may be that consumers tend to link skin protection capability to the presence of natural ingredients, although artificial ingredient detergent can have high skin protection capability in the presence of certain additives.

The Price factor has little importance (1.07%) in the buying decision. The main reason may be that liquid detergent is a low involvement product. Even the highest price is only \$14. It is very unlikely to find a liquid detergent to be higher than \$ 14 in the supermarket. Moreover, the price range (\$8 - \$14) is not too great though it is the actual situation in the realistic world. As seen from the level, consumers slightly prefer higher price to lower price. Perhaps, this is due to the perception of respondents that higher price means good quality.

For the Colour attribute, people prefer yellow colour to the other two. This is mainly due to the fact that most of the detergents have lemon fragrance and are yellow in colour. Consumers are used to the yellow colour. They also prefer green colour to no colour and the reason is

that the green colour is much more popular in different kinds of cleansing solvents. Colourless product is not popular because it may be too new to the respondents.

In conclusions, consumers still prefers high cleansing power. They are price insensitive and will not hesitate paying more for better quality, skin protection and natural ingredient. However, though they are price insensitive, they are not likely to trade off quality and performance for natural ingredient and green movement. High cleansing power is still at the top of the priority list (see Appendix XVIII).

Green Consumer Segments

The respondents are segmented according to their marks from the 5 environment-related questions. The three segments are Not Environmental Friendly Group, Passive Green Supporter and Active Green enthusiast.

For the Not Environmental Friendly Group, consumers place cleansing power the first criterion and this attribute is much more important (54.55%) than the average value of all respondents (43.57%). The second most important attribute is colour and this group prefers more traditional yellow detergent to the other two colours. They are much more price sensitive than other groups (12.73%) and they prefer cheaper products. For the last two attributes, they are not too important in affecting the

buying decision. Maybe this is due to the pragmatic nature of this group. They want skin protection capability but they will not sacrifice the opportunity to buy cheaper and yellow detergents.

For the Passive Green Supporters, they know something about green movement but they would not actively participate in such campaign. They will, however, support for their benefits and at their convenience. This character can be deduced from results of this group. Their decision pattern is very similar to the whole respondents. The cleansing power (42.40%) is at the first place, then skin protection and ingredient (25.28% and 21.75%) follow. They are also price insensitive. The major difference between this group and all respondents is that the importance of skin protection is a bit higher and that of ingredient is a bit lower. Moreover, in this group, green colour is almost no better than colourless product.

For the active green enthusiast, though the most important attribute is still cleansing power, the value drops to only 36.61%. Both the values of skin protection and ingredient attributes rise (26.02% and 27.23%). Consumers rank natural ingredient higher than high skin protection capability. Moreover, the price attribute has dropped to a very lower level (0.91% only).

For the colour, this group prefers green to yellow to

colourless. The reason may be due to the close relation of green colour with environmental friendly. Colourless product seems to be irrelevant to environmental friendly aspects. However, the failure of cleanliness concept in liquid detergent may be due to the perception that transparent product lacks some additives to give the same cleansing power as its colour counterparts. Therefore, aggressive promotion must be conducted to emphasize its quality. On the other hand, transparent product may be very attractive in other product categories such as soft drinks, which has direct contact with human beings, since transparency is usually associated with pure and good health.

In conclusion, all consumers put cleansing power the most important factor in their decision. However, its importance drops from 54.55% in Not Environmental Friendly Group to 42.4% in Passive Green Supporters and to 36.61% in Active Green Enthusiast. The Active Green Enthusiast tends to be more concerned over the ingredients of the detergent. They prefer natural ingredient and the importance index of this attribute is 27.23% for this group. Compare this value with that of Not Environmental Friendly Group (9.09%). The Active Green Enthusiast Group is very price insensitive (0.91%) compared with Not Environmental Friendly Group (12.73%). Moreover, in the colour attribute (9.23%), the Active Green Enthusiast Group prefers the green colour to yellow. All other groups prefer yellow

colour (see Appendix XIII & XVIII).

Demographic Effect

In order to investigate the influences of demographic characteristics on the criteria in choosing liquid detergents, the sample is divided according to their ages, education level, and family monthly income level; and they are analyzed independently to see if we can observe any special trend.

The Effect of Age

In fact, the results of each group are consistent to the overall results. The importance of the factors, in percentage, arranged in descending order is 1) Cleansing Power (ranged from 50-26%); 2) Skin Protection Capability (ranged from 29-19%); 3) Ingredient (ranged from 34-15%); 4) Colour (ranged from 12-7%); 5) Price (ranged from 11-1%) (see Appendix XVIII).

However, there is a special finding. It was found that the importance of cleansing power of the youngest group (20 years old or below) is significant lower than that of the other groups, while the importance of ingredient is the highest among all groups (see Appendix XIV). In conclusion, for the youngest group, the utility of natural and degradable ingredient is higher than that of high cleansing power.

The reason is that most of them are just helping their mothers or parents to buy the liquid detergents, they are not the final users. Consequently, they will not consider the cleansing power of the products as the most important factor, although it is the basic function of the products and is important to the respondent who is the final user. Moreover, they are younger and received more messages and information about environmental protection through the schools and media. They may be more concerned about the problem of pollution all over the world. Besides, liquid detergents are one of the major domestic pollutants and they consider that natural and degradable contents are less polluting and chose the content of the ingredients as the most important factor.

The Effect of Education

In conclusion , the results are also similar to the overall results. The results show that the importance of the factors arranged in descending order is: 1) Cleansing Power (ranged from 44-39%); 2) Skin Protection (ranged from 27-16%); 3) Ingredient (ranged from 22-21%); 4) Price (ranged from 14-9%); 5) Colour (ranged from 8-3%) (see Appendix XVIII).

It was found that the importance of ingredient is nearly the same among all five groups, ranging from 22 to 21% (see Appendix XV). That is, most of the housewives in

Hong Kong possesses a relative high level of awareness towards environmental protection. Actually, it is not surprising and is consistent with the work done by the government in recent years. The government has done a lot of promotional programmes to educate the public about the importance of environmental protection.

The Effect of Respondents Family Monthly Income

Actually, there is not too much that can be drawn from the results. In general, the results are also consistency with the overall results with Cleansing Power (ranged from 52-34%) as the most important factors, while the others, arranged in descending order, are Skin Protection Capability (ranged from 26-21%); Ingredient (ranged from 28-16%); Colour (ranged from 14-7%); Price (ranged from 10-1%) (see Appendix XVIII).

The only special thing is that the utilities of high (\$14) and low (\$8) price are different among the five groups. However, there is no specific patterns. The reason may be that liquid detergent is a low involvement product with relatively low price and the difference between \$14 and \$8 is not very large to the customers.

Relationship Between Demographic and Consumers' Attitudes Towards Environmental Protection

No demographic differences among the different green

consumer segments were found. Using chi-square analysis, there were no significant differences between the segments at $\alpha = .10$ with regard to age ($X^2 = 10.67$), education ($X^2 = 8.29$), and family monthly income ($X^2 = 14.96$). Hence, the hypothesis that attitudes toward environmental protection is independent of customers' demographic characteristics cannot be rejected (see Appendix XVII).

Conclusion

On the whole, consumers consider cleansing power as the most important criterion in their purchasing decision. They are price insensitive and will not hesitate to pay more for better performance, skin protection, and natural and degradable ingredients. However, though they are less price sensitive, they are not likely to trade off skin protection and performance for natural and degradable ingredient or environmental friendly attributes. In addition, colour is not an important criterion in the buying behaviour as its importance is not significant when compared with others.

According to the results, the respondents ranked the environmental friendly attributes as the third important criterion. This means that, though consumers are price insensitive, they would not trade off skin protection and performance for natural and degradable ingredients. It can be concluded that the concept of green marketing in liquid

detergent is not working very well in Hong Kong nowadays. Fortunately, the youngest group have shown some preference for environmental friendly products to other attributes. Therefore, in the near future, the awareness of environmental protection should increase as these youths grow up, and the concept will then become much more popular. In the meantime, environmental friendly attributes are only complementary to the cleansing power and skin protection attributes.

On the other side, the importance of colour attribute is very low and it is usually the least or second least important criterion, which means that the colour of the products is not an important consideration to the consumers. Moreover, in general, the utility of "Colourless Product" is the lowest among the three colours, namely green, yellow and colourless. It is because yellow and green are the two most common colours associated with such products as liquid detergent in Hong Kong, and the respondents may not be familiar with the colourless concept. So, in conclusion, the concept of "Transparent/Clear" in Hong Kong is not too popular or even unknown among the general public.

The findings of attitudes and values approach in segmentation are quite satisfactory. By segmenting the respondents in such way, it was found that there is significant difference in the buying behaviour between the

active and passive environmentally concerned group as well as environmentally unconscious group. In general, respondents put cleansing power as the most important criterion in their buying decisions. However, its importance dropped from about 55% in Not Environmental Friendly Group to about 37% in Active Green Enthusiast. The Active Green Enthusiast tends to be more concerned over the nature of the ingredients in the detergent. They prefer natural ingredient and are very price insensitive (0.91%) when compared with the Not Environmental Friendly Group (12.73%). Moreover, when considering the attribute - colour (9.23%), the Active Green Enthusiast Group prefers green to yellow. The reason may be due to the close relation between green colour and green products.

For the demographic characteristics, it was found that among the three demographic characteristics, only age has effects on the purchasing decision. The younger the age of the respondent, the more credit would be given to environmental friendliness. Other characteristics like family income levels and education levels have no significant influence on the purchasing decision. The finding is consistent with the findings of Webster (1975) and Balderjahn (1988) which revealed that demographics were weak predictors of ecological behaviour.

Implication

In fact, it is observed that the buying behaviour between different groups of environmental commitment is rather different. The green consumers and the youth prefer detergents with natural and degradable ingredients to those without. Therefore, it can be presumed that the consumers have become increasingly environmentally conscious. Hence, we can conclude that a strategic marketing planning process is necessary for dealing with these rising concerns. In putting this process into place, consumer marketers should keep in mind the following :

- i. Environmentalism is not just a passing fad. It is strongly supported and will be here for the long run.
- ii. "Green" consumers, which are growing in importance, exercise choices that reflect a preference for environmental-friendly products.
- iii. Effective communication and continuous monitoring are critical process for the long-term viability of a green marketing strategy.
- iv. Green marketing offers increased long-term profit potential and reduced environmental risk as well as the basis for a sustainable competitive advantage to companies that pursue it optimally.

Limitations

- i. The main limitations of this study is the fear of information overload of the respondents. In such a case, several factors have to be discarded after the pre-test. Though these discarded factors are not considered too important by the respondents, the predictivity may be improved if they were included. Moreover, only five questions about environmental aspects are asked to segment the respondents. Fortunately, these five questions, selected from pre-test, are able to segment the respondents.
- ii. Since the study was conducted via interviews in the streets, it is not practical to approach the same respondents after a period of time and asked to perform the rank ordering on the same set or on a second set of stimuli as a test of reliability. (The second stimulus set would have n descriptions from the same factor levels as the first set but would avoid duplication of the first set.) Nevertheless, a matched sample might be taken in the future studies to look at the reliability of the results reported in this paper, and to see if there is significant shifts in the importance and part-worths of the attributes.

- iii. The possibility of conducting external validity test is also made impractical by the nature of study (in the streets with no incentives to the respondents) as well as information overload. The test, referred to as predictive validity, is proposed by Parker and Srinivasan (1976), by comparing the predictions against a respondent's actual behaviour with respect to real stimuli. During recent years, individual level comparisons in which conjoint analysis is used to predict actual choices at some later date was addressed by Srinivasan (1988) and Krishnamurthi (1988), etc. Future studies should address this issue though predictive validity is not a focus in this study.
- iv. Through the use of orthogonal design, all interaction effects have been ignored. Nevertheless, some respondents have the perception that natural ingredient has better skin protection capability. It may be better to incorporate interaction effects in future research. An algorithm that incorporates selected interaction terms after main effect terms have been estimated, has been proposed by Green, Carroll and Carmone (1978).
- v. This study is particular to the liquid detergent

product. However, since this is a low involvement product, people will not be too price sensitive and this agrees with our results. For higher involvement product, people tend to rely upon different strategies in purchasing and will be much more price sensitive.

- vi. According to a report from Mintel in 1991, 31% of male and 46%¹⁰ of female will actively seek green substitutes during purchasing. However, in this study, the target is female and it is not possible to study any difference in consumer behaviour with respect to gender.
- vii. Conjoint analysis requires respondents to rank profile cards. This characteristic makes respondents over 50 difficult in examining the cards due to visual problems. However, these respondents have been excluded from our sample.
- viii. Almost every respondent will claim that they care for the environment in an interview. This cast uncertainties over their answers to the five environment related questions. Some of them may even lie. This is also the reason why conjoint analysis is used instead of self-explicated method in predicting buying behaviour. People may

¹⁰Peattie, Ken. *Green Marketing*. Pitman 1992.

lie on socially sensitive questions when self-reporting method is used in data collection.

- ix. In the research, convenience sampling was used in the research due to the constraints on economic resources and time. Nevertheless, the survey was conducted in four different sites in order to get access to different social classes and to have a better coverage.

問 卷 調 查

你好，我們是中文大學的學生，現在正進行一項問卷調查，麻煩你花幾分鐘為我們解答以下問題。

第一部份

你覺得以下那些活動是環保支持者應該支持的：（請選出“5”項）

1. 使用環保購物袋.....
2. 過去一年有因環保而購買慳電家庭用品.....
3. 參加植樹運動.....
4. 參加廢紙回收運動.....
5. 即使其他人不改變他們的生活習慣，環境保護也應由個人做起.....
6. 過去一年有因環保而放棄使用/放棄購買破壞臭氧層的噴髮膠.....
7. 游說自己的朋友一起支持環保運動.....
8. 捐款支持環保運動/環保團體.....
9. 善用舊膠袋，不會用完即棄.....
10. 要求政府去妥善處理及將垃圾分類.....
11. 過去一年有因環保而放棄使用/放棄購買發泡膠飯盒.....
12. 詳細考慮才購買印有“環保”的物件/用品.....

第二部份

1. 你的年歲大約是：

1. 20 或以下
2. 21 - 25
3. 26 - 30
4. 31 - 35
5. 35 - 40
6. 41 或以上

2. 你的教育程度大約是：

1. 小學 或以下
2. 中1 - 中3
3. 中4 - 中5
4. 中6 - 中7
5. 大專 或以上

3. 你的家庭收入大約是：

1. 低過 \$ 9,999
2. \$10,000 - \$14,999
3. \$15,000 - \$19,999
4. \$20,000 - \$24,999
5. \$25,000 或以上

QUESTIONNAIRE SURVEY

We are a group of students from the Chinese University of Hong Kong. Now we are conducting an questionnaire survey and this will take you just a few minutes to complete.

Section I

Which of the following items that you think an environmental concern people should behave or posses?

(Please tick "FIVE" of them)

1. To use the environmental protection bags. ()
2. To buy "Electricity Saving" electronic appliances because of environmental concern during the past year. ()
3. To take part in "Tree Planting" activity ()
4. To take part in "Paper Recycle" activity ()
5. Environmental protection should start from "Individual" even other people are not changing their ways of living ()
6. Refused to buy/use aerosol products, like hair-spray, because of environmental concern ()
7. To persuade his/her friends to take part in environmental activities ()
8. Donate to the organisations which are involved in environmental activities ()
9. To make good use of plastic bags, instead of throw them away after used once ()
10. To request the government to process the rubbish properly and sort them into different categories ()
11. Refused to buy/use the expanded foam box because of environmental concern ()
12. Think carefully before buying those products which are labelled as "Environmental Friendly" ()

Section II

1. Age:
 - i. 20 years or below ()
 - ii. 21 - 25 years old ()
 - iii. 26 - 30 years old ()
 - iv. 31 - 35 years old ()
 - v. 36 - 40 years old ()
 - vi. 41 years old or above ()

2. Education level:
 - i. Primary or below ()
 - ii. Form 1 - 3 ()
 - iii. Form 4 - 5 ()
 - iv. Form 6 - 7 ()
 - v. Tertiary or above ()

3. Household monthly income:
 - i. \$9,999 or below ()
 - ii. \$10,000 - \$14,999 ()
 - iii. \$15,000 - \$19,999 ()
 - iv. \$20,000 - \$24,999 ()
 - v. \$25,000 or above ()

BOTTLE 1

價錢

\$ 14 (600ml)

成份

天然物質

可自然分解

去污力

強

護膚功能

高

BOTTLE 2

價錢

\$ 8 (300ml)

成份

人造物質

不可自然分解

去污力

弱

護膚功能

低

Appendix II

BOTTLE 1

價錢

\$ 14 (600ml)

成份

- 天然物質提煉
- 可自然分解

去污力

- 強

護膚功能

- 高



BOTTLE 2

價錢

\$ 8 (600ml)

成份

- 人造物質
- 不可自然分解

去污力

- 弱

護膚功能

- 低



BOTTLE 3

價錢

\$ 14 (600ml)

成份

- 人造物質
- 不可自然分解

去污力

- 強

護膚功能

- 低

BOTTLE 4

價錢

\$ 8 (600ml)

成份

- 天然物質提煉
- 可自然分解

去污力

- 弱

護膚功能

- 高



BOTTLE 5

價錢

\$ 14 (600ml)

成份

- 人造物質
- 不可自然分解

去污力

- 弱

護膚功能

- 高



BOTTLE 6

價錢

\$ 8 (600ml)

成份

- 天然物質提煉
- 可自然分解

去污力

- 強

護膚功能

- 低



BOTTLE 7

價錢

\$ 14 (600ml)

成份

- 天然物質提煉
- 可自然分解

去污力

- 弱

護膚功能

- 低

BOTTLE 8

價錢

\$ 8 (600ml)

成份

- 人造物質
- 不可自然分解

去污力

- 強

護膚功能

- 高



BOTTLE 1

Colourless

Price

\$14

Ingredient

Natural & Degradable

Cleansing Power

Strong

Skin Protection Capability

High

BOTTLE 3

Green

Price

\$14

Ingredient

Artificial & Non-degradable

Cleansing Power

Strong

Skin Protection Capability

Low

BOTTLE 5

Yellow

Price

\$14

Ingredient

Artificial & Non-degradable

Cleansing Power

Weak

Skin Protection Capability

High

BOTTLE 2

Colourless

Price

\$8

Ingredient

Artificial & Non-degradable

Cleansing Power

Weak

Skin Protection Capability

Low

BOTTLE 4

Green

Price

\$8

Ingredient

Natural & Degradable

Cleansing Power

Weak

Skin Protection Capability

High

BOTTLE 6

Yellow

Price

\$8

Ingredient

Natural & Degradable

Cleansing Power

Strong

Skin Protection Capability

Low

BOTTLE 7

Green

Price

\$14

Ingredient

Natural & Degradable

Cleansing Power

Weak

Skin Protection Capability

Low

BOTTLE 8

Green

Price

\$8

Ingredient

Artificial & Non-degradable

Cleansing Power

Strong

Skin Protection Capability

High

問 卷 調 查

Appendix III

你好，我們是中文大學的學生，現在正進行一項有關經濟環境的市場調查，麻煩你花幾分鐘為我們解答以下問題。

你在家中是否負責購買或烹調了

第一部份

請你選出每星期對各類飲料的消費

請留意

1. _____

第二部份

1. 你通常購買哪類牛奶？(請填出品牌名稱)
2. 你通常購買哪類鮮奶？(請填出品牌名稱)
3. 你通常購買哪類鮮奶？(請填出品牌名稱)
4. 你通常購買哪類鮮奶？(請填出品牌名稱)
5. 你通常購買哪類鮮奶？(請填出品牌名稱)

第三部份

1. 你的年級是

1. 大一
2. 大二
3. 大三
4. 大四
5. 其他

2. 你的家庭成員包括

1. 爸爸
2. 媽媽
3. 哥哥
4. 姐姐
5. 弟弟
6. 妹妹
7. 其他

3. 你的家庭月收入約是

1. 低過 \$ 8,000
2. \$ 10,000 - \$ 14,999
3. \$ 15,000 - \$ 19,999
4. \$ 20,000 - \$ 24,999
5. \$ 25,000 或以上

問 卷 調 查

你好，我們是中文大學的學生，現在正進行一項有關洗潔精的市場調查，麻煩你花幾分鐘為我們解答以下問題。

你在家中是否負責購買洗潔精？ 是 否

第一部份

請你選出最喜歡至最不喜歡的洗潔精

最喜歡

最不喜歡

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____

第二部份

1. 你是否覺得即使其他人不改變他們的生活習慣，環境保護也應由個人做起？.....是 否
2. 你有無使用環保購物袋？.....有 無
3. 你有無參加廢紙回收運動？.....有 無
4. 你有無善用舊膠袋，不會用完即棄？.....有 無
5. 你有否參加要求政府去妥善處理及將垃圾分類的運動？.....會 否

總分 _____

第三部份

i. 你的年歲大約是：

1. 20 或以下
2. 21 - 25
3. 26 - 30
4. 31 - 35
5. 36 - 40
6. 41 或以上

ii. 你的教育程度大約是：

1. 小學 或以下
2. 中 1 - 中 3
3. 中 4 - 中 5
4. 中 6 - 中 7
5. 大專 或以上

iii. 你的家庭收入大約是：

1. 低過 \$ 9,999
2. \$ 10,000 - \$ 14,999
3. \$ 15,000 - \$ 19,999
4. \$ 20,000 - \$ 24,999
5. \$ 25,000 或以上

QUESTIONNAIRE SURVEY

We are a group of students from the Chinese University of Hong Kong. Now we are conducting a questionnaire survey and this will take you just a few minutes to complete.

Section I

Please rank the detergents displayed from:

"1 - The Most Favour" to "8 - The Least Favour"

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___

Section II

Have you done or agree with the following items?

1. Environmental protection should start from "Individual" even other people are not changing their ways of living Y() N()
2. To use the environmental protection bags. Y() N()
3. To take part in "Paper Recycle" activities Y() N()
4. To make good use of plastic bags, instead of throw them away after used once Y() N()
5. To request the government to process the rubbish properly and sort them into different categories Y() N()

Score: _____

Section III

1. Age:

- | | | |
|------|---------------------------------|-----|
| i. | 20 years or below | () |
| ii. | 21 - 25 years old | () |
| iii. | 26 - 30 years old | () |
| iv. | 31 - 35 years old | () |
| v. | 36 - 40 years old | () |
| vi. | 41 years old or above | () |

2. Education level:

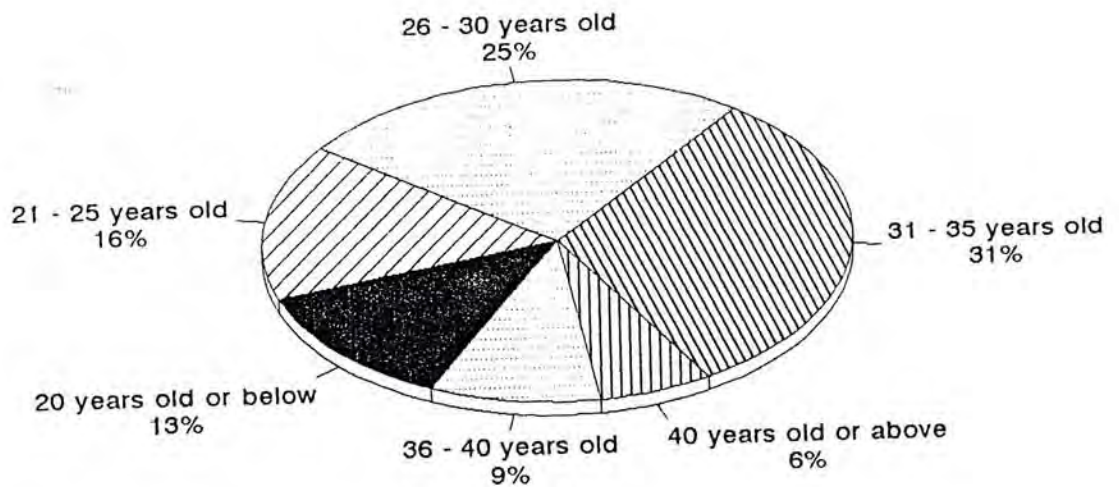
- | | | |
|------|-----------------------------|-----|
| i. | Primary or below | () |
| ii. | Form 1 - 3 | () |
| iii. | Form 4 - 5 | () |
| iv. | Form 6 - 7 | () |
| v. | Tertiary or above | () |

3. Household monthly income:

- | | | |
|------|-------------------------------|-----|
| i. | \$9,999 or below | () |
| ii. | \$10,000 - \$14,999 | () |
| iii. | \$15,000 - \$19,999 | () |
| iv. | \$20,000 - \$24,999 | () |
| v. | \$25,000 or above | () |

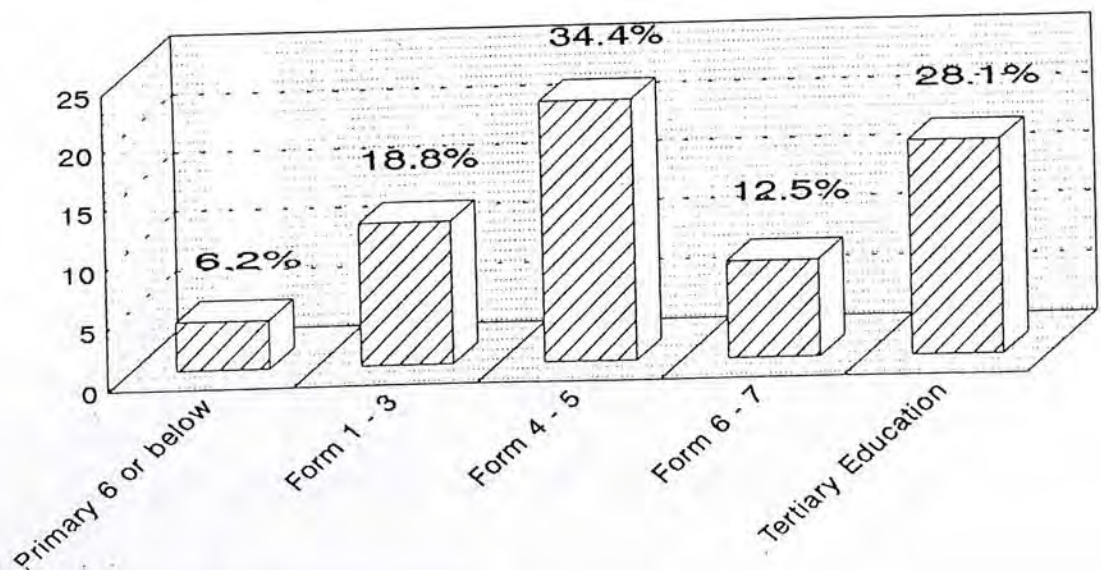
Appendix IV

Age Distribution of Households Part II



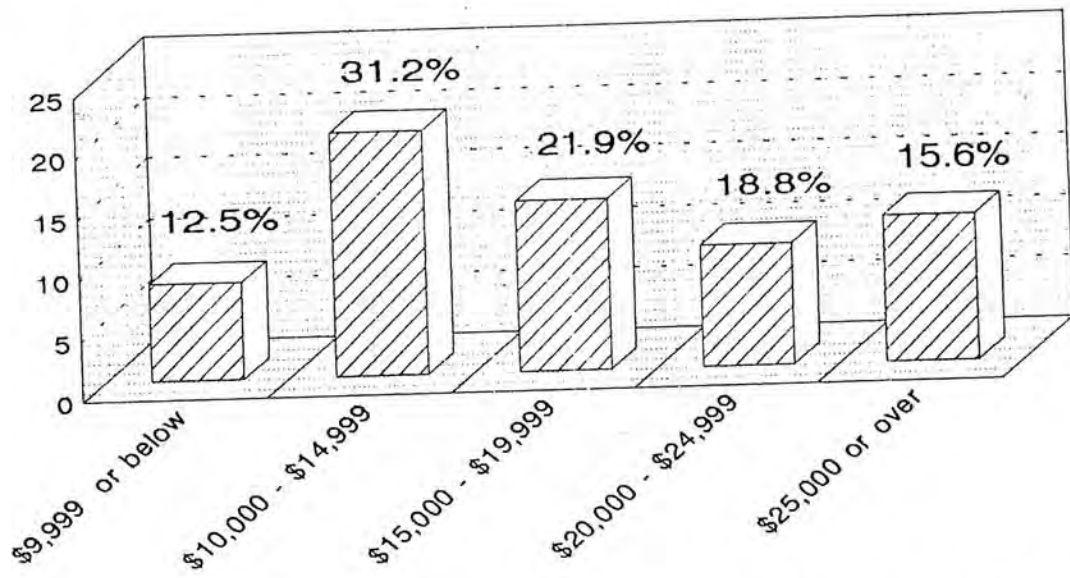
Appendix V

Education Level of Households Part II



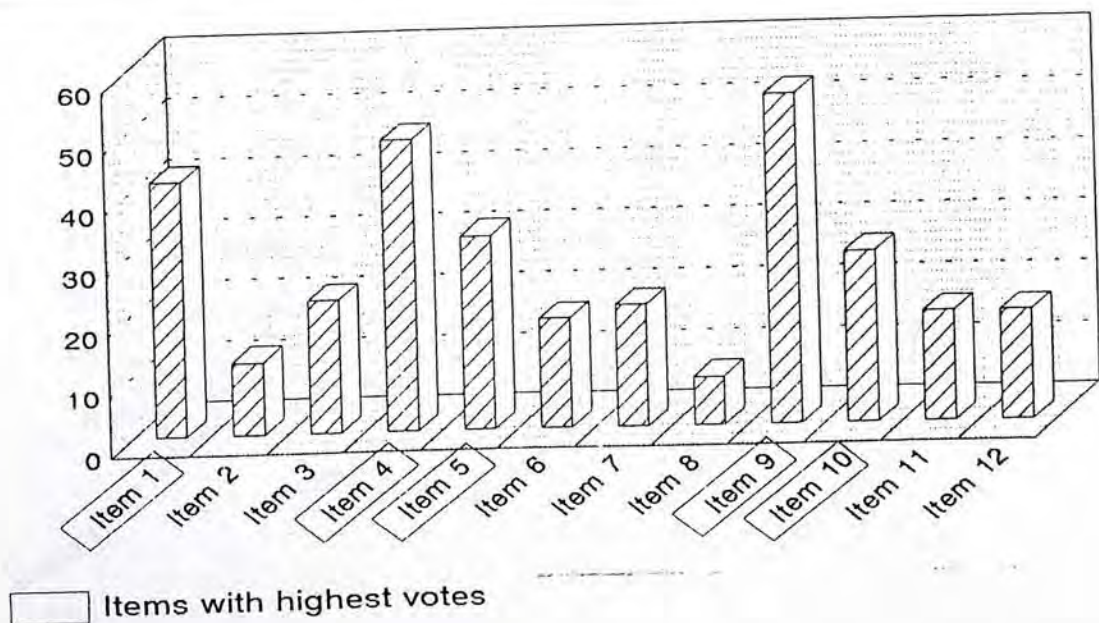
Appendix VI

Monthly Income of Households Part II



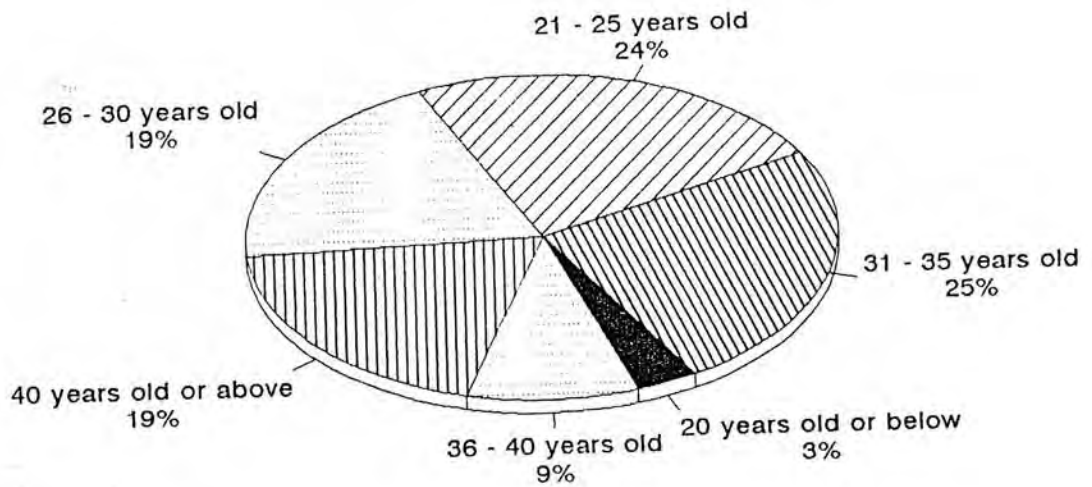
Appendix VII

Voting of Households Part II



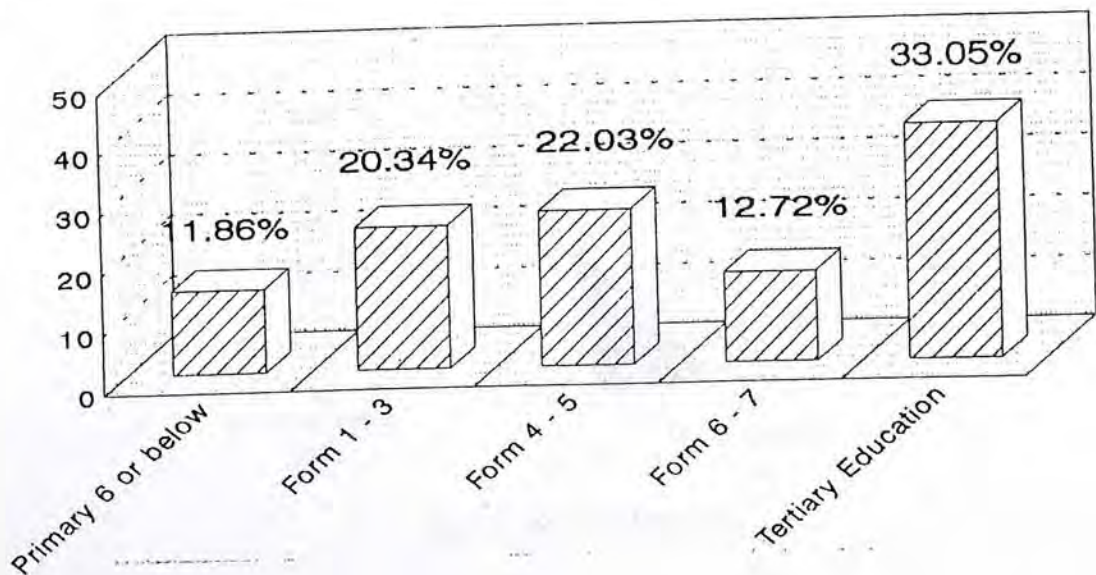
Appendix VIII

Age Distribution of Households Part III



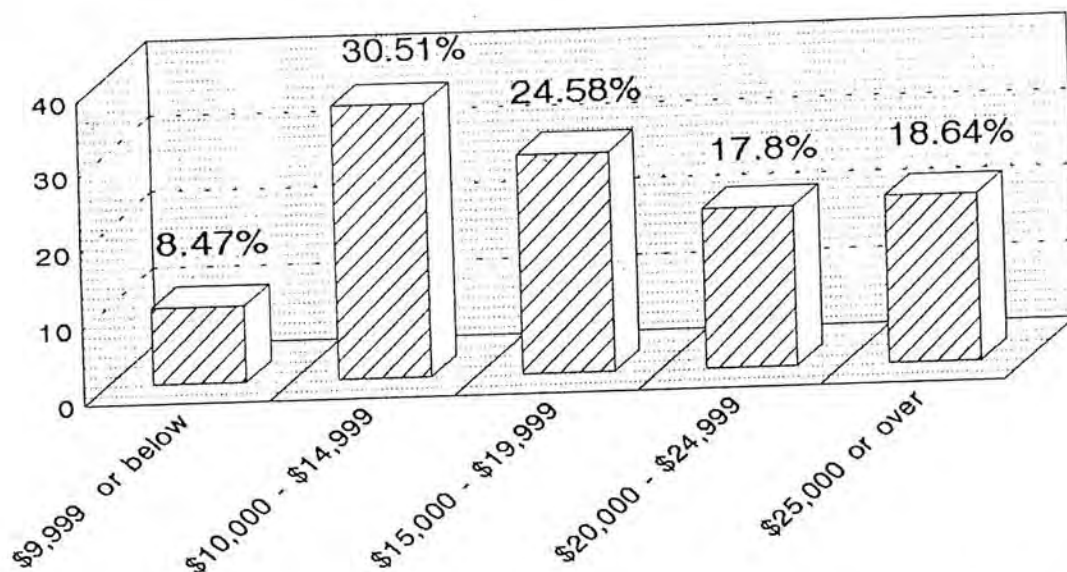
Appendix IX

Education Level of Households Part III



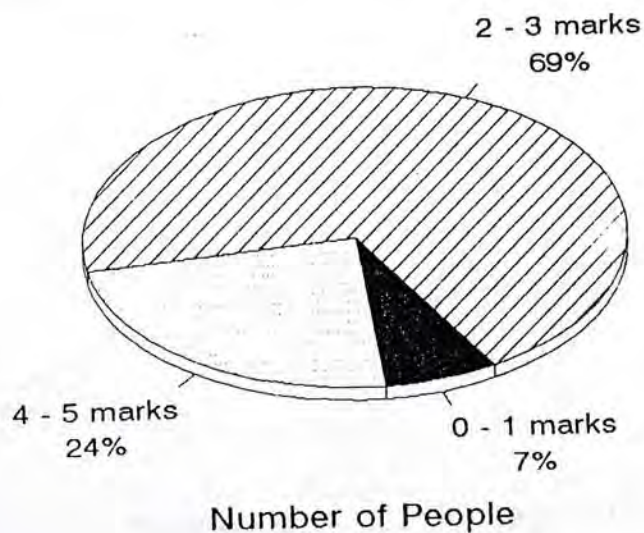
Appendix X

Monthly Income of Households Part III



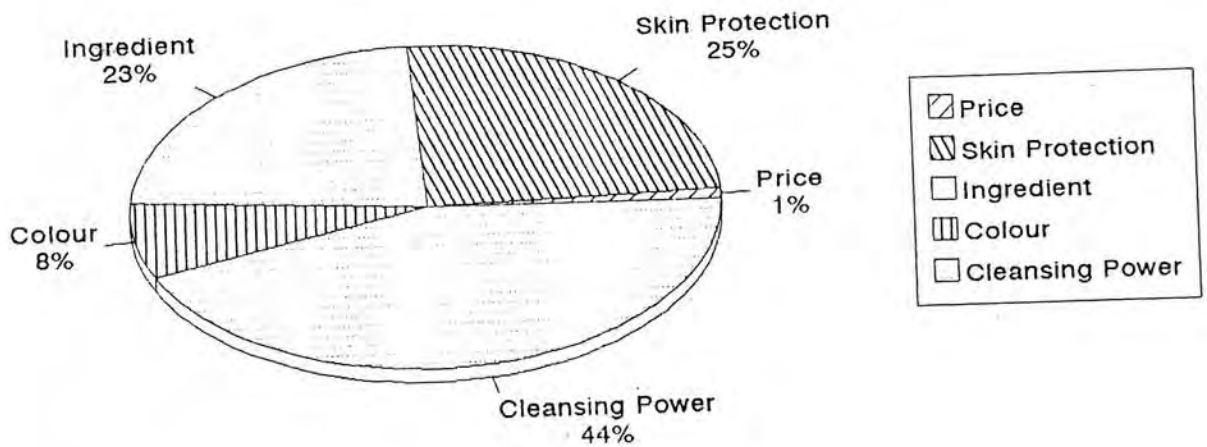
Appendix XI

Green Consumer Segments Part III



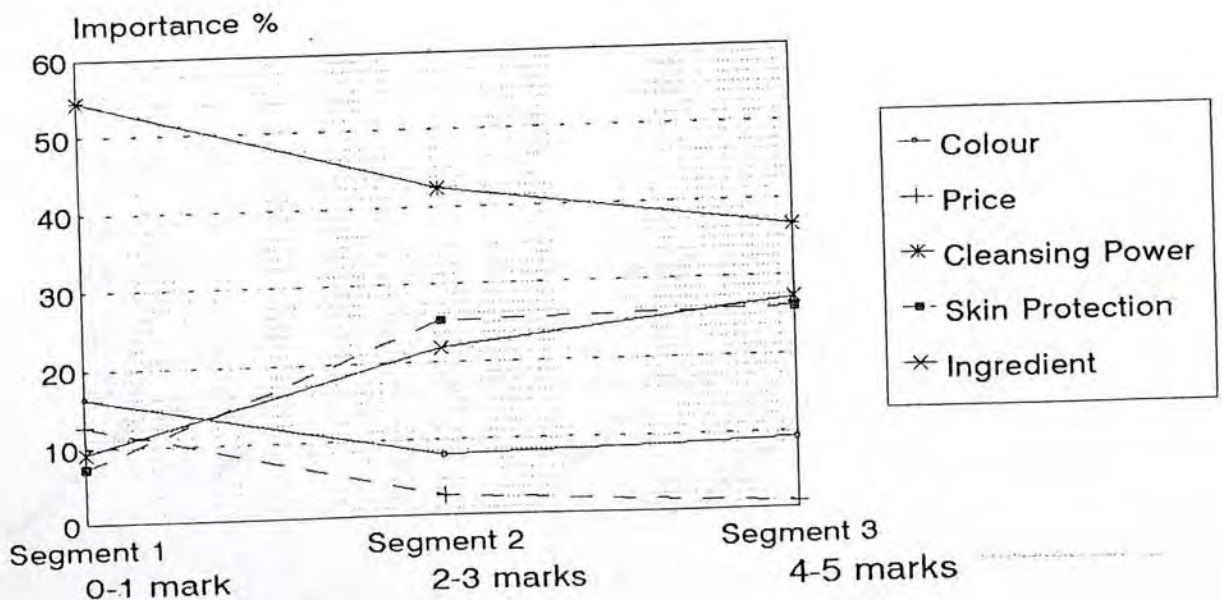
Appendix XII

Overall Result of Importance % Part III



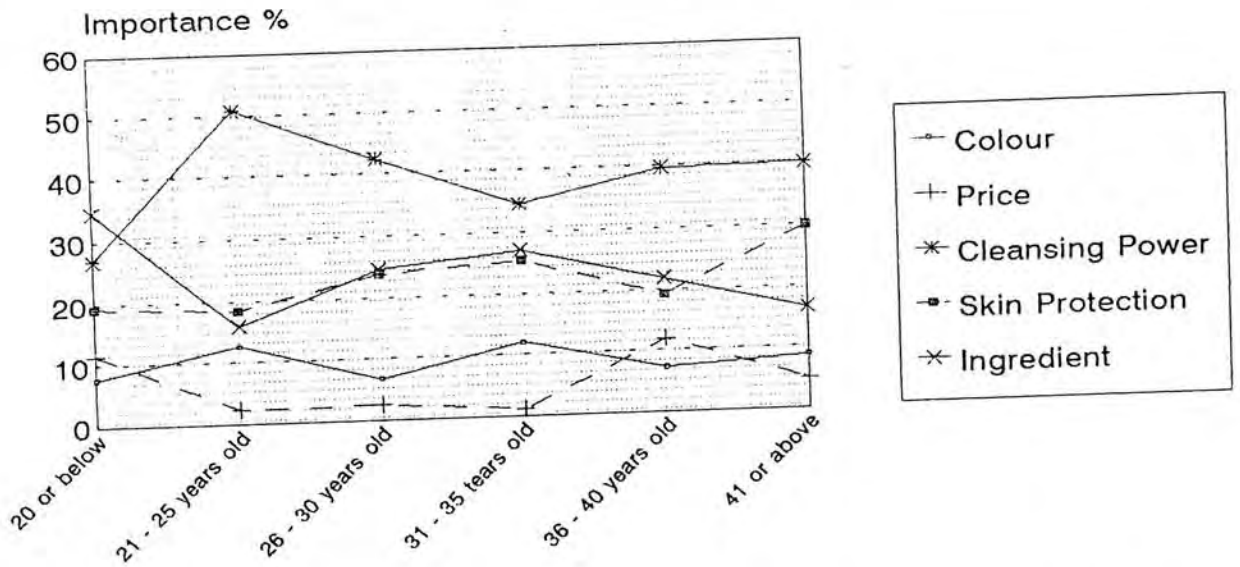
Appendix XIII

Green Consumer Segments Average Importance %



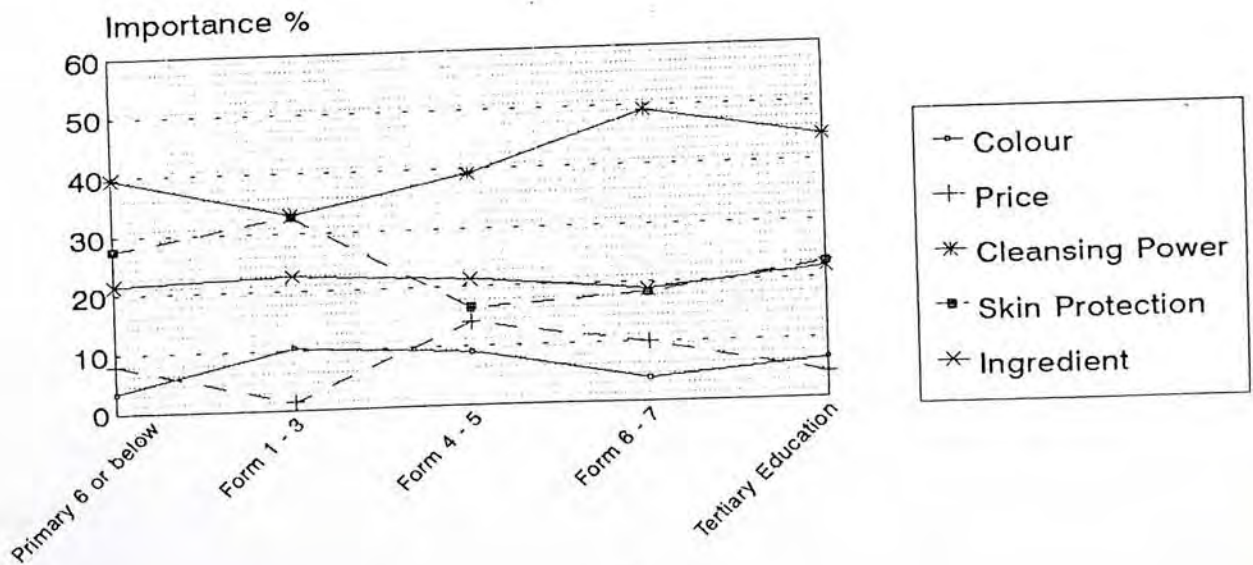
Appendix XIV

Age Segment Average Importance %



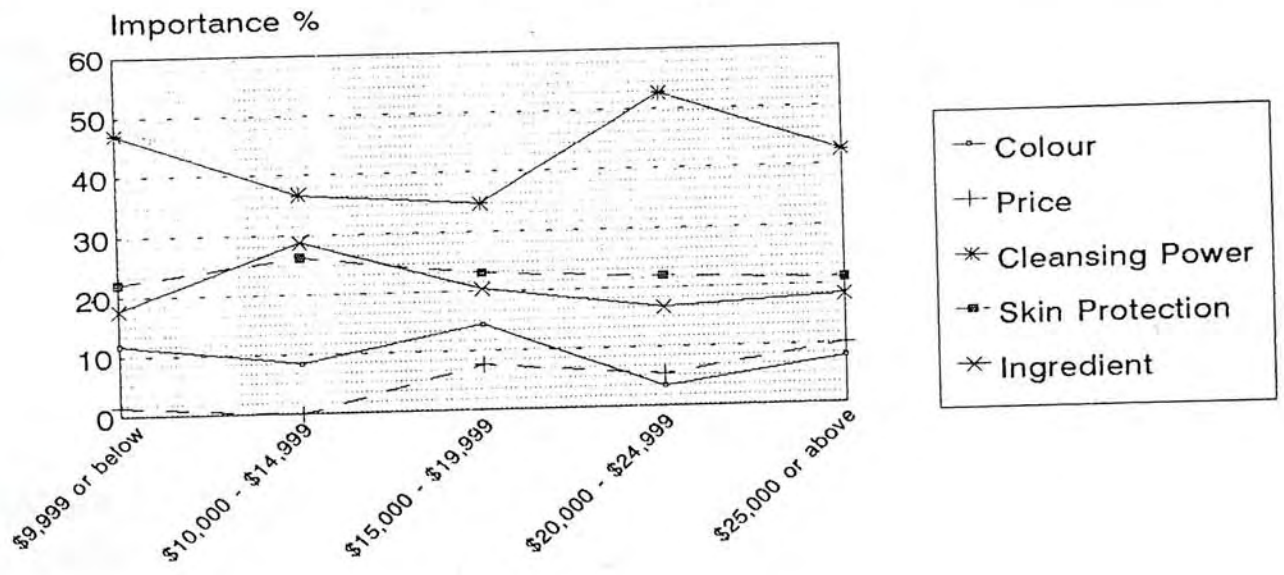
Appendix XV

Education Level Segments Average Importance %



Monthly Income Segments

Average Importance %



Appendix XVII

Ages	Score			
	0 - 1	2 - 3	4 - 5	
20 or below	0	4	0	4
21 - 25	0	22	6	28
26 - 30	2	16	5	23
31 - 35	4	21	4	29
36 - 40	0	7	4	11
41 or above	3	13	7	23
	9	83	26	

$$X^2 = 10.67122$$

Education Level	Score			
	0 - 1	2 - 3	4 - 5	
P.6 or below	1	11	2	14
F.1 - F.3	2	17	5	24
F.4 - F.5	4	17	5	26
F.6 - F.7	2	11	2	15
Tertiary Education	0	27	12	39
	9	83	26	

$$X^2 = 8.2945$$

Monthly Income	Score			
	0 - 1	2 - 3	4 - 5	
\$9999 or below	2	7	1	10
\$10000 - \$14999	0	32	4	36
\$15000 - \$19999	4	18	7	29
\$20000 - \$24999	2	11	8	21
\$25000 or above	1	15	6	22
	9	83	26	

$$X^2 = 14.9895$$

Appendix XVIII

Summary of the Exhibits Attached:

Exhibit 1	Overall Results	<i>All Respondents</i>
Exhibit 2	Segment 1	<i>Score 0 - 1</i>
Exhibit 3	Segment 2	<i>Score 2 - 3</i>
Exhibit 4	Segment 3	<i>Score 4 - 5</i>
Exhibit 5	Segment 4	<i>Age 20 or below</i>
Exhibit 6	Segment 5	<i>Age 21 - 25</i>
Exhibit 7	Segment 6	<i>Age 26 - 30</i>
Exhibit 8	Segment 7	<i>Age 31 - 35</i>
Exhibit 9	Segment 8	<i>Age 36 - 40</i>
Exhibit 10	Segment 9	<i>Age 41 or above</i>
Exhibit 11	Segment 10	<i>Primary Education</i>
Exhibit 12	Segment 11	<i>Form 1 - 3</i>
Exhibit 13	Segment 12	<i>Form 4 - 5</i>
Exhibit 14	Segment 13	<i>Form 6 - 7</i>
Exhibit 15	Segment 14	<i>Tertiary Education</i>
Exhibit 16	Segment 15	<i>\$9,999 or below</i>
Exhibit 17	Segment 16	<i>\$10,000 - \$14,999</i>
Exhibit 18	Segment 17	<i>\$15,000 - \$19,999</i>
Exhibit 19	Segment 18	<i>\$20,000 - \$24,999</i>
Exhibit 20	Segment 19	<i>\$25,000 or above</i>

Exhibit 1

GENERAL RESULT

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color		trans	green	yellow				
IMPORT. %:	7.71	.00	.19	.46				
price		high	low					
IMPORT. %:	1.07	.00	-.06					
power		high	low					
IMPORT. %:	43.57	.00	-2.58					
prodkin		yes	no					
IMPORT. %:	24.79	.00	-1.47					
ingre		nature	arti					
IMPORT. %:	22.86	.00	-1.36					

Exhibit 2

SEGMENT 1

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color		trans	green	yellow				
IMPORT. %:	16.36	.00	.44	1.13				
price		high	low					
IMPORT. %:	12.73	.00	.88					
power		high	low					
IMPORT. %:	54.55	.00	-3.75					
prodkin		yes	no					
IMPORT. %:	7.27	.00	-.50					
ingre		nature	arti					
IMPORT. %:	9.09	.00	-.63					

Exhibit 3

SEGMENT 2

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	7.96	.00	.05	.49				
price								
IMPORT. %:	2.62	.00	-.16					
power								
IMPORT. %:	42.40	.00	-2.60					
prodkin								
IMPORT. %:	25.28	.00	-1.55					
ingre								
IMPORT. %:	21.75	.00	-1.33					

Exhibit 4

SEGMENT 3

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	9.23	.00	.54	.20				
price								
IMPORT. %:	.91	.00	-.05					
power								
IMPORT. %:	36.61	.00	-2.16					
prodkin								
IMPORT. %:	26.02	.00	-1.54					
ingre								
IMPORT. %:	27.23	.00	-1.61					

Exhibit 5

SEGMENT 4

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	7.69	.00	-.25	.50				
price								
IMPORT. %:	11.54	.00	-.75					
power								
IMPORT. %:	26.92	.00	-1.75					
prodkin								
IMPORT. %:	19.23	.00	-1.25					
ingre								
IMPORT. %:	34.62	.00	-2.25					

Exhibit 6

SEGMENT 5

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	12.62	.00	.79	.27				
price								
IMPORT. %:	2.27	.00	-.14					
cpower								
IMPORT. %:	50.78	.00	-3.20					
prodkin								
IMPORT. %:	18.44	.00	-1.16					
ingre								
IMPORT. %:	15.89	.00	-1.00					

SEGMENT 6

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	6.76	.00	-.41	.22				
price								
IMPORT. %:	2.49	.00	.15					
power								
IMPORT. %:	42.35	.00	-2.59					
prodkin								
IMPORT. %:	23.84	.00	-1.46					
ingre								
IMPORT. %:	24.56	.00	-1.50					

SEGMENT 7

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	11.98	.00	.35	.74				
price								
IMPORT. %:	1.11	.00	-.07					
power								
IMPORT. %:	34.54	.00	-2.14					
prodkin								
IMPORT. %:	25.35	.00	-1.57					
ingre								
IMPORT. %:	27.02	.00	-1.67					

Exhibit 9

SEGMENT 8

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color		trans	green	yellow				
IMPORT. %:	7.28	.00	.39	.50				
price		high	low					
IMPORT. %:	11.92	.00	-.82					
power		high	low					
IMPORT. %:	39.74	.00	-2.73					
prodkin		yes	no					
IMPORT. %:	19.21	.00	-1.32					
ingre		nature	arti					
IMPORT. %:	21.85	.00	-1.50					

Exhibit 10

SEGMENT 9

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color		trans	green	yellow				
IMPORT. %:	8.77	.00	-.14	.54				
price		high	low					
IMPORT. %:	4.91	.00	.30					
power		high	low					
IMPORT. %:	40.00	.00	-2.48					
prodkin		yes	no					
IMPORT. %:	29.82	.00	-1.85					
ingre		nature	arti					
IMPORT. %:	16.49	.00	-1.02					

Exhibit 11

SEGMENT 10

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	3.36	.00	-.09	.18				
price								
IMPORT. %:	8.05	.00	-.43					
power								
IMPORT. %:	39.60	.00	-2.11					
prodkin								
IMPORT. %:	27.52	.00	-1.46					
ingre								
IMPORT. %:	21.48	.00	-1.14					

Exhibit 12

SEGMENT 11

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	10.46	.00	.04	.67				
price								
IMPORT. %:	1.31	.00	.08					
power								
IMPORT. %:	33.01	.00	-2.10					
prodkin								
IMPORT. %:	32.68	.00	-2.08					
ingre								
IMPORT. %:	22.55	.00	-1.44					

Exhibit 13

SEGMENT 12

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color		trans	green	yellow				
IMPORT. %:	8.98	.00	.40	.58				
price		high	low					
IMPORT. %:	14.07	.00	-.90					
power		high	low					
IMPORT. %:	39.22	.00	-2.52					
prodkin		yes	no					
IMPORT. %:	16.47	.00	-1.06					
ingre		nature	arti					
IMPORT. %:	21.26	.00	-1.37					

Exhibit 14

SEGMENT 13

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color		trans	green	yellow				
IMPORT. %:	3.87	.00	-.12	.23				
price		high	low					
IMPORT. %:	9.94	.00	.60					
power		high	low					
IMPORT. %:	49.17	.00	-2.97					
prodkin		yes	no					
IMPORT. %:	18.23	.00	-1.10					
ingre		nature	arti					
IMPORT. %:	18.78	.00	-1.13					

SEGMENT 14

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	6.56	.00	.37	.44				
price								
IMPORT. %:	4.25	.00	.28					
power								
IMPORT. %:	44.40	.00	-2.95					
prodkin								
IMPORT. %:	22.78	.00	-1.51					
ingre								
IMPORT. %:	22.01	.00	-1.46					

SEGMENT 15

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	11.76	.00	.60	.80				
price								
IMPORT. %:	1.47	.00	-.10					
power								
IMPORT. %:	47.06	.00	-3.20					
prodkin								
IMPORT. %:	22.06	.00	-1.50					
ingre								
IMPORT. %:	17.65	.00	-1.20					

Exhibit 17

SEGMENT 16

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	8.43	.00	-.01	.51				
price								
IMPORT. %:	.00	.00	.00					
power								
IMPORT. %:	36.67	.00	-2.24					
prodkin								
IMPORT. %:	26.20	.00	-1.60					
ingre								
IMPORT. %:	28.70	.00	-1.75					

Exhibit 18

SEGMENT 17

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	14.36	.00	.06	.91				
price								
IMPORT. %:	7.59	.00	-.48					
power								
IMPORT. %:	34.69	.00	-2.21					
prodkin								
IMPORT. %:	23.04	.00	-1.47					
ingre								
IMPORT. %:	20.33	.00	-1.29					

Exhibit 19

SEGMENT 18

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	3.47	.00	.20	-.21				
price								
IMPORT. %:	5.41	.00	-.33					
power								
IMPORT. %:	52.51	.00	-3.24					
prodkin								
IMPORT. %:	22.01	.00	-1.36					
ingre								
IMPORT. %:	16.60	.00	-1.02					

Exhibit 20

SEGMENT 19

TABLE OF AVERAGE UTILITIES

	1	2	3	4	5	6	7	8
color								
IMPORT. %:	7.91	.00	.51	.25				
price								
IMPORT. %:	10.19	.00	.66					
power								
IMPORT. %:	42.53	.00	-2.75					
prodkin								
IMPORT. %:	21.09	.00	-1.36					
ingre								
IMPORT. %:	18.28	.00	-1.18					

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