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The Preferences of Consumers When Selecting Clothing Detergent Products

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ABSTARCT

The retailing environment has shown that consumer purchases are dependent upon the consideration and subsequent evaluation of product attributes. Consumer's selection of products are driven by their preferences for the attributes that the products possess. The aim of this study was to investigate product attribute preferences for cross-category shopping products in Durban. The quantitative study design based on a cross-sectional descriptive survey was conducted. The study population consisted of consumers within the city of Durban. The study sampled 213 students selected from three universities in Durban (University A, B and C). Research respondents were chosen using convenience sampling. Respondents were purposely selected based on their capacity to give meaningful information relevant to the study. The Cronbach alpha test was conducted to test for reliability of the first instrument. The results indicated acceptable, consistent scoring patterns for the sections of the research instrument. The study revealed that for clothing detergent products, product form is the most important attribute followed by product effectiveness. It is important to note that significant differences were found in the respondent's preferences for product attributes in terms of the respondent's demographics. For clothing detergents, significant differences were found in terms of respondents preferences for the price, scent, size and product form of clothing detergents. Subsequently, generalised product attribute preferences were obtained. The findings of the study are limited due to the low response rate among older respondents. Future studies may benefit from investigating sub-categories. Moreover, future studies should consider other consumer segmentation methods in order to better understand and classify retail behaviour when developing modelling approaches. Retail managers may benefit from communicating more value for money for their skincare product offerings. Brands that are synonymous with longer lasting products either through offering more volume or products that require less application to achieve desired results may provide a competitive advantage.

Keywords: Attributes Preferences, Conjoint Analysis, Consideration Set, Clothing Detergent, Heuristics, Product Category
JEL Classifications: M3, M30, M31, M310

1. INTRODUCTION

Consideration set models have been applied in a variety of domains, including the analysis of survey data, scanner panel data and data collected in laboratory settings (Scherer et al., 2017). Seminal research has shown that the use of consumer consideration sets in choice modelling has largely been justified on the grounds that stage one provides a more realistic representation of the choice process, and stage two leads to improved forecasts and a better explanation of consumer behaviour (Horowitz and Louviere, 1995). Hauser and Wernerfeit (1990) and Roberts and Lattin (1991) proposed utility-maximising models for nominal product classes along with other models of choice. Nonetheless, it has been generally accepted that including the consideration set in choice model studies has been shown to improve model estimation (Horowitz and Louviere, 1995).

Within a consumer's mind, the sum total of all values of a product or brand's attributes constitute the value that the consumer attaches to the product (Kabaday et al., 2013). The decision to purchase products, therefore, involves the evaluation of alternatives based on the merits of each product's attributes (Forbes, 2008; Babin and Harris, 2017). Generally, consumers do not attach value to the entire product's attributes. Consumers seem to place greater value

on attributes that they deem more important. It was, therefore, of interest to the researcher to determine the attributes South African consumers prioritise in their consideration of selected shopping products.

In order to understand the importance placed by consumers on attributes Sharma (2011) proposed the use of multiple cues in product selection studies. The study indicated that using multiple cues would lessen the possibility of inflating the importance of other product attributes such as the country-of-origin. Particularly, among shopping goods which are evaluated using multiple attributes such as suitability, quality, price, and style such an investigation would be on interest. Moreover, a study by Jin et al. (2010) observed that the significance of product attributes varies due to the number of demographic factors to be considered. Purchasing motives are moderated by demographics such as age (Parment, 2013). Therefore, an investigation of generational cohorts may reveal information that will enable greater understanding of consumer behavioural patterns. Davis, Lang and San Diego (2014) also argued that gender plays a significant role in determining purchasing intention.

Furthermore, it was of interest to the researcher to investigate the influence of age and gender in determining product choice. According to Preez et al. (2007) South African retailers make use of the South African Advertising Research Foundations' (SAARF) Living Standards Measure (LSM) to select their target markets. The South African Advertising Research Foundation collects data through the All Media and Products Survey (AMPS). These surveys gather data from a nationally-representative sample on the consumption of media and products throughout South Africa. The Living Standards Measurement (LSM) was used as the input for an empirically derived segmentation of all South African social strata, based on a subset of variables contained in AMPS (Chipp et al., 2012. p. 20). Many South African retailers have applied the SAARF Living Standards Measure (LSM) groupings to define their target markets (Haupt, 2006; Preez et al., 2007). For the purposes of this study, the LSM grouping were also used in order to provide a better understanding of South African consumers attribute preferences. Subsequently, the following objectives were established:

- To identify product attribute preferences for clothing detergent cross-category shopping products offered by the leading retail supermarkets (Woolworths, Pick n Pay, Spar, Game and Shoprite) in Durban, South Africa.
- Investigate the effect of consumer demographics and living standard measures (LSM) on product attribute preferences clothing detergents cross category shopping products.

2. LITERATURE

For over four decades the phenomenon of the consider-then-choose approach to decision making has been well-documented (Hauser et al., 2009). The idea of consideration is linked to the concept of economic rationality among consumers. Consideration sets are based on the notion that consumers form sets that maximise their utility and minimises the costs associated with achieving that desired level of utility (Hauser et al., 2009, p. 209). All brands that can be considered by the consumer to provide the highest possible level of satisfaction from among all recognised brands will be selected for consideration (Kim et al., 2012).

Although widely accepted within marketing literature, some authors have questioned the notion of a two-stage process opting for a sequential multi-stage approach to product selection (Kardes et al., 1993: Iiuber, 2014). Despite this, the proposition that consumers do not consider all alternatives when making choices has not lacked support (Horowitz and Louviere, 1995). Due to the importance of the consideration set in the consumer decision process as well as the numerous supporting articles that have been published, there have been calls for further research into the dynamics of product consideration and the shape of the consideration set, among other factors (Kim et al., 2012).

2.1. Consideration and Choice

Studies in consumer behaviour have suggested that the consideration decision might be fundamentally different from that of choice decisions (Hauser et al., 2009). The argument has been that, consumers make use of memory based evaluations before looking at the attributes of all available options. Consumers use information that is already in their possession to decide whether to consider products from a specific brand, however, choice modelling assumes that consumer consider the attributes of all options (Adamowicz et al., 2008; Rao, 2014; Hair, 2019). Early researchers such as Payne (1976) have indicated that the consumer makes use of the consider-then-choose approach to purchasing decisions. This approach is based on experimental research and is also backed by existing prescriptive marketing literature (Hauser, 2014). In line with the consider-then-choose approach, the first stage may be shaped by memory based retrieval cues (stimulated internally or externally). Stage two, retrieval cues act as 'screening criteria' which also determine the brands selected by the consumer. The consideration set may be regarded as an extension of the consumer choice set. The size of the set is determined by the volume of product brands recalled from the individuals' memory (Stocchi et al., 2016).

Interestingly, some studies have examined the factors that affect the nature of the consideration set (Kim et al., 2012). Such studies included an investigation of the level of knowledge, in-store displays, advertising, and consumer preferences. Nonetheless, previous studies had not fully explored a retail store's influence on the formation of consideration/evoked sets. Retailers perform an important function in the business and marketing process and their function is not limited to selling manufacturers' products. As a stand-alone entity, the retail organisation possesses its own image which has the potential to influence consumer patronage and product choice (LeBlanc and Turley, 1994; Neupane, 2015). However, while there happens to be a number of possible descriptions for the consideration-set, the explanation is based on arguments that it is rational for consumers to form consideration sets (Hauser, 2014). As consumers pursue the tasks and interests of their lives, they consider the attributes and benefits of marketplace offerings, judging if they are worth purchasing. The individual may, therefore, form a subset of offerings with one or more of these attributes that are critical to them, which are then evaluated in more

detail. Consideration sets have been proposed as a mechanism for simplifying the choice process. Like many decision heuristics, consideration sets are consistent with a benefit-vs.-cost trade-off (Gilbride and Allenby, 2004; Mushtaque, 2017).

2.2. Consideration Set Formation Approaches

There are three very different views of the consumer choices that have been used in choice set modelling. The first which has been referred to as the economic view focuses on utility maximisation. Alternatives are selected using combinations of attribute bundles that offer the best trade-off. Alternately, preferences in a utility-maximising context may be defined more broadly to include other dimensions of the choice context, such as time–search costs and the opportunities for postponement (Adamowicz et al., 2008; Palazzolo, 2015). The second view is more behavioural and psychological and it argues that real choice processes may bear little resemblance to the rational processes that economists assume. In this view, if preferences even exist, they are lumpy and inaccurate; and choices result from unique heuristic rules associated with the external appearance of options in choice sets. Alternately, preferences are merely constructed at the time of choice, based on contextual factors, and an apparent preference for specific attributes merely reflects a derived demand resulting from preferences over much more proximal sources of satisfaction (Louviere and Meyer, 2008).

The third view focuses primarily on statistical ways to model discrete outcomes (in this case, choices) (Adamowicz et al., 2008). They tend to view choices simply as data. This view is consistent with a concern that preferences may be clear and well crystallised for the individual, but there may be a very noisy mapping from preferences to the observable attributes associated with the alternatives offered in any given choice set (Louviere and Meyer, 2008). Consumers use various decision rules or heuristics to simplify complicated decision tasks. This approach seems to favour the second view of rationality. Theoretical and empirical support for the use of consideration sets by consumers exists and has been displayed through decision protocols displayed in supermarkets. A phased decision process reduces the cognitive demands of the decision maker, and that the formation of the consideration set is linked to specific attributes and that the final selection is more holistic (Gilbride and Allenby, 2004).

2.3. Heuristics

Consumers often face a myriad of alternative products. Evidence suggests that consumers, who are faced with many products from which to choose, simplify their decisions with a consider-then-choose decision process in which they first identify a set of products, the consideration set, for further evaluation and then choose from the consideration set. There is also compelling evidence that consumers use heuristic decision rules to select the products for their consideration sets. Both the consider-then-choose decision process and the heuristic decision rules enable consumers to screen many products more rapidly with reduced cognitive and search costs and are thus both fast and frugal heuristics (Hauser, 2014). There are numerous cases where consumers use heuristic rules to screen products for future consideration. These rules are often simpler than those implied by the traditional additive-partworth rules used in the conjoint analysis. The study of ecological rationality characterises both heuristics and the environmental structures in which a given heuristic can be successful for a given task (Hauser, Ding and Gaskin, 2009; Aouad et al., 2021). Particularly in cognitive sciences, this coincides with normativity (Mousavi and Gigerenzer, 2014).

Cognitive heuristics are general rules of thumb that tell decision-makers what aspects to pay attention to, what to ignore and what strategy to take. This is important because decisions normally entail several alternatives and attributes. Alternatives are the options from which to choose. Examples might be different brands of coffee or different banks. Attributes are considered as components of the alternatives. Examples may include the taste or smell of a coffee or the location or opening hours of a bank (Crowder, 2015). Heuristics refer to tools that are developed through direct learning or over the course of an individual's evolution. When comparing uncertainty of real-world situations with the architecture of calculated risk, it becomes clear that most daily business decision-making situations are of the former type. Moreover, a complex uncertain problem often calls for a simple robust solution. Heuristic strategies are simple rules of thumb that solve complex uncertain situations precisely because of their simplicity, not despite it. More calculation, time, and information are not always better (Mousavi and Gigerenzer, 2014).

2.4. The Use of Heuristics

A heuristic is not simply a shortcut that avoids extra effort at the expense of reduced accuracy. It is a strategy that effectively matches the structure of information in the environment, and in doing so can be ecologically rational. The effectiveness of this ecological match has nothing to do with a mimicking of the structure of an environment in terms of its complexity (Mousavi and Gigerenzer, 2014). Heuristic strategies, in fact, ignore some of the complexity of the environment (such as available information for estimating correlations from a sample) in order to reduce both the estimation error and effort. Contrary to a common misunderstanding (for example, Kahneman and Frederick, 2002; Shah and Oppenheimer, 2008), the accuracy-effort trade-off is neither the essence of a heuristic nor does it apply to decisions under uncertainty. Heuristic strategies use learned and evolved core capacities such as memory and recall. This is why they are fast. An example is the recognition heuristic, which exploits partial knowledge (Mousavi and Gigerenzer (2014). A good heuristic can be better than a complex strategy when used in the proper environment. Less can be more. The recognition heuristic is ecologically rational when a correlation exists between recognising an option and the criteria for judgment.

There are many potential explanations for the predictive success of simple heuristics including the idea that heuristics make efficient use of data in environments to which the heuristic is adapted. For consideration decisions, we do not know which answer is best. Nonetheless, the use of heuristics is heavily reliant on informational cues or indicators which can be used by consumers to infer the values of products. As a result, investigating consumer preferences for different informational cues during product consideration may provide essential information to organisations.

2.5. Stated Preference Models

Considerable research has been applied to the task of determining how consumers combine perceptions of product attributes into preferences. In many of these applications, a linear additive function of directly stated importance-weights of product attributes and ratings of product attributes are used to predict a preference measure. According to Butler et al. (2008:748) multi-attribute preference models (MAPM) are methodologies for modelling complex preferences that depend on more than one attribute or criterion, and include multi-attribute utility theory (Keeney and Raiffa, 1976; Dyer and Sarin, 1979), conjoint analysis (Green et al., 2001), and the Analytic Hierarchy Process (Saaty, 1980; Forman and Gass, 2001).

MAPM belong to a category of models known as the Stated Preference (SP) techniques. SP methods are structured to imitate real choices with a high degree of authenticity. Numerous SP approaches that have been developed. SP method can be categorised into contingent valuation as discrete choice experiment (or choice experiments) (Johnston et al., 2017). Every one of these techniques involves the consideration of proposed options and expression of the identified preferences through surveys. The methods measure the economic value of goods through the use of survey methods. Despite this similarity, there exist noteworthy methodical variances between the SP techniques (contingent valuation, conjoint analysis and choice modelling).

Among the techniques, choice experiments or multi-attribute valuation techniques (MAV); that is, conjoint analysis and choice modelling approaches remain, generally, the most recognised. The application of conjoint analysis has been recommended for use in situations where a limited number of attributes and attribute levels are used to form the available options (Scholl et al., 2005). Therefore, conjoint analysis has been generally used in such situations as the ideal model for the establishment of consumer preferences.

2.6. Conclusion

Consumers consider different products as part of their decision making process. Identifying how consumers formulate consideration sets have been formed as well as the factors that affect its size has been explained. The use of heuristics as a way of simplifying the decision making seems to fit in with the idea of the consideration set. Stated preference models like conjoint analysis have been used successfully by researchers to identify product attributes. Therefore, this section has provided insight into the use of conjoint analysis in an effort to establish product attributes that consumer may use as heuristics in the formation of consideration sets.

3. RESEARCH METHODOLOGY

A quantitative research approach was used in the study. Using a cross-sectional descriptive research design, a sample population of 231 respondents participated in a survey designed to ascertain the attribute preferences for clothing detergent products. For the purpose of this study respondents were selected from three universities in the greater Durban area, namely; University A, University B and University C. In the study, purposive sampling was used to select the three Durban universities for their ability to provide the researcher access to desired consumer demographics. In this study convenience sampling as well as purposive sampling were used within the study.

3.1. Data Collection

Conjoint analysis is a research technique used to determine how respondents develop preferences for products or services. The methodology allows the researcher to emulate real buying situations where consumers are faced with multiple options for selection and its ability to measure overall preference judgments directly using behaviourally oriented constructs such as intention to buy. Using the part-worth function model a set of part-worths or utility values for the separate attribute (factor) levels were used to obtain the total utility for each profile presented to respondents for selection. Various data collection procedures can be used in conjoint analysis studies; however, in this study the full-profile approach was used. The full profile approach utilizes the complete set of factors for the subject to evaluate. It has been argued that the full-profile approach gives a more realistic description of stimuli by defining the levels of each of the factors and possibly taking into account the potential environmental correlations between factors in real stimuli.

Respondents from the Durban campuses of the three universities were selected via classroom intercept. Respondents considered three specific features of six attributes that were to be analysed and gave each feature a preference This study employed a visual (diagrammatic) description of the profile cards with attribute displayed columns and profiles in rows (Appendix 1).

3.2. Data Analysis

After the data was entered into Excel spreadsheets and cleaned for missing data, SPSS.12 was used to conduct conjoint analysis. Conjoint utilities (part-worths) were scaled to an arbitrary additive constant within each attribute. The arbitrary origin on the scaling within each attribute resulted from dummy coding in the design matrix. In order to determine associations between variables a multivariate technique was used to visualise the main patterns of product–contexts association on the correspondence map (Giacalone et al., 2015). Correspondence analysis (CA) is a generalisation of principal component analysis tailored to handle nominal variables. When the data table is a set of observations described by a set of nominal variables, CA becomes multiple correspondence analysis (MCA) (Abdi and Béra, 2017). Correspondence analysis is a multivariate exploratory space reduction technique for categorical data analysis. Descriptive statistics were also used which included the construction of graphs and tables, and the calculation of various descriptive measures such as averages, measures of variation, and percentiles (Isotalo, 2009). Inferential techniques included the use of correlations and Chi-squared test values; which are interpreted using the p-values. Inferential statistics allowed the researchers to make predictions about the population on the basis of information obtained from a sample that is representative of that population (Giuliano and Polanowicz, 2008).

4. RESULTS

For the purpose of the study, the targeted population was 240 respondents divided among the four generational cohorts (Baby Boomers, Generation X, Y and Z). A total of 213 respondents from to Generation X, Y and Z participated within the study.

4.1. Reliability and Validity

SPSS version 12.0, was used to determine the preferences for clothing detergent profiles. A list of ten profiles depicted in Appendix 1 were presented to respondents and ranked by the respondents in their order of preference. The Pearson correlation between preference orders marked by respondents and reproduced by conjoint program was examined. The value of Kendall's tau for two hold-outs was examined. The Pearson's calculation indicated a value close to 1 (r = 0.941) for the data indicating a good fit for the model. Moreover, Kendall's coefficient of concordance is an important non-parametric measure of relationship (Bolboaca and Jäntschi, 2006). Kendall's tau for holdouts is = 1 and shows that there is a perfect correlation between observed and predicted rank orders for the holdouts (Table 1). Therefore, this serves to validate the utility scores presented in Table 2.

Table 1: Clothing detergent conjoint analysis validity

Correlations[a]		
	Value	Significant
Pearson's R	0.941	0.000
Kendall's tau	0.857	0.001
Kendall's tau for Holdouts	1.000	

[a]Correlations between observed and estimated preferences

Table 2: Clothing detergent conjoint analysis results

Attribute	Attribute level	Part worth utility estimate	Relative importance (%)
Product form	Liquid	0.224	20.78
	Powder	−0.224	
Product effectiveness (strength)	Average	−0.135	18.78
	Very effective	0.135	
Size	2 kg/2 l	−0.101	16.66
	1 kg/1 l	0.101	
Durability	3 weeks	−0.360	15.72
	2 weeks	0.360	
Scent	Floral	−0.016	14.59
	Oceanic	0.016	
Price	Low priced	−0.066	13.47
	Moderately priced	0.066	

4.2. Conjoint Analysis Responses

Table 2 illustrates a measure of the relative importance of each attribute known as an importance score or value. As expressed in percentages, the values were computed by taking the utility range for each attribute separately and dividing by the sum of the utility ranges for all attributes. The values thus represent percentages and have the property that they summate to 100. The calculations, it should be noted, are done separately for each subject, and the results are then averaged. Table 3 also shows part-worth scores (utility estimates) established for each attribute of each clothing detergent product profile. The results show that the most important clothing detergent attribute is product form (20.78) followed by product strength (18.78), size, durability, scent and price. Utility estimates also show the differences in preferences for each attribute level. A positive utility score indicates respondent preferences. For the durability of clothing detergents respondents preferred 2 weeks (0.360) in favour of 3 weeks (−0.360).

4.3. Inferential Statistics

The Friedman's test was used to test if the relative importance values differed significantly across attributes. A significant difference in importance rankings across attributes, $\chi^2(5) = 20.029$, $P = 0.001$. In particular: product form is significantly more important than durability, scent, price and size.

4.3.1. Attribute preferences

Conjoint analysis enabled the researcher to determine the preferences of each attribute within a combination of attributes presented in a product profile. It allows for the decomposition of preferences (Eggers and Sattler, 2011). The following sections present the finding for the demographic variables that showed significant differences in the responses provided. The mean importance values for each attribute have been ordered in descending order with higher mean values indicating greater importance and lower mean values indicating low importance.

4.3.2. Generation

As shown in Table 3 significant differences were observed in respondents importance score for the price and product form of clothing detergent products. There is a significant difference in the importance rankings for price, where $f(2) = 4.432$, $P > 0.13$. Price was rated as important by Generation Z (M = 0.1570 ± 0.13348) respondents, followed by Generation Y (M = 0.1285 ± 0.11757) and Generation X (M = 0.787 ± 0.6416). Table 5 also showed the existence of significant differences in the importance rankings for the product form of clothing detergents, where

Table 3: Analysis of variance - attribute importance across generational cohorts

ANOVA						
Attributes	Generation	Frequency	Mean±SD	f	df	Significant
Price	Gen Z	93	0.1570±0.13348	4.432	2	0.013 (significant)
	Gen Y	94	0.1285±0.06416			
	Gen X	25	0.0787±0.11757			
	Total	212	0.1351±0.12222			
Product form	Gen X	25	0.3343±0.20178	10.529	2	0.000 (Significant)
	Gen Y	94	0.2186±0.16956			
	Gen Z	93	0.1636±0.15566			
	Total	212	0.2081±0.17515			

ANOVA: Analysis of variance, SD: Standard deviation

Table 4: Chi-squared test - attribute importance within generational Cohorts (X and Y)

Chi-squared test						
Generation	**Frequency (n)**	**Attributes**	**Mean±SD**	**χ^2**	**df**	**Significant**
Gen X	25	Product form	0.3343±0.20178	29.148	5	0.000 (significant)
	25	Size	0.1907±0.14523			
	25	Scent	0.1482±0.17878			
	25	Product strength	0.1332±0.14059			
	25	Durability	0.1148±0.13998			
	25	Price	0.0787±0.06416			
Gen Y	94	Product form	0.2186±0.16956	13.120	5	0.022 (significant)
	94	Product strength	0.1851±0.14004			
	94	Durability	0.1655±0.13036			
	94	Size	0.1534±0.12855			
	94	Scent	0.1488±0.13055			
	94	Price	0.1285±0.11757			
Gen next Z	93	Product strength	0.2015±0.15397	8.953	5	0.111 (not significant)
	93	Size	0.1756±0.13597			
	93	Product form	0.1636±0.15566			
	93	Durability	0.1600±0.13050			
	93	Price	0.1570±0.13348			
	93	Scent	0.1424±0.11638			

[a]Friedman test. SD: Standard deviation

Table 5: Analysis of variance - attribute importance across gender groups

ANOVA					
Gender Scent	**Frequency (n)**	**Mean±SD**	**f**	**df**	**Significant**
Female	109	0.1630±0.14634	3.905	1	0.049 (significant)
Male	103	0.1278±0.10945			
Total	212	0.1459±0.13063			

[a]Asymptotically F distributed. ANOVA: Analysis of variance, SD: Standard deviation

$f(2) = 10.529$, $P > 0.000$. The results of the test show that Generation X ($M = 0.3343 \pm 0.20178$) rated the product form of clothing detergents as important. Generation X respondents had a higher importance score for the product form compared to Generation Y ($M = 0.2186 \pm 0.16956$) and Generation Z ($M = 0.1636 \pm 0.15566$) respectively.

A separate Chi-squared test was conducted in order to determine the existence of variances in importance score for each attribute in terms of each generational cohort. The value of the Chi-squared statistic for Generation X is given as 29.148, the degrees of freedom (*df*) for the test is 5 and the corresponding P-value is 0.000. Generation Y is 13.120, degrees of freedom (*df*) is 5 with a corresponding P-value of 0.022. The Chi-squared test showed no significant differences for Generation Z (Table 4). Table 4 also shows the differences in Generation Y importance rankings for clothing detergent product. Durability, product strength and product form received higher importance rankings compared to price. Generation Y respondents also ranked product form as more important than the size and scent of clothing detergent products.

4.3.3. Gender

An analysis of variance test was conducted in order to test the presence of variances in the scoring patterns of respondents in terms of their age. The ANOVA test revealed the presence of significant difference ($P < 0.05$) in the scoring patterns of respondents for the scent of clothing detergents. The female respondents mean ranking ($M = 0.1630 \pm 0.14634$) for the scent of clothing detergents shows that scent was more important to the female respondents when compared male respondents (Table 5).

Table 6 shows the Chi-squared test was conducted to test for variances in the importance rankings within between genders. Table 6 shows that significant differences were found in the responses given by male respondents. The male respondents rated product form ($M = 0.2178 \pm 0.18594$) as more important than any of the other attribute. Product strength ($M = 0.1993 \pm 0.15180$) was rated as more important than the price ($M = 0.1292 \pm 0.13043$) of clothing detergent products. The scent ($M = 0.1278 \pm 0.10945$) of clothing detergent products received the lowest importance score. No significant differences were found among the responses of female respondents as depicted in Table 6.

4.3.4. Employment type

No significant differences were found in the importance rankings of respondents in terms of their employment type ($P < 0.05$). A Chi-squared test revealed the presence of differences in the responses of respondents who were employed full-time. The respondents who are employed full-time ranked product form. Durability received a higher importance score compared to the price and scent of clothing detergents (Table 7).

4.3.5. Residence

Table 10 depicts the existence of variances in responses provided in terms of the respondent's place of residence. No significant differences were observed in respect to the type of residence ($P < 0.05$) and the price of clothing detergents. Table 8 shows that more students residing in a student commune ($M = 0.2662 \pm 0.17569$) ranked the size of clothing detergents as important more than all the other respondents.

The analysis of variance test did not reveal the presence of significant differences in the importance rankings for the price of clothing detergents ($P > 0.05$). However, since the equal variance

Table 6: Chi-squared test - attribute importance within gender groups

Chi-squared test						
Gender	**Frequency (n)**	**Attributes**	**Mean±SD**	**χ^2**	**df**	**Significant**
Male	103	Product form	0.2178±0.18594	17.753	5	0.003 (significant)
		Product strength	0.1993±0.15180			
		Durability	0.1672±0.14002			
		Size	0.1587±0.12977			
		Price	0.1292±0.13043			
		Scent	0.1278±0.10945			
Female	109	Product form	0.1990±0.16464	7.493	5	0.186 (not significant)
		Size	0.1760±0.13772			
		Product strength	0.1738±0.14227			
		Scent	0.1630±0.14634			
		Durability	0.1476±0.12359			
		Price	0.1407±0.11425			

[a]Friedman test. SD: Standard deviation

Table 7: Chi-squared test: attribute importance - employed full-time

Chi-squared							
Employment type	**Frequency (n)**	**Attributes**	**Mean**	**SD**	**χ^2**	**df**	**Signifcant**
Employed fulltime	34	Product form	0.2928	0.20511	21.471	5	0.001 (significant)
		Durability	0.1837	0.14123			
		Product strength	0.1515	0.08803			
		Size	0.1509	0.13727			
		Scent	0.1216	0.12453			
		Price	0.0995	0.07134			

[a]Friedman test. SD: Standard deviation

Table 8: Analysis of variance - attribute importance across residence types

ANOVA					
Type of residence	**Frequency (n)**	**Mean±SD**	**f**	**df**	**Significant**
Price					
University residence	63	0.1624±0.14039	2.528	3	0.058 (not significant)
Flat	30	0.1514±0.12990			
Private home	102	0.1186±0.11135			
Student commune	16	0.0932±0.06171			
Total	211	0.1344±0.12211			
Size					
Student commune	16	0.2662±0.17569	4.390	3	0.005 (significant)
Private home	102	0.1745±0.13747			
University residence	63	0.1483±0.11360			
Flat	30	0.1301±0.11460			
Total	211	0.1673±0.13414			

ANOVA: Analysis of variance, SD: Standard deviation

Table 9: Welch Statistic: Attribute importance - residence type

Welch statistic Robust tests of equality of means				
	Welch statistic[a]	**df1**	**df2**	**Significant**
Price	3.353	3	62.766	0.024
Size	3.147	3	52.780	0.033

[a]Asymptotically F distributed

assumption was not met as a result of the unequal sample sizes, using the Welch statistic $f(3, 62.766) = 3.353$, $P < 0.05$ as depicted in Table 9. Therefore, there is no evidence against the variances in the importance rankings for price in terms of the respondent's place of residence. As shown in Table 8, price received a higher importance score from respondents residing in a university designated residence compared to respondents within a student commune. Price received a lower importance score from the respondents residing in a private residence (0.1186 ± 0.11135) compared to respondents in a flat ($M = 0.1514 \pm 0.12990$). The following research hypotheses were set based on the findings of the study;

H0: There is a difference in attribute importance in terms of the type of residence

H1: There is no difference in attribute importance in terms of the type of residence

Table 9 shows the presence of significant differences in the responses obtained in terms of the respondent's residence type. In terms of type of residence, the price of clothing detergents shows a p-value of 0.024 and size shows a p-value of 0.033. Significant differences were found in the respondents rating of price and product size. Therefore we failed to reject H0.

Table 10: Chi-squared test: attribute importance - residence types

Chi-squared						
Type of residence	**Frequency (n)**	**Attributes**	**Mean±SD**	**χ^2**	**df**	**Significant**
Student commune	16	Size	0.2662±0.17569	13.996	5	0.016 (significant)
		Product form	0.2225±0.24003			
		Durability	0.1655±0.14338			
		Scent	0.1541±0.09042			
		Product strength	0.0985±0.10533			
		Price	0.0932±0.06171			
Private home	102	Product form	0.2248±0.17679	20.704	5	0.001 (significant)
		Product strength	0.1846±0.15018			
		Size	0.1745±0.13747			
		Scent	0.1490±0.14893			
		Durability	0.1485±0.13569			
		Price	0.1186±0.11135			

[a]Friedman test. SD: Standard deviation

Table 11: Welch Statistic: attribute Importance - living standards

Welch statistic Robust tests of equality of means				
	Welch statistic[a]	**df1**	**df2**	**Significant**
Price	13.754	7	22.026	0.000

[a]Asymptotically F distributed

The Chi-squared test in Table 10 showed the existence of variances the importance rankings of respondents residing in a student commune and respondents in private home ($p < 0.05$). The size ($M = 0.2662 \pm 0.17569$) of clothing detergent products received a higher importance score compared to all other product attributes from respondents in a student commune. Product form received a high importance mean score form respondents in a private residence compared to the durability, price and scent of clothing detergent products. The price ($M = 0.1186 \pm 0.11135$) of clothing detergent products received a low importance score compared to product strength and size, respectively (Table 10).

4.3.6. Living standard measure (LSM)

An analysis of variance was also conducted with regards to the importance mean rankings of respondents' living standard. In terms of price, evidence against the variances found in respondents answers were found, where $f(7) = 1.841$, $p > 0.05$. Clearly, significant differences exist between respondents LSM levels and price.

The equal variance assumption was violated resulting in the use of the Welch statistic, where $f(7, 22.026) = 13/754$, $P < 0.001$ (Table 11). Therefore, there was no evidence against the variances in respondent responses. Price received a high importance mean score from respondents at LSM three compared to the scoring patterns of all other respondents at LSM four, five, six, seven, eight, nine and ten. The price of clothing detergent products received a low importance mean score from respondents at LSM four compared to the scoring patterns of all other LSM (Table 11).

4.4. Differences within Each LSM Group

Table 12 depicts a Chi-squared test in order to determine the presence of significance differences in the responses provided by respondents at seven LSM. Differences were found within the responses of respondents at LSM six and seven ($P < 0.05$). Product strength, size and product form received a high importance mean score from respondents compared to the importance score of scent ($M = 0.1146 \pm 0.09619$).

4.4.1. Generation

As shown in Table 13 significant differences were observed in respondents importance score for the price and product form of clothing detergent products. There is a significant difference in the importance rankings for price, where $f(2) = 4.432$, $P > 0.13$. Table 16 also showed the existence of significant differences in the importance rankings for the product form of clothing detergents, where $f(2) = 10.529$, $P > 0.000$.

A separate Chi-squared test was conducted in order to determine the existence of variances in importance score for each attribute in terms of each generational cohort. The value of the Chi-squared statistic for Generation X is given as 29.148, the degrees of freedom (*df*) for the test is 5 and the corresponding p-value is 0.000. Generation Y is 13.120, degrees of freedom (*df*) is 5 with a corresponding p-value of 0.022. The Chi-squared test showed no significant differences for Generation Z (Table 14).

4.4.2. Living standard measure (LSM)

An analysis of variance was also conducted with regards to the importance mean rankings of respondents' living standard. In terms of price, evidence against the variances found in respondents answers were found, where $f(7) = 1.841$, $P > 0.05$. Significant differences exist between respondents LSM levels and price.

The equal variance assumption was violated resulting in the use of the Welch statistic, where $f(7, 22.026) = 13/754$, $P < 0.001$ (Table 15). Therefore, there was no evidence against the variances in respondent responses. Price received a high importance mean score from respondents at LSM three compared to the scoring patterns of all other respondents at LSM four, five, six, seven, eight, nine and ten. The price of clothing detergent products received a low importance mean score from respondents at LSM four compared to the scoring patterns of all other LSM (Table 15).

Table 12: Chi-squared test: Attribute importance within living standards

Chi-squared test						
Living standard	**Frequency (n)**	**Attributes**	**Mean±SD**	**χ^2**	**df**	**Significant**
LSM 6	54	Product form	0.2170±0.17680	15.117	5	0.010 (significant)
		Product strength	0.2031±0.16220			
		Size	0.1625±0.12739			
		Price	0.1609±0.14420			
		Durability	0.1420±0.11373			
		Scent	0.1146±0.09619			
LSM 10	14	Size	0.2836±0.20754	12.318	5	0.031 (significant)
		Durability	0.2047±0.15630			
		Product form	0.1967±0.13149			
		Product strength	0.1440±0.12996			
		Scent	0.1123±0.10718			
		Price	0.0587±0.06702			

[a]Friedman test. LSM: Living standards measure, SD: Standard deviation

Table 13: Analysis of variance - attribute importance across generational cohorts

ANOVA						
Attributes	**Generation**	**Frequency**	**Mean±SD**	**f**	**df**	**Significant**
Price	Gen Z	93	0.1570±0.13348	4.432	2	0.013 (significant)
	Gen Y	94	0.1285±0.06416			
	Gen X	25	0.0787±0.11757			
	Total	212	0.1351±0.12222			
Product form	Gen X	25	0.3343±0.20178	10.529	2	0.000 (significant)
	Gen Y	94	0.2186±0.16956			
	Gen Z	93	0.1636±0.15566			
	Total	212	0.2081±0.17515			

ANOVA: Analysis of variance, SD: Standard deviation

Table 14: Chi-squared test - attribute importance within generational cohorts (X and Y)

Chi-squared test						
Generation	**Frequency (n)**	**Attributes**	**Mean±SD**	**χ^2**	**df**	**Significant**
Gen X	25	Product form	0.3343±0.20178	29.148	5	0.000 (significant)
	25	Size	0.1907±0.14523			
	25	Scent	0.1482±0.17878			
	25	Product Strength	0.1332±0.14059			
	25	Durability	0.1148±0.13998			
	25	Price	0.0787±0.06416			
Gen Y	94	Product form	0.2186±0.16956	13.120	5	0.022 (significant)
	94	Product Strength	0.1851±0.14004			
	94	Durability	0.1655±0.13036			
	94	Size	0.1534±0.12855			
	94	Scent	0.1488±0.13055			
	94	Price	0.1285±0.11757			
Gen next Z	93	Product Strength	0.2015±0.15397	8.953	5	0.111 (not significant)
	93	Size	0.1756±0.13597			
	93	Product form	0.1636±0.15566			
	93	Durability	0.1600±0.13050			
	93	Price	0.1570±0.13348			
	93	Scent	0.1424±0.11638			

[a]Friedman test. SD: Standard deviation

Table 15: Welch statistic: attribute Importance - living standards

Welch statistic Robust tests of equality of means				
	Welch statistic[a]	**df1**	**df2**	**Significant**
Price	13.754	7	22.026	0.000

[a]Asymptotically F distributed

4.4.3. Differences within each LSM group

Table 16 depicts a Chi-squared test in order to determine the presence of significance differences in the responses provided by respondents at seven LSM. Differences were found within the responses of respondents at LSM six and seven ($P < 0.05$). Product strength, size and product form received a high importance mean score from respondents compared to the importance score of scent ($M = 0.1146 \pm 0.09619$).

Table 16: Chi-squared test: Attribute importance within living standards

Chi-squared test							
Living standard	**Frequency (n)**	**Attributes**	**Mean**	**SD**	χ^2	**df**	**Significant**
LSM 6	54	Product form	0.2170	0.17680	15.117	5	0.010 (significant)
		Product strength	0.2031	0.16220			
		Size	0.1625	0.12739			
		Price	0.1609	0.14420			
		Durability	0.1420	0.11373			
		Scent	0.1146	0.09619			
LSM 10	14	Size	0.2836	0.20754	12.318	5	0.031 (significant)
		Durability	0.2047	0.15630			
		Product form	0.1967	0.13149			
		Product strength	0.1440	0.12996			
		Scent	0.1123	0.10718			
		Price	0.0587	0.06702			

[a]Friedman test. LSM: Living standards measure, SD: Standard deviation

4.5. Correspondence Analysis

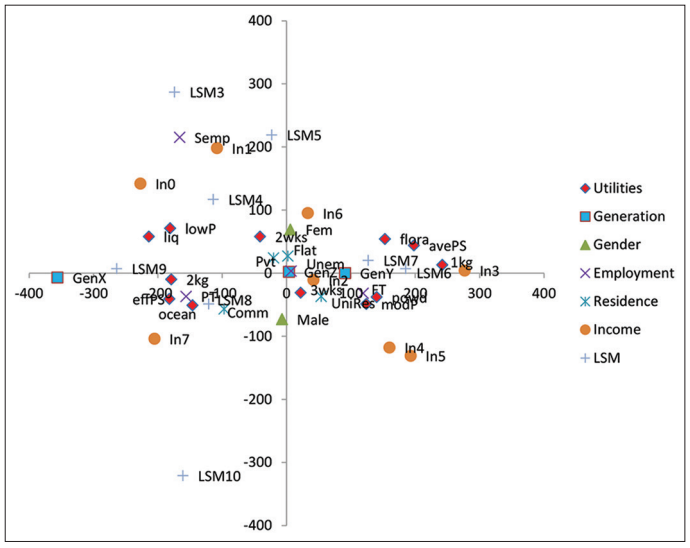
Some of the early success of conjoint analysis has been attributed to multidimensional scaling and correspondence analysis (Desarbo 2007). Therefore, the technique was used to create a visual presentation of the association between product category attributes and consumer demographics, that is, correspondence analysis was conducted in order to determine the relationships between preferences.

4.6. Clothing Detergent Product Category

The horizontal axis of Figure 1 indicates that 66.6% of the variation in the data exists. This axis separates the following utilities: very effective product strength, 2 kg size, oceanic scent, low price and liquid form on the left side (negative side). On the right hand side (positive side) of the horizontal axis, the following utilities are located: average product strength, 1 kg size, moderate price, floral scent and powder form. An association was determined between the following demographics variable and the utilities on the left side of the diagram: people, who belong to Generation X; who are either self-employed or employed part-time; who reside in either a student commune or a private family residence; who earn a high (R20000+) or low (R800-R1399) monthly income; a high (LSM eight, nine and ten), low (LSM three and four) and middle (LSM five) living standard. However, the demographics which are associated with the right hand side include: respondents who are in fulltime employment, respondents who live in a university residence and respondents who earn middle income (R2500-R4999, R5000-R7900, and R8000-R10999) and middle living standard (LSM six and seven).

On the other hand, the vertical axis only presents 5.2% of the variance (Figure 1). This axis differentiates on the basis of durability. Associated with a durability of 2 weeks (positive side) above the axis are female respondents who are self-employed, who live in a flat or in private accommodation, and respondents who have a low living standard (LSM three and four) and middle living standard (LSM five and seven). Associated with a durability of 3 weeks, below the axis are male respondents who have a high living standard (LSM eight and ten) who are also middle income earners (R5000-R7999, R8000-R10999) and those who are high income earners (R20000+). The variables that are situated near the origin do not add value to the scatter plot they account for

Figure 1: Multiple correspondence analysis - Clothing detergents



insignificant variability in the plane for both the horizontal and vertical axis.

5. DISCUSSION

According to the General Household Survey or GHS (Statistics South Africa 2017c), the province of Kwa-Zulu Natal consisted of 14.1% of all households in the province that owned a washing machine. The report also indicated the existence of a positive relationship between asset ownership and household income. Given that a large proportion of the population of the study consisted of respondents who are at LSM level six or higher, it may be assumed that those respondents (LSM 6+) own a washing machine. Respondents residing in a university residence or a flat may be making use of public washing machines. The findings from the General Household Survey are consistent with the findings of the study by Laitala et al. (2017) that showed that in Africa consumers make use of washing machines and laundrette facilities to wash their laundry (results compiled from Egypt, Morocco and South Africa).

While quality has been one of the most frequently cited attributes in numerous studies, it has not been identified as

the most important attribute (Jin et al., 2010, pp. 184). This supports the results of phase two of the study which has shown that quality is not the most important attribute to consumers. According to Clemenz et al. (2012, pp. 55) the functional performance of a product has been described as one of the constructs that define quality. The effectiveness of clothing detergents was found to be less important than the form of the clothing detergent product. Product form was found to be more important than the effectiveness of the clothing detergent. The use of the washing machine may also be attributed to the prioritisation of product form.

The attribute of size was found to be more important than price. This result could be due to the emphasis on the unit cost of a product. One aspect of potential concern for consumer households is lowering the unit costs of products purchased. Respondents may have placed more importance on the size of clothing detergents because larger product sizes last longer and tend to become more cost effective than purchasing smaller sizes. Therefore the potential to lower their purchasing costs may have led respondents to consider size over price. A study by Gordon, Goldfarb and Li (2013, pp. 22) found that consumers switched between different sizes of detergent during times of economic recession. Although their results showed differences in purchase sizes the differences were not large. However, the results show that in order to optimise their purchases consumers considered differences in sizes, thereby making product size an important attribute to the decision making process.

6. CONCLUSION

As presented by the results of the study a description of the population distribution of university student responses who took part within the study was provided. Also, a presentation of the conjoint analysis results for the clothing detergent product profile preferences was provided. Inferential statistics were also used in the form of independent t-test, Friedman test, Anova and the Chi-squared test. Significant differences were found in respondents preferences for clothing detergent product attributes across all demographic variables. Correspondence analysis was used within the study to illustrate different relationships between clothing detergent product attributes.

A common method used within management sciences is conjoint analysis which has been used by previous studies in management sciences to determine attribute preferences for different products (Hauser and Rao, 2004; Bradlow, 2005; Netzer et al., 2008). Conjoint analysis results revealed that the respondents placed more importance on the form of the product than any other attribute. Product strength which is an indicator of performance quality has been identified as the second most important attribute in the consideration of clothing detergents. Following product strength, the findings show that the size of the product and the durability of clothing detergents, respectively, are more important than price.

Attribute level preferences showed that respondents favoured liquid clothing detergents and not powdered detergents. Initially respondents were presented with three options (bar soap, powder and liquid). However, the results of phases one and two indicate that respondents displayed a preference for liquid detergents. Respondent's also displayed preferences for smaller sized detergents (one kilogram) which was also consistent with the preference for two weeks lasting durability. With regard to preferences for clothing detergent scents show that respondents favoured oceanic fragrances. Price was the least important attribute in the consideration of clothing detergents. Interestingly, respondents also favoured the moderately priced detergents.

Significant differences were found in the preference of clothing detergent product profiles according to demographic variables. According to respondent's gender, female respondents significantly preferred profile five more than their male counterparts. However, male respondents significantly preferred profile eight more than their female counterparts. According to the respondents' generational cohorts significant differences were discovered in the preferences for profile two, five, six and nine. Generations X significantly preferred profiles nine and five more than any other generational group. Generation Z and Y each significantly preferred profile two and six respectively. Significant differences were found in the preferences of profile one and eight according to respondent's monthly income. Furthermore, significant differences were found in the respondents' preferences for profile four according to respondent's living standards. The results implied that respondents belonging to the upper middle class and upper class groups have a greater preference for products in profile four.

The continued need to understand consumer preference changes necessitated this study as it allowed for an investigation of consumer preferences patters for an existing product category. Both retailers and clothing detergent manufactures may better position their product offerings emphasising the attributes that their consumer favour. Consumer targeting may also be aided by the results of this study.

The study has been limited by the sample size. The study failed to achieve the targeted sample size due to a number of disruptions during data collection. Student protests as well as industrial action in the form of staff strikes hindered respondent participation. One of the limitations of the study is the time constraint within which research is conducted as it is in the form of a cross-sectional study. Another limitation was the delays experienced within the data collection process. Difficulties were experienced in obtaining permission to collect data from the institutions. Within the same context, since participation is voluntary, some respondents withdraw from the study making it difficult to obtain respondents. The results of the study are also not representative of the entire population and only reflect those of the respondents who participated in the research process. This may be attributed to disruptions in the data collection process. The study shows that there was a low response rate among older respondents (Generation X and Baby Boomer Generation). Data collection was conducted pre-Covid-19 and only caters to the in-person shopping experience where the customer physical goes into a shopping isle of a particular retail shore. Therefore, the categorisation only applies to shopping behaviour in brick and mortar retail stores.

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APPENDIX

Appendix 1: Clothing detergent product profiles