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The Lacking Relevance of Market Segmentation

- A cross-category study using the Dirichlet model

Market segmentation is a core concept in marketing, but its relevance is being questioned. Researchers using the Dirichlet model claims that buyer profiles between competing brands rarely differ. However, this radical claim has been criticized by segmentation advocates for relying on studies that only uses simpler segmentation methods such as demographics.

This thesis tests the validity of this claim, regarding an unsegmented market, by attempting to replicate previous research based on simpler segmentation methods such as demographics. And add to previous research by testing the more sophisticated segmentation methods: need states, consumer materialism and person-situation segmentation. A quantitative and descriptive research design is used. The sample consists of 997 responses, collected in an online survey based on Juster scale purchase probabilities.

The results support prior findings with regard to demographics. And also indicate that more sophisticated segmentation methods does not generate managerially useful segmentation at the brand level. In essence, buyer profiles between competing brands does not differ enough to mandate the marketing strategies advocated by traditionalists.

Based on these findings, and previous extensive research in the field, marketers should change their practices regarding segmentation, targeting, positioning, brand portfolio management and brand growth strategies. Specifically marketers should target all category buyers, avoid narrow targeting, and focus on brand penetration rather than customer loyalty.

Keywords: Market Segmentation, Dirichlet model, Juster scale, Need state, Person-Situation segmentation, Materialism

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1 INTRODUCTION

"In the communication jungle out there, the only hope to score big is to be selective, to concentrate on narrow targets, to practice segmentation."

– Al Ries & Jack Trout in Positioning: the Battle for Your Mind (1986, p. 6)

"...no brand should adopt narrow targeting: they all sell to all buyers of the category."

– Byron Sharp in Marketing: Theory, Evidence, Practice (2013, p. 229)

"There is no brand segmentation. Blasphemous as it may sound to traditionalists, this marketing mainstay scarcely even exist."

–Rachel Kennedy & Andrew Ehrenberg (2001, p. 1)

1.1 Two Opposing Views on Market Segmentation and thus Brand Growth

The practice and science of marketing is in essence about how to increase market share. Market share is made up of two factors: number of customers and amount of sales per customer. Thus there are two ways to increase market share: 1) Get additional customers to buy your brand, or 2) Get existing customers to buy your brand more often. Consequently, one fundamental strategic question that all marketers need to be able to answer is: *Should we focus on acquiring additional customers by reaching more people, or should we focus on getting certain people and existing customers to buy our brand more often?* Traditional marketing textbooks give one commonly known answer to this question, while researchers of buying behaviour, such as Sharp and Ehrenberg give a completely different answer. Different marketing managers will also offer different answers. Thus this is a question that divides both academics and practitioners, and is extremely relevant to everyone who studies, teaches or practices marketing today.

Kotler's well-known textbook Principles of Marketing, a book used by practitioners and in undergraduate programmes all over the world, answer the question with this key phrase: "A company must identify the parts of the market that it can serve best and most profitable. It must... build the *right relationships* with the *right customers*. Thus, most companies have moved away from mass marketing and towards targeted marketing – identifying market segments, selecting one or more of them, and developing products and marketing programmes tailored to each" (Kotler, 2008, p. 410). The right customers are heavy buyers and loyal customers. Light and

disloyal buyers should be "fired" or ignored (p. 30). The right relationships are built by increasing customer loyalty through relationship management - marketers should thus focus on retaining existing customers rather than simply focusing on attracting new customers (p. 386). In essence a brand should avoid targeting the entire market and focus on selected market segments. And managers should attempt to improve customer retention (consumer loyalty) by building strong customer relationships.

The above describes the traditional approach to marketing. There are three concepts that are completely fundamental to this traditional marketing process: *segmentation, targeting and positioning* (see e.g. Kotler and Keller, 2006). In a theoretical stepwise process the marketer manager: 1) *Segment* the marketplace to discover different groups of consumers with similar needs, characteristics or behaviour. 2) *Target* the consumer groups that the brand can satisfy in a superior way. 3) Decide on a brand *position* that appeals particularly to the chosen segment or segments. An intended outcome of the process of segmentation, position and targeting - and a core belief among many marketers - is that a brand's customers are similar to each other. I.e. that the customers of a certain brand share characteristics - such as needs, demographic factors and personal values - that make them different from customers of competing brands. E.g. that people who drive Volvos have different values than people who drive BMWs. Or that people who drink the expensive beer brand Corona are different from people who drink the cheap beer brand Sofiero.

Ehrenberg, Sharp and colleagues argue that this is a myth. That "...brand-specific segments generally do not exist – interchangeable brands usually compete in what for them is a single, unsegmented mass market. There is no support for the idea that competing brands each appeal to a unique sub-set of users that look different from the customer bases of competitors" (Sharp, 2013, p. 231). These authors critique the traditional school of marketing, which they claim is based on intuition and myths. They argue that marketing is a relatively young and undeveloped science, which needs established empirical laws to function just like architecture or medicine. Sharp makes an analogy to the ancient practice of bloodletting in medieval medicine and suggests that marketers operate like medieval doctors. That marketing managers, with the best intentions, bleed the companies that employ them by basing their actions and recommendations not on science but on impressions and myth-based explanations (Sharp, 2010, p. 7). Thus these

authors suggest that academics and practitioners rethink the relevance of several core marketing concepts including segmentation, targeting and positioning - based on new studies of buying behaviour. (Ehrenberg et al., 2004; Sharp, 2010; Sharp, 2013)

Market segmentation in particular is an area strongly criticized. Ehrenberg et al. (2004) claims that the market segmentation field focuses solely on techniques rather than on presenting systematic empirical results that proves the usefulness of segmentation. Ehrenberg and Kennedy (2001) jest that segmentation literature is "searching for the Emperor's new clothes". I.e. researchers accept the established opinion blindly and do not search for actual proof of managerially useful market segments. Marketing textbooks (e.g. Kotler et al., 2008; Jobber, 2007) are full of segmentation bases, but none of these have been validated by the kind of empirical investigation focusing on actual buying behaviour requested by Ehrenberg. A number of research studies supports Ehrenberg's arguments by showing that buyers very rarely differ between competing brands, which suggests that there are no meaningful market segmentation at the brand level (Hammond et al., 1996; Kennedy & Ehrenberg, 2001; Ehrenberg et al., 2004; Uncles et al., 2012). However, buyers do differ between categories. I.e. *category segments* often exist. For example luxury brands and expensive categories are bought to a higher degree by wealthier buyers. Cat owners buy cat food, dog owners buy dog food; and thus represent category segments. But there are no meaningful differences between *brand segments*; i.e. buyers of competing brands in the same category, such as buyers of Gucci and Versace in a luxury category (Sharp, 2010, p. 72).

The findings of Ehrenberg, Sharp and colleagues are partly based on the Dirichlet model, which is a statistical stochastic model that predicts consumer purchase patterns such as brand choice and purchase incidence (Kearns, 1999; Scriven & Bound, 2004). The model has been subjected to an extensive amount of empirical investigation and the following three main purchase patterns have been confirmed (Uncles et al., 1995; Ehrenberg et al., 2004).

1) Differences in market share are a result of differences in brand penetration.

2) Differences in loyalty (average purchase frequency) follow the marketing law of *Double Jeopardy*, i.e. bigger brands have more loyal customer than smaller brands. Therefore there are no "strong" and "weak" brands with regard to consumer loyalty, only big and small brands.

3) According to the *Duplication of Purchase law:* **"**A brand's customer base overlaps with the customer base of other brands in line with their market share" (Sharp, 2010). Thus consumers are highly disloyal. In average a particular brand's customers buy other brands more often than they buy the particular brand. Almost no consumers are a 100 percent loyal to a specific brand, and those who are a 100 percent loyal are in average light users of the category. (Sharp et al., 2002; Ehrenberg et al., 2004)

These above cited authors thus argue that a brand competes with all brands in the category, rather than just those with a similar brand position. That brand growth does not come from building increased loyalty (increased purchase frequency) among existing customers in a particular market segment, since market share mainly is a causal effect of brand penetration. To grow a brand the focus should instead be on new customer acquisitions (brand penetration).

Thus Sharp, Ehrenberg and colleagues give us a completely different answer to our initially stated question: *Should we focus on acquiring additional customers by reaching more people, or should we focus on getting certain people and existing customers to buy our brand more often?* Contrary to Kotler's traditional marketing approach that focuses on *the right customers* (specific brand segments of heavy buyers and loyalists) and *the right relationships* (focus on customer retention rather than new customer acquisition). Sharp, Ehrenberg and colleagues argue that marketers should: 1) Target the entire market of category buyers, use sophisticated mass marketing rather than narrow targeting. 2) Focus on new customer acquisition (penetration) rather than customer retention (loyalty). And 3) attempt to reach all buyers including light users, not just loyal or heavy buyers. Table 1 below summarizes the key differences.

Table 1: Two Opposing Views on Marketing

SCHOOL OF THOUGHT	SEGMENTATION	TARGETING	POSITIONING	GROWTH STRATEGY
Traditional Marketing Approach (Kotler)	A brand cannot appeal to all buyers in the market, identify brand segments	Narrow, targeted marketing	Brands compete based on positioning	Growth through targeting brand loyals and heavy buyers
Dirichlet Model Approach (Sharp & Ehrenberg)	Brands are bought by all buyers in the market; identify a category segment	Sophisticated mass marketing	Brands compete with all brands in the category	Growth through brand penetration

Source: Adapted from Sharp, 2010, p. xiv; Kotler, 2008

Clearly, these two approaches to marketing are not compatible. One of them has to be wrong. This thesis will investigate this problem by attempting to find specific brand segments since the existence or nonexistence of brands segments is one of the key dividing issues. If brand segments are found this would indicate that brands can grow according to the traditional marketing school. If no brand segments are found it strongly suggests that the strategies of the new approach to marketing (based on the Dirichlet model and related findings) are likely to be more successful.

1.2 Research Gap

The extensive segmentation literature, with Kotler at the front, have been heavily criticised by Ehrenberg and colleagues for lacking any form of empirical arguments supporting their cause (e.g. Wright, 1996; Ehrenberg et al., 2004). These critics points out how the segmentation literature is based on assumptions, arbitrary decisions, and unstable solutions that has no connection to actual purchase behaviour. As a contrary suggestion, the Dirichlet model's ability to successfully predict purchases patterns in a wide array of categories has been used as an empirical argument for the lack of brand segmentation in most markets (Ehrenberg, 1994; Uncles et al. 1995; Ehrenberg et al., 2004). There is however only three larger studies - Hammond et al. (1996), Kennedy and Ehrenberg (2001) and Uncles et al. (2012) - who in recent time directly have investigated the differences in brand purchase profiles. All three studies have tested if there are segmentation bases that can identify different brand purchase groups. None of them have found any managerially useful differences and thereby supported the previous Dirichlet findings regarding the absence of brand segmentation. The studies have on the other hand been criticised for mainly focusing on demographic or other simpler variables and not investigating more sophisticated segmentation methods (Wedel & Kamakura, 2001).

There is thus an evident need of additional research that contributes with empirical evidence to the debate regarding the relevance of brand segments. In addition to replicate findings based on less sophisticated segmentation methods such as demographics, previously investigated in the above cited studies, there has been a request (Wedel & Kamakura, 2001) to test more sophisticated and modern segmentation methods. Three such more advanced segmentation methods, advocated both by academics and practitioners, are: i) Psychographic segmentation based on materialism (Richins, 2004). ii) Need states segmentation (Carlotti et al., 2004). iii) And person-situation segmentation (Dickson, 1982; Yang et al. 2002). To our knowledge, none

of these methods have previously been investigated from the brand purchase behaviour aspect discussed above. The two later approaches are different from most segmentation methods in that they focus on situational elements. The reasoning is that the same consumer has different needs and behaves differently depending on the situation she is in. These methods will be described in more detail in the theoretical background.

1.3 Purpose and Research Question

The purpose of this thesis is to investigate the proposed lack of brand segmentation based on differences in consumer purchase patterns. Specifically to verify or disprove that no managerially useful[1] brand segments exist for Fast Moving Consumer Goods (FMCG) categories, if more sophisticated segmentation methods such as materialism, need states and personal-situational segmentation are used.

Thus the main research question is: *Do buyer profiles of brands in the same FMCG category differ enough to provide managerially useful brand segments?*

1.4 Expected Knowledge Contribution

This thesis contributes by giving a novel perspective to the research of Sharp, Ehrenberg and colleagues. We attempt to replicate some of their findings regarding demographic variables and the occurrence of the Dirichlet patterns. And contribute with new knowledge by also testing more modern segmentation bases such as consumer's materialism, need states and person-situation segmentation.

The results are likely to be useful for both academics and practitioners, especially for brand managers, management consultants and market researchers. Managerial implications should include improved practices for brand portfolio management, media mix strategies, targeting, positioning, segmentation, new brand/product development and overall growth strategies.

1.5 Delimitations

Prior studies (Hammond et al., 1996; Kennedy & Ehrenberg, 2001; Uncles et al., 2012) have indicated a lack of brand segmentation in other markets than FMCG, such as durables and

[1] A definition of "managerially useful" can be found in the methodology part on page 42. It is defined based on previous research which uses mean average deviation to measure if brand user profiles differ between brands in a category.

financial services. But the main focus have been FMCG categories, therefore we have chosen to limit our study to FMCG.

In this thesis the proposed lack of brand segmentation is investigated solely from a purchase perspective, i.e. are different brands bought by different consumer segments? Whether or not there are segments with different brand attitudes has also been questioned (Ehrenberg et al., 2004), but are not examined in this thesis. However empirical support for a lack of brand segmentation based on actual purchase behaviour would make it less relevant to also study brand segmentation at the attitude level (Ehrenberg et al., 2004).

Given limited time and resources, we have delimited the number of segmentation bases we analyze. The variables chosen have been motivated by perceived research relevancy and are subjected for detailed discussion in the theory part of the thesis. We have further delimited the study to one country, Sweden, and three categories: i) Take-home beer with an alcohol level of above 4,4 percent. ii) Take home ice cream. iii) Fresh (not instant) take home coffee. These categories will hereafter by referred to as simply beer, ice cream and coffee. The delimitation to three categories is motivated by the extensive analytical approach our study requires. Due to delimitations the findings are primarily generalizable to FMCG, which is in line with the purpose of the thesis. While the findings may be applicable to other markets, such as durables and services, further research need to be conducted to verify that.

1.6 Definitions and Clarifications

Brand segmentation: Competing brands in a category appeal to different segments of buyers e.g. the buyer profiles of Coca Cola customers and Pepsi customers differ (Uncles et al., 2012)**.**

Category segmentation: Competing categories appeal to different segments of buyers e.g. the buyer profiles of soft-drink customers and beer customers differ (Ehrenberg et al., 2004; Uncles et al., 2012).

Double jeopardy: Brands with less market share have so because they have far fewer buyers, and these buyers are also slightly less loyal (Sharp, 2010). Thus small brands are punished twice (Ehrenberg et al., 2004).

Duplication of Purchase law: A brand's customer base overlaps with the customer base of other brands in line with their brand penetration in the market. I.e. brands share more customers with larger brands and fewer customers with smaller brands (Sharp, 2010).

Need state: A human need or benefit sought in a specific situation or context.

Person-situation segmentation: A segmentation method combining personal characteristics with situational factors such as need states.

1.7 Thesis Outline

The thesis is divided into five parts: 1) Introduction, 2) Theory and Research Question Generation, 3) Methodology 4) Research and Analysis 5) Discussion. The first part, *Introduction,* has introduced the reader to the prevailing conflicting opinions about segmentation and described the purpose and intended knowledge contribution of this thesis. The second part, *Theory and Research Question Generation*, consists of a literature review of market segmentation and the underlying theory of the Dirichlet model. Five specific research questions are outlined in the end of the literature review. Part three, *Methodology,* describes the methodological and analytical approach of the thesis. In part four, *Research and Analysis,* the results are presented and each research question is answered. In the final part, *Discussion,* conclusions based on the research questions are presented and discussed. Then managerial implications are described using actual brand data from the findings. The thesis concludes with a criticism of the study and a discussion of relevant areas for future research.

2 THEORY AND RESEARCH QUESTION GENERATION

The theoretical background of this thesis consists of three parts. In the first part, the Dirichlet model and its findings are described. Secondly, market segmentation and segmentation methods are investigated. Thirdly, based on the previous two parts the research questions are generated.

For a reader unfamiliar with Ehrenberg's work, the Dirichlet model might at a first sight seem as a mathematically complicated and narrow restriction that does not strictly relate to the field of market segmentation or to the purpose of this thesis. However, the Dirichlet model is a fundamental concept for researchers who argue that brand segments are irrelevant. Understanding the Dirichlet model with its embedded purchase patterns is thus a necessary starting point for understanding the concept of an unsegmented market.

2.1 The NBD-Dirichlet Model

The NBD[2]-Dirichlet model, usually referred to as the Dirichlet model, originally presented by Goodhardt et al. (1984)[3], is a stochastic model that have been shown to accurately predict aggregated purchase patterns in fast moving consumer goods markets and other frequently bought categories (Kearns 1999; Scriven & Bound, 2004). The Dirichlet model consists of a set of probability functions that specifies repeat purchase behaviour, this set of probabilities are determined by a number of theoretical distributional assumptions (Driesener, 2005). A key assumption of the model is the absence of brand segmentation.

In the following literature review the Dirichlet model will be explained in more detail. First, definitions central to the model and the theoretical assumptions behind the model will be described. Secondly, the main findings derived from the model are summarized. Finally, the validation of and possible deviations from the model will be discussed.

The calibration process of the Dirichlet model, from survey data, will be explained in the method part of this thesis and is therefore not brought up in the theory part. The underlying mathematical derivations and estimations of the model are rather complex (Ehrenberg et al., 2004), and will

[2] NBD = Negative Binomial Distribution

3 Even though Goodhardt et al. (1984) is the first fully documented publication of the Dirichlet model, it should be noted that simpler sub-models such as the NBD-model (Ehrenberg 1959) have been developed earlier as pointed out by Ehrenberg (1984). For the reader interested in the historical development of the Dirichlet model we recommend pages 13-20 in Driesener (2005).

not be outlined in this thesis. For the reader interested in a more detailed description of the mathematics behind the model we recommend the articles written by Goodhardt et al. (1984) and Rungie & Goodhardt (2004).

2.1.1 The Model Definitions

The Dirichlet model is a stochastic model of purchase behaviour, which means that it encompasses a composition of different types of probability distributions that are used to model consumer behaviour (Driesener, 2005). The unit analysed is number of consumers purchase occasions, not the number of units bought per consumer. However, by analysing the number of purchase occasions one can accurately predict repeat purchase patterns aggregated for a brand as a whole, irrespectively of package sizes or variants (Ehrenberg, 1988). The Dirichlet model can thus aggregate different sizes, flavours and SKUs into one parent or umbrella brand; which can be used as the common level of analysis (Goodhardt et al., 1984; Ehrenberg et al., 2004). It is also possible to combine two brands into a single "super" brand or to aggregate several small brands into an "all other brands" group. The analysis of purchase occasions also extends the applicability of the model to categories such as gallons of petrol, or hectograms of confectionery, etc. Several studies (e.g. Jeuland et al., 1980; Ehrenberg, 1988) have shown how the studied purchase patterns in a category are very similar irrespectively of whether the analytical unit is purchase occasions or actual sales volume. Many of the brand performance metrics predicted by the Dirichlet model do not take sales volume into account at all and which entity to analyse have therefore seldom been an issue brought up.

When calibrating and interpreting the Dirichlet model it is important to make a consistent and accurate definition of the potential buyers, sometimes referred to as "shoppers", of a category (Driesener, 2005). In addition to actual category buyers the shopper population also includes non category buyers, as long as they are considered to have a reasonable opportunity to make a category purchase. The "reasonability to buy boundary" should be interpreted rather broadly. For example in a category such as pet food the shopper population will include all consumer households, regardless of if they have a pet or not. However all consumers should not be defined as shoppers in a category such as aviation fuel.

2.1.2 The Model Assumptions:

In the Dirichlet model consumers are regarded as being well experienced and therefore not easily influenced by the extra learning input from an additional purchase or from seeing a product advertisement etc. (Ehrenberg et al., 2004). The consumers are thought of as having personal repertoires with brands and with stable personal purchase propensities, which are treated as stochastic probabilities in the model, for buying each brand in the repertoire. However the composition of brands in the repertoire, the magnitude of the purchase propensities for the different brands in the repertoire and the purchase frequency are assumed to greatly vary between different buyers (Sharp & Driesener, 2000). The model do not take into account whether the brands are differently marketed or functionally differentiated from each other, all such potential brand differentiating factors are incorporated in the model's steady state purchase probabilities (Ehrenberg et al., 2004).

The Dirichlet model consists of a set of probability functions that specifies how many category purchases each of a number of consumers will make in a given time period and how these purchases are spread out between different brands in the category (Driesener, 2005). These probabilities are determined by a number of underlying distributional assumptions.

2.1.2.1 Two Primary Assumptions Regarding the Market

There are two primary assumptions relating to the studied market or category (Goodhardt et al., 1984). The model is defined for steady state and unpartitioned markets (Ehrenberg et al., 2004). The first of these two broader assumptions denotes how the aggregated level of purchasing should be the same from one time period to another of equal length (Kearns, 1999); even though the purchase behaviour of individuals will vary. E.g. while a particular consumer might buy different brands of their repertoire in the first and the second period, the aggregated brand metrics such as market share etc. should be the same. The second assumption describes an unsegmented market where the consumers' brand choices to a large degree should be independent (Goodhardt et al., 1984).

2.1.2.2 Five Additional Distributional Assumptions

The two primary assumptions are operationalised through five more specific distributional assumptions (Goodhardt et al., 1984), which now will be outlined. The first two assumptions concern purchases of the product category:

1) Poisson distributions for individual purchases

A consumer's category purchases are assumed to be spread randomly over time within each consumer's long-run probability of purchase (the consumer's expected mean purchasing rate from the category in the long run). The probability of purchase is independent of when the previous purchase was made. In other words a person who is expected to buy from the category 10 times a year will have a weekly category purchase probability of around 20 percent during every single week of that year (10 purchase / 52 weeks ≈ 20%), irrespectively of when actual purchases are made. Two prerequisites for this assumption is that the successive periods of time are similar and of equal length, and that the periods are not too short since purchases made in one period should not influence those made in the next (for product categories such as e.g. cocoa tins, a period of one week might therefore be to short).

2)A gamma distribution for consumers' differentiating average purchase rates

The heterogeneity of consumers in their long run average purchasing rates from the category is assumed to vary between individuals according to a Gamma type of distribution. Unless the overall average purchasing rate is very high, this distribution means that there will be few heavy buyers of the category and a high ratio of light buyers.

From these two assumptions it follows that the distribution of consumers making one, two, three and *n* category purchases in a given time period follows a Negative Binomial distribution (NBD). The following two assumptions for the Dirichlet model concern the brand choice:

3) Multinomial distributions for specific purchases

A consumer is assumed to buy a brand, at any purchase occasion, as randomly with their own fixed brand choice probabilities. The consumer's probability of buying a particular brand in her repertoire, at a particular occasion, should be independent of prior purchase events. A consumer with for example three brands in the repertoire portfolio with the steady state probabilities of 0.7, 0.2 and 0.1 is therefore assumed to buy these brands 70 %, 20% and 10 % of the time and in a random order.

4) A multivariate Beta distribution of brand choice probabilities

Consumers are assumed to be heterogeneous in their brand choice probabilities. Different consumers are expected to vary when it comes both to the composition of brands in their repertoires and regarding the steady state purchase probabilities for the different brands. The heterogeneity in probabilities of buying various brands among the consumers is assumed to vary according to a multivariate Dirichlet (Beta) distribution.

The integration of these two distributional assumptions forms the second component of the Dirichlet model, a Dirichlet multinomial distribution which models how the category purchases are distributed between different brands. The last assumption concerns the relationship between category purchasing and brand choice.

5) The independence of purchase incidence and brand choice

The Dirichlet distribution of brand choice probabilities are assumed to be the same irrespective of how often particular consumers buy from the category.

The two primary assumptions as well as the five distributional assumptions have found strong support, both theoretically and empirically (Ehrenberg et al., 2004). In this literature review, we will mainly pay attention to assumption of an unsegmented market which in the Dirichlet model is related to the distribution of brand choices. The whole second part of the theoretical background will be dedicated to this topic. The theoretical support and limitations of the remaining model assumptions is available in appendix II.

2.1.3 Findings

Before describing the findings related to the Dirichlet model, it might be appropriate to first describe the character of these contributions in a broader sense. The Dirichlet model is a descriptive model; based on simple inputs it can accurately predict some of the main empirical purchase patterns in repertoire markets (Driesener, 2005). The model does not provide a direct guide to marketers for how to improve their marketing strategy. However the model do provide a frame of reference, in each specific category and especially when it comes to general patterns across several categories, from which several essential marketing insights can be drawn which in turn has implications for the success of different market strategies.

2.1.4 General Output

The direct output from the Dirichlet model, when calibrated in a specific category, is the estimation of a number of different brand performance measures related to the aggregated purchase patterns (Rungie and Goodhardt, 2004). Some of the most essential brand performance measures are outlined below (the particular definitions is taken from Ehrenberg et al., 2004).

- *Category penetration* = The percent of the shopper population buying the category
- *Category purchases per buyer* = The average purchase frequency of the category per buyer of the category
- *Brand market share* = Total purchases of a brand / Total purchases of the category
- *Brand penetration* = The number buying the brand at least once / The total number of potential customers
- *Brand purchases per buyer* = The average purchase frequency of the brand per buyer of the brand,
- *Brand share of Category Requirements* = Brand purchases per buyer / Category purchases per buyer)
- *Brand 100% loyal buyers* = The percent buying only the brand of the buyers of the brand
- *Duplication of purchase law* = The percentage of the buyers of a brand who also bought brand 1,2,3,...n at least once during the investigated time period (i.e. the duplication of brand penetrations).

The only observed input variables needed to obtain all these measure predictions are the category penetration, the brand penetration of one particular brand, the average purchase frequency of the category and the average purchase frequency of the brand (Ehrenberg et al., 2004). In practice it is recommended to use the brand input data (penetration and average purchase frequency on the brand level) from a number of leading brands to receive a superior fit.

An illustration of how the brand performance measure output can look like is presented in table 2 below. This particular table is taken from Ehrenberg et al. (2004) and it illustrates the average performance measures, both the observed (*o*) and the predicted theoretical values (*t*), across the

top eight brands in 12 product categories[4]. The brands are sorted according to market share, notice that the correlation between market share and the other metrics according to the Double Jeopardy Law. Also observe the brand switching behaviour illustrated in the six columns to the right, i.e. the Duplication of Purchase Law.

Table 2: Dirichlet Model Performance Measures

Annual observed and theoretical performance measures

Brands (by share)	Brand size			Loyalty-related measures (annual)								Switching (annual)					
	Market share (%)	Percent buying		Purchases (per buyer)		Percent buying 5+ times		Category purchases per buyer		100% loyal				Percentage who also bought brand:			
										Percent buying		Purchases[a]		A		C		E	
		O	*T*	O	*T*	O	*T*	O	*T*	O	*T*	O	*T*	O	*T*	O	*T*	O	*T*
A	28	46	*46*	3.9	*3.9*	24	*25*	10	*10*	22	*16*	4.1	*2.5*	100	*100*	31	*31*	17	*20*
B	19	35	*36*	3.6	*3.5*	21	*20*	11	*11*	16	*13*	4.4	*2.2*	51	*55*	32	*31*	18	*21*
C	12	25	*25*	3.1	*3.1*	16	*17*	12	*12*	11	*11*	4.4	*2.0*	57	*56*	100	*100*	20	*21*
D	9	22	*21*	2.8	*2.9*	13	*14*	11	*12*	11	*10*	2.7	*1.9*	55	*56*	35	*31*	23	*21*
E	7	14	*16*	3.2	*2.8*	19	*14*	12	*12*	12	*9*	2.9	*1.9*	53	*56*	34	*32*	100	*100*
F	5	12	*11*	2.7	*2.8*	11	*12*	12	*12*	10	*9*	2.9	*1.8*	56	*56*	35	*32*	19	*22*
G	4	11	*10*	2.7	*2.9*	11	*12*	12	*12*	9	*9*	2.6	*1.8*	56	*56*	35	*29*	17	*18*
H	3	6	*7*	3.2	*2.6*	13	*13*	13	*12*	7	*9*	3.4	*1.7*	52	*56*	30	*30*	17	*18*
Average brand	11	21	*21*	3.2	*3.1*	16	*16*	12	*12*	12	*11*	3.6	*2.0*	54	*56*	33	*31*	19	*20*

Source: Ehrenberg et al. (2004)

Normally this output is calculated for one category at the time, but the table format is the same. The values under the label *O* are the observed values obtained directly from the raw data, in this case from a large amount of panel data[5]. The values under the label *T* are the predicted theoretical values by the Dirichlet model; they are probability statements (Rungie & Goodhardt, 2004) and can be perceived as benchmarks for what is a "normal" value in accordance with the model's distributional assumptions. As clearly illustrated in the table, the model's predictions have turned out to be very close to the observed data values (Ehrenberg et al., 2004). There are many practical applications which can be derived directly from the Dirichlet models theoretical performance measures (se e.g. Schmittelein et al., 1985; Lomax et al., 2004; Sharp & Sharp 1997; Ehrenberg et al., 2004).

4The categories are: Ketchup, cereals, cheese, orange juice, household cleaners, laundry detergents (2*), paper towels (2*), take-home beer, toothpaste (2*)

5 Data sources for Ehrenberg et al. 2004: AGB (UK), Nielsen and IRI (USA), GfK (Germany), TCI (Japan).

2.1.5 Dirichlet Patterns

In addition to the applications directly related to the brand performance metrics in a specific category, the Dirichlet model also has implications for the understanding of consumers and brands in a broader sense (Ehrenberg et al., 2004), which is the type of contributions primarily related to the purpose of this thesis. Even though the specific values of the performance measures tend to vary between categories. The general patterns they exhibit, often referred to as "Dirichlet-patterns", have turned out to be highly generalizable across many markets (Driesener, 2005). The model's ability to successfully predict these general empirical patterns do in turn support the accuracy of its underlying assumptions (Ehrenberg, 1994; Ehrenberg et al., 2004). Both the general purchase patterns and their theoretical explanations, manifested in the model assumptions, thus provide a number of important insights. Some of the main patterns, in addition to those specified in the model assumptions are:

- Differences in brand market shares are a result of differences in brand penetration (Sharp et al., 2002). While the penetration can fluctuate considerable the average purchase frequency tend to be similar between different brands.
- The small difference in average purchase frequency and other loyalty metrics between brands follow the Double Jeopardy pattern, meaning that smaller brands also tend to have less loyal customers (Ehrenberg et al., 2004).
- Consumers are highly disloyal (Sharp et al., 2002). On average a brand's customers buy other brands more often. Few consumers are a 100 percent loyal to a specific brand and those who are, are mostly light users of the category (Ehrenberg, 2004).

These patterns are clearly apparent in table 2 on page 16. For further reading a detailed list of the most common Dirichlet patterns is provided by Uncles et al. (1995).

2.1.6 Validation of the Model

Ehrenberg (1994) states how each successful prediction by the Dirichlet model is a test of the models underlying theoretical assumptions. According to Uncles et al. (1995) the Dirichlet model is one of the most validated models in the field of marketing. The Dirichlet model has been validated over a wide range of conditions, countries and time periods. Ehrenberg et al. (2004) presents a table, illustrated below, that shows the various conditions for which the

Dirichlet patterns have been validated. These findings have typically been based on panel-data, often including 10 000 + households (Sharp et al., 2002; Ehrenberg et al., 2004).

Table 3: Varied Conditions for Dirichlet-type Patterns

Products and services	Time, space, people
Food, drink, cleaners & personal care	US, UK, Japan Germany, Australasia, etc.
Prescription drugs, OTC medicines	Light & heavy buyers, demographic subgroups
Gasoline, aviation fuel, cars, PCs	Household or individual purchases
Retain chains, financial services, B2B	Different length of analysis periods
TV episodes, programs, and channels	Different points in time 1950-2003

Brands and product variants	Market conditions
Large & small brands	Near-steady markets
Pack sizes, flavors, forms, formats, etc.	Dynamic markets (for loyalty-related measures)
Private/own labels	Non-partitioned markets
Price bands	Partitioned submarkets

Source: Ehrenberg et al. (2004)

Kearns (1999) describes how the majority of the different validation studies that have been conducted supports the research question of unbiased predictions and have found a correlation of 0,9 or more between the predicted and observed values for most of the performance measures.

2.1.7 Deviations from the Model

Ehrenberg et al. (2004) describes some systematic discrepancies from the Dirichlet model's predictions. An example of such a deviation, which is clearly apparent in table 2, is the systematic under prediction of purchase rates for 100% loyal brand buyers. Another common deviation is the over prediction of repeat buying for very long time periods. However Ehrenberg argues that these deviations seldom curtail the practical usefulness of the model.

Sharp and Driesener (2000) conducts an explorative study to test the robustness of the Dirichlet model. They develop a semi-fictive repertoire market with characteristics violating some of the underlying assumptions of the Dirichlet model to test the robustness of the Dirichlet model. The authors bring up how there among other things is expected to be some partitioning of brands in their semi-fictive market. Sharp and Driesener conclude that the poor fit of the Dirichlet model in their study, where some of its underlying assumptions are violated, is an important finding supporting the general usefulness of the model. This is a finding in support of Ehrenberg's

argument that every successfully predictability of the Dirichlet model is a validation of the model's underlying assumptions (Ehrenberg 1994). However the magnitude of Sharp and Driesener's study is limited and it is not known which of their fictive assumption violations that had a certain effect. The extensive validation of the Dirichlet model has not convinced segmentation advocates such as Wedel and Kamakura (2001) that there is an absence of market segmentation at the brand level. Ehrenberg and others have felt a need to support their empirical arguments of an unsegmented market by additional empirical evidence examining differences in brand buyer profiles directly. Recently a new and in this context unexploited survey based method - originally developed by Wright et al. 1998 - have opened up new opportunities for such direct analyses. It is through this survey based method possible to gather both the measures needed for the Dirichlet model (brand penetrations and brand purchase frequencies) and any data variable desired for modern segmentation techniques. Chrysochou et al. (2008) brings up the exploration of the "unsegmented market" assumption that the Dirichlet model rests on, through such a survey based method, as a highly relevant area for further research. In the second part of the theoretical review the foundational need for this type of knowledge contribution will be discussed in detail.

2.2 Segmentation

In the second part of the literature review, the area of segmentation is discussed in detail. First we review the academic discussion regarding the existence or nonexistence of brand segments. Secondly, some of the most used and promising segmentation bases are described in detail. Finally, five specific research questions are generated based on the literature review.

As stated in the introduction the segmentation patterns described in this thesis are concerned with purchase behaviour at the brand level, not at the category level. It relates to whether there is a specific clustering of brands in the market; i.e. if particular sub-groups of consumers are buying different brands or not. The segmentation at the category level is not investigated in this thesis and its existence has not been criticized by the researchers that argue the nonexistence of brands segments. Quite the opposite, Ehrenberg (2004) proposes that there can be strong segmentation at the category level and subcategory level. For example cat owners buy cat-food rather than dog-food, women buy more tampons than men, and people with a higher income buy more from luxury categories in average.

2.2.1 An Unsegmented Market

Sharp and Driesener (2000) define an unsegmented market as a market where there is no special grouping of brands. That is there are no differences in brand buyer profiles; or if viewed in reverse - there are no particular brands appealing to any particular buyer groups. According to Sharp and Driesener (2000), many markets exhibit these characteristics even though it sometimes is difficult for marketers to grasp. The authors further explain that this is primarily because such a market structure is contrary to how a market is described in most marketing text books written by Kotler and others. E.g. text books that imply that particular brands should apply to distinct customer segments, in reality most brands are close substitutes and are bought by most category buyers.

Ehrenberg et al. (2004) argues that the majority of the segmentation literature is focused on techniques rather than empirical results. It is very possible to choose an arbitrary grouping variable and create segments with statistical techniques. An example illustrating this point is the segmentation study "Using astrology in market segmentation" by Mitchell (1995). Mitchell develops a segmentation approach based on consumers' astrological signs. That is Tauruses, Geminis, Virgos and so on. While this study can be seen as just an amusing satire Wright et al. (1996) points out that Michell's segmentation is just as valid as most other segmentation variables in the sense that it is mainly based on a number of assumptions and arbitrary decisions; that lacks any form of stable empirical support related to actual purchase behaviour.

In three extensive studies (Hammond et al., 1996; Kennedy & Ehrenberg, 2001; Uncles et al., 2012) the researchers have directly examined whether the buyer profiles differ between brands. Hammond et al. (1996) shows - based on panel data for 23 grocery product categories in four countries - how the consumer profiles for different brands are similar in terms of socio-demographic characteristics. Kennedy and Ehrenberg (2001) arrive at the same conclusion after having studied panel data for 42 categories in the U.K. An even more extensive replication study - with the same conclusion - was conducted by Uncles et al. (2012). These authors analyzed panel data over 25 years, across 50+ categories and four countries. This type of research has together with studies related to the Dirichlet model itself been used as empirical arguments for why markets are unsegmented (Ehrenberg et al., 2004).

2.2.2 Critique to Studies Advocating an Unsegmented Market

Even though the studies described above have been based on a considerable amount of data, the variables investigated are generally limited to socio-demographic factors such as gender, age, education, income etc. In two of the studies (Kennedy & Ehrenberg, 2001; Uncles et al., 2012) some media usage and some psychographic factors are also tested, but the variables outlined in the studies are of a rather basic nature. In conventional marketing text books (e.g. Kotler & Keller, 2006) these type of variables are still often brought up as relevant segmentation bases. However there are others authors advocating more sophisticated segmentation methods.

Wedel & Kamakura (2001) argues that brand segments do exist and they criticize the conclusions drawn by Kennedy & Ehrenberg (2001). Wedel & Kamakura points out that it has been recognized since the 70s that demographic variables do not discriminate between different brand buyers and they criticize Kennedy & Ehrenberg for the absence of any grouping technique in the data analysis. In response Ehrenberg & Kennedy (2001) argue that there - even in extensive segmentation literature reviews such as Wedel & Kamakura (2000) –has been no demonstrable evidence of stable brand segments. Or of any analytical method that consequently can derive such segments.

2.2.3 Demographic Segmentation

Demographic factors are according to Kotler et al. “the most popular bases for segmenting consumer groups” (2008), p. 413). The authors suggest three reasons that demographics are commonly used: 1) “Wants and usage rates often vary with demographic factors” (Ibid.). 2) Demographic factors are easy to measure. 3) If other bases are used for segmentation, demographic must still be used to assess size of the segment and how to reach it. This is partly because traditional media channels - such as magazines and television channels - are usually measured and segmented using demographics. Therefore linking a brand to a media channel is easy if demographic factors are used in the market segmentation. However, as previously mentioned other researchers claim that it has been known since the 70s that demographic variables do not discriminate between different brand buyers (Wedel & Kamakura, 2001).

2.2.4 Psychographic Segmentation: Materialism

When demographic segmentation has proven to not generate the desired results marketers have turned to segmentation by life style, personality characteristics or consumer values, i.e.

psychographic segmentation. The basic assumption of psychographic segmentation is that consumers with similar values or lifestyles will "acquire similar assortments of products for the expression of their values" (Fournier et al., 1992). There exists several value based segmentation methods, both academic methods such as LOV (Kahle, 1983) and VALS (Mitchell, 1983) and professional methods such as TNS Sifo's "Life Values". Whatever method is used a consumer's level of materialism is often a significant determiner of what group she is placed in. According to Richins (2004) there has been well over a hundred modern studies examining materialism from different angles. Materialism can be defined as "the importance a consumer attaches to worldly possessions" (Belk, 1984). As with demographics it has been suggested by some authors such as Wedel and Kamakura (2001) - who otherwise argue for the existence of brand segments - that simpler psychographic variables seldom discriminate between buyers. However materialism is an element that often are brought up by Kotler and others (e.g. Kotler & Keller, 2006) and it is used by practitioners. To our knowledge no previous research has investigated if psychographic segmentation using materialism is able to generate differences in brand buyer profiles.

In psychographic segmentation methods (e.g. TNS Sifo's Life Values) there is usually one group that does not consider ownership of material things as greatly desirable, and does not view it as a token of success. Another group with more materialistic and hedonistic values are more focused on acquiring things and displaying them as status symbols. Conceptually the modern perception of materialism can be traced back to the end of 19th century and Thorstein Veblen work "The Theory of The Leisure Class" (1899). Verblen described the "conspicuous consumption" of the industrial revolution's newly rich; i.e. a deliberate consumption of goods and services intended to display socio-economic status. Later work has suggested that consumers with materialistic personal values have a positive attitude to conspicuous consumption (Podoshen, 2012). That is materialistic consumers are considered to be more likely to buy expensive brands and use products as status symbols. That consumers buy things as a way to express their identity has long been a central tenet for marketers. In a well cited article, Levy (1959) refer to products and brands as "Symbols for Sale". Levy argues that products are used to interpret the "caste" of the user. Brands and products are thus often seen as markers of personal values and tokens that demonstrate group belonging.

2.2.5 An Advanced and Transparent Segmentation Method

A considerable number of different segmentation methods have been described in literature reviews over the years, both in terms of different segmentation variables (Kotler & Keller, 2006; Jobber, 2007) and in terms of different statistical techniques (Jain, 2009). The more sophisticated methods often tend to produce different outcomes depending on the specific clustering algorithm used and have drawbacks in terms of transparency (ibid.). For example segmentation based on clustering have three major drawbacks: i) They are based on arbitrary subjective decisions that will generate different solutions. ii) They are unstable over time. And iii) they are not robust enough to withstand even small data changes (Hoek, 1993; Wright, 1996). The frequently advocated "benefit sought" variable suffers from these drawbacks (Haley 1968; Jobber, 2007) since the common application of this variable goes hand in hand with some kind of clustering algorithm (Malhotra 2010).

Ehrenberg and Kennedy (2001) argue that not one specific advanced statistical technique has proved to be a continuous success story. They further argue that accurate empirical support for brand segmentation cannot be generated from arbitrary studies which are not possible to replicate. In this thesis it is thus our ambition to investigate more sophisticated segmentation methods which can live up to the criteria of transparency and thereby be subject to replication. A promising method, which meets the above specified criteria, is described below.

2.2.6 Personal-Situation Segmentation and Need States

According to Dickson (1982), much of the segmentation literature has been focused on the grouping of consumers in homogenous group without including situational factors in the analysis. Dickson emphasize how this is conceptually wrong since it is the personal-situational interaction - i.e. how a particular group of consumers behave in a particular situation - which should provide the most correct basis for segmentation. Several studies such as Currim (1981), Desai and Hoyer (2000), Aurier et al. (2000), Yang et al. (2002) and Romero (2008) support the importance that situational factors has on consumers preferences. A practical development of the personal-situational logic, and how it can be used in brand portfolio management, is presented by consultants from McKinsey in Carlotti et al. (2004). They use the term "need state" to describe how the same group of consumers can have several needs based on the occasion in which they will use the product. The term need state is commonly used also by other consultancy firms,

market research firms and by major consumer product companies; especially in the beverage industry. Coca Cola for example developed 17 different need states including hydrate, boost energy, relax, refresh and beautify (Macarthur, 2006). The concept of need states is partly similar to the well-known segmentation variable benefit sought - originally presented by Haley (1968) - in the sense that the main focus is on the consumer's underlying needs. But the essential difference is that an additional situational dimension is brought into the analysis. I.e. the term need state is often used to define the benefit sought in a specific situation.

Based on the above cited studies - and the fact that this method is strongly advocated by practitioners – it should be considered as likely that meaningful results would come from a segmentation procedure based on need states alone. And if not so, at least in combination with personal segmentation variables. The later of these two methods - the personal-situational segmentation - is conceptually similar to the frameworks developed by Dickson (1982) and Yang et al. (2002). The specific framework we use is a two-dimensional segmentation method with income on the Y axis, which Sharp (2010) argues is a demographic variable that has effect, and with need states on the X axis. See figure 1 below. This method is very similar to those used by leading consultancy firms, market research companies and major consumer companies in practise.

Figure 1: Person-Situation Segmentation Framework for the Beer Category

		Situation: Need states		
		To relax at home, alone or with a partner	**To "unleash" at a party**	**To accompany a meal together with friends**
Personal factors	**High income**			
	Low income			

2.3 Research Questions Generation

Five specific research questions are generated based on the first and second part of the literature review.

As apparent from the literature review above there are dipolar views on the existence of brand segmentation. We have picked three product categories and investigated if the segmentation bases generate any managerial useful differences in buyer profiles. The selection of categories and the analytical procedure will be described and motivated further in the method part.

2.3.1 Fit of the Dirichlet Model

As a prerequisite for the other research questions, RQ1 tests that the three categories follow the Dirichlet patterns. If RQ1 would not be validated, the Dirichlet model's assumption of an unsegmented market would be challenged even before the brand buyers groups are studied in detail. (Sharp & Driesener, 2000; Ehrenberg et al., 2004; Uncles et al., 2012)

RQ1 – Do the three categories (beer, take home ice cream and coffee) conform to the Dirichlet model?

2.3.2 Demographic Segmentation

The demographic bases of income, age, gender and educational level are tested in all of the three categories. As shown in previous studies (Hammond et al., 1996; Kennedy & Ehrenberg, 2001; Uncles at al., 2012) it is unlikely that demographic segmentation bases will provide actionable differences. However, Sharp suggests that income may have some effect on purchase patterns (Sharp, 2010, p. 72), especially on a subcategory level or between price tiers. Kotler and Keller (2006) describe how high income groups tend to buy more premium brands and products. Kotler points out the importance of demographics with regard to buying advertising space, since media channels are usually measured according to demographic variables (Kotler, 2008, p. 413). Thus demographics are used quite a lot in the media industry for market segmentation.

RQ2a – Do Brand segments based on income as a segmentation base provide a managerially useful segmentation?
RQ2b - Do Brand segments based on gender as a segmentation base provide a managerially useful segmentation?
RQ2c – Do Brand segments based on age as a segmentation base provide a managerially useful segmentation?
RQ2d – Do Brand segments based on education as a segmentation base provide a managerially useful segmentation?

2.3.3 Psychographic Segmentation: Materialism

Psychographic segmentation and materialism has been a subject of strong interest for both marketers and psychologists (Belk, 1985a; Kahle, 1983; Mitchell, 1983; Richins, 2004). If brand segments exist in any of the three categories, it would be likely that materialistic consumers would differ in their brand choices from consumers that score low in materialism. According to theory the materialistic consumers should be more inclined towards conspicuous consumption (Podoshen, 2012). I.e. materialists should prefer more expensive brands with a higher social demonstrable function. Nevertheless, previous studies (Kennedy & Ehrenberg, 2001; Uncles et al., 2012) indicate that there should be no meaningful differences between brand user groups in the same category based on psychographics. On the other hand practitioners, influenced by Freud's and Maslow's findings regarding needs and motivation, have long used psychological factors in marketing research (Kotler, 2008, p. 255). No previous study has empirically tested if materialism is a segmentation variable able to generate managerially useful differences in brand buying profiles.

RQ3 – Do brand segments based on materialism as a segmentation base provide a managerially useful segmentation?

2.3.4 Segmentation using Need States

Some researchers claim that focusing on need states - i.e. consumers' needs in a particular situation or point in time - will create a stronger base for market segmentation (Dickson, 1982; Carlotti, 2004). It has even been proposed that one brand cannot cover all of a consumer's need states. I.e. one brand is not likely to be in a consumer's consideration set in all need states. If this is true, a clear segmentation between brands should occur. No previous study has empirically tested if this type of segmentation variable produces managerially useful differences in brand buying profiles.

RQ4 – Do brand segments based on need states as a segmentation base provide a managerially useful segmentation?

2.3.5 Person-Situation Segmentation: Income intersected with Need States

Dickson (1982) proposes that the combination of personal variables (such as demographic segmentation bases) and situation variables (need states or purchase occasions) are "Segmentation's Missing Link". If true the intersection of income - which even Sharp claims is

significant for category segmentation (2010, p. 72) - with need states should create a useful segmentation method. This method of segmentation is also used by leading industry professionals such as McKinsey & Co (Carlotti et al, 2004). However, as other segmentation methods have failed to provide managerially useful brand segmentation (Hammond & Ehrenberg, 1996; Kennedy & Ehrenberg, 2001; Uncles et al., 2012) it could also be questioned if personal-situational segmentation creates managerially useful brand segments. No previous study has empirically tested if this type of segmentation variable generate managerially useful differences in brand buying profiles.

RQ5 – Do brand segments based on need states intersected with income as a segmentation base provide a managerially useful segmentation?

2.3.6 Summary of Research Questions

Main question: Do buyer profiles of brands in the same FMCG category differ enough to provide managerially useful brand segments?	
RQ1	Do the three categories (beer, take home ice cream and coffee) conform to the Dirichlet model?
RQ2	**a)** Do brand segments based on income as a segmentation base provide a managerially useful segmentation? **b)** Do brand segments based on gender as a segmentation base provide a managerially useful segmentation? **c)** Do brand segments based on age as a segmentation base provide a managerially useful segmentation? **d)** Do brand segments based on education as a segmentation base provide a managerially useful segmentation?
RQ3	Do brand segments based on materialism as a segmentation base provide a managerially useful segmentation?
RQ4	Do brand segments based on need states as a segmentation base provide a managerially useful segmentation?
RQ5	Do brand segments based on need states intersected with income as a segmentation base provide a managerially useful segmentation?

3 METHODOLOGY

In this third part the scientific approach and research method of this thesis are described. It consist of a description of our initial work, scientific method, preparatory work, the main study, the questionnaire including a measurement quality discussion, data cleaning, a generalizability discussion and finally the analytical procedure used.

3.1 Initial work

Most marketing students are introduced to the concept of segmentation in their undergraduate studies by traditional textbooks such as The Principles of Marketing (Kotler et al., 2008). These traditional textbooks tend to portray marketing as focused on the identification of unfulfilled consumer needs. Or "white holes in the market place" that a new product or brand can be targeted towards and positioned to fill. Andrew Ehrenberg's and Byron Sharp's work present quite a different take on marketing. Based on the Dirichlet Model they describe a market where brand segments do not exist, where competing brands share most of their customers with other brands, and niche brands is a rarity if they even exist at all. Our curiosity about the strong opposition between these two different schools of thoughts is the foundation for this thesis.

After having discussed the subject with research professionals from a marketing research firm and a brand consultancy firm it was evident that marketing practitioners were also highly interested in further research regarding segmentation and loyalty patterns in this area. A key problem is that segmentation methods often are based on established truisms and experience - which usually means that the methods have not been subjected to empirical tests. Our segmentation bases and methods, evaluated in this study, were derived both from studying academic literature and interviewing marketing professionals. The purpose of this approach was to verify that the segmentation bases used would be considered relevant by both academics and practitioners.

A final part of the initial work process was to get hold of a system for computing the Dirichlet Model. After reviewing possible options we choose an Excel Visual Basic model created by Dr. Zane Kearns (2002). It allowed us to complete all analyses in Excel. The model is also something of a standard for academic researchers in the field, thus we had the assurance of using a tested and well established method. We reached out to John Scriven, at the Ehrenberg Centre

for Research in Marketing, who was kind enough to provide much appreciated advice regarding the Excel model. In parallel to these steps we also conducted a thorough literature review in the areas of segmentation, brand loyalty and of course the Dirichlet model. After this relatively long initial phase, that validated the practical usefulness of the research and provided us with the tools needed to study our subject, we finally drafted the research questions and began designing the survey.

3.2 Scientific Approach and Overall Research Design

We have used a quantitative and descriptive research design with a single cross sectional survey (Malhotra, 2010). It would have been difficult to provide contributions in line with our purpose by conducting a qualitative study since the generalizability aspect is of such a central importance. Since both the purpose and the specific research questions in our study relates to the pure occurrence of empirical observations rather than to the sources of their existence, it is furthermore a descriptive and not a causal approach that primarily should be suitable. Previous studies related to the Dirichlet model have mainly been based on panel data (Ehrenberg et al., 2004). However Wright et al. (1998) have developed a method to collect the necessary input from survey data. As brought up in the literature review this type of procedure opens up new analytical opportunities, which this thesis has taken advantage of. The research questions related to materialism and need states requires input data that hardly can be obtained through ordinary panel data, and some of our intended knowledge contribution is therefore dependent on a survey based input data method. Since we have not detected any available secondary data source containing the desired information it has been necessary to collect our own primary data. Limited resources have required us to delimit our study to a single cross sectional survey, which means the collection of one sample at one point in time (Malhotra, 2010).

3.3 Preparatory

This phase where composed of selecting product categories for study and selecting which need states to include in the main study. Preferably we would have liked to bring in as many product categories and need states as possible in the questionnaire in order to increase the generalizability of our findings. However the extensive and repetitive nature of the questions needed to obtain the necessary input for each category investigated (Wright et al., 2002) implies a risk of poorer data quality as the number of categories in the survey increases (Bryman & Bell, 2007). This issue is

enhanced by the fact that the questions for each individual need state in a certain category is of a similar type and magnitude as the input question required for the category itself. There is no clear-cut rule for how to solve this trade off, but previous studies using a similar method such as Uncles & Lee (2006) and Sing et al. (2012) have brought in four to six different product categories into the survey. We have decided to narrow down our study to three categories and to only investigate the need states in one of these.

There are three key reasons why we selected the three categories of beer, ice cream, and coffee. First, the categories are constituted of frequently purchased products with a high category penetration in the Swedish population. This is beneficial for survey based data gathering since fewer respondents will need to be screened out as non-category buyers. Secondly, even though we do not possess detailed sales statistics for all three categories, we have enough market data to determine and rank the top brands in order of their market share in each category (Passport, 2013; Systembolaget, 2013). This is an essential prerequisite given our survey method since all existing brands in a market hardly can be included in the questionnaire. Finally, the three selected categories exhibit different characteristics, which potentially could be expected to enhance the generalizability of other findings towards the whole FMCG industry.

The beer market also exhibits some additional features, which make it particularly interesting to dig deeper into. According to Fischer et al. (2010) the beer market is one of those categories in which brands have the highest importance in consumer's decision making. Dickson (1982) brings up the beer market as an evident example of a category where the consumption behaviour is strongly influenced by situational factors. Yang et al. (2002) have shown how there is a relationship between situations, personal variables, motivating conditions and brand preferences in the beer market. The beer market is also one of the categories most frequently segmented based on need state or other situational variables in the market research industry. Thus if a need state segmentation method (RQ 4-5) can produce managerially useful brand segments in other categories it would be very likely to generate useful brand segments in the beer category as well. We have therefore decided to investigate the different need states solely for the beer category.

To determine which need states to analyse a pre-study was carried out. We consulted industry research experts and relevant literature (Yang et al., 2002) to select six need states. We then tested the existence of each need states in an online quantitative pre-study with more than 500

respondents. The data supported a relative frequently occurrence of all six need states. However as the need states overlapped, we selected the three least overlapping need-states for the main study. Thus the analytical procedure related to the need states in this thesis have no intent to cover the complete category span of all possible need states in the beer market; but it is constructed to reflect potential differences between the need states within this span. The pre-study is described in more detail in appendix I.

3.4 Main Study

The main study in this thesis has followed a similar approach as Uncles & Lee (2006) and Singh et al. (2012). A self-completion survey based method, developed by Wright (1998), has been used to estimate the Dirichlet inputs. However in addition to the potential differences in repeat purchase patterns between age segments - investigated in both of the above mentioned studies - we have also analysed several other variables including gender, income, education, materialistic values, need states and personal-situational segmentation.

The exclusion criterion for our questionnaire (Olsson and Sörenssen, 2011) was people under the age of 20 and older than 64 years. The lower age boundary is an outcome of the legal restrictions for purchasing beer in Sweden; and the higher boundary is the standardized age limitation frequently by industry market researchers studying FMCG.

The survey method used, originally developed by Wright et al. (1998), is built on the Juster probability scale and it has been successfully replicated and extended in several studies (Wright, 1999; Wright et al., 2000; Wright et al., 2002; Wright, 2002). In these studies the Juster scale method has been validated against panel data and the estimated brand metrics usually show a very strong correlation, above 90 percent, with real market data. The method has been used in several recent studies investigating the Dirichlet patterns (Uncles and Lee, 2006; Han and Uncles, 2009; Krystallis & Chrysochou, 2011; Sing et al., 2012).

The Juster scale, originally developed by Juster (1966), is an 11 point probability scale used to measure demand in a product category by aggregating the individual probabilities of a certain behaviour within a specified time frame (Wright et al., 2002). Data from the Juster Scale is a pure estimation of the respondent's probabilities to engage in future behaviour, and should therefore not be perceived as an attitudinal construct (Wright et al., 2002). The scale has been

replicated and extended in several studies over the years (Wright et al., 2002). Brennan (2004) lists well over hundred articles investigating or applying the scale in different contexts. Studies such as Belk (1985b) and Day et al. (1991) have shown how the Juster scale significantly outperform purchase intention scales for a wide sample of products and categories, including FMCG products, with regard to purchase predictions. Wright (1999) and Wright et al. (2002) describes in more detail the unsuitability of using purchase intention or purchase recall surveys as a substitute for the Juster scale when measuring the Dirichlet inputs.

3.5 Questionnaire

In the following section the self-completion questionnaire used in our study will be outlined in more detail. We will first outline the composition of the specific questions, then describe the overall survey design in general and finally discuss the measurement reliability and validity. Reliability and validity are the main variables to consider when evaluating the data quality of a quantitative research and they are interrelated in the sense that a high reliability is a prerequisite for high validity (Bryman & Bell, 2007). The questionnaire in its full length is available in appendix IV.

3.5.1 Questionnaire Composition

The questionnaire can be seen as composed by two different parts that are different from each other both in terms of design and anticipated question contribution. The initial part of the survey is intended to estimate the two purchase metrics *brand penetration* and *brand purchase frequency* in each investigated category. These two inputs are enough to calibrate the Dirichlet model (Wright et al., 2002). However to investigate differences in brand buying profiles, the primary purpose with this thesis, these brand metrics also needs to be complemented with additional buyer information (Uncles et al., 2012). The second sub-part of the questionnaire is intended to capture this supplemental information.

To estimate the Dirichlet model inputs we used the Juster scale method. In this method each respondents are asked two questions per category. The first question is an 11-point probability interval scale (Wright et al., 2002). In the illustrative example below, taken from Singh et al. (2012), this question has been used to obtain estimates in a specific detergent category.

Figure 2: Juster Scale

What are the chances that you, personally will buy the following detergent brands over the next 3 months? For each brand, circle the number from o to 10 according to the following scale:

10 Certain, practically certain (99 in 100)
9 Almost sure (9 in 10)
8 Very probable (8 in 10)
7 Probable (7 in 10)
6 Good possibility (6 in 10)
5 Fairly good possibility (5 in 10)
4 Fair possibility (4 in 10)
3 Some possibility (3 in 10)
2 Slight possibility (2 in 10)
1 Very slight possibility (1 in 10)
0 No chance, almost no chance (1 in 100)

1. Attack	0	1	2	3	4	5	6	7	8	9	10
2. Top	0	1	2	3	4	5	6	7	8	9	10
3. Ariel	0	1	2	3	4	5	6	7	8	9	10
4. Bold	0	1	2	3	4	5	6	7	8	9	10
5. New Beads	0	1	2	3	4	5	6	7	8	9	10
6. Other detergent brands	0	1	2	3	4	5	6	7	8	9	10

Source: Singh et al. (2012)

According to Wright et al. (2002), the second and complementary question should be measured on a ratio scale and have the following design: *"How many times are you most likely to < purchase/shop at > < brand j > in the next < period >?"*. In the example above, see figure 2, this question should be asked for all the brands studied and for the "other alternative". The specified time frame, the stated brands and the number of brands are category specific elements (Wright et al., 2002), but otherwise this example represents a generic question design.

Regarding which time period to investigate, Wright et al. (2002) gives the following guideline, "The period should be long enough to give a measurable chance of purchase, but not so long that purchase becomes virtually certain for most respondents". We have taken into consideration the periods used in similar studies (Uncles & Lee, 2006; Singh et al., 2012); and decided to use a 4-week period for beer, and a 3-month period for both coffee and ice cream. Regarding which brands to select for each category we have used market share statistic from Passport (2013) and Systembolaget (2013) to determine the top brands in each category. Rather than selecting a similar amount of brands in each category we have sought to cover a similar magnitude of the market in all three cases, which is the common procedure used in other studies.

As previously motivated, the potential impact of different need states (RQ 4-5) will solely be investigated in the beer category. From the conducted pre-study we picked out the following three need states for the main study: i) "To 'unleash' at a party", ii) "To accompany a meal together with friends", iii) "To relax at home, alone or with a partner". Thus for each of these need states, the two Dirichlet input questions presented above are asked.

The second part of the questionnaire is intended to measure buying profiles in terms of the respondent's demographic characteristics and materialistic values (RQ 2-3). The demographic questions relate to the respondents gender, age, income and education and have all been constructed in accordance to standardized research procedures. The age variable has been divided into the three age groups of 20-34, 35-49 and 50-64. The income variable have been separated into a low-income group and a high-income group with a threshold value of a personal annual income of 300 000 SEK before taxes. The education variable has been divided into a group with a postsecondary education and a group with lower education, including all respondents without a postsecondary education.

The materialistic question battery used is Richins's (2004) 9-item materialism scale, as presented in the literature review. This is a validated scale recommended in market research scale reviews such as Bearden et al. (2011). Each item in the scale is measured on an 5 point Likert scale from *strongly disagree* to *strongly agree* (Richins 2004), which is the recommended number of points for unipolar scales in general (Robinson et al. 1999). The nine materialistic questions (Richins 2004) have been added together to form a materialism index with theoretical values ranging from 9 to 45[6], as the lowest value is 9x1=9 and maximum value 9x5=45. The creation of an overall materialism index is a common and established procedure (Belk, 1985a). Three groups of equal size, each representing one third of the sample, but with different value scores along this index variable have been derived. The materialistic segmentation variable has then been analysed through a comparison of the group with the most materialistic values and the group with the least materialistic values, according to the materialism index scale. It could be argued that an even more delimited analysis, such as a comparison between two even smaller groups at the end points of the index scale, would provide larger variations. However, if potential differences in

[6] The question in the 9-item materialism scale originally scored in reversed order, see Richins (2004) were transformed before added to the overall index.

brand buying profiles between two more extreme sub groups are not reflected in our more superficial comparisons, the managerial relevance of such variations is highly questionable. The size is one of Kotler's main criteria when evaluating if a specific segment is managerially useful or not (Kotler and Keller, 2006).

3.5.2 Questionnaire Design

Since it is usually desirable to provide a clear context for the respondents before they are exposed to the specific questions (Malhotra, 2010), the questionnaire has been initiated by a brief presentation of the intended study. In accordance with Malhotra's (2010) recommendations to enhance the logical order of the survey, we have bundled all questions relating to a particular category or subject together and used brief transitional phrases when switching topics. The first battery in the survey is the Juster scale questions related to the beer category and its need states. Thereafter follows the demographic and materialistic value section. The survey ends with the Juster scale questions related to coffee and finally ice cream. Due to the somewhat repetitive nature of the Juster scale questions, we have avoided to place all three categories in a successive order.

To increase the relevance and minimize the effort required by the respondents, potential issues brought up by Malhotra (2010), we have sometimes used filter questions in the survey. Respondents scoring zero for all alternatives in the initial Juster scale question related to beer consumption, indicating that there is no chance that they will consume take-home beer at all within the investigated period, have not been exposed to any of the need state questions. For the frequency of purchase occasions questions the respondents have only been exposed for those brand alternatives where they previously have answered that there is at least a very slight possibility, a probability of 1 in 10 or more, that they will purchase one of the brand alternatives within the specified time period.

The nine materialism questions were bundled together with nine additional questions about the respondent's values in general. This procedure has been carried out to not reveal the purpose of what is being measured and thereby risk an undesirable bias. Due to the potential risk of positioning effects (Malhotra, 2010), the order of the alternatives for all Juster scale and materialism questions have been randomized in the survey.

Bryman and Bell (2007) states how it always is desirable to pre-test a self-completion questionnaire. We have conducted a pilot study among 50 respondents and made minor adjustments in accordance with the obtained feedback. The participants in the pilot test have not been included in the main study.

3.5.3. Measurement Reliability

Reliability refers to the consistency of the applied measures and this variable can be perceived as composed by three prominent factors, *internal reliability*, *stability* and *inter-observer consistency* (Bryman & Bell, 2007).

Internal reliability or internal consistency refers to consistency of the different indicators that make up a scale (Bearden et al., 2011). Cronbach's alpha is a measure that can be used to evaluate the internal reliability (Malhotra, 2010). The Juster scale method is not composed by multi-item measurements and this has not been an issue brought up in the literature (Wright et al. 2002). The nine item materialistic scale used in this thesis has successfully been evaluated based on its internal consistency in more than 15 raw data sets with an average Cronbach's alpha of 0.82 (Richins, 2004). The alpha obtained in our study (0.86) is slightly above this mean value and higher than the general rule of thumb level (0,6) for a satisfying internal consistency (Malhotra, 2010). However as emphasized by Bearden et al. (2011) since the alpha measurement is positively associated with the number of item investigated there is an issue embedded in these type of evaluations.

Stability relates to the degree of consistency of the measurements over time (Bryman & Bell, 2007). A high stability is obtained if respondents exposed to the same measurement at two different points in time generate similar results. According to Robinson et al. (1991), the stability factor has often been assessed less frequently than the internal reliability within the marketing literature in general. The Juster scale questionnaire method has been evaluated against panel data collected earlier and later in time and for the same respondents with a successful outcome (Wright et al., 1998; Wright et al., 2000). However the stability factor for these measurements has not been evaluated in a longer time horizon, which perhaps is less surprising given the dynamic aspects of the estimated purchase metrics over longer time periods. As far as we know, the materialistic scale has not been evaluated based on its stability for a specific sample over time.

Inter-observer consistency refers to the potential inconsistency between the subjective judgments, related to data recoding or translation, between several data observers (Bryman & Bell, 2007). This has not been a relevant issue for this thesis and will therefore not be subjected for further discussion.

3.5.4 Measurement Validity

Measurement validity is concerned with whether a measurement really measure the concept it is intended to measure (Bryman & Bell, 2007). There are several ways of assessing the validity of a measurement and different procedures might be more or less suitable for the measurements used in this study.

Since the purchase metrics estimated by Juster scale procedure are possible to determine based on real panel data, the validity of the Juster scale measurements can be determined through a comparison with the real observations (Wright et al., 2000). The validity of the Juster scale measurements have successfully been confirmed in several studies using different benchmarking approaches with observed data (Wright et al., 1998; Wright, 1999; Wright et al., 2000; Wright et al., 2002).

Since the Juster scale method has been validated in previous studies, it is expect to accurately describe the actual purchase metrics adequately in this study. However there are two potential weaknesses in particular that, we believe, deserves some attention. With over 3000 stock keeping units sold in 2012 (Systembolaget, 2013), the Swedish take-home beer category represents an extraordinary fragmented market. We are not aware of any previous study that has used a survey-based method to investigate the Dirichlet patterns for a market with such characteristics. The extensive fragmentation might potentially encompass a source of error. The need-state procedure is another unique character for this study and it is therefore also accompanied with a potential risk of reduced measurement validity.

The materialism scale has been validated in other ways than the Juster scale procedure, which is a natural consequence of their different characteristics. The different sub-dimensions and items of the scale were originally developed by Richins and Dawson (1992) through an extensive literature review in combination with qualitative research (Richins, 2004). The construct validity (Bryman & Bell, 2007) for the original scale has been evaluated through a correlation analysis

between 72 variables - all hypothesized to be associated with materialism - in over 15 data sets (Richins, 2004). The shortened 9-item scale, used in this thesis, has successfully been validated with a similar method and over the same amount of data sets.

3.6 Data Cleaning

The obtained raw data has been checked and treated for inconsistency, as recommended by Malhotra (2010). Of the 1087 respondents initiating the survey, 1021 completed the whole questionnaire. Furthermore, 44 respondents were removed for providing inconsistent information or extreme values. 17 respondents had given demographic information incompatible with their background profile in the panel database, 14 persons had speed raced through the questionnaire (indicated by unusual fast responses and a single answer provided throughout the whole questionnaire) and 11 respondents were determined as extreme outliers for some of the different frequency of purchase occasion questions. The demographic profiles of the removed respondents were fairly similar to the rest of the sample. After the complete data cleaning process, the data consisted of 979 respondents who successfully had completed the whole questionnaire.

3.7 Generalizability

In line with the delimitations of this thesis it is our ambition to generalise the findings to FMCG categories. There are however two factors in particular inhibiting this desired generalizability. First, there is a potential issue related to the representativeness of the sample. Secondly, the study investigates only three FMCG categories. Each of these two limitations will now be discussed in turn.

3.7.1 Sample Representativeness

A random quota sample (Malhotra, 2010), intended to be representative for the Swedish population in the investigated age span of 20-64, has been collected from an online panel in the period March 12 to March 21 in 2013. The quotas have been created in terms of ten gender-age groups based on official Swedish population statistics from SCB (2013). The demographic composition of our sample, the 979 respondents who successfully completed the questionnaire, is illustrated in table 4 below.

Table 4: Sample Demographics

Age span	Male	Female
20-24	6%	4%
25-34	10%	10%
35-44	14%	12%
45-54	12%	12%
55-64	11%	9%

The response rate has been above 85 percent, the threshold value for an excellent rate according to Mangione (1995) and over 90 percent of the respondents initiating the survey also completed it successfully.

The fairly large sample size (979 respondents) in combination with the demographic representativeness of the sample should increase the likely precision of our study (Bryman & Bell, 2007). But there are simultaneously potential sampling errors that could harm the generalizability and external validity of our findings. Bryman & Bell (2007) points out the risk of ending up with an unrepresentative sample as a potential drawback from using a purely online-based data collection. However, since over 90 percent of the Swedish population is Internet users (World Bank, 2012) this potential issue is likely to be fairly limited.

There is also an issue regarding the international representativeness of the Swedish population in terms of the investigated purchase patterns. Even though the particular brands purchased in a category tend to differ between countries, the general purchase patterns have in previous cross-country studies been shown to the same (Ehrenberg et al., 2004). The findings of this study should therefore be generalizable to other markets than Sweden.

3.7.2 Cross-Category Delimitations

The delimitation to study only three categories for RQ1-3 - and only one category for RQ4-5 - decreases the possibility to generalizability our findings to the whole FMCG industry. Previous studies based on panel data such as Uncles et al. (2012) are more extensive than our study and it can be argued that three categories are far too few to be representative for all FMCG categories. However there are also factors increasing the generalizability of our findings. The three studied categories have partly been selected to represent a wider spectrum of common category differences within FMCG. Beer, coffee and ice-cream are rather different in terms of functional attributes; they are partly sold in different distribution channels and the categories have different

levels of brand fragmentation (Passport, 2013). Regarding RQ4-5 the beer market is, according to both literature and research practice, one of the most suitable categories for studying need states and situational factors. The generalizability of this part of our study would therefore not necessarily be enhanced by an analysis of these variables in a number of additional industries where they previously, in theory and practice, have been regarded as less suitable. Previous purchase pattern studies have shown how different FMCG categories often differ in their overall penetration (Driesener, 2005). E.g. more shoppers buy toothpaste then stick ice cream, but not in their overall purchase patterns (Uncles et al., 1995). We do therefore expect our findings to be sufficiently generalizable towards the broader FMCG industry, but simultaneously encourage any reader to be aware of the embedded uncertainty caused by the study's limitations.

3.8 Analytical Procedure

The analytical procedure of this thesis has been conducted in three steps. First, the investigated Dirichlet parameters have been derived mathematically. Secondly, the Dirichlet patterns were investigated at the category level (RQ1). Thirdly, the differences in brand buyer profiles from the investigated segmentation variables were determined by calculating Mean Absolute Deviations (MAD) and through an additional analysis of the purchase patterns (RQ 2-5).

Before the analytical procedure is described in more detail one important clarification might be in order. In this thesis we have not used any form of statistical significance tests to investigate our research questions. The focus is instead solely related to the magnitude of the studied relationships. Combs (2010) emphasise how there is an unfortunate tendency among academic researchers to trade relevance for statistical power. Combs points out that statistical power says little about whether the effects are of managerial or theoretical relevance when large samples are analysed. Given the rather extensive amount of data analysed in this study, a sample of nearly 1000 respondents, even very small differences will be significant. However, this does not necessarily mean that the differences are managerially relevant. Other studies in the field, e.g. Hammond et al. (1996), Kennedy and Ehrenberg (2001), Ehrenberg et al. (2004), Uncles and Lee (2006), Sharp (2010), Singh et al. (2012), Uncles et al. (2012) have not included statistical power in their analyses.

3.8.1 Mathematical Derivations

In accordance with the survey based method used in this thesis, the raw data obtained from the Juster scale needs to be derived mathematically to receive the desired estimated Dirichlet inputs (Wright et al., 2002). We have followed the procedure explained by Wright et al. (2002) and the derivations have been carried out for each category or need state separately. The mathematical calculations are described in detail in appendix V.

3.8.2 Dirichlet Patterns at the Category Level

From the mathematical calculations we use the four input variables needed to evaluate the Dirichlet patterns in a category. The four input variables are: brand penetration (*bj*), category penetration (*B*), brand purchase frequency (*wj*) and category purchase frequency (*W*). RQ1 is investigated through an assessment of the perceived fit of the Dirichlet model and the occurrence of the three main Dirichlet patterns for each category. As described previously in the literature review the general occurrence of the Dirichlet patterns, as well as the Dirichlet model's ability to successfully predict these patterns, have been used as an argument supporting the Dirichlet model's underlying assumption of an unsegmented market. Therefore the RQ1 investigates potential deviations from the Dirichlet patterns and the general fit of the Dirichlet model.

To calibrate the Dirichlet model we have used an Excel based open software, Kearns (2009), and a user guide presented by Bound (2009). This software has been evaluated by Bassi (2011) and used by researchers such as Sharp (2002), Scriven and Bound (2004) and Sign et al. (2012). The fit of the Dirichlet model has been evaluated with two methods – correlation and MAD – methods previously used by Scriven and Bound (2004) and Wright (1999).

3.8.2.1 Fit Benchmarks

Four goodness of fit benchmarks are used to test RQ1, i.e. the fit of the Dirichlet model. RQ1 is accepted if all the four goodness of fit benchmarks, summarized in the table below, is accepted for each of the three categories. The benchmarks are developed by Wright (1999) and Scriven & Bound (2004).

Table 5: Fit Benchmarks for Research Question 1

	Penetration (bj)		Purchase frequency (wj)	
Category	Correlation	MAD	Correlation	MAD
Coffee	≥0.9	≤3%	≥0.6	≤0.9
Beer	≥0.9	≤3%	≥0.6	≤0.9
Ice Cream	≥0.9	≤3%	≥0.6	≤0.9

The first benchmark is correlation between observed brand penetration and theoretical brand penetration. This benchmark requires a correlation of 0,9 or above. The second benchmark is correlation between observed purchase frequency and theoretical purchase frequency. The second benchmark requires a correlation of 0,6 or above. Since all metric variables are ratio scaled we have used a Pearson correlation coefficient for this analysis (Malhotra, 2010). The third and fourth benchmarks are based on Mean Absolute Deviation (MAD). For penetration a MAD value of 3 percent or below is required. For purchase frequency 0,9 or lower. The calculation of MAD values is illustrated in the equation below; *g* represents the number of investigated brands in the category.

Equation 1: Mean Average Deviation (MAD)

$$MAD = \frac{\sum_{j=1}^{g} |O_j - T_j|}{g}$$

3.8.3 Mean Absolute Deviation (MAD)

RQ 2-5 relate to whether any managerially useful brand segments can be created based on the studied segmentation bases. These research questions are evaluated using an established method (Kennedy & Ehrenberg 2001; Uncles & Lee, 2006; Uncles et al., 2012). Mean absolute deviations (MADs) for each segmentation variable have been calculated, i.e. the average sizes of the differences between brand and category profiles. The analysed entity is the differences in brand market shares, which are obtained from the four Dirichlet inputs described in the previous section.

The calculation of these MAD values will now be illustrated using an example from Uncles et al. (2012). The table below shows the market shares (in percent) for different brands in the Soy Sauce category and the market share of different age segments. Laocai has for example a market

share of 29 percent in the category; and 22 percent of the purchases of Laocai comes from the youngest age group.

Table 6: User Profiles for Soy Sauce - Sample Measures

	Market Share	Age segments			Ave. "brand" MAD
		Young	Middle	Older	
Category	**100**	**19**	**45**	**36**	
Laocai	29	22	41	37	2,9
Amoy	26	17	46	37	1,4
Haiou	18	19	46	36	0,5
Haday	11	26	49	26	6,6
Others	11	12	47	40	4,8
No Brand	4	21	51	29	4,5
Ave "measure" MAD					**3,5**

Source: Uncles et al. (2012)

The percentage of Laocai purchases sums to 100 percent over the three age segments since they are mutually exclusive. On the category level the youngest age group represents 19 percent of the total category purchases; again the sum of category purchases for all segments equals 100 percent. Laocai has a slight overrepresentation of young buyers compared with the category benchmark (|19-22|), which generates an absolute deviation of 3. The two additional absolute deviations for the Laocai brand's other age groups are 4 (|45-41|) and 1(|36-27|). Thus the MAD value of Laocai is 2,9, the average of these three absolute deviations. Once MAD values have been calculated for all brands it is possible to determine an overall MAD for the segment variable in the category by averaging all individual brand MADs.

In the above exemplified category the MAD for the age variable is 3,5. It is this value that can be interpreted as an estimate of the usefulness of this particular segmentation approach (Uncles et al., 2012). Since MAD values are determined from absolute rather than relative deviations small buyer groups will to some extent have to compensate through larger deviations to generate the same values as a comparison based on fewer and larger buyer groups. This should be a desirable feature since size often is an important criterion in segmentation evaluation (see e.g. Kotler & Keller, 2006). It has been argued that MAD values below 5,0 percentage points indicate no brand segmentation at all; and that MAD values below 10,0 percentage points indicate no managerially useful brand segmentation (Hammond et al., 1996; Uncles at al., 2012). In this thesis we will use

the last threshold value to determine if any of the investigated segmentation bases (RQ2-5) can generate managerially useful brand segments.

RQ2-3 relate to segmentation based on demographics and materialism. If the calculated MAD values are below 10 percentage points, in all three categories, the segmentation bases does not provide managerially useful brand segments.

Table 7: Benchmark tests for Research Question 2-3

Research question	Segment base	MAD value in each category
RQ2a	Income	<10
RQ2b	Gender	<10
RQ2c	Age	<10
RQ2d	Education	<10
RQ3	Materialism	<10

For RQ4, a MAD value is obtained through an analysis of three different need states in the beer category. In RQ5 we investigate Person-Situation segmentation (intersection of need states and personal income) in the beer category; this MAD value is calculated through a six group comparison (three need states x two income groups).

Table 8: Benchmark tests for Research Question 4-5

Research question	Segment base	MAD value for beer category
RQ4	Need states	<10
RQ5	Person-Situation (Need states x income)	<10

Both research questions are thus solely investigated in the take-home beer category. As motivated earlier, this is the category where the need state variable is expected to produce the highest variations in brand buyer profiles.

3.8.4 Additional Analysis

As a complementary analysis to the MAD value procedure we have also examined the purchase patterns between the investigated segments in more detail when appropriate. A high MAD value does not per definition imply that a segmentation solution is managerially useful. There are additional expectations embedded in a segmentation procedure that preferably also should be fulfilled. The income, education, materialism and potentially also the need state variable are such

examples. As described in the literature review consumers with materialistic values are expected to buy more expensive brands (Podoshen, 2012); so also with high income or well educated segments (Kotler & Keller, 2006). Thus if for example the income variable generate a high MAD value in a category, these differences are expected to have a connection to brand price levels. Buyers with a high income are expected to be overrepresented among premium brand purchasers and underrepresented among budget brand purchasers. Should the relationship between income groups and price levels be completely random there is an evident risk that the high MAD value to a large extent were generated by what Uncles et al. (2012) refers to as none exploitable random variations.

Even though this type of reasoning applies for many brand attributes, e.g. women are expected to buy more feminine positioned brands (Kotler & Keller, 2006) and people motivated by ideals and responsibilities are expected to buy brands positioned as durable (Kotler & Keller, 2006) etc., we have delimited our additional analysis to price. This is a variable that can be measured easily and rather objective from available sales prices and it is an attribute that is relevant for several of the analysed variables. If any of the above mentioned variables generates a managerial useful (above 10) or near a managerial useful MAD (7,5-10) value in a category, the additional price analysis will be carried out. This analysis will also be conducted for the need state and personal-situational method, which are investigated in one category solely. Variations in e.g. the social demonstrable function (Fisher et al. 2010) between different need states could be expected to imply a systematic relationship between need states and price levels.

4 RESEARCH AND ANALYSIS

In this part the results concerning the five research questions are presented. The research questions are answered in the following order: Fit of the Dirichlet Model, Demographic segmentation bases, Materialism as a segmentation base, Need states as a segmentation base, and finally Person-Situation as a segmentation base.

4.1 Fit of the Dirichlet Model

RQ1 investigates if the three categories (beer, ice cream and coffee) conform to the Dirichlet model's predictions. As can be seen from table 9 below - the three categories conform to the goodness of fit benchmarks. This should imply that the Dirichlet patterns, such as Double Jeopardy, and potentially also the model assumptions including that of an unsegmented market holds for the three categories.

Table 9: RQ1 - Fit Test for Dirichlet Patterns

	Penetration		Purchase frequency	
	Correlation	*MAD*	*Correlation*	*MAD*
Fit benchmark	*≥0.9*	*≤3%*	*≥0.6*	*≤0.9*
Coffee	0,99	1%	0,98	0,2
Beer	0,98	3%	0,97	0,3
Ice Cream	0,99	3%	0,84	0,3

RQ1 – Do the three categories (beer, take home ice cream and coffee) conform to Dirichlet model?

Yes

Table 10 is a detailed example, taken from the studied coffee category, of what the benchmark fit test shows. Studying the table one can see the strong fit between the observed values *(O)* and the theoretical *(T)* values predicted by the Dirichlet model.

Table 10: Detailed Example of Dirichlet Model Fit

Brand	Penetration		Market share	Purchase frequency	
	O	*T*	*O*	*O*	*T*
Gevalia	35%	38%	31%	2,6	2,5
Zoegas	30%	33%	25%	2,5	2,3
Löfbergs Lila	22%	22%	15%	2,0	2,1
Arvid Nordqvist	18%	15%	10%	1,7	2,0
ICA	13%	11%	7%	1,6	1,9
Coop	9%	6%	4%	1,2	1,9

0 = observed values the from survey

T = theoretical values from the Dirichlet model

The data follows the patterns of Double Jeopardy; i.e. larger brands have a higher brand penetration and are purchased more frequently. Smaller brands have less loyal buyers and decreased penetration. The same loyalty patterns, including the Double Jeopardy Law, occur in all the three categories studied and they also apply after a breakdown into the different user groups analysed i.e. men have the same overall loyalty patterns as women etc.

4.2 Demographic Segmentation

RQ2 investigates if the demographic variables provide managerially useful brand segmentation. Table 11 shows the findings for the coffee category relating to this research question. The column to the far right and the bottom row shows MAD values[7] for each brand and for each "segment". As mentioned previously in the method part a MAD value below 10 percentage points is considered not managerially useful. For the coffee category, the income segments have the lowest MAD value of 4,0 percent. While the education segments has the highest MAD value of 6,8 percent. For example consider the brand Arvid Nordqvist whose user group is slightly skewed towards people with a higher income[8] and a college education. However no segment MAD values are above 10 percentage points in the coffee category.

Table 11: Demographic Segmentation Bases - Coffee Category

		Income segments			*Gender segments*			*Age segments*				*Education segments*		
Brand	**Market share**	**High Income***	**Low income***	**Ave. "brand" MAD**	**Women**	**Men**	**Ave. "brand" MAD**	**20-34**	**35-49**	**50-64**	**Ave. "brand" MAD**	**High School**	**College**	**Ave. "brand" MAD**
Category	**100%**	46%	38%		49%	51%		23%	38%	38%		48%	52%	
Gevalia	31%	46%	39%	1%	54%	46%	4%	22%	43%	35%	3%	54%	46%	6%
Zoegas	25%	51%	37%	3%	44%	56%	5%	21%	36%	39%	3%	43%	57%	5%
Löfbergs Lila	15%	46%	44%	3%	52%	48%	3%	24%	41%	36%	2%	58%	42%	9%
Arvid Nordquist	10%	51%	30%	7%	41%	59%	9%	30%	27%	40%	8%	37%	63%	11%
ICA	7%	36%	40%	6%	63%	37%	14%	22%	31%	50%	6%	53%	47%	5%
Coop	4%	39%	39%	4%	52%	48%	2%	29%	35%	47%	4%	52%	47%	4%
Other brand	9%	40%	39%	n/a	44%	56%	n/a	26%	43%	39%	n/a	34%	66%	n/a
Ave. "measure" MAD				**4,0%**			**6,2%**				**4,3%**			**6,8%**

*Note: *High income (above 300 000 SEK per year). *Low income (below 300 000 SEK per year).*

In fact none of the demographic variables generates a MAD value above 10 percentage points in any of the three categories, see table 12 below. Thus brand segmentation based on demographic variables does not provide managerially useful brand segments.

[7] See Methodology page 42-43 for a description of how MAD (mean average deviation) is calculated.
[8] The income groups does not equal 100 percent (46%+38%=84%). This is because the respondents were not forced to state their personal income in the survey if they felt it were too sensitive information to give away.

Table 12: RQ2 MAD Values for Demographics for All Categories

	Income	Gender	Age	Education	Category Ave.
Coffee	4,0%	6,2%	4,3%	6,8%	5,3%
Beer	7,9%	5,2%	4,5%	6,1%	5,9%
Ice Cream	5,5%	7,0%	6,3%	3,9%	5,7%
Segment Ave.	**5,8%**	**6,1%**	**5,0%**	**5,6%**	**5,6%**

RQ2a – Do brand segments based on income as a segmentation base provide a managerially useful segmentation? ***No***

RQb – Do brand segments based on gender as a segmentation base provide a managerially useful segmentation? ***No***

RQc – Do brand segments based on age as a segmentation base provide a managerially useful segmentation? ***No***

RQd – Do brand segments based on education as a segmentation base provide a managerially useful segmentation? ***No***

The segmentation base in all categories that generated the highest MAD value was income in the beer category; Sharp suggest that income affect purchase patterns at the category and subcategory level (Sharp, 2010, p. 72). I.e. not between brands but between categories and sub categories. At the subcategory level we can see a slight trend where more expensive beer brands are bought more often by consumer with a high income, see table 13 below[9].

Table 13: Beer Category - Price Tiers

Price tier	Price index	High income	Low income
Category	100	46%	42%
Premium	109-165	46%	41%
Medium	84-96	40%	48%
Budget	65-80	36%	55%

However this trend does not apply to all brands. Some expensive brands such as Heineken is bought more often by consumers with a low income, while other expensive brand such as

[9] The price indexes have been calculated in two steps and based on detailed price data from Systembolaget (2013). Firstly the price for each brand has been determined from a weighted price average of all SKUs making up the brand (the weights have been determined based on the relative sales of the different SKUs). Secondly the index has been calculated by dividing each brand's price with the average price of all investigated brands. The one third of the brands with the highest price indexes have been labelled premium brands and the one third with the lowest price indexes have been labelled budget brands.

Staropramen is bought more often by consumer with a high income. And several of the cheapest brands are bought in equal proportion by both income groups, such as Åbro and Sofiero. See table 14 below and observe the price index column to the left.

Table 14: Segmentation Base Income - Beer Category

	Price index	High Income*	Low income*	Ave. "brand" MAD
Category	**100**	46%	42%	**7,9%**
Corona	165	39%	47%	6%
Heineken	145	35%	51%	10%
Staropramen	145	58%	32%	11%
Carlsberg	120	44%	43%	1%
Mariestads	109	52%	34%	7%
Falcon	96	38%	52%	8%
Arboga	95	39%	49%	7%
Norrlands Guld	94	41%	47%	5%
Spendrups	85	41%	47%	5%
Åbro	84	44%	44%	2%
Småland	80	38%	53%	9%
Pripps	76	28%	58%	17%
Stockholm Festival	70	43%	54%	7%
Sofiero	70	45%	43%	1%
Fem komma tvåan	65	27%	66%	21%

*Note: *High income (above 300 000 SEK per year).*

Low income (below 300 000 SEK per year).

4.3 Psychographic Segmentation: Materialism

RQ3 investigates if brand segments based on materialism as a segmentation base provide managerially useful brand segmentation. The category with the highest MAD due to differences in materialism was the beer category. However, all MAD values are below 10 percentage points.

Table 15: RQ3 MAD Values Materialism – All Categories

Category	MAD
Coffee	2,5%
Beer	7,7%
Ice Cream	4,3%
Segment Ave.	**4,8%**

RQ3 – Do brand segments based on materialism as a segmentation base provide a managerially useful segmentation? ***No***

Looking at the beer category in detail no stable trend appears with regard to brand choice. Materialistic buyers seem to favour some of the expensive beer brands such as Corona and Heineken. On the other hand non-materialists are overrepresented as buyers of other expensive brands such as Staropramen and Mariestads. See table 16 below.

Table 16: Segmentation Base Materialism - Beer Category

	Price index	Non-materialists	Materialists	Ave. brand MAD
Category	**100**	**28%**	**42%**	**7,7%**
Corona	165	29%	53%	6%
Heineken	145	21%	46%	5%
Staropramen	145	36%	45%	5%
Carlsberg	120	24%	32%	7%
Mariestads	109	32%	39%	4%
Falcon	96	20%	44%	4%
Arboga	95	17%	63%	16%
Norrlands Guld	94	29%	40%	2%
Spendrups	85	25%	61%	11%
Åbro	84	20%	44%	5%
Småland	80	20%	53%	9%
Pripps	76	23%	55%	9%
Stockholm Festival	70	13%	69%	21%
Sofiero	70	29%	46%	3%
Fem komma tvåan	65	21%	56%	10%

Identical results can be seen for the inexpensive brands. Some of the cheaper brands are favoured by materialists such as Fem komma tvåan, Arboga and Stockholm Festival; while there is almost no difference for other cheap brands such as Sofiero.

If we look at the difference between price tiers, a somewhat surprising trend appears. Consumers with materialistic values are skewed toward cheaper beer brands.

Table 17: Materialism - Price Tiers

Price tier	Price index	Non-materialists	Materialists
Category	**100**	**28%**	**42%**
Premium	109-165	28%	43%
Medium	84-96	22%	50%
Budget	65-80	21%	56%

4.4 Segmentation using Need States

RQ4 investigates if need states provide managerially useful brand segments. The MAD value for need states is 3,3 percent – see table 18 below - which is less than the threshold of 10 percentage points.

RQ4 – Do brand segments based on need states as a segmentation base provide a managerially useful segmentation? ***No***

While the average for the category is well below 10 percent, some exceptions on particular brands can be noted, see table 18 below. Fem komma tvåan seem to be consumed to a higher degree in the need states of "To 'unleash' at a party". And this particular beer brand is more seldom consumed as a "meal companion". However, no general trend is evident in the category with regard to need states. Different beer brands are consumed quite evenly across all the three needs states.

Table 18: RQ4 Need States - Beer Category

	Price index	To relax at home, alone or with a partner	To accompany a meal together with friends	To "unleash" at a party	Ave. brand MAD
Category	100	**37%**	**37%**	**26%**	**3,3%**
Corona	165	33%	43%	25%	3%
Heineken	145	32%	36%	32%	4%
Staropramen	145	38%	40%	21%	3%
Carlsberg	120	34%	40%	26%	2%
Mariestads	109	37%	40%	23%	2%
Falcon	96	36%	35%	28%	2%
Arboga	95	39%	36%	25%	2%
Norrlands Guld	94	35%	36%	29%	2%
Spendrups	85	37%	41%	23%	2%
Åbro	84	37%	31%	32%	4%
Småland	80	36%	39%	25%	1%
Pripps	76	39%	29%	31%	5%
Stockholm Festival	70	44%	32%	24%	5%
Sofiero	70	41%	31%	28%	4%
Fem komma tvåan	65	36%	26%	38%	8%

If we look at the price tier level, we see that cheaper beers are not used as often as meal companions. But in general there are no great differences between the price tiers with regard to need states.

Table 19: Need States - Price Tiers

Price tier	Price index	To relax at home, alone or with a partner	To accompany a meal together with friends	To "unleash" at a party
Category	**100**	**37%**	**37%**	**26%**
Premium	109-165	35%	40%	25%
Medium	84-96	37%	36%	27%
Budget	65-80	39%	31%	29%

4.5 Person-Situation Segmentation: Income intersected with Need States

RQ5 investigates the most complex segmentation method, the intersection of income with need states. The income segmentation for the beer category generated a MAD value of 7,9 percent, the need states segmentation a MAD value of 3,3 percent. The intersection of income with need states generated a MAD value of 2,6 percent. Well below the threshold of 10 percent.

RQ5 – Do brand segments based on need states intersected with income as a segmentation base provide a managerially useful segmentation? ***No***

Table 20: RQ5 Person-Situation Segmentation – Beer Category

		Low income			High income			
	Price index	To relax at home, alone or with a partner	To "unleash" at a party	To accompany a meal together with friends	To relax at home, alone or with a partner	To "unleash" at a party	To accompany a meal together with friends	Ave. brand MAD
Category	100	**18%**	**14%**	**18%**	**19%**	**11%**	**19%**	**2,6%**
Corona	165	18%	13%	25%	14%	10%	19%	3%
Heineken	145	20%	22%	20%	12%	11%	16%	4%
Staropramen	145	12%	11%	14%	25%	11%	27%	4%
Carlsberg	120	18%	15%	23%	17%	11%	17%	1%
Mariestads	109	17%	10%	17%	20%	13%	23%	2%
Falcon	96	18%	16%	19%	19%	10%	17%	1%
Arboga	95	17%	13%	16%	21%	14%	18%	1%
Norrlands Guld	94	17%	16%	18%	19%	13%	17%	1%
Spendrups	85	20%	14%	22%	17%	8%	18%	2%
Åbro	84	20%	18%	15%	18%	14%	15%	2%
Småland	80	25%	16%	22%	10%	11%	16%	4%
Pripps	76	25%	22%	21%	15%	9%	9%	4%
Stockholm Festival	70	25%	14%	19%	19%	10%	13%	2%
Sofiero	70	24%	15%	16%	18%	11%	16%	2%
Fem komma tvåan	65	29%	28%	17%	7%	10%	9%	7%

No clear trend regarding brand choice appears. Fem komma tvåan is the beer brand with the highest MAD value. It is the cheapest beer brand with a price index of 65. It seems to be slightly more favoured by consumers with a lower income when partying and relaxing at home. However, Heineken one of the most expensive beer brands with a price index of 145, is also skewed slightly toward low income consumers across all the three need states. Staropramen, one of the most expensive beer brands with a price index of 145, is preferred slightly more by high income consumers both as a meal companion and to relax at home. On the other hand Corona, the most expensive brand with a price index of 165, is bought more often by low income consumers as a meal companion. Thus there is no general trend at the brand level.

At price tier level though, we can see that the high income group are skewed toward drinking expensive beers as a meal companion, see table 21 below. On the other hand they high income group is fine with drinking beer brands from any price tier when partying.

Table 21: Person-Situation Segmentation - Price Tiers

		Low income			High income		
Price tier	**Price index**	**To relax at home, alone or with a partner**	**To "unleash" at a party**	**To accompany a meal together with friends**	**To relax at home, alone or with a partner**	**To "unleash" at a party**	**To accompany a meal together with friends**
Category	**100**	**18%**	**14%**	**18%**	**19%**	**11%**	**19%**
Premium	109-165	17%	14%	20%	18%	11%	21%
Medium	84-96	19%	16%	18%	19%	12%	17%
Budget	65-80	26%	19%	19%	14%	10%	13%

The low income group are skewed toward cheaper beer brands when relaxing at home, and to some degree when partying.

4.6 Summary of Research Questions

Table 22 below is a summary of all MAD values. As no MAD value was at or above 10 percent, no segmentation base provided a managerially useful segmentation. The most complex segmentation method person-situation segmentation, a method favoured by leading industry professionals, generated the lowest MAD value of 2,6 percent.

Table 22: MAD Values for all Categories and Segmentation Bases

	Category Ave.*	Income	Gender	Age	Education	Materialism	Need states	Need states x Income
Coffee	**4,8%**	4,0%	6,2%	4,3%	6,8%	2,5%	-	-
Beer	**5,3%**	7,9%	5,2%	4,5%	6,1%	7,7%	3,3%	2,6%
Ice Cream	**5,4%**	5,5%	7,0%	6,3%	3,9%	4,3%	-	-
Segment Ave.	**5,2%**	**5,8%**	**6,1%**	**5,0%**	**5,6%**	**4,8%**	-	-

The range of MAD values for the segment averages are between 4,8 percent to 6,1 percent. The highest observed MAD value was 7,9 percent for the income segments in the beer category. However no stable trend with regard to income could be observed for the beer category at the brand level, on the other hand there was a slight trend between price tiers where people with higher income to some degree tended to buy more expensive beer brands.

Main question: Do buyer profiles of brands in the same FMCG category differ enough to provide managerially useful brand segments?	
RQ1	Do the three categories (beer, take home ice cream and coffee) conform to the Dirichlet model ***Yes***
RQ2	**a)** Do brand segments based on income as a segmentation base provide a managerially useful segmentation? **b)** Do brand segments based on gender as a segmentation base provide a managerially useful segmentation? **c)** Do brand segments based on age as a segmentation base provide a managerially useful segmentation? **d)** Do brand segments based on education as a segmentation base provide a managerially useful segmentation? ***No to all***
RQ3	Do brand segments based on materialism as a segmentation base provide a managerially useful segmentation? ***No***
RQ4	Do brand segments based on need states as a segmentation base provide a managerially useful segmentation? ***No***
RQ5	Do brand segments based on need states intersected with income as a segmentation base provide a managerially useful segmentation? ***No***

5 DISCUSSION

This final part of the thesis starts with a conclusion regarding the main research question. Secondly, the effects of the findings concerning the five underlying research questions are discussed. Thirdly, the managerial implications of the findings are provided with practical examples. The thesis concludes with a discussion regarding potential criticism of the study and an outlook for future research possibilities.

5.1 Conclusion: Brand Segments Lack Relevance for FMCG

The results indicate that managerially useful FMCG brand segments cannot be generated based on the segmentations bases: demographics, materialism, need states and personal-situation segmentation using the intersection of income with need states. The results validate prior findings with regard to the fit of the Dirichlet model (e.g. Ehrenberg et al., 2004) and the lacking usefulness of demographic segmentation bases (Hammond et al., 1996; Kennedy & Ehrenberg, 2001; Uncles et al., 2012). And add to previous research by also demonstrating that the more sophisticated segmentation methods - materialism indexes, need states and person-situation segmentation - does not provide managerially useful brand segments.

Several researchers have ignored Ehrenberg's finding and some have doubted Ehrenberg's and his colleagues' methods for identifying brand segments (e.g. Wedel & Kamakura, 2001). Nonetheless the findings in this study strongly support Ehrenberg's and his colleagues' work. When we began this research we had a very open mind regarding the existence or nonexistence of brand segments. We attempted to pick brands, categories and segmentation methods - such as the person-situation method - that we considered as highly likely to break the commonly seen Dirichlet patterns. However the result is consistent and show how none of these methods are able to generate a single managerially useful brand segmentation in any of the three categories. Thus the main conclusion from this study is that there appears to be no managerially useful brand segments in FMCG.

The findings from this study should not be evaluated in isolation. They should rather be perceived as an additional piece in the expanding empirical puzzle generated by Ehrenberg, Sharp and colleges. When taking all these findings into account it seems very reasonable to question many of the recommendations proposed in the traditional marketing school, such as

Kotler's Principles of Marketing (2008). This reasoning will be developed further in the managerial implication section, but before that a more detailed discussion related to each of the five research questions will be outlined.

5.2 Understanding Segmentation

5.2.1 Dirichlet Model Fit

The successfully predictability of the Dirichlet model were perhaps the least surprising result of our study given the extensive empirical validation of the model in previous studies (Uncles et al., 1995; Ehrenberg et al., 2004). Practitioners and academic researchers will profit immensely from studying the Dirichlet patterns of Double Jeopardy and the Duplication of Purchase Law. These laws should be considered basic concepts and deserve to be as well-known as the 4 Ps. It is time for marketers to stop relying on truisms and pseudo-scientific attitudinal constructs and start relying on empirical laws based on actual purchase behaviour. The marketing department has lost influence within firms, partly because of a lack of accountability (Verhoef & Leeflang, 2009). And it is not strange that CEOs and CFOs doubt the value of marketing when marketers have based their work on intuition and myth-based knowledge. Scientific tools such as the Dirichlet model allows marketer to become more accountable and start working as data scientists rather than intuitive artists.

5.2.2 Demographic Segmentation

There were few surprises in the results regarding demographics. Our results and findings from previous studies (e.g. Kennedy & Ehrenberg, 2001) indicate that demographic segmentation at best should be used to identify category buyers, rather than a particular brand buyer group. For example category users of wedding dresses in Sweden mostly consist of women; the mean age is 33 years for a first marriage and 48 years for a second marriage (SCB, 2013). This example would constitute a useful segmentation at the category level using demographics. Another example would be tampons which naturally should be targeted towards women. Income may affect what price tier the category buyers choose to shop from, but probably far less than most marketers think. According to Barnard et al. (1997), the main reason for having brands in different price tiers is to satisfy consumers variety seeking. The authors states how there are no high spending or price sensitive brand segments.

5.2.3 Psychographics: Materialism

Marketing has flirted with psychology since the 1950s, and plenty of focus groups and deep interviews have been conducted in attempts to dissect the secrets of the human brain. The idea that people with different lifestyles and values buy different brands to express their identity is strongly rooted in marketing thought (Levy, 1959). However, a consumer's degree of materialism seems to be a poor segmentation base, even at subcategory level in FMCG. As illustrated in the price-tier analyses for the beer category (table 17 in the analysis). It's likely that even if materialistic consumer are more prone to conspicuous consumption (see Podoshen, 2012), they probably only are so in certain categories which they personally consider important. E.g. car enthusiasts might consider their car to be an important symbol, but may not think that beer brands matter as much. The hard truth that marketers need to face is that people don't care that much about brands, at least not in the FMCG industry. Brands are not like political parties, family members, "cults" or sport teams (Sharp, 2010). Most people don't care if brand X stands for rough eco-friendliness and brand Y stands for adventurous fun - it's still just a product. And like most products a commodity with plenty of substitutes. Brands thus function more like labels that help people find what they look for, rather than deep emotional expressions of individuality and group belonging (Ehrenberg et al., 2004). However, a brand can still benefit from associating itself with "the rough outdoors" or "exotic luxury". This can be a good way to communicate a distinct and memorable brand identity, which make the brand easy to remember and find in the store.

5.2.4 Need States

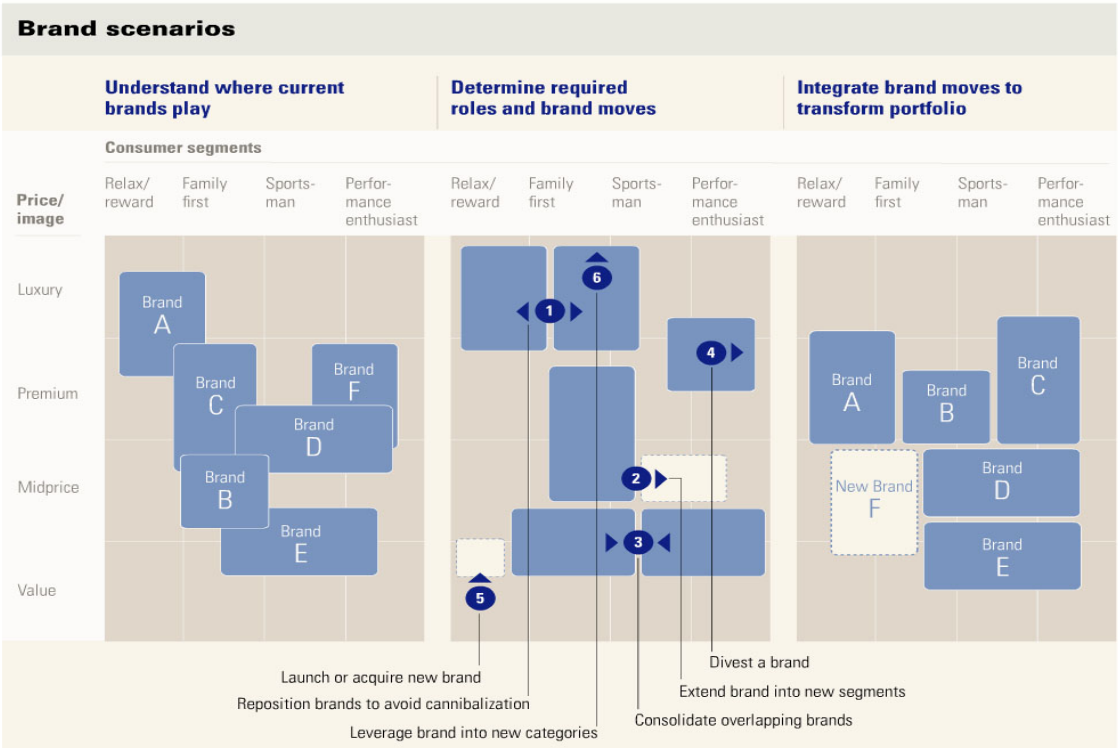
Need states is a well used concept within marketing, especially in the beverage industry. And certainly we as different people have different needs in different situations. Many people drink water to recover and hydrate after working out, this is a need state that a marketer can attempt to use by getting people to drink sport drinks instead of water in this need state. But based on our findings it seems people are content to drink all beer brands in all need states. If you have a particular brand at home, you will drink it as a meal companion, even if the brand is positioned as a party beer. Thus marketers should expect a high degree of cannibalization between brands even if positioned in different need states. According to both literature (e.g. Dickson, 1982; Yang et al., 2002; Fischer et al., 2010) and research practice, the beer category should be one of the most suitable categories for using need states and situational factors to identify managerially

useful brand segments; given that such actually exist. The need state method can therefore be expected to be an unsuitable method for brand segmentation in most FMCG industries. However, the concept of need states may be more useful at the category level to understand opportunities for adding consumption possibilities to a product. For example by creating smaller packages for beverages to make them easier to consume in a need state of "on the go".

5.2.5 Person-Situation Segmentation

The results for person-situation segmentation indicated that most beer brands sell in quite similar proportions to both low and high income consumers in all need states. Person-situation segmentation at the brand level make sense if one subscribes to the traditional approach to marketing, i.e. that markets are made up of loyal buyers groups that share similar needs. But this is a fictional market of stable quadrants where brands are thought of as Lego bricks, and thus supposedly easily moved and repositioned. Such make-believe frameworks make it simple for consultants to sell quick-fix recommendations that are easy for clients to understand. In reality though, such unscientific recommendations are likely to do harm. The figure below, from McKinsey Quarterly, illustrates this kind of fictional market with nonsense recommendations.

Figure 3: Example of a Management Consultancy's Framework of a Fictional Market with Brand Segments



Source: Carlotti et al. (2004)

In a real FMCG market, where buyers are highly disloyal and buyers of one brand do not have the same needs, a new brand - such as brand F in the figure above - is not launched into a "hole in the market" or a "white space" where there is no or little competition. Brand F will compete with the entire category, just as any other brand no matter what need state or price range you believe you compete in. Another unwise recommendation from the figure above is to "consolidate overlapping brands". You can't tell which brands have more or less overlapping customers because of positioning. As the Duplication of Purchase Law states a brand's size determine the percentage of overlapping customers, not positioning (Ehrenberg et al., 2004). Neither can you "Reposition a brand to avoid cannibalization". You would actually have to decrease Brand's X market share to decrease cannibalization of Brand Y, for example by limiting distribution. This example shows the validity of Sharp's (2010) previously mentioned analogy between the bloodletting conducted by medieval doctors and the marketing practices of today. Perhaps especially with regard to consultants that may be inclined to create and package a profitable cure before identifying the disease.

5.3 Managerial Implications

The combined results from this study and from previously research indicate that brand segments are not managerially useful. These findings have a strong impact on several marketing concepts including but not limited to: brand portfolio management, positioning, targeting and segmentation, and of course strategies for brand growth. In essence instead of focusing on the traditional concepts of segmentation, targeting and positioning (see e.g. Kotler & Keller, 2006) an FMCG marketer should: 1) Target the entire market of category buyers, use sophisticated mass marketing rather than narrow targeting. 2) Focus on new customer acquisition (penetration) rather than customer retention (loyalty). And 3) attempt to reach all buyers including light users, not just loyal or heavy buyers. In the following discussion these areas will be explored further based on the findings from this study and from previous research. Some of the issues have been discussed in previous papers, such as Ehrenberg et al. (2004) and Sharp (2010). However our findings contribute with additional insights to the discussion, specifically with regard to more advanced segmentation methods such as materialism indexes, need states and person-situation segmentation.

5.3.1 Brand Position Does Not Determine Competition

Traditional marketing theory (e.g. Ries & Trout, 1981; Kotler and Keller, 2006) dictates that brands compete based on positioning. A brand's position is often displayed on a positioning map, as the fictive illustrative example in figure 4 below. Based on this brand positioning map one would assume that Zoegas and Arvid Nordqvist compete in the premium segment, while the private labels compete in the low price segment.

Figure 4: Example of a Brand Positioning Map

But while such theories may make intuitive sense and allows for a convenient way to think about a market, the real world does simply not work like that. Any FMCG category should instead be understood as following. Most category buyers purchase from a personal repertoire of several brands and few are a 100% loyal to one brand (Sharp, 2010). The composition of brands in the repertoire as well as the propensities to buy the specific brands in the repertoire is randomly distributed between different category buyers (Ehrenberg et al., 2004). But as discussed earlier segmentation can occur at the category level, i.e. a specific group of consumers sometimes are category buyers to a larger extent then another group of consumers. Table 23 below illustrates the purchase patterns for the coffee category.

Table 23: Segmentation at the Cateogory Level – Coffee Category

Buyer group	Purchase frequency	Category penetration	100% loyals (T*)
Category ave.	**4,24**	**71%**	**18%**
Women	4,25	74%	18%
Men	4,23	68%	18%
20-34 Years	3,65	63%	18%
35-49 Years	4,32	69%	17%
50-64 Years	4,61	80%	18%
Low income	4,16	68%	17%
High income	4,29	74%	18%
Non-materialists	4,22	70%	24%
Materialists	4,05	69%	16%

**T= theoretical values derived from the Dirichlet model*

When interpreting the loyalty levels in the table it is important to be aware of two factors. First, the values illustrated are related to the investigated three month period, for longer periods of time the number of 100 % loyalists decreases. Nearly all buyers are 100 percent loyal during one week (Ehrenberg et al., 2004). Secondly, even though we cannot calculate the real observed values of this brand metric from the survey data (Wright et al., 2002), there is substantial empirical evidence for 100 percents loyalists to be light buyers of the category (Uncles et al., 1995; Sharp, 2010). Regarding coffee, older consumer do seem to buy a bit more than young consumer, but in average most people buy about four units of coffee during a three month period. These four purchases are then divided between the brands in the category according to brand penetration, as can be seen in table 24 below.

Table 24: Dirichlet Patterns - Coffee Category

Brand	Penetration		Market share	Purchase frequency	
	O	*T*	*O*	*O*	*T*
Gevalia	35%	38%	31%	2,6	2,5
Zoegas	30%	33%	25%	2,5	2,3
Löfbergs Lila	22%	22%	15%	2,0	2,1
Arvid Nordqvist	18%	15%	10%	1,7	2,0
ICA	13%	11%	7%	1,6	1,9
Coop	9%	6%	4%	1,2	1,9

0 = observed values the from survey

T = theoretical values from the Dirichlet model

This means that each brand is purchased about *two times* in a *three month period*, with larger brands being purchased slightly more often and smaller brands less often according to the Double Jeopardy Law. The noteworthy exceptions in the table above are the two private labels, Ica and Coop. The private labels, especially Coop, have a somewhat lower purchase frequency

than would be expected according to the theoretical values. This may be due to the decreased physical availability of the private labels, since they are only available in each particular brand's own store. The general patterns are the same even when broken down separately for each market segment. Table 25 below is similar to table 24, but is calculated for the two educational brand segments.

Table 25: Education Segments - Coffee Category

	High School or Lower			College or Higher		
	Penetration	Purchase frequency	Market Share	Penetration	Purchase frequency	Market Share
Category	71%	4,71	52%	70%	3,89	48%
Gevalia	39%	2,93	34%	32%	2,34	27%
Zoegas	27%	2,78	22%	33%	2,26	27%
Löfbergs Lila	25%	2,36	18%	20%	1,67	12%
Arvid Nordquist	16%	1,65	8%	20%	1,74	13%
ICA	14%	1,80	7%	12%	1,37	6%
Coop	9%	1,42	4%	9%	1,00	3%
Other	14%	1,52	6%	19%	1,65	12%

The educational variable is the segmentation base that generated the highest MAD value in the coffee category. But as can be seen in the table above there are still only some small deviations in brand user profiles, even though the group without college education buy more coffee in average. Notice that the general Dirichlet patterns, such as the Double Jeopardy Law, are present in both user groups.

The Dirichlet model calculates theoretical values that describe how brands share their customers based on brand penetration. E.g. 41 percent of the people who buy Gevalia are also expected to buy Zoegas, this pattern is commonly referred to as the Duplication of Purchase Law (Ehrenberg et al., 2004), see table 26 below[10].

[10] Note that we are not able to determine the observed values only theoretical values, a current limitation of the survey based method (Wright et al. 2002).

Table 26: Duplication of Purchase Law

	Gevalia	Zoega	Löfbergs Lila	Arvid Nordqvist	ICA	Coop
Gevalia	n/a	41%	27%	19%	14%	08%
Zoegas	48%	n/a	28%	20%	14%	08%
Löfbergs Lila	48%	42%	n/a	20%	14%	09%
Arvid Nordqvist	49%	42%	28%	n/a	14%	09%
ICA	49%	42%	28%	20%	n/a	09%
Coop	49%	42%	28%	20%	15%	n/a

Regarding cannibalization, the patterns outlined above suggest that if a company manages two or more brands in the same category issuing a price promotion for one brand is likely to affect sales of the other brands even if they are "positioned" differently. With regard to new product launches if a marketing manager would attempt to launch a new coffee brand, she should expect that any "segment" would buy the brand about two times in three months – and not more often. To expect that the brand would gather a specific segment of loyal buyers that purchase the new brand four or five times in three months is contradictory to the Duplication of Purchase Law (Uncles et al., 1995). Thus launching a new brand as a "niche" brand targeted towards a particular "segment" - hoping to turn most of the "segment" into 100% loyal customers - is a strategy heavily criticized by Ehrenberg et al. (2004) for the above reasons.

5.3.2 Market Leaders are Brands Bought Proportionately by All Category Users

It is likely that one of the reasons that market-leading brands have achieved a leading position is that they have reached, and are relevant to, all kinds of category buyers. These brands are bought proportionately by all "segments" of category users. Thus some brands labelled as "niche" or "targeted" brands may simply have ended up in an unattractive position because the brands have failed to be relevant to all category buyers. Thus disproportionate market share in a user group can be a problem rather than a strength, and a key reason for why the brand is not a market leader. In the table below note that the marketing leading brands in the study have lower MAD values than brands with less market share.

Table 27: Smaller Brands Have Failed to Reach All Category Buyers - Coffee

		Income segments			*Gender segments*			*Age segments*				*Education segments*			
	Market share	High Income*	Low income*	Ave. "brand" MAD	Women	Men	Ave. "brand" MAD	20-34	35-49	50-64	Ave. "brand" MAD	High School	College	Ave. "brand" MAD	Total Ave. "brand" MAD
Category	**100%**	46%	38%		49%	51%		23%	38%	38%		48%	52%		
Gevalia	31%	46%	39%	1%	54%	46%	4%	22%	43%	35%	3%	54%	46%	6%	**3,6%**
Zoega	25%	51%	37%	3%	44%	56%	5%	21%	36%	39%	3%	43%	57%	5%	**4,1%**
Löfbergs Lila	15%	46%	44%	3%	52%	48%	3%	24%	41%	36%	2%	58%	42%	9%	**4,2%**
Arvid Nordquist	10%	51%	30%	7%	41%	59%	9%	30%	27%	40%	8%	37%	63%	11%	**8,6%**
Ave. "measure" MAD				**4,0%**			**6,2%**				**4,3%**			**6,8%**	**5,3%**

*Note: *High income (above 300 000 SEK / year). *Low income (below 300 000 SEK/year).*

Consider Arvid Nordqvist, a brand with disproportionately fewer buyers among women with low income, age 35-49, without college education. Arvid Nordqvist's customer profile is thus slightly skewed towards high income men, age 20-34, with a college degree. However this should not necessarily be viewed as a strength, as the brand misses out on sales from other user groups. Even if Arvid Nordqvist could gain a 100 percent market share among young, high income, high educated, males - that buyer profile only constitutes less than 5 percent of all category buyers - according to our data. While traditional marketing thought argues that you cannot be all things to all people, that a brand "cannot appeal to all buyers in the market place" (Kotler, 2008, p. 410). I.e. you need to choose what to stand for and whom to sell to. The results from our study and previous research indicate that a brand aiming to gain market share should stand for something that all category buyers can relate to; and target the entire market. Rather than attempting to stand for something that only some people relate to or find desirable. The aim should thus be to avoid giving people a reason not to buy, rather than giving a selected few a reason to buy.

Table 28: Smaller Brand Have Failed to Reach All Category Buyers - Ice Cream

		Income segments			*Gender segments*			*Age segments*				*Education segments*			
	Market share	High Income*	Low income*	Ave. "brand" MAD	Women	Men	Ave. "brand" MAD	20-34	35-49	50-64	Ave. "brand" MAD	High School	College	Ave. "brand" MAD	Total Ave. "brand" MAD
Category	**100%**	43%	41%		49%	51%		31%	43%	26%		43%	57%		
GB	26%	42%	43%	1%	54%	46%	5%	26%	47%	27%	3%	45%	55%	2%	**2,8%**
Sia Glass	16%	49%	38%	5%	55%	45%	6%	24%	44%	31%	4%	40%	60%	3%	**4,5%**
Ben & Jerry's	12%	45%	38%	3%	41%	59%	8%	43%	48%	9%	11%	41%	59%	2%	**5,9%**
Ave. "segment" MAD				**5,5%**			**7,0%**				**6,3%**			**3,9%**	**5,7%**

*Note: *High income (above 300 000 SEK / year). *Low income (below 300 000 SEK/year).*

In the ice cream category Ben & Jerry's have failed to reach the older age group. Unilever owns both the market-leading brand GB and the third largest brand Ben & Jerry's, but not second largest brand Sia Glass. Thus Ben & Jerry's may not aim to overtake GB but certainly the main competitor Sia Glass. To do so it is likely that Ben & Jerry's will have to increase penetration in

user groups were they are not strong today, i.e. among older consumers. Thus while text book Kotlerian marketing thought revolves around differentiation, segmentation and increasing loyalty among existing customers - in the brand segmentless world it is more important to reach all category buyers and remove reasons not to buy (Sharp, 2010).

5.3.3 A Brand Identity Is Not a Brand Segment

A frequent question among markers is "What kind of person is brand X?". This is a good question to ask since it makes sure the brand identity is distinctive and memorable. However our study indicates how brand identity should not be confused with brand user profile, and a question that should not be answered lightly based on intuition is "What kind of person buys brand X?".

The beer brands Norrlands Guld and Mariestads are both owned by Spendrups. Norrlands Guld is positioned as a relaxed brand with the tagline: *"När du vill va dig själv för en stund"*. In English: "When you want to be yourself for a while". The advertising features relaxed, working class men from rural northern Sweden. The beer brand Mariestads' tagline is *"För Livsnjutare"*. In English: "For Epicureans". And the advertising features different artists, musicians and actors in urban aspirational settings. Based on the advertising one may assume that a typical Norrlands Guld buyer is a non-materialistic, young, low income, male. While a Mariestads buyer is a materialistic/aspirational, older, high income, male or female.

And there is a scrap of truth in that. These brands showed larger differences than most other beer brands. Older and wealthier people buy Mariestads a bit more often than Norrlands Guld. Young, low-income males buy Norrlands Guld a bit more often than Mariestads. But as can be seen from table 29 below, the differences are smaller than you would expect from the dipolar positioning of the brands. With some small differences in age, income and materialism – the brands are bought by basically the same customers.

Table 29: Demographic and Psychographic Segmentation - Norrlands Guld & Mariestads

		Income segments		*Gender segments*		*Age segments*			*Education segments*		*Psychographics*	
	Price index	High Income*	Low income *	Women	Men	20-34	35-49	50-64	High School	College	non-materialists	Materialists
Category	100	52%	48%	34%	66%	35%	38%	27%	49%	51%	28%	42%
Mariestads	109	60%	40%	40%	60%	26%	42%	32%	51%	49%	21%	46%
Norrlands Guld	94	47%	53%	35%	65%	34%	39%	27%	52%	48%	29%	40%

With regard to materialism Norrlands Guld is bought more often than Mariestads by non-materialists, but still just one percent more often than the average for the category. The different pricing strategies of the brands partly explain the difference in the income segment. High income buyers are somewhat skewed towards more expensive brands, as illustrated previously in table 13.

Studying need states we also see that the brands are purchased not only by roughly the same people, but also for roughly the same purposes.

Table 30: Person-Situation Segmentation - Norrlands Guld & Mariestads

		Low income			High income		
	Price index	To relax at home, alone or with a partner	To "unleash" at a party	To accompany a meal together with friends	To relax at home, alone or with a partner	To "unleash" at a party	To accompany a meal together with friends
Category	**100%**	**18%**	**14%**	**18%**	**19%**	**11%**	**19%**
Mariestads	109	17%	10%	17%	20%	13%	23%
Norrlands Guld	94	17%	16%	18%	19%	13%	17%

Norrlands Guld seemed to be slightly more used as a party beer for the low income segment, and Mariestads as a meal companion for the high income segment. But differences are far less than would be expected based on the brand positioning. While it makes sense to have brands in difference price tiers, the usefulness of differentiation is questionable. The results show that a high degree of cannibalization is likely to occur even between brands positioned as differently as Norrlands Guld and Mariestads.

5.4 Criticism of the Study

There are some weaker areas in the study which can be subject to criticism. The Juster scale survey method (Wright et al., 1998) used in the thesis have previously been validated in several studies (e.g. Wright et al., 2000; Wright et al., 2002). However we have only partly been able to benchmark the purchase metrics obtained in our study with real sales data, and these comparisons have then taken place solely on an aggregated category level. One of the primary motives for applying this type of survey based method is to collect data otherwise not available (Chrysochou et al., 2008) and the delimited benchmarking opportunities with sales data is therefore simultaneously also a prerequisite for the desirability of our approach. On an

aggregated category level the obtained data seems to correspond well in the coffee market, most likely rather well in the ice cream market and at least sufficiently well in the beer market.

In the coffee market we have had the most accurate opportunities to benchmark our estimated market shares with real market data from Passport (2013). However the real market shares for the 3 month investigated period do not necessarily have to correspond perfectly with the Passport sales data available for the previous year 2012, which is a source of error in the comparison. Overall there is a good correspondence between the two data sources, with a correlation of 97 percent as illustrated in appendix III. Market share for the market leader Gevalia, seems to be somewhat under predicted. But this could partly be due to a continuing trend since Gevalia has decreased in market share for two consecutive years. For the Ice Cream industry we have not access to data with sufficiently precision to be able to benchmark in any detail. In the available sales data from Passport the package ice cream are unfortunately bundled together with impulse ice cream. However in a broader comparison, the obtained data correspond well. For the beer category we have access to sales statistics from the monopoly distributor, Systembolaget, but again only on a yearly basis for 2012. The obtained purchase data for this market seems to be adequate for the purpose of this thesis, but there is a slightly higher uncertainty in these estimates than for the other two categories. The market share of some of the premium brands, such as Staropramen, Heineken and Corona, seem to be somewhat overestimated. While the market shares of less expensive brands, such as Sofiero, seems to be somewhat underestimated. There are some external factors that possible could explain these discrepancies including the sales peak for many beer brands during the summer and the fragmentation of the beer category. The fragmentation could impose an error in the sense that the 15 brands used in the questionnaire do not represent the complete market. The limitation to the top 15 beer brands in this study has been carried out to attain a comprehensible survey and it is still a rather high number of analysed brands compared with other studies.

Even though there are some discrepancies in the aggregated measurements for the beer market, we do not perceive them to be of a magnitude violating the main findings in the thesis. In addition we have no reason to believe that there should be any systematic over or under predictions for the different brand segments investigated, no such discrepancies have been reported in previous studies. The measurement validity of the investigated need states are

however embedded in some uncertainty. This procedure is partly unique for this study and has therefore not been subjected to validation in other studies. We have investigated three particular need states with different characteristics without any knowledge of their absolute sizes. Even though some discrepancies, of an uncertain magnitude, could be expected to occur for all absolute estimates related to the need states procedure it does not per definition impose an error for our findings. This study has solely been focused on the relative differences at the brand level, within and between the need states. An essential error violating our findings would therefore only occur if there are systematic and relative discrepancies between the estimates. Even though we have no reason to believe that this is a prevailing error, there is still a considerable amount of uncertainty related to this area and it is important to be aware of this issue when evaluating our results.

The analytical unit in this study has been purchase occasions and not sales volume in coherence with the Dirichlet model's requirements (Ehrenberg, 1988). It could be argued that this is a drawback reducing the relevancy of our findings. However it has been shown that market shares calculated by purchase occasion and sales volume are similar without any systematic differences (Jeuland et al., 1980); and that the number of units bought by a particular buyer over several occasions tend to be constant (Ehrenberg, 1988). For most FMCG categories the average number of unit bought at each purchase occasion is one (Ehrenberg, 1988). In our study it is primarily the beer category where there potentially could occur discrepancies between purchase occasions and sales volumes since several units of beer often are bought simultaneously. For this reason we added a control question in the survey related to sales volume in the beer market, which is a recommended procedure when this is a potential issue (Ehrenberg, 1988). The average number of beer bought per occasion turned out to be around four with a standard deviation between the different brands of below 10 percent, indicating that there are no systematic discrepancies between the entities.

The large and demographical representative sample used in the study should reduce the uncertainty related to the potential collection of a biased sample, but there is often an uncertainty element related to online samples (Bryman & Bell, 2010) and our research is no exception. The limitation to three investigated categories is an uncertainty factor in the generalizability of our findings. The study has only investigated what we considered to be the most relevant

segmentation methods advocated by academics and practitioners, and it has been delimited to one point in time. This thesis should therefore in itself only be perceived as a limited contribution within the field.

5.5 Future Research

Ehrenberg and his colleges have, as described in the literature review, presented extensive empirical evidence regarding the occurrence of the Dirichlet patterns and lacking relevance of brand segments. The contribution from this thesis is only a small additional piece in this expanding empirical puzzle, but it is partly provided from a different angle and this is what makes it unique. The knowledge gap in the field is mainly related to the absence of studies investigating more sophisticated segmentation methods. And this therefore makes an interesting area for future research. Even though studies such as Kennedy and Ehrenberg (2001) have studied a large amount of variables, these have mainly been of a simpler nature, which has been criticised (Wedel & Kamakura, 2001). Future studies using a similar analytical approach as in this thesis have the potential to investigate more advanced segmentation approaches since the researcher can use almost any variable of choice in a questionnaire. Thus similar studies can easily replicate tests of the person-situation method, need states, materialism indexes or investigate other untested segmentation methods. However, as previously mentioned in the theory part, there are prerequisites to any serious study of brand segmentation. The method should be both transparent and potentially applicable for several categories. The drawback with the survey based method is that it limits the number of categories that can be investigated in a single questionnaire, which increases the importance of replication studies to verify the findings. Another valuable empirical contribution area would be an investigation of the Dirichlet patterns, and lack of brand segmentation, in non-FMCG markets with unique characteristics. The current empirical research is mainly related to repertoire markets such as FMCG. But research has also been done concerning durables (Kennedy & Ehrenberg, 2001; Uncles et al., 2012), regarding subscription markets (Sharp et al., 2002), and regarding store-choice (Keng & Ehrenberg, 1984). However to our knowledge there has been little or no research related to markets such as luxury goods. This is an industry which according to previous research (Atwal & Wiliams, 2008) exhibit unique characteristics, thus limiting the suitability of a traditional marketing strategies. And the absence of brand segmentation in the luxury market has yet to be investigated.

Even though Ehrenberg et al. (2004), Sharp (2010) and others have extensive empirical support for their criticism of the Kotlerian marketing school; their thoughts seem to have received only a limited impact in the academic world. And many consultants proclaiming themselves as brand management expert seem to lack knowledge of Ehrenberg's and Sharp's work. Basic text books used in marketing courses are often written by Kotler or other authors clearly sharing similar ideas (e.g. Jobber, 2007; Best, 2009). Such literature with the old approach of marketing focused on brand segmentation and positioning, have not really been updated for decades, and they do not offer good training for future practitioners. In the marketing research industry there seem to still be an overwhelming focus on brand segmentation and brand positioning solutions both in FMCG and other markets. Therefore the lacking knowledge of Ehrenberg's findings among academics and practitioners need to be explored further. Since this is an area previously not investigated, the strongest contributions might potentially come from a more explorative qualitative research approach (Malhotra, 2010).

Ehrenberg and Sharp have spent some effort on opposing the Kotlerian view of marketing. The authors have argued for a new marketing agenda where the focus should be on building brand salience (Ehrenberg et al., 1997). Or as Sharp (2010) defines salience in two parts: mental and physical availability. However, these concepts would benefit from being developed and described in more concrete, practical terms. This could be one factor preventing researchers and practitioners from adopting Ehrenberg's ideas. The definition of brand salience presented by Ehrenberg et al. (1997) is fairly broad: "Salience is broader than any single measure of brand performance. It depends on virtually all the different possible measures of performance correlating". Sharp's (2010) explanation of mental and physical availability partly suffers from a similar drawback of vagueness. Given that the authors are correct in their critic regarding central parts of current marketing thought and practice, something this study has given additional support for, the area of future research related to alternative conceptual developments should be immense, rewarding and highly useful for both practitioners and academics. However the starting point for such research should be empirical observation of consumer's actual purchase behaviour; and not vice versa. Otherwise new contributions are likely to suffer from the same mistakes made by previously dominating authors.

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APPENDICES

Appendix I: Pre-Study for Selection of Need States

The pre-study were conducted using an online based self-completion survey, where the randomly chosen participants had to answer two questions. Firstly they were asked if they had bought beer from Systembolaget at least once during the last 12 month. All respondents that stated that they had purchased from Systembolaget, approximately 500 persons, where then asked the following question: *In which of the following occasions have you bought beer from Systembolaget in the last 12 months?* The following alternatives were six different need state alternatives and "other".

The need states in the pre-study were developed in collaboration with research experts; that previously had worked with major beer brands. It should be noted that need states is often overlapping, and that the need states of the pre-study are not mutually exclusive. The table below illustrate the distribution of answers in percentages.

Need states	Percentages
To "unleash" at a party	24%
To socialize with friends at home	50%
To socialize with friends in connection with an outdoor activity	28%
To accompany a meal, alone or with a partner	38%
To accompany a meal, together with friends	38%
To relax at home, alone or with a partner	51%
Other occasion	12%

The aim of the pre-study was to investigate the relevance of the different need states. All the six need states seem to occur quite often; and the alternatives outperform the other-alternative. All of the tested need states were therefore determined as possible candidates for further analysis in the main study. We decided to pick the three least overlapping need states in order to maximize their influence on the consumer behaviour, i.e. to make the differences between need states as large as possible. This was an attempt to give the need states segmentation approach the best possible opportunity to generate market segments with different brand buyer profiles. All three of the selected need states - *To "unleash" at a party, To accompany a meal together with friends , To relax at home alone or with a partner* - are used by leading Swedish industry experts to segment the beer market.

Appendix II: Justification of the Dirichlet Model's Underlying Assumptions

Justification of the two primary assumptions:

(i) *Steady state market*

Ehrenberg (1988) points out that, even though completely stationary markets seldom exist. Most categories are near stationary, according to real market data, which is more than enough for the model to work. Barnard and Ehrenberg (1997) states that there is strong support for near stationary markets in a medium time horizon. Ehrenberg (1988) describes how the stationary condition underlying the Dirichlet model does not make the model irrelevant for markets where there are considerable efforts among different actors to create change. In such scenarios the model can be used as an important benchmark to evaluate if there have been any departures from the otherwise prevalent stationary market structure.

(ii) *Market partitioning*

This assumption is investigated directly in our thesis.

Justification of the five distributional assumptions:

(i) *Poisson distributions for individual purchases*

The accuracy of the Poisson approximation has been supported by several studies (e.g. Ehrenberg, 1959; Chatfield & Goodhardt, 1973; Dunn, 1983). However, there is some criticism as well. Chatterfield and Goodhardt (1973) describes how the Poisson assumption might be an issue for products that are sold in several quantities, as opposed to single unit. But they still consider that the NBD model can be applied under such conditions if the analysis is conducted based on purchase occasions. These authors also note that the Poisson distribution is less suitable for individuals with a very high purchasing rate, but points out that such individuals in general represents a fairly small part of the overall buying population.

Goodhardt and colleagues (1984) remarks that despite the criticism, the deviations from the Poisson distribution are of such a small magnitude that they will not impose

any obstacle for the Dirichlet model to work well. The robustness of the model in this context is also pointed out by Chatfield and Goodhardt (1973).

(ii) A gamma distribution for consumer average purchase rates

Goodhardt et al. (1984) state that the distribution of the mean category purchasing rates for the product class P has to be a gamma if the following two theoretical prerequisites hold. *If for different product-classes P, Q, R, S, etc. (like toothpaste, breakfast cereals, canned soup, etc.):*

(1) the average purchase rate of P is independent of the rates for other products Q,R, S,..., and

(2) P's proportion of a consumer's total purchases, namely P/(P + Q + R + S + . . .), is independent of her total rate of purchasing all products.

Goodhardt et al. (1984) points out that these independence conditions are most likely approximately fulfilled in practice. A drawback with the gamma distribution, noted by Kearns (1999), is that when very long time periods are used eventually all individuals will become category buyers. I.e. all consumers will have a mean purchasing rate larger than zero, which for some categories such as cigarettes obviously contradicts reality. Dalal et al. (1984) states how the heterogeneity in purchasing rates might be more complex than predicted by the gamma distribution, but the authors also remarks that this is an issue for most well known distributions.

Chatfield and Goodhardt (1973) emphasise how the combined negative binomial distribution (NBD) have found support in a large amount of different empirical investigations. Ehrenberg (1959) and Chatfield et al. (1966) shows how the NBD distribution, for most products and brands, fits the observed distribution of consumer purchases. However the authors of both studies remark that for observed frequency distributions with high standard deviation (of around 5 or more), the theoretical standard deviation tend to be to large compared with the observed one. According to Ehrenberg (1959) such distributions with high standard deviations are generally categories with high means, in other words categories bought very often such as bread or milk.

(iii) Multinomial distributions for specific purchases

The zero-order behaviour is not consistent with "learning", "satiation" or other types of purchase event feedback as pointed out by Bass et al. (1984). The authors argue that a theoretical condition for a zero-order process of brand choice is when consumers already have processed enough relevant brand information. Consumers might then avoid the mental cost associated with thinking in each purchase occasion by instead routinizing their behaviour without processing any new information. Especially in frequently purchased product categories where activities from new brands is of less importance; the brand choice behaviour might be so routine that is resembles a zero-order process.

The occurrence of a zero-order process, where each consumer behave as if random with their own stable choice probabilities for buying the different brands in their own repertoire portfolio, is supported by several studies (Bass et al. 1984; Goodhardt et al., 1984; Ehrenberg et al., 1994). According to Ehrenberg et al. (1994) do price promotions only impose short term fluctuations on this process, but do not seem to have any after effects on the promoted brands sales or on the repeat buying loyalty.

(iv) A multivariate Beta distribution of brand choice probabilities

Goodhardt et al. (1984) describes how a prerequisite for the Dirichlet distributed brand choice probabilities is that the market is unsegmented. The authors argue that the Dirichlet distribution is the only possible model in a strictly unsegmented market with fixed multinomial brand choice probabilities for each consumer over time. The validity of this assumption is investigated directly in our thesis.

(v) *The independence of purchase incidence and brand choice*

According to Goodhardt et al. (1984) the assumption of independence between the purchase frequency and the brand choice probabilities is in line with experiences from several product fields. According to Ehrenberg et al. (2004) observed market shares for different brands are in general the same for light, medium and heavy category buyers.

For the reader interested in an even more detailed literature review related to the justification of the model's assumptions we recommend the second and third chapter in Kearns (1999).

Appendix III: Fit of Survey Data to Panel Data

The data gathered comes from a survey, therefore estimations of market share is expected to differ from market share data based on purchase panels. For example both the strongest brands and the smallest brands seem to get slightly higher values than what would be expected, see data below for the coffee category.

Brand market share	Survey data March 2013	Panel data 2012
Gevalia	31%	41%
Zoega	25%	23%
Löfbergs Lila	15%	14%
Arvid Nordquist	10%	10%
ICA	7%	4%
Coop	4%	2%
Other brand	9%	7%

However the correlation between the survey data, gathered in March 2012, and the panel data for 2012 is 97%. Thus for our purposes, to compare differences between consumer segments at one point in time, the potential differences between the measurements systems is acceptable.

Appendix IV: Survey Design

The original survey was in an online format, this version have been reconstructed for print.

Q1. What are the chances that you, personally, will buy the following beer brands from Systembolaget over the next 4 weeks? Circle the number from 0 to 10 according to the following scale:

10 Certain, practically certain (99 in 100)
9 Almost sure (9 in 10)
8 Very probable (8 in 10)
7 Probable (7 in 10)
6 Good possibility (6 in 10)
5 Fairly good possibility (5 in 10)
4 Fair possibility (4 in 10)
3 Some possibility (3 in 10)
2 Slight possibility (2 in 10)
1 Very slight possibility (1 in 10)
0 No chance, almost no chance (1 in 100)

1.	Sofiero	0	1	2	3	4	5	6	7	8	9	10
2.	Carlsberg	0	1	2	3	4	5	6	7	8	9	10
3.	Norrlands Guld	0	1	2	3	4	5	6	7	8	9	10
4.	Mariestads	0	1	2	3	4	5	6	7	8	9	10
5.	Pripps	0	1	2	3	4	5	6	7	8	9	10
6.	Falcon	0	1	2	3	4	5	6	7	8	9	10
7.	Spendrups	0	1	2	3	4	5	6	7	8	9	10
8.	Åbro	0	1	2	3	4	5	6	7	8	9	10
9.	Arboga	0	1	2	3	4	5	6	7	8	9	10
10.	Stockholm Festival	0	1	2	3	4	5	6	7	8	9	10
11.	Fem komma tvåan	0	1	2	3	4	5	6	7	8	9	10
12.	Småland	0	1	2	3	4	5	6	7	8	9	10
13.	Staropramen	0	1	2	3	4	5	6	7	8	9	10
14.	Heineken	0	1	2	3	4	5	6	7	8	9	10
15.	Corona	0	1	2	3	4	5	6	7	8	9	10
16.	Other beer brand	0	1	2	3	4	5	6	7	8	9	10

Q2. How many times are you likely to buy *brand j* over the next 4 weeks?

Q3. How many units (cans or bottles) do you usually buy of *brand j*, each time you buy beer?

Q4, Q5, Q6. What are the chances that you, personally, will buy the following beer brands from Systembolaget over the next 4 weeks <u>In order to</u>…

(Q4) To relax at home, alone or with a partner

(Q5) To "unleash" at a party

(Q6) To accompany a meal together with friends

Circle the number from 0 to 10 according to the following scale:

10 Certain, practically certain (99 in 100)
9 Almost sure (9 in 10)
8 Very probable (8 in 10)
7 Probable (7 in 10)
6 Good possibility (6 in 10)
5 Fairly good possibility (5 in 10)
4 Fair possibility (4 in 10)
3 Some possibility (3 in 10)
2 Slight possibility (2 in 10)
1 Very slight possibility (1 in 10)
0 No chance, almost no chance (1 in 100)

1.	Sofiero	0	1	2	3	4	5	6	7	8	9	10
2.	Carlsberg	0	1	2	3	4	5	6	7	8	9	10
3.	Norrlands Guld	0	1	2	3	4	5	6	7	8	9	10
4.	Mariestads	0	1	2	3	4	5	6	7	8	9	10
5.	Pripps	0	1	2	3	4	5	6	7	8	9	10
6.	Falcon	0	1	2	3	4	5	6	7	8	9	10
7.	Spendrups	0	1	2	3	4	5	6	7	8	9	10
8.	Åbro	0	1	2	3	4	5	6	7	8	9	10
9.	Arboga	0	1	2	3	4	5	6	7	8	9	10
10.	Stockholm Festival	0	1	2	3	4	5	6	7	8	9	10
11.	Fem komma tvåan	0	1	2	3	4	5	6	7	8	9	10
12.	Småland	0	1	2	3	4	5	6	7	8	9	10
13.	Staropramen	0	1	2	3	4	5	6	7	8	9	10
14.	Heineken	0	1	2	3	4	5	6	7	8	9	10
15.	Corona	0	1	2	3	4	5	6	7	8	9	10
16.	Other beer brand	0	1	2	3	4	5	6	7	8	9	10

Q7-Q9. How many times are you most likely to buy *brand j* over the next 4 weeks in order to "…"?

(Q7) To relax at home, alone or with a partner

(Q8) To "unleash" at a party

(Q9) To accompany a meal together with friends

Q10. Read each of the following statements as if it referred to you. Then, please indicate your agreement or disagreement with the statement by registering a number in the blank next to the question.

The numbers correspond to the following responses (1 = strongly disagree; 2 = disagree; 3 = don't agree or disagree; 4 = agree; and 5 = strongly agree):

Q10.1 Sweden should accept more refuges than we do today.
Q10.2 I admire people who own expensive homes, cars, and clothes.
Q10.3 It is important to maintain traditional values and opinions.
Q10.4 My life would be better if I owned certain things I don't have.
Q10.5 The things I own say a lot about how well I am doing in life.
Q10.6 I like a lot of luxury in my life.
Q10.7 I am an epicurean.
Q10.8 I am a creative person
Q10.9 I like to own things that impress people.
Q10.10 I often introduce new things to my friends

Q11. Read each of the following statements as if it referred to you. Then, please indicate your agreement or disagreement with the statement by registering a number in the blank next to the question.

The numbers correspond to the following responses (1 = strongly disagree; 2 = disagree; 3 = don't agree or disagree; 4 = agree; and 5 = strongly agree):

Q11_1 I prefer to receive instructions regarding what to do, rather than be take own responsibility.
Q11_2 It sometimes bothers me quite a bit that I can't afford to buy all the things that I'd like.
Q11_3 Buying things gives me a lot of pleasure.
Q11_4 I want to live a life of challenges, new events and change.

Q11_5 I try to keep my life simply, as fare as possessions are concerned.
Q11_6 I want to enjoy my life without worrying about the future
Q11_7 We should strive for society based on equality
Q11_8 I'd be happier if I could afford to buy more things.
Q11_9 It's important to me that other people see myself as a successful person
Q11_10 I have to admit that I do like to impress other people.

Q12. Are you a female or male? (Male/Female)

Q13. Which year are you born? (Range: 1908-1993)

Q14. What is your personal income before tax? (Range: 0-800 000+ SEK)

Q15. What is the highest educational degree you have attained?
(Elementary school, High School, College or above, None of the above)

Q16. What are the chances that you, personally, will buy the following coffee brands over the next 3 months?

Circle the number from 0 to 10 according to the following scale:

10 Certain, practically certain (99 in 100)
9 Almost sure (9 in 10)
8 Very probable (8 in 10)
7 Probable (7 in 10)
6 Good possibility (6 in 10)
5 Fairly good possibility (5 in 10)
4 Fair possibility (4 in 10)
3 Some possibility (3 in 10)
2 Slight possibility (2 in 10)
1 Very slight possibility (1 in 10)
0 No chance, almost no chance (1 in 100)

1. Zoega	0	1	2	3	4	5	6	7	8	9	10
2. Arvid Nordquist	0	1	2	3	4	5	6	7	8	9	10
3. Löfbergs Lila	0	1	2	3	4	5	6	7	8	9	10
4. Gevalia	0	1	2	3	4	5	6	7	8	9	10
5. ICA	0	1	2	3	4	5	6	7	8	9	10
6. Coop	0	1	2	3	4	5	6	7	8	9	10
7. Other	0	1	2	3	4	5	6	7	8	9	10

Q17. How many times are you likely to buy *coffee brand j* over the next 3 months?

Q18. What are the chances that you, personally, will buy the following take home ice cream brands over the next 3 months?

Circle the number from 0 to 10 according to the following scale:

10 Certain, practically certain (99 in 100)
9 Almost sure (9 in 10)
8 Very probable (8 in 10)
7 Probable (7 in 10)
6 Good possibility (6 in 10)
5 Fairly good possibility (5 in 10)
4 Fair possibility (4 in 10)
3 Some possibility (3 in 10)
2 Slight possibility (2 in 10)
1 Very slight possibility (1 in 10)
0 No chance, almost no chance (1 in 100)

1. Mövenpick	0	1	2	3	4	5	6	7	8	9	10
2. Ben & Jerry's	0	1	2	3	4	5	6	7	8	9	10
3. Häagen-Dazs	0	1	2	3	4	5	6	7	8	9	10
4. Carte d'Or	0	1	2	3	4	5	6	7	8	9	10
5. Sia Glass	0	1	2	3	4	5	6	7	8	9	10
6. Eisstern (Lidl)	0	1	2	3	4	5	6	7	8	9	10
7. GB	0	1	2	3	4	5	6	7	8	9	10
8. Coop	0	1	2	3	4	5	6	7	8	9	10
9. ICA	0	1	2	3	4	5	6	7	8	9	10
10 Viennetta	0	1	2	3	4	5	6	7	8	9	10
11 Other	0	1	2	3	4	5	6	7	8	9	10

Q19. How many times are you likely to buy *ice cream brand j* over the next 3 months?

Appendix V: Mathematical Derivations for Dirichlet inputs

In accordance with the survey based method used in this thesis, the raw data obtained from the Juster scale needs to be derived mathematically to receive the desired estimated Dirichlet inputs (Wright et al. 2002). We have followed the procedure explained by Wright et al. (2002) and the derivations have been carried out for each category or need state separately.

Purchase Probabilities and Brand Penetration

First each Juster score, ranging from 0 to 10, is divided by ten to form a purchase probability. The purchase probability that person *i* purchases brand *j* in the investigated time period can be noted as *pij*. The brand penetration for brand *j* is calculated as the average of each purchase probability for that brand, which is illustrated in the following equation.

Equation 2: Brand Penetration

$$b_j = \left(\sum_i p_{ij}/n \right) \times 100,$$

Category Penetration

The penetration for the category (*B*) is calculated as one minus the probability of not buying any brands in the period. This is calculated for each individual separately and then the mean of these values is used to obtain the probability of not buying from the category for each individual *i.* We first calculated the probability of not buying from brand 1,2,3…n for that respondent and then determined the product of these probabilities. The mathematical formula for the category penetration is expressed in the equation below.

Equation 3: Category Penetration

$$B = \left(\sum_i \left(1 - \prod_j (1 - p_{ij}) \right) / n \right) \times 100.$$

Brand Purchase Frequency

To estimate the purchase frequency for brand *j* in the period, the total brand volume is divided with the expected number of buyers for that brand. The total brand volume is first calculated at the individual level as *pij* times *vij*, where *vij* is obtained from the frequency question outlined earlier, and then the sum of all these individual brand volume values is determined. The expected number of brand buyers for brand *j* is determined as *bj* times the total number of respondent's *n*. The whole calculation is presented in the following equation.

Equation 4: Brand Purchase Frequency

$$w_j = \sum_i p_{ij} v_{ij} / nb_j,$$

Category Purchase Frequency

Finally the category purchase frequency (*W*) is estimated. This parameter is calculated as the sum of all individual brand purchase frequencies *wj* divided b the expected number of category buyers as illustrated in the last equation below.

Equation 5: Category Purchase Frequency

$$W = \sum_i \sum_j p_{ij} v_{ij} / nB,$$