

Has brand loyalty declined? A longitudinal analysis of repeat purchase behavior in the UK and USA

Published in *Journal of Business Research*, (68) 2015 pp. 425-432.

John Dawes Ehrenberg-Bass Institute, University of South Australia, contact John.Dawes@marketingscience.info

Lars Meyer-Waarden University Toulouse, Strasbourg Business School

Carl Driesener Ehrenberg-Bass Institute, University of South Australia,

Abstract: This research examines long-term loyalty change in a wide variety of FMCG categories in the UK and USA, over time periods ranging from six to thirteen years. The study uses three loyalty measures: polarization index (ϕ), average brand share of requirements (SCR), and average repertoire size. Analysis over 26 categories shows mixed results for the proposition that loyalty is declining. Overall, there is a very small decline in average SCR of 0.77 percent per year (0.77 of 1 percent); but no statistically significant change in polarization and repertoire size over time. Indeed while some specific categories exhibit slight loyalty declines others show small increases. Furthermore, several of the loyalty measures are negatively correlated with category purchase frequency and the number of SKUs in the category – that is, if these category factors increase in a year, loyalty declines somewhat in the year.

Keywords: brand loyalty, repeat-purchase, consumer panel data, Dirichlet model, polarization index.

Note this version of the paper features corrections made to figures in Table 4. The published version of the paper in JBR had some errors in SCR averages for the US categories. The overall average % yearly change in SCR in the published paper was 0.9%, the corrected figure is 0.77%. That is, a 0.77 of 1 percent decline in SCR per year from whatever the base figure is. The figure is not ‘percentage points’ as in the published abstract, it is percentage change.

To explain: take a brand with 30% annual SCR in year 1. It would be expected to have (30% minus (30% x 0.0077) = 29.77% SCR in year 2. These SCR changes are correlated with changes in category purchase frequency and SKU proliferation, if those do not change then the brand’s SCR likely would not change. Also in the published paper many of the Table 4 correlations between SCR and time were denoted NS when they should have been asterisked as significant, this has also been corrected. John Dawes is responsible for these errors in the published version – contact using above email address for any clarification.

1. Introduction

A brand's sales depend on how many customers it has, and how much they buy it – that is, penetration and repeat-purchase loyalty (e.g. Uncles & Ellis 1989). Ongoing consumer propensity to buy a brand is integral to current and future sales revenue and profits. As a consequence, marketers are vitally concerned with building and maintaining customer loyalty (e.g. Raj 1985; Reichheld & Teal 1996). Brand owners therefore invest in product improvements, advertising, and extending distribution coverage to attract new buyers, and bolster the loyalty of current buyers. Likewise, retailers spend considerable amounts on private label brands and loyalty schemes to encourage store loyalty (Meyer-Waarden & Benavent 2009). Given such efforts, marketers may be worried about recurring claims in the literature that brand loyalty is eroding (e.g. Dubow 1992; Kapferer 2005), see also Pointer Media Network (2009). However, only small number of empirical studies have specifically investigated the evolution of aggregate-level brand loyalty metrics. Johnson (1984) examined a wide range of US categories while Dekimpe, Steenkamp, Mellens and Abeele (1997) analyzed 21 categories over two years in Holland. An issue is that these studies were conducted in the 1980's or 1990's, and since then, there may have been significant shifts in consumer purchase behavior. Therefore, updated research is needed to clarify this topic. More recently Sharp et al. (2012) in a discussion about the usefulness of the Dirichlet model, present loyalty metrics for a range of brands in the US and UK. However, little analysis was conducted as to the possible correlates or causes of loyalty change.

Our research therefore builds on these past investigations by conducting a large-scale study in which we analyze the long term evolution of loyalty over six to thirteen years in two country-markets: the UK and USA. We first explain the rationale for expecting loyalty decline and describe past studies about it. We then outline our method, which is to examine changes over time in the ϕ brand-switching parameter derived from the Dirichlet model; as

well as the widely used brand loyalty metrics, SCR (Share of category requirements) and Repertoire size. We describe our panel data covering 26 consumer goods (FMCG) categories that we use to examine brand loyalty. We then present results, and show how category purchase frequency and possibly SKU proliferation, appear to be correlates of loyalty change over time. We then suggest some directions for future research.

2. Loyalty and loyalty evolution

Loyalty is a concept that has considerable diversity in the way it is defined and measured. Some researchers argue that loyalty towards a brand necessarily comprises positive attitudes about the brand as well as a positive behavioral tendency to buy it (e.g. Jacoby & Kyner 1973; Jacoby & Chestnut 1978; Dick & Basu 1994).

The focus in the present study is on behavioral loyalty towards brands, and whether it is changing over time. The rationale for focusing on behavioral loyalty is that (a) the study attempts to add to previous investigations of behavioral loyalty; (b) extensive data exists on such behavior while no equivalent long-term information on consumer attitudinal brand loyalty is available; and (c) arguably marketers are specifically interested in behavioral loyalty since it directly translates to sales revenue.

There is a range of measures for behavioral loyalty towards brands. These measures include purchase frequency or interpurchase interval over a time period (Morrison 1966; Sharp & Sharp 1997), repeat-purchase rate (Fader & Schmittlein 1993; Colombo, Ehrenberg & Sabavala 2000), share of category requirements or SCR (e.g. Bhattacharya, Fader, Lodish & Desarbo 1996; Jung, Gruca & Lopo 2010; Pare & Dawes 2011), tenure – the length of time a buyer remains as a buyer (Reichheld & Teal 1996; East, Lomax & Narain 2001); repertoire size (e.g. Uncles & Ehrenberg 1990; Banelis, Riebe & Rungie 2013), and the proportion of brand buyers who are solely loyal (e.g. Raj 1985). Each of these measures, while distinct, are all correlated with market share: small brands tend to have somewhat lower loyalty while

larger brands have somewhat more – regardless of how it is measured (Ehrenberg, Goodhardt & Barwise 1990; Ehrenberg & Goodhardt 2002). Some loyalty measures require careful interpretation as they can be confounded with other factors such as the consumer's rate of purchase – for example, one-time buyers in a period are by definition 100% loyal (Uncles & Lee 2006). Indeed, if the average rate of purchase for a category changes over time, brand loyalty metrics may change commensurately. An alternative measure, the Polarization index (e.g. Sabavala & Morrison 1977; Corsi, Rungie & Casini 2011), also known as the standardized switching rate – controls for such confounds and is therefore an important measure used in this study.

Over a period of decades, a body of knowledge has developed about behavioral loyalty incorporating facts, or 'empirical generalizations', briefly outlined here:

- Loyalty differs far less between brands in a category than does the number of buyers for each brand (Ehrenberg 2000).
- Large brands receive more loyalty, small brands receive less, commonly known as the double jeopardy effect (Ehrenberg, Goodhardt & Barwise 1990).
- Consumer Loyalty is related to purchase incidence – heavy buyers of a category buy more brands, consequently are less loyal to any particular brand (Banelis, Riebe & Rungie 2013).
- Large brands tend to monopolize light buyers in a category (McPhee 1963).
- Buyers of small brands tend to be heavier category buyers (Ehrenberg 1991).
- When brands grow, the change in penetration is generally larger than the change in loyalty (Baldinger, Blair & Echambadi 2002; Dawes 2009).

This fact-base about loyalty is useful for marketers in interpreting performance metrics for their own or for competitor brands and for planning marketing strategy (e.g. Ehrenberg,

Uncles & Goodhardt 2004). An important question that arises is whether brand loyalty in general is stable or declining over time.

2.1 Rationale for loyalty decline

There are several reasons to think brand loyalty – that is, specifically repeat-purchase loyalty - could be declining. First, customer loyalty is often managed with minimal differentiation across the entire customer base. Therefore, heterogeneity of the customer base is not adequately taken into account and individual customer differences may get ignored. This means that products or services are not personalized and even worse offered without adequate targeting. Thus, customers do not have their needs fully satisfied, which could result in more brand switching as time goes on.

Second, brand discounting and price promotions in sectors such as retail grocery are endemic (e.g. Hendel & Nevo 2006). There is some evidence that repetitive promotions encourage consumers to buy on deal (Mela, Jedidi & Bowman 1998). In turn, buying deal to deal could widen brand repertoires and decrease loyalty.

Third, there has been considerable growth in both the number of brands (including private-label brands) available and the range of product variants being offered in the past twenty years (Putsis 1997; Wan, Evers & Dresner 2012). It is reasonable to think that this proliferation widens consumer repertoires and thus decreases loyalty.

Another argument is that today's consumer is more discerning and discriminating than their forebears, more cynical about brands and hence potentially less brand loyal (O'Dell & Pajunen 2000).

Finally, the 2007/08 global financial crisis caused a decrease in consumer buying power, resulting in belt-tightening. Trimming expenditure on the part of consumers could prompt more switching between brands to take advantage of temporary promotions. Behavior such as

buying less expensive brands in periods of economic downturn can persist after the downturn has finished (Lamey 2014), again with the potential result of lowered brand loyalty.

2.2 Studies about loyalty evolution

Given these significant market changes over the last 15 or so years, and the continual assertions of declines in brand loyalty, a careful examination of loyalty decline is warranted. We now review the limited empirical evidence on long-term erosion or change in loyalty.

Ehrenberg (1988) examined how the proportion of buyers in one quarter who bought in the next quarter (e.g. Q1 to Q2) was quite predictable; but as one examined progressively longer non-consecutive quarters, (e.g. Q1 to Q3, or Q4) the proportion of repeat buyers declined. While the study identified this apparent erosion among repeat-buyers, the overall loyalty levels for the brands remained quite stable (because new buyers replaced the existing ones who bought less, or dropped out). The same effect was reported by East & Hammond (1996). Next, Stern and Hammond (2004) examined the inter-relationship between loyalty and purchase incidence. They found that loyalty declined necessarily over successive consumer purchases - since more purchase occasions affords more opportunity to buy multiple brands. However, the decline in loyalty tapered after approximately 50 purchases. These cited studies concern changes in the purchase propensities of *individuals*; that is, how buyers of a brand in one time period tend to repeat-buy it in subsequent periods or occasions; but they did not examine *overall* brand loyalty rates over time.

Two studies have examined loyalty at the aggregate level and how it has changed over time. Johnson (1984), examined 50 major brands in 20 US product categories over a period of eight years. He found some decline in loyalty for certain brands, but noted the decline often accompanied category growth. That is, growth in the category attracted new brands, which broadened consumer repertoires. Johnson concluded there was some evidence of loyalty decline, but its magnitude was small. Dekimpe, Steenkamp, Mellens and Abeele (1997)

found little evidence that loyalty was declining in a study using data from 21 FMCG categories covering a one- to two-year period (1993-94). Lastly, Sharp et al. (2012) provide data for a range of FMCG categories in the USA and UK. They reported how share of category requirements declined slightly in some cases.

While these studies find little evidence of loyalty decline, more investigation is needed. First, the Johnson and Dekimpe et al. studies were conducted 30 and 15 years ago respectively. Consumers and markets may have changed considerably since then. The more recent Dekimpe et al. study was limited to data spanning a maximum of two years, which may not be enough to detect long-term changes in loyalty. More recently, Sharp et al. (2012) reported small SCR decline over long time periods for a limited number of categories, but evidence across a broader base and using multiple loyalty indicators would be welcome.

3. Research method and analysis of brand loyalty

The current study focuses on behavioral loyalty – namely, observed repeat purchasing over time. There is a rich tradition of examining and modeling behavioral loyalty (e.g., Kahn, Kalwani & Morrison 1988; Uncles, Hammond, Ehrenberg & Davies 1994; East & Hammond 1996; East, Harris, Lomax & Wilson 1997; Ehrenberg, Uncles & Goodhardt 2004).

Some might consider the modeling of only behavior, with no attitudinal data, as a shortcoming. However, it is reasonable to think that if attitudes do exert some influence on loyalty we should see the end result of attitude change on behavior over the long-term analysis of purchasing conducted here. Moreover, no equivalent long-term database of consumer attitudes to brands is accessible to researchers.

An issue with behavioral loyalty metrics such as purchase frequency, SCR, or repeat rates is that they are potentially confounded by changes in category purchasing or market share

shifts. For example, if one only examines the average purchase frequency for brands, a decline in this metric could either indicate loyalty decline or merely reflect a change in category-level purchase rates. Similarly, if the average brand repertoire size is increasing this could either be a loyalty change or a change in the frequency with which the category is bought. Finally, changes in measures such as share of category requirements and purchase rates could be due to changes in market share – since market share and loyalty are systematically related (Ehrenberg 2000). These measures are quite dependent on the number of purchases (Stern & Hammond 2004). That said, measures such as repertoire size or SCR have a great advantage in that they are model-free, that is they can be derived from a simple application of arithmetic to the raw data. This simplicity makes them accessible, understandable, and readily used by managers or analysts. Furthermore, if there are changes over time in measures such as SCR or repertoire, one can examine if the change is related to factors such as changing category purchase frequency.

3.1 Dirichlet Model

The study uses two types of loyalty measures. First, to control for the confounding factors such as category-level purchasing and changes in brand share, the analysis uses a brand-switching metric derived from the Dirichlet multinomial model (Goodhardt et al., 1984). The Dirichlet model, or sometimes called the negative binomial distribution (NBD)-Dirichlet is a combination of two main distributions - the NBD and the Dirichlet multinomial distribution (DMD) - see Goodhardt, Ehrenberg and Chatfield (1984). The Dirichlet model rests on a small set of interrelated assumptions that describe and predict the patterns of purchase incidence and brand choice for any market that is stationary and unsegmented. One basic assumption of the model is that, for individual consumers, brand choice probabilities are independent of category purchase incidence. We use the Dirichlet model based on four considerations: first of all, the model is well established in the marketing literature (Fader &

Schmittlein 1993), and has contributed greatly to the understanding of repeat buying. Second, the data requirements are few (product category penetration and purchase frequency, as well as brand market shares) and the model's parameters have clear managerial interpretations. The accuracy of Dirichlet estimates has been reported in numerous studies (e.g. Fader & Schmittlein 1993; Uncles, Ehrenberg & Hammond 1995; Ehrenberg, Uncles & Goodhardt 2004). Finally, the model estimates the category switching parameter S , which is a measure of loyalty independent of the time frame of analysis, category purchase rate or other issues that affect the more traditional behavioral loyalty metrics (Ehrenberg 2000; Ehrenberg, Uncles & Goodhardt 2004). S is the sum of the Dirichlet's brand choice heterogeneity parameters and is thus a measure of behavioral loyalty for the category across the buyer population. It is important to note that an overall decline in loyalty necessarily implies increased switching between most if not all brands in a category, not just between a small subset, and it is precisely such overall changes in loyalty that changes in S captures. The polarization index, ϕ , is computed from S ($\phi = 1/(1+S)$) and also captures changes in the heterogeneity in consumer choice vectors. The polarization index appears in several guises in the marketing literature. It is reported to be a reliable and stable measure of loyalty for repeated purchases from a product category, which makes it adequate for this investigation (Chatfield & Goodhardt 1970; Kalwani & Morrison 1977; Sabavala & Morrison 1977; Goodhardt, Ehrenberg & Chatfield 1984; Fader & Schmittlein 1993). ϕ ranges between zero and one, where zero indicates maximum homogeneity in consumer choice (all buyers have the same propensity to buy individual brands), maximised brand switching and hence lower loyalty. As ϕ approaches 1, there is maximum heterogeneity, which implies no switching between brands and extreme loyalty (i.e., each consumer buys only their favorite brand). Importantly, ϕ is an un-confounded measure of loyalty. The latent brand choice probabilities are not affected by changes in category purchasing, nor by the time period of analysis, though the observed

behavior in each case would be. Full details about S and ϕ and the procedures for calculating them can be found in Appendix C in Ehrenberg's book (2000) or in Rungie (2003).

ϕ is supplemented with two other consumer behavior measures, being the average repertoire size; namely the average number of brands customers buy at least once in a twelve month time period, and Share of Category Requirements (SCR). SCR measures how much of a buyer's requirements are allocated to a brand compared to his/her total category purchases. Repertoire size indicates how many alternatives are substituted for the brands in a period (Ehrenberg 2000). Using these three measures allows for a comprehensive assessment of brand loyalty levels and their evolution over time.

The analysis also endeavors to identify what if any relationships exist between these loyalty measures, and several category level factors: (a) category purchase frequency, namely the average number of purchases by buyers in the category, (b) market growth, (c) the number of stock keeping units (SKUs: unique code that refers to the particular product, brand, pack size and formulation) present in the category each year. As identified earlier, measures such as SCR should be related to category purchase rates. Johnson (1984) found some evidence brand loyalty change was related to category growth, which in turn should correlate with category purchase frequency. Finally, SKU proliferation is implicated as a possible cause of loyalty decline because more options are said to weaken established buying habits and induce variety seeking (Quelch & Kenny 1994). That said, one might argue that if each brand possesses more SKU's the additional variety offered by each might actually inhibit switching across brands, hence loyalty may not change at all.

3.2 Data

The data used in this study is from 26 product categories. Kantar UK (formerly TNS) provided UK data covering between 7 and 13 years of the period 1998 to 2010. This data

consists of 15 FMCG food, beverage, personal care, laundry and pet food categories (margarine, tea bags, instant coffee, laundry detergents, breakfast cereals, butter, crackers, crisps and savory snacks, dog food, cat food, shampoo, fabric conditioner, cough liquid, tooth paste, body spray & deodorants) and more than 300 brands. The data is gathered from a selected panel of over 15,000 households across the UK.

US data was provided by Nielsen, and the IRI academic database (Bronnenberg, Kruger & Mela 2008), covering 11 food, personal care and pet food categories (fabric conditioner, margarine, deodorants, breakfast cereals, cat food, yoghurt, frozen dinners, paper towels, beer, laundry detergent, pizza) and more than 120 brands for the period 2005-2010 inclusive for Nielsen, and 2001-2007 for IRI. The Nielsen panel is gathered from 100,000 households across the US. Participating consumers of both panels record their purchases using electronic scanners immediately after shopping trips. The national panels are geographically and demographically representative of the UK and US consumer population. The IRI data are from two US cities with populations of approximately 50,000 people. The diversity of categories and panel sources should help produce results that are applicable to packaged good categories in general. Using a range of different time periods avoids the results being idiosyncratic to any one period.

As with any consumer panel, some panelists drop out over time therefore the analysis uses specific 52-week periods, selecting only the panelists reporting for that full 52 weeks. This approach avoids the downward bias in repeat-purchasing metrics that would otherwise occur if panelists present for only part of the 52 weeks were included. The year-on-year comparisons of brand loyalty therefore draw on the panelists reporting for each respective year.

The study analyzes only brands that were present in the market for all years. The analysis used the top 20 brands with the remainder included in analysis as an all-others aggregation.

This approach is consistent with prior studies (e.g. Fader & Schmittlein 1993; Ehrenberg 2000; Pare & Dawes 2011). For every category the analysis was performed on yearly time frames. Hence for those categories with 13 years of data, 13 analyses were conducted.

3.3 Dirichlet model estimation

The observed brand performance data (e.g. category and brand penetration as well as purchase frequency, market shares) was entered into excel-based Dirichlet software (Kearns 2010), to fit the Dirichlet model and hence estimate S and ϕ (Bound 2009).

4. Results

4.1 Evolution of purchasing frequencies

Over-time changes in category purchase frequency and SKU proliferation are examined before looking at loyalty change. Table 1 shows purchase frequency over time across the 26 categories. Two measures of over-time change are presented: the average percentage year-on-year change, and the correlation of purchase frequency with time. These two measures enable us to identify whether there is any consistent time trend evident, and the magnitude of the change.

Table 1 here.

Table 1 shows that in 9 of the 26 categories, purchase frequency is trending down, with a statistically significant correlation between purchase frequency and time. However, there are other categories showing increases. Overall, the average percentage change in purchase frequency is -0.66%, and it is not statistically significantly different from zero.

It is worth noting that breakfast cereals and margarine look quite different in the US data compared to the UK data. US buyers buy cereal on average 12 times per year, but UK buyers buy on average 25 occasions per year. A check revealed the total number of packs bought per year is approximately the same across the two markets, therefore it seems US buyers buy more products per trip. For margarine, US buyers buy about 6 times per year, but UK buyers buy twice as often; and indeed the number of packs bought in a year in the UK is also higher. The authors do not have data to compare typical pack sizes in the US to UK, but a reasonable explanation might be that sizes are larger in the US.

Table 1 confirms that some, at least, of these categories are trending down in annual purchase frequency, while others are increasing. These changes in category-level buying statistics justify the use of the ϕ index since it controls for such changes in category buying rate. While strictly speaking the Dirichlet describes stationary markets, it is robust to the modest changes in annual purchasing rates seen in these categories.

Examined next is the extent to which total SKU's in these categories grow or decline over time. SKU information is available for some but not all of the years in the Kantar databases, and for all the IRI data, but such information is not available from the Nielsen data. Table 2 summarizes SKU evolution over time. Overall, the number of SKU's in these categories is increasing by 3.3 percent per year. The correlation between SKU count and time is $r=0.70$ ($p < 0.01$), suggesting a reasonably coherent upward trend. Only one category shows a downward trend, namely margarine in the UK. The reasons for that trend are not ascertainable from the data.

Table 2 here

4.2 Change in the loyalty metrics over time

Table 3 shows the ϕ index for the UK and US markets over time. ϕ is within the bounds typically observed for FMCG (see Driesener 2005; Sharp, Driesener & Rungie 2006).

Table 3 here

The first finding is that the extent of brand loyalty – in terms of ϕ - is quite different across the categories. In the UK, breakfast cereals, crisps/savory snacks, body sprays/deodorants, cat and dog food and shampoos, show somewhat more switching (the values of ϕ are lower) between brands than does butter, margarine, tea bags, laundry detergents, toothpaste, coffee, fabric conditioners, or cough liquids - controlling for the differences in category buying frequency. In the US, Cereal appears to have markedly lower loyalty (lower ϕ) than the other categories.

The key finding for this research is that ϕ exhibits a slight downward trend in only some cases. In 8 of the 15 UK categories (breakfast cereals, crisps and savory snacks, margarine, laundry detergents, tea bags, toothpaste, crackers, fabric conditioner) there are negative correlations between ϕ and time, all statistically significant at $p < 0.05$. The average percentage decrease per year among these categories is -2.2 percent per year. However, in the US, there is only one product category with a statistically significant ($p = 0.05$ level) decrease in ϕ over time - yoghurt. Moreover, there are some categories with increasing loyalty trends over time - such as cat food in the UK, and cereal and paper towels in the US. Over the 26 categories, the average year on year change in the polarization index is -0.47%, but the figure is not

statistically significantly different to zero. Likewise the overall correlation coefficient between polarization and time is non-significant.

Turning to average Share of Category Requirements (SCR), there is a somewhat more noticeable change over time – although it is still very small. As shown in Table 4, the average yearly percentage change in SCR is -0.77%, statistically different to zero at $p < 0.05$. The average correlation coefficient between SCR and time across all the categories is -0.29 ($p < 0.05$). Next, the same analysis was applied to repertoire size, detailed tables of which are not included due to space constraints. Repertoire size exhibits no consistent change across the 26 categories with an average yearly percentage change of -0.09% (non-significant) and correlation with time of, co-incidentally, $r = -0.09$ (non-significant).

Table 4 here

4.3 Correlations between the Loyalty Measures and category level factors

While the analysis of changes in loyalty over time finds that only SCR appears to show a consistent, statistically significant trend over time, it could still be the case that year-to-year fluctuations in loyalty (either polarization, repertoire size, or SCR) might be related to other factors. Next we examine several category level factors that could influence loyalty, namely market growth (Johnson 1984), purchase frequency, and SKU count. Preliminary analysis shows that market growth does not exhibit as strong a relationship with loyalty changes as does purchase frequency, therefore the analysis focuses on the latter, as well as the number of SKU's in each category over time.

Our analysis (see Table 5) indicates that the year on year changes in polarization are related to changes in category purchase frequency ($r = -0.23$, $p < 0.05$), but are not related to

changes in the number of SKUs in the categories over time ($r=-0.18$, n.s.). Changes in SCR in these categories over time are related to both SKU's ($r= -0.33$, $p<0.05$) and category purchase frequency ($r=-0.38$, $p<0.05$). That is, more SKU's in stores over time tend to push SCR down slightly, as does more frequent purchasing of the category. Finally, repertoire size is related to category purchase frequency ($r= 0.26$, $p<0.05$) – if the category is bought more often one year to another, consumers tend to pick from a slightly wider repertoire of brands. Repertoire size is not related to SKU's (-0.07 , n.s). Table 5 also shows the correlations among the loyalty measures. As would be expected, SCR and polarization are positively correlated, since a higher figure for either signals higher loyalty ($r=0.56$, $p< 0.05$). Both SCR and polarization are negatively correlated with repertoire size ($r= -0.44$ and $r=-0.51$, $p< 0.05$), since a bigger repertoire arguably denotes less loyalty than a smaller one.

Table 5 here

5. Conclusion and managerial implications

Many studies have examined brand loyalty and the possible factors that underlie excesses or deficits of loyalty. This study makes a unique contribution by examining the longitudinal evolution of brand loyalty over multiple years in the recent past; and by showing a simple yet useful relationship between loyalty, category purchase rates and SKU count.

The findings of this research provide only very weak support for the proposition that consumers are exhibiting declining loyalty. In some categories there are downward trends in loyalty, but in others the trends are upwards. Only in 9 of the 26 categories (35%) are there negative statistically significant correlations between the ϕ loyalty parameter and time. The overall correlation coefficient between these metrics is non-significant. Furthermore, the

average year on year change in the polarization loyalty parameter is very slight, only -0.47% and not statistically significant; while there is a statistically significant although quite small overall change in SCR, less than 1 point per year. There is no statistically significant change in repertoire size. These findings, as well as the insights from examining correlations between the loyalty metrics and some category level factors, suggest that even if there is some small change in SCR over time, it appears to be related to the fact that the category purchase rate varies from year to year in some cases. Also, that on average there are more SKU's in these sorts of categories, and there is an inverse, but weak relationship between SKU numbers per category, and average SCR for that category. This finding raises several questions. First, if consumers are loyal to a small repertoire of brands at least in part to reduce cognitive energy, why would more variants induce less loyalty? Arguably, loyalty could increase to reduce the cognitive load in choosing among a large number of alternatives. Second, SKU proliferation means in general, consumers of any particular brand face more choice for *that* brand as well as for *competitor* brands. In which case, loyalty equilibrium would be maintained, not lowered. The answer could be as suggested by Quelch and Kenny (1994) - more SKU choice could weaken established habits - perhaps more flavor, form or package offerings by established brands induce consumers to consider those factors across brands, leading to lowered SCR, more brand switching and less loyalty.

The overall results here are somewhat reassuring for marketers – loyalty for their brands is not going out the back door. While there is a slight overall change, its magnitude is very small, less than 1 point of SCR per year. Furthermore, such changes are somewhat more likely to be expected in categories that are growing (higher category purchase frequency, and perhaps more SKUs over time). It may be that an outcome of category growth is slightly lower brand loyalty (Johnson 1984). If marketing was truly less effective now than twenty years ago, we might have expected to see much more marked changes in buying behavior

than noted here. Our results support Johnson's contention (1984) that loyalty decline may be more of a myth than a well-founded empirical fact.

The analysis has also shown that category average purchase frequency can exhibit a noticeable downward trend over time in some categories. This is an important phenomenon to track and confirm if there is a possible link to other category purchasing metrics such as quantity purchased per occasion, and the extent of brand loyalty. Knowing more about category purchase rates might assist marketers contextualize their loyalty metrics – if loyalty for their brand has increased slightly, is it a real change, or could it be due to category level changes? Likewise, if marketers have mandated targets to grow or improve brand metrics such as loyalty, knowing how these metrics are likely to respond to changes in the category purchase rate would be useful knowledge.

6. Limitations and further research

There are some limitations of the study that bear mention. First, the principal aim of this research was to assess the evidence from a reasonably broad range of grocery categories to determine if brand loyalty is declining. The study analyzed brands within categories, but reported the average results for each category. It may be that within any category, some brands exhibit different loyalty paths over time. Also, the study only explored a small number of potential factors that might help explain loyalty changes. While there appears to be little loyalty change in aggregate, some categories do exhibit slight upward loyalty changes while others trend downward. More work should be done on dissecting the reasons why such trends are occurring. Next, although the Dirichlet model, which provided the basis for the loyalty metrics, is well established in the marketing literature, the absence of marketing and consumer covariates is a limitation. For example, one could examine marketing mix factors such as price and promotion in depth; likewise the analysis could be extended to a less aggregated level such as brand type (manufacturer, store brand) or consumer sub-group. The

Pareto/NBD model incorporating covariates could be an alternative analysis approach (Castéran, Meyer-Waarden & Benavent 2007).

An extension to other FMCG categories and countries is also recommended in order to generate more generalized knowledge on this topic. Indeed, taking the analysis out of the grocery domain and into durables, for example, would be illuminating. While long-term panel data are generally not available for markets outside grocery, one could use methods such as comparison of historical data of repeat-purchase rates (e.g. Colombo, Ehrenberg & Sabavala 2000) with more recent data to ascertain if consumer behavior is changing over time.

An interesting observation from the study pertains to the fact that 8 of 15 UK categories showed a slight decline in polarization and SCR, whereas the incidence of decline was lower in the USA. While the sample size of categories does not facilitate a robust country-to-country comparison, the notion that there could be differences in loyalty evolution across countries is intriguing and an avenue for further research.

While the study here found only very weak loyalty changes – partly explainable as due to category purchasing changes and SKU count - the findings still represent an exciting opportunity for further research. If there are some categories that do exhibit loyalty declines and others that do not - what is the difference between such categories? Are categories with heightened levels of in-store promotions the ones that show more apparent loyalty declines? Is it easier to build loyalty in some product categories than in others and why? Does brand extension really lead to less loyalty? Do certain categories succeed in disproportionately attracting brand-loyal consumers and why? Which marketing mix variables are most effective in building a loyal consumer base? What is the role of consumer characteristics? These are all

important questions for future research. As stated earlier, our results are specific to FMCG. The existing literature proposes several other factors, such as competitive structure, and has argued that loyalty is higher in categories or sectors that involve consumers more (e.g., baby products, clothing - Laurent & Kapferer 1985). Further research in other areas should test how these and other factors influence brand loyalty, though such efforts might be difficult in industries that lack market wide scanner-panel purchasing data.

In this study, we found a weak, inverse relationship between the breadth of offerings in a category and brand loyalty. In many markets that are outside the scope of investigation here, the number of brand and product alternatives available has become almost unlimited due to the Internet. Based on the results here, one could conjecture that this wider choice might result in lowered loyalty. Or, as might be argued logically, in the face of bewildering variety consumers may prefer their known and safe choices, hence loyalty could be stable or even increase. This is an avenue for future investigation.

It is worth noting that the global financial crisis may still be playing out in these categories. The time-windows for some of our categories end between 2007 and 2010. Some of the small decreases in brand loyalty could be partly attributed to belt-tightening over the period 2008-2010. Analysis over subsequent time periods could better establish whether such macro-level factors play a part in brand loyalty changes.

References

- Baldinger, AL, Blair, E, Echambadi, R. (2002). Why Brands Grow. *Journal of Advertising Research*, 1: 7-14.
- Banelis, M, Riebe, E, Rungie, CM. (2013). Empirical evidence of repertoire size. *Australasian Marketing Journal*, 21: 59-65.
- Bhattacharya, CB, Fader, PS, Lodish, LM & Desarbo, WS. (1996). The Relationship Between the Marketing Mix and Share of Category Requirements. *Marketing Letters*, 7 (1): 5-18.
- Bound, J. (2009). User's Guide to DIRICHLET. *Marketing Bulletin*: 20.
- Bronnenberg, BJ, Kruger, MW, Mela, CF. (2008). The IRI marketing data set. *Marketing Science*, 27 (4): 745-748.
- Castéran, H, Meyer-Waarden, L, Benavent, C. (2007). *Incorporating covariates into the Pareto/NBD model to model customer lifetime value*. German-French Conference for Quantitative Marketing. ESSEC.
- Chatfield, C, Goodhardt, GJ. (1970). The Beta-Binomial model for consumer purchasing behaviour. *The Journal of The Royal Statistical Society Series C (Applied Statistics)*, 19 (3): 240-250.
- Colombo, R, Ehrenberg, A, Sabavala, D. (2000). Diversity in analyzing brand-switching tables: The car challenge. *Canadian Journal of Marketing Research*, 19: 23-36.
- Corsi, A, Rungie, C, Casini, L. (2011). Is the polarization index a valid measure of loyalty for evaluating changes over time? *Journal of Product and Brand Management*, 20 (2): 111-120.
- Dawes, J. (2009). You need more customers: the key is how many you have, not how much they buy. *Marketing Research*, Summer: 30-31.
- Dekimpe, MG, Steenkamp, J-BEM, Mellens, M & Abeele, PV. (1997). Decline and Variability in Brand Loyalty. *International Journal of Research in Marketing*, 14 (No. 5): 405-420.
- Dick, AS, Basu, K. (1994). Customer Loyalty: Toward an Integrated Conceptual Framework. *Journal of the Academy of Marketing Science*, 22 (No. 2): 99-113.
- Driesener, C. (2005). Empirical generalisations in the parameter values of the Dirichlet model: an examination across 50 categories. Adelaide, University of South Australia.
- Dubow, JS. (1992). Occasion-based vs user-based benefit segmentation: A case study. *Journal of Advertising Research*, 32 (March/April): 11-18.
- East, R, Hammond, K. (1996). The Erosion of Repeat-Purchase Loyalty. *Marketing Letters*, 7 (2): 163-171.

- East, R, Harris, P, Lomax, W & Wilson, G. (1997). First-Store Loyalty and Retention Among Supermarket Customers. London, Kingston Business School.
- East, R, Lomax, W, Narain, R. (2001). Customer tenure, recommendation and switching. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behaviour*, 14: 46-54.
- Ehrenberg, A, Goodhardt, G. (2002). Double Jeopardy revisited, again. *Marketing Insights, Marketing Research*, Spring 2002: 40-42.
- Ehrenberg, AS, Goodhardt, G, Barwise, TP. (1990). Double Jeopardy revisited. *Journal of Marketing*, 54 (3): 82-91.
- Ehrenberg, ASC. (1988). Repeat-buying: facts, theory and applications. London: Oxford University Press.
- Ehrenberg, ASC. (1991). New Brands and the Existing Market. *Journal of the Market Research Society*, 33 (4): 285-299.
- Ehrenberg, ASC. (2000). Repeat-Buying: facts, theory and applications. *Journal of Empirical Generalisations in Marketing Science*, 5: 392-770.
- Ehrenberg, ASC, Uncles, MD, Goodhardt, GG. (2004). Understanding brand performance measures: using Dirichlet benchmarks. *Journal of Business Research*, 57 (12): 1307-1325.
- Fader, PS, Schmittlein, DC. (1993). Excess behavioral loyalty for high-share brands: deviations from the Dirichlet model for repeat purchasing. *Journal of Marketing Research*, 30 (4): 478-493.
- Goodhardt, GJ, Ehrenberg, ASC, Chatfield, C. (1984). The Dirichlet: A comprehensive model of buying behaviour. *Journal of the Royal Statistical Society*, 147 (5): 621-655.
- Hendel, I, Nevo, A. (2006). Measuring the implications of sales and consumer inventory behavior. *Econometrica*, 74 (6): 1637-1673.
- Jacoby, J, Chestnut, R. (1978). Brand Loyalty: Measurement and Management. New York: John Wiley & Sons.
- Jacoby, J, Kyner, DB. (1973). Brand Loyalty Vs. Repeat Purchasing Behavior. *Journal of Marketing Research*, 10 (February): 1-9.
- Johnson, T. (1984). The myth of declining brand loyalty. *Journal of Advertising Research*, 24 (1): 9-17.
- Jung, S, Gruca, T, Lopo, R. (2010). Excess loyalty in CPG markets: a comprehensive examination. *Journal of Empirical Generalisations in Marketing Science*, 13 (1): 1-13.
- Kahn, BE, Kalwani, MU, Morrison, DG. (1988). Niching Versus Change-of-Pace Brands: Using Purchase Frequencies and Penetration Rates to Infer Brand Positionings. *Journal of Marketing Research*, 25 (November): 384-390.

- Kalwani, MU, Morrison, DG. (1977). Estimating the Proportion of "Always Buy" and "Never Buy" Consumers: A Likelihood Ratio Test with Sample Size Implications. *Journal of Marketing Research*, 14 (November): 601-606.
- Kapferer, J-N. (2005). The roots of brand loyalty decline: an international comparison. *IVEY Business Journal Online*, March/April: 1-6.
- Kearns, Z. (2010) Dirichlet.Xls. Palmerston North, Massey University.
- Lamey, L. (2014). Hard economic times: A dream for discounters. *European Journal of Marketing*, forthcoming.
- Laurent, G, Kapferer, J-N. (1985). Measuring Consumer Involvement Profiles. *Journal of Marketing Research*, 22 (February): 41-53.
- McPhee, WN. (1963). Formal Theories of Mass Behaviour. New York: The Free Press of Glencoe.
- Mela, CF, Jedidi, K, Bowman, D. (1998). The Long-Term Impact of Promotions on Consumer Stockpiling Behavior. *Journal of Marketing Research*, 35 (May): 250-262.
- Meyer-Waarden, L, Benavent, C. (2009). Grocery retail loyalty program effects: self-selection or purchase behavior change? *Journal of the Academy of Marketing Science*, 37 (3): 345-358.
- Morrison, DG. (1966). Interpurchase Time and Brand Loyalty. *Journal of Marketing Research*, 3 (August): 289-291.
- O'Dell, S, Pajunen, JA. (2000). The butterfly customer: Capturing the loyalty of today's elusive customer. Toronto: John Wiley & Sons.
- Pare, V, Dawes, J. (2011). The persistence of excess brand loyalty over multiple years. *Marketing Letters*, 21 (2): 163-175.
- Pointer Media Network. (2009). Losing loyalty: the consumer defection dilemma. St. Petersburg, FL, Pointer Media Network, The Chief Marketing Officer (CMO) Council.
- Putsis, WPJ. (1997). An empirical study of the effects of brand proliferation on private label - National brand pricing behavior. *Review of Industrial Organization*, 12: 355-371.
- Quelch, JA, Kenny, D. (1994). Extend Profits, Not Product Lines.
- Raj, SP. (1985). Striking a Balance Between Brand 'Popularity' and Brand Loyalty. *Journal of Marketing*, 49 (Winter): 53-59.
- Reichheld, FF, Teal, T. (1996). The Loyalty Effect: The Hidden Force Behind Growth, Profits, and Lasting Value. Boston, Massachusettes: Harvard Business School Press.
- Rungie, C. (2003). How to Estimate the Parameters of the Dirichlet Model using Likelihood Theory in Excel. *Marketing Bulletin*, 14.

- Sabavala, DJ, Morrison, DG. (1977). A Model of TV Show Loyalty. *Journal of Advertising Research*, 17 (December, No. 6): 35-43.
- Sharp, B, Driesener, C, Rungie, C. (2006). *Confirmation of the Dirichlet brand loyalty parameter limits for repertoire categories: 127 replications*. 35th European Marketing Academy Conference. Athens, Greece.
- Sharp, B, Sharp, A. (1997). Loyalty Programs and Their Impact on Repeat-Purchase Loyalty Patterns. *International Journal of Research in Marketing*, 14 (5): 473-486.
- Sharp, B, Sharp, A, Wright, M. (1999). *Questioning the Value of the True Brand Loyalty Distinction*. Australian & New Zealand Marketing Academy 1999. Sydney. School of Marketing, University of New South Wales.
- Sharp, B, Wright, M, Dawes, J, Driesener, C, Meyer-Waarden, L, Stocchi, L & Stern, P. (2012). It's a Dirichlet World: Modeling individuals' Loyalties reveals How Brands Compete, Grow, and Decline. *Journal of Advertising Research*, 52 (2): 203-213.
- Stern, P, Hammond, K. (2004). The Relationship Between Customer Loyalty and Purchase Incidence. *Marketing Letters*, 15 (1): 5-19.
- Uncles, M, Ehrenberg, A, Hammond, K. (1995). Patterns of Buyer Behavior: Regularities, Models, and Extensions. *Marketing Science*, 14 (3, Part 2 of 2): G61-G70.
- Uncles, M, Lee, D. (2006). Brand purchasing by older consumers: an investigation using the Juster scale and the Dirichlet model. *Marketing Letters*, 17 (1): 17-29.
- Uncles, MD, Ehrenberg, ASC. (1990). Brand Choice Among Older Consumers. *Journal of Advertising Research* (August/September): 19-22.
- Uncles, MD, Ellis, K. (1989). The Buying of Own Labels. *European Journal of Marketing*, 23 (No. 3): 47-70.
- Uncles, MD, Hammond, KA, Ehrenberg, ASC & Davies, RE. (1994). A Replication Study of Two Brand-Loyalty Measures. *European Journal of Operational Research*, 76 (2): 375-385.
- Wan, X, Evers, PT, Dresner, ME. (2012). Too much of a good thing: The impact of product variety on operations and sales performance. *Journal of Operations Management*.

The authors thank Kantar, Nielsen and SymphonyIRI for making this data available. All estimates or analyses in this paper based on Kantar, Nielsen, or SymphonyIRI Group, Inc. data are by the authors and not Kantar, Nielsen or SymphonyIRI Group, Inc.

Table 1 Evolution of Category Purchase Frequency

	98	99	00	01	02	03	04	05	06	07	08	09	10	Avg. % Change p.a.	Correlation with time	P-value of correlation
UK Kantar	98	99	00	01	02	03	04	05	06	07	08	09	10			
Breakfast Cereals	27	25	24	22	21	22	21	22	22	22	25	25	24	-1	-0.14	0.65 n.s.
Margarine	18	17	17	15	15	14	14	14	13	13	13	13	13	-3	-0.92	0.01 **
Tea Bags	12	11	11	10	10	8	8	8	7	7	8	7	7	-5	-0.92	0.01 **
Crisps/ Sav Snack	35	32	30	26	24	29	29	28	31	30	33	35	36	0	0.35	0.24 n.s.
Laundry Deterg.	11	10	9	8	8	8	8	8	8	8	9	7	7	-4	-0.74	0.01 **
Toothpaste	7	6	6	6	6	6	6	6	6	6	6	6	6	-1	-0.46	0.11 n.s.
Bodysprays/Deod	5	5	5	5	6	6	6	6	6	6	6	7	7	3	0.90	0.01 **
Butter	11	11	12	11	11	11	11	11	12	12	11	12	12	1	0.51	0.07 n.s.
Inst. Std Coffee	9	9	8	6	6	6	6	6	6	6	6	7	7	-3	-0.65	0.01 **
Crackers	6	7	7	8	8	9	9	9	12	12	11	12	12	5	0.95	0.01 **
Cat Food	60	65	74	63	60	75	82	85	98	98	98	98	99	4	0.92	0.01 **
Dog Food	40	40	39	36	36	40	41	42	42	43	41	40	37	-1	0.24	0.43 n.s.
Shampoo	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0.18	0.56 n.s.
Fabric Condit	8	8	8	8	8	8	8	8	8	8	7	8	7	-2	-0.69	0.01* *
Cough Liq	2	2	2	2	2	2	2	2	2	2	2	2	2	-2	-0.09	0.77 n.s.
US Nielsen																
Margarine								7	7	6	6	6	6	-2	-0.96	0.01 **
Yogurt								9	10	10	10	10	11	3	0.91	0.01 **
Cereal								13	13	12	13	13	12	-2	-0.41	0.16 n.s.
Cat								14	14	14	14	14	14	0	0.24	0.42 n.s.
Deods								3	3	3	3	3	3	0	-0.13	0.67 n.s.
Shampoo /Condit								3	3	3	3	3	3	-1	-0.78	0.01 **
US IRI																
Frozen Dinner				11	10	12	10	10	11	14				3	0.47	0.10 n.s.
Paper Towels				8	7	7	6	5	5	5				-8	-0.96	0.01 **
Beer				6	7	7	8	8	8	7				2	0.76	0.01 **
Ldy. Detergent				6	6	6	5	5	5	5				-3	-0.86	0.01**
Pizza				9	9	9	10	10	10	9				1	0.47	0.10 n.s.
Average														-0.66 n.s.	-0.07 n.s.	-

** statistically significantly different from zero at p=0.01; * statistically significantly different from zero at p=0.05; n.s. statistically non significantly different from zero.

The average yearly change is calculated by taking the % differences year to year and averaging them. The Avg. change figures are a *percentage of the yearly figure not absolute percent changes*. Note some of the variables are correlated with time even though they appear not to change – this is due to rounding.

Table 2 Evolution of the number of SKUs present each year

UK Kantar	98	99	00	01	02	03	04	05	06	07	08	09	10	Avg. % Change p.a.	Correlation with time	P-value of correlation
Breakfast Cereals	958	983	1001					1263	1192	1245	1237	1234	1208	1	0.92	0.01 **
Margarine			305	279	262	256	243	223			206	188	192	-5	-0.98	0.01 **
Tea Bags						606	605	618	596	583	667	654	655	1	0.67	0.06 n.s.
Crisps/Sav Snacks											1883	1931	1923	1	0.78	0.30 n.s.
Laundry Detergent	765	690	704			920	790	798	1010	878	959	1141	984	2	0.82	0.01 n.s.
Toothpaste	397	369	357			388	417	440	438	425	403	417	401	0	0.58	0.07 n.s.
Bodysprays/Deod								1096	1137	1232	1350	1302	1244	2	0.75	0.11 n.s.
Butter			97	106	114	116	116	139			191	200	203	6	0.98	0.01 **
Instand Std Coffee	335	343	349			416	428	453			452	448	450	2	0.92	0.01 **
Crackers			281	280	319	385	437	533			635	592	611	8	0.96	0.01 **
Cat Food			957	957	1073	1755	1803	1978			2495	2434	2361	8	0.95	0.01 **
Dog Food						1275	1226	1199			2744	2800	2759	7	0.94	0.01 **
Shampoo			838	851	918						1163	1163	1132	2	0.98	0.01 **
Fabric Condit	374	402	381		467	419	458							2	0.81	0.03 *
Cough Liq												137	142	4	0.92	0.01 **
US IRI																
Frozen Dinner				603	761	665	636	713	657	940				9	0.58	0.04 *
Paper Towels				156	162	190	169	172	188	226				7	0.80	0.01 **
Beer				556	617	597	618	620	637	645				3	0.87	0.01 **
Laundry Detergent				270	310	297	295	302	333	337				4	0.84	0.01 **
Pizza				407	428	455	515	521	497	536				5	0.91	0.01 **
Average														3.3 **	0.70 **	

** statistically significantly different from zero at p=0.01; * statistically significantly different from zero at p=0.05; n.s. statistically non significantly different from zero.

Table 3 Evolution of the Polarization Index

	98	99	00	01	02	03	04	05	06	07	08	09	10	Avg. % Change p.a.	Correlation with time	P-value of correlation
UK Kantar																
Breakfast Cereals	.24	.24	.23	.22	.23	.23	.23	.23	.23	.22	.19	.19	.20	-1.8	-0.79	0.01 **
Margarine			.36	.37	.36	.33	.34	.36	.37	.36	.32	.23	.26	-4.1	-0.71	0.01 **
Tea Bags	.50	.50	.50	.50	.50	.45	.45	.45	.48	.45	.42	.42	.42	-1.6	-0.91	0.01 **
Crisps/Sav Snacks	.23	.23	.22			.19	.17	.19			.20	.18	.18	-2.0	-0.78	0.01 **
Laundry Detergent	.48	.48	.45	.45	.43	.42	.45	.48	.48	.45	.42	.40	.37	-2.2	-0.65	0.01 **
Toothpaste	.42	.37	.38	.36	.36	.36	.38	.38	.37	.37	.34	.33	.31	-2.6	-0.71	0.01 **
Bodysprays/Deod.			.28	.31	.32	.30	.31	.32	.34	.29	.29	.26	.25	-1.4	-0.49	0.09 n.s.
Butter			.41	.43	.39	.42	.41	.43						0.9	0.20	0.50 n.s.
Instand Std Coffee	.53	.50	.48	.45	.43	.48	.50	.56	.59	.63	.53	.42	.45	-1.8	0.09	0.77 n.s.
Crackers			.33	.31	.29	.28	.28	.26						-5.0	-0.95	0.01 **
Cat Food			.11	.09	.11	.15	.14	.15	.13	.13				2.0	0.64	0.02 *
Dog Food			.27	.26	.24	.23	.23	.24	.27	.28	.24	.21	.24	-1.4	-0.34	0.26 n.s.
Shampoo			.26	.28	.27	.25	.27	.27	.26	.28				0.8	0.18	0.67 n.s.
Fabric Condit.	.47	.46	.46			.42	.43	.44						0.6	-0.84	0.02 *
Cough Liq.	.44	.46	.31	.41	.48	.46			.39	.42	.47	.45	.48	1.4	0.31	0.30 n.s.
US Nielsen																
Margarine								.42	.45	.45	.43	.43	.43	0.40	-0.13	0.80 n.s.
Yogurt								.37	.34	.37	.33	.31	.31	-3.86	-0.85	0.02 *
Cereal								.13	.13	.14	.14	.14	.14	1.43	0.83	0.03 *
Cat								.32	.37	.32	.32	.37	.36	1.72	0.41	0.40 n.s.
Deods								.29	.29	.31	.30	.29	.30	0.60	0.26	0.61 n.s.
Shampoo / Condit.								.31	.30	.30	.29	.30	.35	2.17	0.48	0.32 n.s.
US IRI																
Frozen Dinner				.32	.38	.30	.31	.35	.41	.29				-3.60	0.06	0.90 n.s.
Paper Towels				.27	.22	.26	.31	.41	.42	.46				7.47	0.92	0.01 *
Beer				.52	.49	.48	.49	.46	.47	.48				-1.21	-0.69	0.10 n.s.
Laundry Detergent				.37	.37	.37	.39	.38	.37	.40				1.21	0.58	0.21 n.s.
Pizza				.37	.37	.37	.34	.35	.38	.37				-0.25	-0.08	0.87 n.s.
Average														-0.47 n.s.	-0.15 n.s.	-

** statistically significantly different from zero at p=0.01; * statistically significantly different from zero at p=0.05; n.s. statistically non significantly different from zero.

Table 4 Evolution of Average Brand Share of Category Requirements (SCR)

Corrections have been made here to the table that appears in the published JBR paper. The average reported in the published paper was -0.9, the corrected figure is -0.77.

UK Kantar	98	99	00	01	02	03	04	05	06	07	08	09	10	Avg. Change p.a.	Correlation with time	P-value of correlation
Breakfast Cereals	15	15	15			15	15	15	17	17	13	13	13	-2	-0.33	0.31 n.s.
Margarine			21	22	22	22	22	23	24	22	20	18	19	-1	-0.52	0.10 n.s.
Tea Bags	34	34	34			34	34	34	35	34	33	33	31	-1	-0.55	0.07 n.s.
Crisps/Sav Snacks	15	15	14			13	13	13			14	13	13	-2	-0.72	0.02 *
Laundry Detergent	31	31	31	30	30	29	33	34	34	33	30	31	30	0	0.16	0.61 n.s.
Toothpaste	27	26	27	27	26	26	27	26	25	24	25	24	23	-1	-0.86	0.00 **
Bodysprays/Deod			27	28	25	26	26	25	28	24	25	22	22	-2	-0.75	0.01 **
Butter			25	28	24	25	24	25			21	20	20	-1	-0.89	0.001 **
Instand Std Coffee	35	33	33	33	33	34	36	36	35	34	32	30	30	-1	-0.44	0.13 n.s.
Crackers			27	25	23	21	22	21						-6	-0.94	0.001 **
Cat Food			12	12	11	11	11	10	11	12				0	-0.33	0.42 n.s.
Dog Food			19	20	19	19	20	21	20	19	21	20	19	0	0.23	0.45 n.s.
Shampoo			31	32	30	28	29	29	31		26	25	25	-1	-0.86	0.001 **
Fabric Condit	34	34	34			30	31	32						1	-0.85	0.02 *
Cough Liq			60	63	47	63	60	56			56	57	60	-1	-0.06	0.84 n.s.
<hr/>																
US Nielsen																
Margarine								31	33	33	33	33	33	1	0.65	0.19 n.s.
Yogurt								24	22	23	21	20	20	-4	-0.92	0.01 **
Cereal								11	11	12	11	11	12	2	0.41	0.47 n.s.
Cat								19	21	20	18	21	20	1	0.14	0.82 n.s.
Deods								36	36	37	37	35	36	0	-0.21	0.72 n.s.
Shampoo / Condit								35	30	30	31	34	33	-1	0.08	0.90 n.s.
<hr/>																
US IRI																
Frozen Dinner				29	28	28	30	28	27	22				-4	-0.65	0.20 n.s.
Paper Towels				33	31	32	36	41	40	41				3	0.90	0.02 *
Beer				52	49	50	47	46	46	48				-1	-0.73	0.12 n.s.
Laundry Detergent				39	39	38	42	41	41	43				1	0.83	0.05 *
Pizza				31	30	31	30	29	30	31				0	-0.20	0.73 n.s.
<hr/>																
Average														-0.77 **	-0.29 **	-

** statistically significantly different from zero at $p < 0.01$; * statistically significantly different from zero at $p < 0.05$; n.s. statistically non significantly different from zero.

Note, the 0.77 is not absolute percent points it is the percentage change in SCR year to year, e.g. from 30% SCR to (30 minus (30 x 0.0077)).

Table 5 Average correlations among the Measures over time

	φ	SCR	Repertoire size	SKU	Cat. Purch. Frequency
φ	-	0.56*	-0.51*	-0.18 n.s.	-0.23*
SCR	-	-	-0.44*	-0.33*	-0.38*
Repertoire size	-	-	-	-0.07 n.s.	0.26*

* statistically significantly different from zero at $p=0.05$; n.s. statistically non significantly different from zero.