Consumer behavior analysis: the case of brand choice

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Abstract

Cognitive theories have dominated the field of consumer behavior for the last decades. However, the observed lack of consistency between attitudes and behavior has suggested the need of investigating more thoroughly situational and behavioral variables. Consumer behavior analysis can be viewed as an alternative theoretical approach that emphasizes situational variables and measures of behavior. Within consumer behavior analysis, the Behavioral Perspective Model (BPM) interprets consumer behavior as occurring at the intersection of the individual's learning history and the consumer setting, which signals utilitarian and informational consequences associated with consumption-related responses. Utilitarian consequences are mediated by the product or service and are related to its functional benefits. Informational consequences are social, mediated by other people, and are related to feedback upon consumers' behavior, such as social status and prestige. In the present paper, as an example of the type of research inspired by the BPM, investigations on consumers' patterns of brand choice are described, which have been able to identify, among other things, how consumers' brand repertoires are formed and how brands are selected within those repertoires.

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Taken together, results indicate that the BPM offers a useful conceptual framework for interpreting, investigating and explaining consumer behavior.

Key-words: Consumer behavior, brand choice, marketing, behavior analysis, buying behavior.

Análise do comportamento do consumidor: o caso da escolha da marca.

Resumo

Teorias cognitivas têm dominado a área de comportamento do consumidor nas últimas décadas. Entretanto, a observada falta de consistência entre atitudes e comportamento tem sugerido a necessidade de investigar mais a fundo variáveis situacionais e comportamentais. A análise do comportamento do consumidor pode ser vista como uma abordagem teórica alternativa que enfatiza variáveis situacionais e medidas de comportamento. Dentro da análise do comportamento do consumidor, o Modelo na Perspectiva Comportamental (BPM) interpreta o comportamento do consumidor como um evento que ocorre na intersecção da história de aprendizagem do indivíduo e do cenário de consumo, o que sinaliza conseqüências utilitárias e informativas associadas a respostas relacionadas ao consumo. Conseqüências utilitárias são mediadas pelo produto ou serviço e são relacionadas aos seus benefícios funcionais. Conseqüências informativas são sociais, mediadas por outras pessoas, e são relacionadas ao *feedback* sobre o comportamento do consumidor, tais como *status social* e prestígio. No presente trabalho, como exemplo do tipo de pesquisa inspirada pelo BPM, investigações sobre os padrões de escolha de marcas de consumidores são descritas, as quais conseguiram identificar, dentre outras coisas, como os repertórios

de marcas dos consumidores são formados e como marcas são selecionadas dentro desses repertórios. Tomados em conjunto, os resultados indicam que o BPM oferece um arcabouço teórico útil para interpretar, investigar e explicar o comportamento do consumidor.

Palavras-chave: comportamento do consumidor, escolha de marca, marketing, análise do comportamento, comportamento de compra.

Introduction

The study of consumer behavior has been given increasing attention in the context of the expansion of the study of marketing and marketing research over the past decades (e.g. Kotler, Armstrong, Saunders & Wong, 2001; Jobber, 2004; Keith, 1960). Today, consumer researchers account for almost half of all marketing faculty in business schools (Simonson, Carmon, Dhar, Drolet, & Nowlis, 2001) and is a growing area of research in other disciplines such as sociology, communication and anthropology (e.g., Miller, 1995). One of the reasons for the interest in the subject has been that markets and companies have been growing in size and hence there is no longer a great deal of proximity between sellers and buyers. Whereas selling for the most basic commodities like food used to be an everyday social experience, it largely has become an anonymous process with minimal personal interaction, possibly even without any face to face contact when shopping over the internet. Most purchases for food items and other products, at least in urbanized areas, are done in supermarkets where there is little interaction between staff and customers.

However, despite the rapid growth and development in the study of consumer behavior, there are considerable di-sagreements about what consumer research is, what its objectives are, and how it differs from other disciplines (Simonson *et al.*, 2001). Consequently, the field lacks a universally-accepted theoretical framework or model (Foxall, 2005). The disciplines of Economics and Psychology (especially cognitive and social) have traditionally provided the theoretical foundations of consumer behavior and have lent their research towards more cognitive approaches (Jacoby, Johar & Morrin, 1998). Although several theoretical approaches have influenced consumer research, such as behaviorism, physiological psychology, psychoanalytic psychology, cognitive psychology and interpretative psychology (cf. O'Shaughnessy, 1992), social-cognitive theories and models have dominated the field with an increasing emphasis on cognition (e.g., decision making) rather than on social phenomena (e.g., reference groups) (cf. Simonson et al., 2001). Hence, many consumer choice models portray consumer behavior as a process where thinking, evaluating and deciding prevail (e.g., Engel,

Blackwell, & Miniard, 1995; Howard & Sheth, 1969). Although the importance of emotions in buying behavior has also received a growing share of attention in recent years (e.g. O'Shaughnessy & O'Shaughnessy, 2002; Bitner, 1992; Dawson, Bloch & Ridgway, 1990; Donovan & Rossiter, 1982), the large majority of studies are designed to investigate consumer decision-making processes, inspired by cognitive information processing theories (see Jacoby *et al.*, 1998, and Simonson *et al.*, 2001, for comprehensive reviews).

As an example, it has been widely assumed that measuring attitudes and beliefs will enable marketers to predict consumers' behavior. The Theory of Reasoned Action (Ajzen & Fishbein, 1980) and the Theory of Planned Behavior (Ajzen, 1985) have been very influential in this respect and have been used extensively to demonstrate the link between attitudes and action. According to these theories, psychological constructs, such as attitudes and beliefs, which are formed through direct or indirect experience with the attitude object (e.g., a product's attribute), would influence the person's intention to act in relation to the object, which in turn would influence the person's behavior (e.g., buying the product). Such constructs (e.g., attitudes) have been usually measured on the basis of consumers' responses to questionnaires, the results of which are then used to predict consumers' behavior towards the object (e.g., purchasing). However, it has been repeatedly pointed out by scholars that this relationship is in fact much weaker than assumed (e.g. Wicker, 1969; Foxall 1987). Although such criticisms had some impact on the adoption of these theories, which has declined in use since (Simonson *et al.*, 2001), the most commonly adopted solution to these weak relations between attitude and behavior were to make slight changes in theory or methodology. One way of doing this was to propose, for example, dual-process theories, according to which consistent relations between attitude and behavior need not always occur for they would depend on other factors, such as level of consumer's involvement (e.g., Chaiken, 1980; Petty & Cacioppo, 1983) or level of correspondence between measures of attitude and measures of behavior (e.g., Kraus, 1995). Since then an enormous amount of studies have attempted to identify the variables that influence attitude-behavior consistency, which do not propose any substantial change in the basic theoretical

and conceptual framework of the research and, consequently, multiply the number of psychological constructs related to the phenomena of interest (cf. Glasman & Albarracin, 2006). Considering that the field is very akin to marketing where prediction of what consumers will do is of paramount importance, empirical results showing inconsistency between attitudes and behavior may discourage the adoption of cognitive models to explain consumer behavior, or, at least, encourage the search for alternative types of explanation. In fact, a closer examination of the development of this tradition of research indicates that when more emphasis is given to possible effects of situational variables and to measures of behavior, the level of prediction of behavior increases substantially (cf. Foxall, 1997). These findings suggest that approaches of consumer behavior that give more emphasis to situational variables and behavioral measures might be promising alternatives to the prevailing cognitive theories.

There is yet another reason to look for epistemologically different approaches of consumer behavior, namely, the excessive dominance of the social-cognitive way of theorizing. According to some epistemologists, scientific development of a field depends on diversity of ideas, on opposing, incompatible views strongly held by different research groups. According to this position, the overwhelming predominance of one single theoretical perspective may impoverish the intellectual milieu and hinder scientific development of the field (cf. Feyerabend, 1993; for more details of these ideas as applied to consumer behavior and marketing, see Foxall, 1997).

Consumer behavior analysis

An alternative approach to consumer behavior that emphasizes the influence of situational variables and direct measures of behavior might be found in behavioral psychology, particularly in Skinner's operant theory (cf. Skinner, 1953, 1969, 1974). Behavior analysis, as this field is usually known, has developed a coherent and systematic set of theoretical concepts, derived from a long tradition of experimental and applied research. It has always emphasized the role of situational variables in the determination of behavior, paying particular attention to events that antecede and follow individuals' responding, and has defended the

adoption of direct measures of behavior, with little use of hypothetical constructs in its theories. One of the central concepts in operant theory is the three-term contingency ($S^D - R - S^R$), which specifies what responses (R) are reinforced (S^R) or punished in the presence of what situations or discriminative stimuli (S^D). According to the three-term contingency, reinforcing and punishing consequences of responding increase and decrease, respectively, its future occurrence probability in similar situations. Events in the situation would acquire discriminative (or inhibiting) functions by signaling the probability and magnitude of reinforcement that would be contingent upon the emission of a given response. This conceptual framework has been used to analyze and interpret a very broad range of phenomena, including, for example, learning, verbal behavior, clinical interventions, politics, and religion (e.g., Skinner, 1953, 1957). Behavior analysis has also developed a strong tradition of experimental research on choice and consumption that could enrich the investigation of consumer behavior. The field has developed systematic theoretical treatments of choice and consumption, based on results from laboratory experiments and institutional interventions, such as the matching law (Herrnstein, 1970) and laboratory analysis of demand (Hursh, 1984), which are now part of the interdisciplinary area usually known as *behavioral economics*.

Despite the fact that behavior analysis has been heavily criticized since the cognitive revolution entered its ascendancy from the 1960s onwards, the characteristics mentioned above would in themselves justify the exploration of its usefulness in the field of consumer behavior. Moreover, recent research developments in behavior analysis have addressed some of the most common criticisms directed to it. Behavior analysis was much criticized for its excessive use of animal experiments to the exclusion of investigating complex, typically human phenomena. In the last decades behavior analysis has come to treat subject areas that lie at the very heart of cognitive psychology, among them thinking, decision making and language. The distinction between behavior that is simply the result of the individual's direct contact with the environment ("contingency-shaped" behavior) and that which is the result of verbal interventions from others or from the individual him/herself ("rule-governed" behavior) is particularly relevant here. The advent of investigations of stimulus

equivalence, and naming, to give two examples, have transformed behavior analysis from a school of Psychology that was once easily disparaged, because it was seen as denying relevant human phenomena, to an exciting intellectual and practical exploration of human complexity.

In order to integrate consumer research with behavioral principles, Foxall (1990, 1997) developed a model which has, since its emergence, proved a useful framework: the Behavioral Perspective Model (BPM). Foxall (2002, p.20) argues that the BPM summarizes empirical regularities, resembling the parsimonious and inductive approach advanced by Skinner. Foxall (1998, p.337) summarizes the model as portraying "the rate at which consumer behaviors take place as a function of the relative openness of the setting in which they occur and the informational and utilitarian reinforcement available or promised by the setting". These components of the model are explained in what follows.

The BPM represents an adaptation of the three-term contingency and locates consumer behavior at the intersection of the consumer's learning history and the current behavior setting, that is, at the consumer situation. Thus, the BPM provides an environmental perspective to consumer behavior and hence includes situational influences into the analysis of purchase and consumption. In behavioral terms, consumer behavior, the dependent variable, is a function of the individual's learning history related to a given type of consumption, the behavior setting and the consequences the behavior produces. Figure 1 combines all these variables to provide a general picture of the Behavioral Perspective Model.

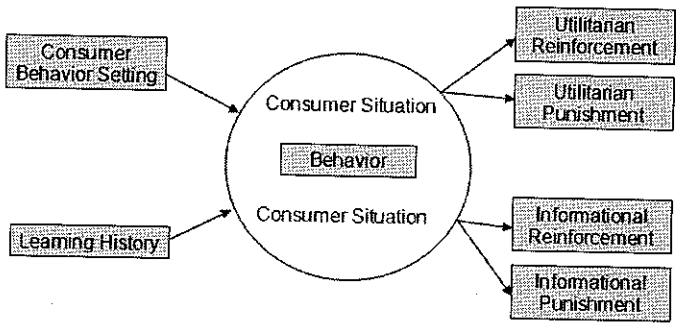

Figure 1: The behavioral perspective model of consumer choice (Adapted from Foxall 1966).

The behavior setting is defined as the social and physical environment in which the consumer is exposed to stimuli signaling a choice situation. A doctor surgery's waiting area, a supermarket or an open-air festival in a public park are all examples of behavior settings, varying in their scope and capacity of evoking consumer responses. This scope translates into a continuum between an open and a closed setting, allowing consumers different degrees of control over their behavior. The more open setting, like for instance the park festival, grants consumers to behave in a relatively free way with the option to wander around, talk, listen to music, eat, drink, smoke or even leave the scene. Towards the other end of the spectrum consumers are less free in their choice and are indeed expected to conform to a pattern of behavior set by someone else. Schwartz and Lacey (1988, p. 40) describe a closed setting as where "only a few reinforcers are available, and usually, only one has special salience; the experimenter (behavior modifier) has control over conditions of deprivation and access to reinforcers; there is only one, or at most a few, available means to the reinforcers; the performance of clearly defined, specific tasks is reinforced; [...]; the contingencies of reinforcement are imposed and varied by agents not themselves being subjected to the contingencies; and there are no effective alternatives to being in the situation".

For example, according to society's norms, patients in a surgery's waiting area are expected to sit quietly and wait in a patient manner until they are called for their treatment. Of course, they are free to read magazines, possibly chat with other waiting patients or walk out of the surgery if the waiting time is considered too long (in which case they will not receive treatment).

The other element of the consumer situation, the learning history, refers to the similar or related experiences a consumer has had before encountering the current behavior setting. This previous experience helps the consumer to interpret the behavior setting accurately by predicting the likely consequences her behavior in this situation will incur. In other words, the otherwise neutral stimuli of the behavior setting are transformed into discriminative stimuli, indicating the availability of three types of consequences contingent upon the consumer's behavior. First, utilitarian reinforcement refers to the direct and functional benefits the purchase and/or consumption of a product (or service)

involves. These are benefits mediated by the product or service. Secondly, informational reinforcement circumscribes the more indirect and symbolic consequences of behavior, such as social consequences (e.g., social status and self-esteem). These are consequences mediated by other people and function as feedback to the consumer as how well he or she is performing as a consumer. The third type of consequence, costs to the consumer in monetary and non-monetary form, is the aversive outcome of behavior.
As an example, the utilitarian consequence of buying a car is the benefit of owning and using the products afterwards, in a purely functional and hedonic sense, for it gives, for instance, door-to-door transportation, with minimum weather exposure and free time schedule. Conversely, the informational reinforcement of owning a car might be related to the social status and admiration of others, particularly if it is a prestigious and expensive car make (e.g., a Bentley or Mercedes). The aversive but unavoidable outcome of shopping is the surrendering of money at the cash point but also the time spent searching for an item. Foxall (1990) argues that all products and services contain elements of utilitarian, informational and aversive consequences. Additionally, like the behavioral setting scope, which can vary from highly open to highly closed, the reinforcement patterns of the BPM are arrayed as a continuum from high to low utilitarian reinforcement and from high to low informational reinforcement.

Thus, the probability of purchase and consumption depends on the relative weight of the reinforcing and aversive consequences that are signaled by the elements in the consumer behavior setting (cf. Alhadeff, 1982). According to this view, product, brand, and service attributes, including price, may be interpreted as programmed reinforcing (i.e., benefits) and aversive events. Manufacturers, retailers, and brand managers direct all their efforts to modifying and shaping the reinforcing and aversive properties of the attributes of their products and brands, so as to make them more attractive to the consumer. Branding, promotional activities, new product development and product selection are just a few options open to the supply side. These endeavors may or may not work, and this is why they ought to be interpreted as programmed reinforcing (or aversive) events rather then actual reinforcing (or aversive) events. According to

this theoretical perspective, one of the main tasks in marketing is to identify what events can function as benefits (or aversive stimuli), to what extent, for what consumers, and under what circumstances (Foxall, 1992).

This theoretical framework has been adopted to investigate a wide range of phenomena, such as consumer brand choice (Foxall & James, 2001, 2003; Foxall, Oliveira-Castro & Schrezenmaier, 2004; Oliveira-Castro, Ferreira, Foxall & Schrezenmaier, 2005; Oliveira-Castro, Foxall, & Schrezenmaier, 2005, 2006; Foxall & Schrezenmaier, 2003), consumers' reactions to shopping environments (Foxall & Greenley, 1999; Foxall & Yani-de-Soriano, 2005; Soriano & Foxall 2002), social responsible consumption (Davies, Foxall, & Pallister, 2002; Foxall, Oliveira-Castro, James, Yani-de-Soriano, & Sigurdsson, 2006), product searching behavior (Oliveira-Castro, 2003), among others. The model has also served as inspiration to philosophical research that attempts to reconcile, in an epistemologically coherent way, behaviorism and cognitive psychology (Foxall, 2004, 2005). As it is not possible to explore all these topics within the present paper, some of the research that has been carried out on brand choice is presented next, as an illustration of the kind of investigation based on this theoretical approach to consumer behavior.

Consumer brand choice

In the last decades, several regularities have been discovered concerning consumer brand choice and the behavior of brands in the market (e.g., Ehrenberg, 1988), which should be considered by any researcher interested in the topic. Using consumer panel data of mainly, but not only, frequently and regularly bought branded consumer products, Ehrenberg and colleagues have analyzed enormous amounts of data and reported interesting and systematic results (for examples of and detail about the research programme see Ehrenberg, 1988; Ehrenberg, Goodhardt & Barwise 1990; Ehrenberg & Scriven 1999; Ehrenberg, Uncles & Goodhardt, 2004; Goodhardt, Ehrenberg & Chatfield 1984; Uncles, Ehrenberg & Hammond 1995). Among such results, Ehrenberg's (1972/1988) showed that most consumers practice multi-brand purchasing, choosing apparently randomly from a

small "repertoire" of often three or four brands in a particular product category. Most of the brands are perceived to perform in a functionally similar way and are therefore assumed to be substitutable. Furthermore, during a period of one year, in order to meet their requirements in a product category, consumers of any given Brand A tend to buy other brands more often than they buy Brand A. For example, in the US breakfast cereal market consumers make on average about four purchases of the brand Shredded Wheat in one year, but buy other brands about 37 times in the same period (Ehrenberg & Goodhardt, 1977). By contrast, only a small proportion of consumers (approximately 10%) are exclusive buyers of or 100% loyal to any particular brand during, for example, one year. Sole buyers are described as relatively light users of their favorite brand, disconfirming traditional marketing research which claims that showing exclusive loyalty to one particular brand is to be set equal with being a heavy user and therefore a disproportionably valuable to the company. This also contrasts with the wide-spread belief that higher loyalty rates lead to improved profitability (Reichheld and Sasser, 1990). When comparing across brands, results show that competitive brands differ mainly in the number of buyers they have and not so much in how loyal those buyers are, although there is a 'double-jeopardy' (DJ) tendency, that is, brands with smaller market shares do not only attract fewer buyers of the product category but those buyers buy the brand less frequently than buyers of larger brands. All these results have been replicated across more than 50 product categories (for example, grocery products, aviation fuel, store choice, newspapers) and few exceptions have been found in markets characterized by frequent and routine consumption, such as the observed deviations discovered in some US Spanish-language and religious TV stations, which attract heavy viewing from their relatively few viewers (Ehrenberg *et al.*, 1990).

This line of research has enabled the development of a mathematical model to describe the regularities found, the Dirichlet Model (Ehrenberg *et al.*, 2004; Goodhardt *et al.*, 1984), which comprises two main areas: repeat-buying patterns of whole product categories and brand-purchasing patterns. Thus, by making some basic assumptions, the model can specify probabilistically how many purchases in one product category each

consumer makes in a time-period and which brand he or she buys on each occasion. Moreover, the performance of single brands can be predicted in different situations such as market introduction or during and after sales promotions (Ehrenberg, 1991; Ehrenberg, Hammond & Goodhardt, 1994). The model has been criticized mainly for the reason that it does not give attention to the underlying patterns and motivations of consumers and their purchases (Bartholomew 1984; Jeuland 1984) or the underlying variables (Popkowski-Leszczyo, Sintra and Timmermans 2000). It is certainly true that Ehrenberg's work has remained largely descriptive and has not questioned why consumers behave in the way that has been repeatedly observed. Goodhardt *et al.* (1984, p. 638) have also supported this: "why one person (or household) generally consumes more toothpaste or soup than others, or somewhat prefers brand j to k or vice versa, is not accounted for by the model and is in fact at this stage still largely unknown".

The following are some of the questions left unanswered by this line of research: 1) It has been assumed that brands within an individuals' repertoires are functionally substitutes, but can this be empirically demonstrated or tested? 2) Is the quantity consumers buy on each shopping occasion relatively constant, as assumed by the model? 3) Although it has been assumed that any consumer can have any brand repertoire, how are brand repertoires formed? In what follows, lines of research that have investigated these questions are described.

Substitutability of brands and the Matching Law

Choice, according to behavioral interpretations, is usually treated as the rate at which a particular behavior is performed, usually in the context of other competing behaviors (Herrnstein, 1997). This view suggests that choice is not a single event but the distribution of behavior over time, for example, the proportion of times that A is chosen over B or B over C. The behavioral explanation for choice is sought not in mental deliberations, as cognitive psychology would suggest, but in the environmental events that accompany the behaviors in question, the pattern of reinforcement and punishment that increases or decreases the prob-

ability of those behaviors being repeated and the contingencies encountered. The analysis of any one choice (i.e., any one sequence of behavior) requires the analysis of other behavioral choices that might have been enacted instead and the configurations of reinforcement and punishment that maintain or inhibit them. In the context of the study of choice in behavioral psychology, the matching law is a quantitative formulation describing a proportional relationship between the allocation of an organism's behavior to two concurrently available response options on the one hand and the distribution of reinforcement between the two concurrent behaviors on the other hand (Herrnstein, 1961). The matching law states that animals or human beings match their behavior in proportion to the reinforcement the behavior produces. In experiments using pigeons as subjects, Herrnstein (1961, 1970) found that organisms distribute their behavior between the two options according to the rate of reinforcement the behavior receives from responding to each option respectively. If animals such as pigeons and rats have the opportunity to choose between pecking key X or key Y, each of which delivers food pellets (reinforcers) on its own concurrent variable-interval schedule[5] , they allocate their responses on X and Y in proportion to the relative rate of reinforcement R. Hence, individuals are said to "match" their behavior in proportion to the reward or punishment this behavior obtains. In its general formulation, the matching law can be described by the following equation (Baum, 1974):

$$\frac{B_x}{B_y} = b\left(\frac{R_x}{R_y}\right)^s \qquad \textit{Equation 1}$$

where B is the behavior the individual allocates to options *x* and *y* and R is the reinforcement contingent upon that behavior. The parameters *b* and *s* are empirically obtained, and can be

[5]An interval schedule maintains a constant minimum time interval between rewards (reinforcements). Fixed interval schedules maintain a constant period of time between intervals, while on a variable interval schedule the time varies between one reinforcer and the next. Concurrent schedules permit simultaneous choice procedures.

interpreted as measures of bias towards one of the alternatives and of sensitivity to changes in reinforcement ratio, respectively.

Rachlin, Kagel and Battalio (1980) propose that the exponent s in Equation 1 represents substitutability between reinforcement sources, that is, when the exponent s is equal to 1.0 there is perfect substitutability between reinforcers. According to this interpretation, after some necessary adaptations related to characteristics of consumer brand choice, the generalized matching law can be used to measure the level of substitutability between different brands. In the case of brand choice, the equation is calculated based upon the ratio of the amount paid (responding) for the preferred brand divided by the amount paid for the other brands as a function of the ratio of the amount bought (reinforcement) of the preferred brand divided by the amount bought of the other brands (cf. Foxall, 1999). The data in this case can be obtained from consumer panels, formed by volunteers who record all their purchases within certain product categories during several weeks and passes the information on to commercial firms or researchers.

Recent investigations using a small sample of consumers (Foxall & James, 2001, 2003) recording purchases of three products and an 80-consumer panel including data for nine different product categories, obtained from a commercial firm (Foxall *et al.*, 2004; Foxall & Schrezenmaier, 2003), indicated that exponents of Equation 1 were very close to unity, showing matching. These results demonstrate that brands within consumers' repertoires function as substitutes, corroborating the assumption put forward by Ehrenberg and colleagues.

Constant quantity: Inter-and intra-consumer demand elasticity

The analysis of demand, which lies at the core of microeconomics, has been one of the most useful and frequently adopted frameworks in behavioral economics. The analysis of demand is usually based on the parameters of demand curves, which plot the quantity purchased or consumed of a commodity

as a function of its price. In the case of experiments in behavioral economics, demand curves usually relate amount consumed of a reinforcer as a function of some schedule parameter, such as the number of responses required by a fixed-ratio schedule[6] . The two main parameters of a demand curve are the elasticity and intensity (Hursh, 1984) of demand, which, in its simplest form, can be obtained by using the following equation (cf. Hursh 1980, 1984; Kagel, Battalio, & Green, 1995):

Log Quantity = a – b (Log Price) *Equation 2*

where *a* and *b* are empirically obtained parameters that represent the intercept and slope of the function, respectively. The advantage of *Equation 2* is that *a* and *b* can be interpreted as coefficients that measure the intensity and elasticity of demand, respectively. Intensity of demand indicates the level of demand at a given price, whereas elasticity of demand shows how consumption changes with changes in price. Elasticity is said to be inelastic when b varies from 0.0 to –1.0, that is, when increases in prices decrease consumption but are accompanied by increases in spending. When b is equal to –1.0 decreases in consumption are perfectly proportional to increases in price and spending remains constant. When b is smaller than –1.0 (i.e., more negative indicating larger elasticity), demand is said to be elastic, that is, consumption decreases proportionally faster than increases in price and spending decreases. As mentioned previously, the Dirichlet Model assumes that the quantity consumers buy on each shopping occasion is relatively constant.

One way of examining this assumption would be to calculate the elasticity of demand for different product categories. An analysis of demand elasticity, in this case, relates the amount consumer buy on each shopping occasion as a function of changes in price. Values of b significantly different than zero would indicate that the quantity consumers purchase on each shopping

[6] Ratio schedules arrange reinforcement for the first response after the emission of a number of responses since the previous reinforcement. In fixed-ratio schedules this number is constant for every reinforcement whereas in variable-ratio schedules it varies around an average value.

trip changes significantly as prices change, suggesting that the quantity individuals buy does change systematically across shopping occasions.

Based on data from a panel of 80 consumers, Oliveira-Castro *et al.* (2005) calculated overall demand elasticity for each of nine product categories (baked beans, biscuits, breakfast cereals, butter, cheese, fruit juice, instant coffee, margarine and tea). For each product, Equation 2 was calculated using all data points obtained from all consumers. Results showed that overall elasticity coefficients were significant ($p \leq .01$) for all nine product categories and ranged from -.23 to -1.01, indicating that quantity bought was not constant and decreased significantly with increases in price.

Although these results refute the constant quantity assumption, they do not clarify the buying patterns associated to changes in quantity. As overall demand elasticity coefficients were calculated by including all data points from all consumers, the observed decreases in quantity bought could be due to different consumers buying different quantities, the same consumers buying different quantities on different occasions, or any combinations of these two patterns. With the purpose of answering this question, Oliveira-Castro *et al.* (2006) calculated inter-and intra-consumer elasticities using the same data set. Inter-consumer elasticity would occur if consumers who buy in average larger quantities pay in average lower prices than consumers who buy in average smaller quantities. Intra-consumer elasticity would occur if consumers were to buy larger quantities when paying lower prices than when paying higher prices, across shopping occasions. Oliveira-Castro *et al.* (2006) calculated inter-consumer elasticity based on the average quantity and price for each consumer for each product category. Inter-consumer elasticity coefficients were negative for all nine product categories and significant ($p \leq .05$) for seven of them, indicating that consumers who buy in average larger quantities tend to pay lower prices. Intra-consumer elasticity coefficients were calculated for each consumer using all data points from all product categories, normalized according to each consumer's mean quantity and price in each category. Intra-consumer elasticity coefficients were negative for 93.4% of consumers and significant for 75% of them. These results indi-

cate that consumers tend to buy larger quantities when paying lower prices. Taken together, these findings refute the constant quantity assumption and suggest that consumers' choices within their brand repertoires are price sensitive (rather than random).

Brand repertoires: the role of utilitarian and informational benefits

With the purpose of testing if brand repertoires are related somehow to the level of utilitarian and informational reinforcement of the brands, as suggested by the BPM, Foxall *et al.* (2004) developed a classification of brands according to their benefit levels. Based on the already-mentioned 80-consumer panel data set, the authors ranked each brand according to two levels of utilitarian benefit and three levels of informational benefit. Benefit levels were ranked based on the interpretation that brands represent programmed reinforcement contingencies arranged by managers and producers. The choice of two utilitarian and three informational levels was based on the size of the sample (not all brands and brand types were purchased by members of the sample during the period) and on the purpose of making comparisons across product categories. Thus, the different levels of utilitarian and informational benefit cannot be defined absolutely: they ultimately are a result of each researcher's focus and interest. For example, as Foxall *et al.* (2004) pointed out, more levels of utilitarian reinforcement could have been identified for some product categories (e.g., cookies and cheese) in the sample they used, but an equal number of levels across products was considered beneficial for their analysis.

In the marketing context of routinely-bought supermarket food products, higher levels of utilitarian benefit can be identified by the addition of (supposedly) desirable attributes. These attributes are considered to have value-adding qualities for the product or its consumption, they are visibly declared on the package or are part of the product name, and ultimately justify higher prices. Moreover, in most cases, several general brands offer product varieties with and without these attributes. In Foxall *et al.* (2004), utilitarian levels were assigned based on additional

attributes (e.g., plain baked beans vs. baked beans with sausage) and/or differentiated types of products (e.g., plain cookies vs. chocolate chip cookies). In the case of differentiated product types, several manufacturers tend to offer the different product types at differentiated prices (e.g., plain cookies were cheaper than more elaborate cookies for all brands examined).

By contrast, informational reinforcement can be linked to brand differentiation, which in turn is usually also related to price differentiation, because the most promoted and best known brands tend to be related to higher levels of prestige, social status, and trustworthiness. In fact, there is a particularly close association between informational reinforcement and brand differentiation in the context of routinely purchased branded goods. As an example, when comparing the levels of brand differentiation of Tesco Value and Kellogg's Cornflakes, Kellogg's is clearly the better known, more differentiated and also more expensive brand, with a higher programmed level of informational reinforcement. This type of variation among brands has been translated into different levels of informational reinforcement. It should be noted that the classification of informational reinforcement levels does not rule out the possibility of there also being different degrees of utilitarian reinforcement between two informational levels. Naturally, a company spokesperson of Kellogg's, or for that purpose any other differentiated brand such as Heinz or DelMonte, would claim that their products are distinct from those of other companies in terms of their "utilitarian" attributes, for instance the quality of raw materials and ingredients, production procedures or health aspects. Equally, buyers and users of differentiated brands are likely to confirm such brands' superiority, e.g., the much better taste in comparison the other, cheaper brands.

In this first attempt of categorizing different levels of reinforcement Foxall *et al.* (2004) took such possibilities into consideration, since most consumer behavior generates both types of consequences. Nevertheless, because brands usually have almost identical formulations (cf. Ehrenberg, 1972/1988; Foxall, 1999), the ranking of informational reinforcement was based on the predominant, more obvious differences between brands. In fact, there is evidence that consumers may not even be able to

distinguish between brands of one product category on the basis of their physical characteristics (e.g., in blind tests).

In Foxall *et al.* (2004) study, the following criteria were the basis for determining the different levels of informational reinforcement: 1) increases in prices across brands for the same product type (e.g., plain baked beans, plain cookies or plain cornflakes) were considered to be indicative of differences in informational levels; 2) the cheapest store brands (e.g., Asda Smart Price, Tesco Value, Sainsbury Economy) were considered to represent the lowest informational level (Level 1); 3) store brands without the add-on good value for money or economy (e.g., Asda, Tesco, Sainsbury) and cheapest specialized brands were thought to embody the medium informational level (Level 2); and 4) higher-priced, specialized brands (e.g., Heinz, McVities, Kelloggs, Lurpak), were assigned to Level 3, the highest informational level.

After classifying all brands of all nine product categories, Foxall *et al.* (2004) examined consumers' brand choices within and across informational levels. This analysis made clear that most consumers bought mostly brands at one particular informational level, rather than across all levels. The percentage of consumers that bought 70% or more of goods at one particular informational level was: for baked beans 92%, tea 91%, coffee 84%, margarine 84%, butter 81%, cereals 68%, fruit juice 68%, cheese 64%, and biscuits 58%. This showed that the majority of consumers made 70% or more of their purchases within brands at the same informational level. Similar analyses also showed that, for 8 of 9 product categories, most consumers also made the large majority of their purchases within the same utilitarian level. The percentage of consumers who made 70% or more of their purchases within the same utilitarian level was: for butter 91%, for baked beans 85%, coffee 84%, tea 84%, cheese 82%, fruit juice 77%, margarine 74%, cereals 66%, and biscuits, 42%. Taken together, these findings clearly indicate that consumers' repertoires of brands are related to the level of informational and utilitarian benefits offered by the brands. This is a clear step in the direction of understanding the formation of brand repertoires, which can be very useful to marketing segmentation strategies.

Intra- and inter-brand elasticities

The previously described tendency of buying larger quantities when paying lower prices still raises questions about the underlying choice patterns. Do consumers buy larger quantities of a given Brand A when Brand A's price is lower or do they buy larger quantities when buying a cheaper Brand B or some combination of both? One of the ways of answering this question would be to analyze intra- and inter-brand elasticities. Intra-brand elasticities would occur if consumers were to buy larger quantities of Brand A when Brand A is cheaper (due to price promotion or regular package size discount). Inter-brand elasticity would occur if consumers were to buy larger quantities when buying a cheaper Brand A than when buying a more expensive Brand B. A theoretically interesting way of looking at inter-brand elasticity would be to consider that inter-brand switching may occur across utilitarian levels, across informational level, or both. This would not only provide information about inter-brand elasticity in general, but would also suggest the type of benefits that may be influencing consumers' choices.

Oliveira-Castro, Foxall *et al.* (2005) conducted these analyses using data from the 80-consumer panel described previously. Intra-brand elasticity was calculated considering changes in quantity and price relative to the average quantity and price for each brand. So, intra-brand elasticity measured changes in quantity above and below the average quantity bought for the brand when its price changed above and below the brand average. Two types of inter-brand elasticities were calculated. Informational inter-brand elasticity, measuring changes in quantity bought as a function of changes in the informational level of the brands, and utilitarian inter-brand elasticity, measuring changes in quantity bought as a function of changes in the utilitarian level of the brands.

Multiple regression analyses, with quantity bought as a function of intra-brand price, inter-brand utilitarian level, and inter-brand informational level (all in log scales), revealed that all elasticity coefficients were significant ($p \leq .05$) for at least eight of the nine product categories (cf. Oliveira-Castro, Foxall *et al.*, 2005). These results suggest that the observed overall demand elasticity can be decomposed into these three choice patterns.

Moreover, when the types of coefficients were compared, results showed that intra-brand elasticity coefficients were larger than inter-brand utilitarian elasticity coefficients, which, in turn, were larger than inter-brand informational coefficients.

Some conclusions concerning brand choice

The results presented here answered, at least partially, some of the open questions concerning consumers' patterns of brand choice. One can conclude from this line of research on brand choice that: 1) The vast majority of consumers practice a multi-brand repertoire when making routine purchases; 2) Brands within the repertoire are functionally substitutable; 3) Brand repertoires are mostly formed by brands belonging to the same level of utilitarian and informational levels; 4) Consumers who buy larger quantities in average tend to pay lower prices in average; 5) Consumers tend buy larger quantities when paying lower prices; 6) This tendency of buying larger quantities with lower prices is related to three different patterns: buying larger quantities of a given brand when its price is lower (intra-brand elasticity), buying larger quantities when buying a brand with lower utilitarian level (utilitarian elasticity), and buying larger quantities when buying a brand with lower informational level (informational elasticity); 7) Intra-brand elasticity is higher than utilitarian elasticity, which is higher than informational elasticity.

Conclusion

Consumer behavior analysis is a new and fast growing field of research (cf. Foxall, 2002; Oliveira-Castro & Foxall, 2005). The investigation of brand choice was presented here as an example of how the field uses behavior principles, usually gained experimentally, to interpret human economic consumption. In addition, laboratory experiments with human subjects have e-nabled propositions about matching to be examined empirically in a simulated shopping mall context (Hantula, DiClemente, & Rajala, 2001; Rajala & Hantula, 2000), and other experiments

have allowed propositions with regard for instance to unit pricing to be examined with human consumers (e.g., Madden, Bickel & Jacobs, 2000).

The area stands academically at the intersection of behavioral economics on one hand, and marketing science – the study of the behavior of consumers and marketers, especially as they interact – on the other. Whilst behavior principles are central to its theoretical and empirical research program, its quest to interpret naturally occurring consumer behavior such as purchasing, saving, gambling, brand choice, the adoption of innovations, and the consumption of services raises philosophical and methodological issues that go beyond the academic discipline known as the 'experimental analysis of behavior', ' analysis' or 'behavioral economics'.

However, there remain problems of interpreting the behavior of consumers acting *in situ* and subject to the multiple influences of modern marketing management and the societal influences that shape consumption. Psychology has long attempted to formulate *rules of correspondence* by which the theoretical constructs it employs to denote unobservable operations can be related to observed behavior. The aim of radical behaviorists has generally been to avoid theoretical terms of this kind but different sorts of rules of correspondence are needed: rules that relate the findings of laboratory research to the interpretation of everyday life to which we address ourselves. The full scope of consumer behavior analysis is not yet fixed: diversity of materials and viewpoints is an essential element in the intellectual adventure and what will prove central and what merely useful has yet to be established.

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