CONSUMER BRAND CHOICE: INDIVIDUAL AND GROUP ANALYSES OF DEMAND ELASTICITY

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Following the behavior-analytic tradition of analyzing individual behavior, the present research investigated demand elasticity of individual consumers purchasing supermarket products, and compared individual and group analyses of elasticity. Panel data from 80 UK consumers purchasing 9 product categories (i.e., baked beans, biscuits, breakfast cereals, butter, cheese, fruit juice, instant coffee, margarine and tea) during a 16-week period were used. Elasticity coefficients were calculated for individual consumers with data from all or only 1 product category (intra-consumer elasticities), and for each product category using all data points from all consumers (overall product elasticity) or 1 average data point per consumer (interconsumer elasticity). In addition to this, split-sample elasticity coefficients were obtained for each individual with data from all product categories purchased during weeks 1 to 8 and 9 to 16. The results suggest that: 1) demand elasticity coefficients calculated for individual consumers purchasing supermarket food products are compatible with predictions from economic theory and behavioral economics; 2) overall product elasticities, typically employed in marketing and econometric research, include effects of interconsumer and intraconsumer elasticities; 3) when comparing demand elasticities of different product categories, group and individual analyses yield similar trends; and 4) individual differences in demand elasticity are relatively consistent across time, but do not seem to be consistent across products. These results demonstrate the theoretical, methodological, and managerial relevance of investigating the behavior of individual consumers.

Key words: consumer behavior, behavioral economics, demand elasticity, marketing, panel data, brand choice, humans

One of the fundamental tenets of behavioral economics is that economic concepts are relevant to and may be profitably used by research in behavior analysis (cf. Allison, 1981; Bickel, Green, & Vuchinich, 1995; Hursh, 1984). The analysis of demand has been one of the most useful and frequently adopted frameworks in behavioral economics. This type of analysis usually is based on the parameters

of demand curves, which plot the quantity of a commodity purchased or consumed 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. 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):

$$\text{Log Quantity} = a + b \log \text{Price}, \quad (1)$$

where a and b are empirically obtained parameters that represent the intercept and slope of the function, respectively. The advantage of Equation 1 is that a and b can be interpreted as coefficients that measure the intensity and elasticity of demand, respectively. More complex forms for the demand curve have been suggested in the literature (e.g., Hursh, Raslear, Shurtleff, Bauman, & Simmon,

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1988; Hursh & Winger, 1995) and will be examined later.

Several experiments conducted with animal subjects have produced results that are compatible with fundamental predictions derived from economic demand theory (cf. Hursh, 1984). According to Kagel *et al.* (1995), this kind of result extends economic choice theory to nonhuman animal behavior and, thus, strengthens the arguments against the assumption, commonly held in economic circles, that economic principles are necessarily based on rational evaluations of alternatives. Another, and possibly the most relevant, aspect of these results is the fact that they have been obtained with data for individual subjects. As pointed out by Kagel *et al.* (1995), most tests of consumer-demand theory have been based on aggregate data, an approach that may lead to serious methodological problems, considering that the theory is a theory about individual consumer behavior. The adoption of aggregate data usually is based on the hypothesis of a "representative consumer", which does not necessarily stand empirical tests (cf. Kagel *et al.*, 1995, p. 71). Therefore, "on a more basic level, the studies reported constitute (arguably) the first real tests of consumer-demand theory" (Kagel *et al.*, 1995, p. 2).

Moreover, when demand curves obtained in the laboratory were compared to those stemming from econometrics and consumer research they showed important similarities, despite the fact that several aspects of the typical market situation are missing in the laboratory (Lea, 1978). These differences between laboratory and marketing conditions, particularly the closeness of the laboratory setting and the use of non-human subjects, may hinder the process of generalization of research findings from one context to the other, which suggests the need to look for additional ways of bridging this gap (cf. Foxall, 2002). One intermediary level of research that fills part of the gap between behavioral economics and marketing analysis is the type of investigation conducted by Battalio *et al.* (1973), who reported one of the few tests of consumer demand theory using price and quantity data obtained for individual human consumers. They obtained data from institutional patients living in a token economy system. Results indicated that data from in-

dividual consumers were consistent with predictions from demand theory.

Considering that a token economy constitutes a less open setting than national economies, one further step to approximate behavioral economics and marketing would be to investigate demand curves for individual consumers making real purchases in existing markets. This type of research has become possible with the availability of consumer panel data, obtained by research firms (cf. Telser, 1962). Panel data are especially valuable for longitudinal studies because changes in purchasing behavior can be monitored very accurately by the continuous measurements, for each individual on each shopping occasion, of the brand name, amount bought, price paid, and so on (Crouch & Housden, 2003). Furthermore, diary panel data are considered to be very precise and less susceptible to errors, especially when based on barcode scanning procedures, than those obtained through consumers' reports of their past behavior in surveys (Churchill, 1999).

In the present paper, demand curves were calculated for separate individual consumers purchasing food products in supermarkets, using data from a consumer panel whose members scanned information concerning their purchases after each shopping trip. As the research investigated consumer behavior occurring in a "natural" economic situation, the basic data do not differ from those used by economists and marketing researchers; the novelty in the present approach lies in the type of analyses that were conducted. The analysis of individual demand curves in natural markets follows the behavior-analytic tradition of focusing on individual behavior, and extends this tradition of research to the investigation of one of the fundamental phenomena of economics, namely, demand elasticity.

In addition to reducing the gap between behavioral economics experiments and naturally-occurring economic phenomena, the investigation of demand curves calculated for individual consumers also may help answer some questions that cannot be addressed by typical group or aggregate analyses of demand found in economics and, specifically, in marketing. This is the case with many econometric models adopted in marketing research to study consumer behavior, that use informa-

tion about each shopping trip of each consumer but estimate model parameters (e.g., elasticity) across consumers. In this type of analysis, several data points from each of many different consumers are simultaneously entered into the equations to calculate empirical parameters (e.g., Guadagni & Little, 1983; Gupta, 1988; Neslin, Henderson, & Quelch, 1985). This methodology may not represent any serious problem for marketing researchers, who are primarily interested in consumer behavior as means to understand the sale volume of brands and products, but it does leave unanswered some relevant questions concerning possible consumer buying patterns.

To illustrate this point, consider the example of demand elasticity coefficients that are calculated for product categories on the basis of panel data where information (e.g., quantity and price) about each consumer purchase is included in the analysis and there are several data points for each consumer, which might be named *overall product elasticity*. In such a case, overall demand elasticity coefficients obtained for the product category, that is, the observed decreases in purchased quantity as a function of increases in prices for the entire category, may result from a combination of intra- and interconsumer elasticities. *Intraconsumer elasticity* measures the tendency for the same consumers to buy larger quantities when buying products with lower prices, due to price promotions and/or buying cheaper brands. *Interconsumer elasticity* measures the tendency for consumers who buy smaller quantities, on average, also to buy more expensive brands, on average. The present paper attempts to identify and separate these possible choice patterns by analyzing inter- and intraconsumer elasticity coefficients for nine different categories of supermarket products. Interconsumer elasticity coefficients were calculated across consumers for each product category, using one pair of data points (average amount bought and average amount paid) for each consumer. Intraconsumer elasticity coefficients were calculated across product categories for each consumer, using all pairs of data points obtained in all product categories for each consumer.

The analysis of individual demand curves also can be used to compare results based on data from groups of consumers with those based on data from individual consumers. The

present work compares overall elasticity coefficients obtained for product categories based on group data with those based on individual data, considering that the form of a function describing group data is not necessarily the same as the form of the function describing individual data (Myerson & Green, 1995; Sidman, 1952).

Analyses of demand curves calculated for individual consumers also can be used to investigate individual differences in demand elasticity. Recent results suggest that consumers of supermarket products show choice behaviors that are consistent across product categories (cf. Ainslie & Rossi, 1998; Andrew & Currim, 2002). Following this line of research, we examine whether individual demand elasticities are consistent across product categories. With the purpose of expanding this type of investigation, we also verify whether individual differences in demand elasticity are consistent across time. In order to do so, demand curves were calculated for each consumer, using data from the first and the second 8-week periods of the total 16-week sample. Elasticity coefficients obtained for the two periods were then compared.

In the present article, all elasticity coefficients were calculated using relative values of quantity and price. In the case of overall product elasticity (all data points of all consumers for each product category), the use of relative values allows for comparisons across product categories which differ with respect to selling units (e.g., package sizes and prices) (cf. Bell, Chiang, & Padmanabhan, 1999; Hursh & Winger, 1995). Relative values of quantity and price were used by dividing each quantity (and price) value by the average quantity (price) in the category. This "normalization" with respect to the category mean also favors the interpretation of the relations between quantity and price, because the equation can be interpreted as measuring whether purchases of quantities above (or below) the mean quantity bought in the product category are associated with prices below (or above) the average price paid in the category. For intraconsumer coefficients, quantity bought and price paid were normalized by the average quantity bought and price paid calculated for each consumer for each product category (cf. Neslin et al., 1985). This normalization procedure makes possible the

inclusion, in the same equation, of data from the same consumer purchasing in different product categories that have different scales for quantity and price. In this case, elasticity coefficients would show changes in quantity as a function of changes in prices relative to the average quantities and prices that the consumer bought or paid, irrespective of product category. In other words, this type of analysis could indicate, for example, whether consumers tended to pay more or less than the average price paid when buying more than the average quantity bought, independently of the product category. The same reasoning was applied to interconsumer coefficients that were calculated relative to the average quantity (price) bought in the category calculated across all consumers of the category. In this case, the normalization procedure allows for comparisons across consumers in the same category by indicating whether or not consumers who buy more or less than the average quantity bought in the category tend to pay prices above or below the average price paid in the category. Such normalization procedures, within a product category and/or consumer, will not affect elasticity coefficients given the use of log-log functions. One disadvantage of this type of procedure is the loss of information concerning the actual levels of consumption and ranges of price, which restricts the interpretation of the results.

METHOD

Sample and Procedure

The market research company, Taylor Nelson Sofres, provided consumer panel data for 80 British consumers and their total weekly purchases in nine fast-moving consumer goods categories over 16 weeks. Taylor Nelson Sofres is one of the largest and best-known companies in its field and collects consumer purchasing data from its so-called TNS Superpanel on a range of consumer goods from 15,000 randomly selected British households. Data collection is operationalized as follows: after each shopping trip, members of the panel scan their purchased items into a sophisticated handheld barcode reader by passing the scanner across the barcodes, which nowadays are printed on all packaged supermarket products. The data then are automatically sent to Taylor Nelson Sofres for central processing

without any further voluntary contribution from the panel participants. The retail outlets at which purchases were made also were identified for each shopping occasion and included major U. K. supermarkets such as Asda (a subsidiary of Wal-Mart), Tesco, and Sainsbury.

The nine product categories that served as the basis for this research are: baked beans, biscuits (cookies), breakfast cereals, butter, cheese, fruit juice, instant coffee, margarine, and tea. The following information was recorded on each shopping occasion for each consumer: brand specification (different versions of the same product category were classified as different brands, e.g., Corn Flakes and Rice Krispies by Kelloggs), package size, name of the supermarket/shop, date, number of units, and total amount spent. As the analysis of brand choice requires information concerning actual purchase across several buying opportunities, data from consumers who bought, within each product category, fewer than four times during the 16-week period were disregarded. Table 1 shows, for each product category, the number of consumers who made four or more purchases, the total number of purchases, average number of purchases per consumer, average total amount spent (British pounds) per consumer, average amount spent per shopping trip, average price per standard amount (e.g., 100 g), average price per package, total number of brands, and average number of brands bought.

Analyses

Overall product price elasticity. Overall price elasticity coefficients were calculated for each product category, using all data points of all consumers in each category, in order to compare the results with those obtained using individual data. Despite the fact that some authors have modeled quantity as a discrete variable (e.g., Gupta, 1988), we followed other investigators, such as Bell *et al.* (1999), in interpreting quantity and prices as continuous variables. The following version of Equation 1 was used to calculate the overall elasticity coefficients for each product category:

$$\log Q_{it} = \alpha + \beta (\log P_{it}) + \varepsilon_{it}, \quad (1.1)$$

where: Q_{it} = the quantity bought by consumer i on shopping occasion t divided by the

Table 1

Number of consumers, total purchases, average number of purchases, average total amount spent (British pounds), average amount spent per shopping trip, average price per standard amount (e.g., 100 g), average price per package, total number of brands, average number of brands bought, for each product category. Data were collected from February to May 2001, when the exchange rate was, approximately, £1 to \$1.43.

Product	Number consumers	Total purchases	Average purchases	Total spent	Average spent	Average price	Unit price	Total brands	Average brands
Baked Beans	39	265	6.79	4.52	0.62	0.07	.51	32	2.18
Biscuits (Cookies)	59	1125	19.07	14.02	0.74	0.30	.63	230	8.93
Breakfast Cereals	56	691	12.34	20.09	1.56	0.27	1.46	125	5.64
Butter	21	174	8.29	9.84	1.17	0.28	.76	21	2.24
Cheese	45	447	9.93	13.38	1.38	1.91	2.76	95	5.24
Fruit Juice	34	336	9.88	13.99	1.52	0.72	1.05	43	2.91
Coffee	19	144	7.58	18.32	2.51	2.09	2.09	31	2.95
Margarine	50	401	8.02	8.75	1.12	0.19	1.01	55	2.70
Tea	32	199	6.22	11.67	2.02	0.61	1.66	30	1.94

average quantity bought in the product category calculated across all consumers on all shopping occasions; P_{it} = the price paid by consumer i on shopping occasion t divided by the average price paid in the product category calculated across all consumers on all shopping occasions; with α and β being estimated regression coefficients, and ε_{it} representing the error term. The equation is similar to that used by Kagel et al. (1995), where β can be interpreted as a direct measure of elasticity. We have not attempted to elaborate price elasticity models. We adopted elasticity coefficients as measures of some possible consumer choice patterns. One consequence of this descriptive approach is that we do not expect to obtain high levels of explained variance (r^2) associated with any of the equations.

Interconsumer and intraconsumer price elasticities. Interconsumer price elasticity coefficients were obtained for each product category, using one data point for each consumer in each category, based on the following version of Equation 1:

$$\log Q_i = \alpha + \beta (\log P_i) + \varepsilon_i, \quad (1.2)$$

where: Q_i = the average quantity bought by consumer i on a given product category divided by the average quantity bought in the product category calculated across all consumers; P_i = the price paid by consumer i on a given product category divided by the average price paid in the product category calculated across all consumers, that yielded

only one pair of data points per consumer, rather than all data points per consumer, for each product category.

Intraconsumer price elasticity coefficients were obtained using all data points for all product categories for each consumer, based on the following version of Equation 1:

$$\log Q_{tc} = \alpha + \beta (\log P_{tc}) + \varepsilon_{tc} \quad (1.3)$$

where: Q_{tc} = the quantity bought by a given consumer on shopping occasion t in product category c divided by the average quantity bought by that consumer in product category c ; P_{tc} = the price paid by a given consumer on shopping occasion t in the product category c divided by the average price paid by that consumer in product category c , that yielded one elasticity coefficient for each consumer using data from all product categories.

Individual product price elasticities. Individual product price elasticity coefficients were calculated separately for each consumer buying each of three product categories, based on the same type of data included in Equation 1.3 (but restricted to one product). In this case, all data points obtained for each consumer in each of three product categories were used. The categories were cheese, breakfast cereals, and biscuits (cookies), which showed higher frequency of purchase during the 16-week period of observation, making possible the calculation of individual regression functions. In this case, data points were normalized to individual averages, calculated for each category, as was done for intraconsumer coeffi-

cients described above (Equation 1.3). These individual price elasticity coefficients obtained for separate product categories were compared to group elasticity coefficients calculated for each product using Equations 1.1 and 1.2.

Split-sample individual elasticities. Elasticity coefficients were calculated for each consumer using data from each half (i.e., Weeks 1 to 8 and 9 to 16) of the sample. These coefficients were obtained using Equation 1.3, including all purchases across all products for each consumer, during each 8-week period. This was done with the purpose of testing the consistency of individual differences across the two split samples.

RESULTS

Overall Product Price Elasticities

Figure 1 presents the demand curve, calculated with all data points from all consumers (Equation 1.1), for each product category. The graphs show log of quantity divided by the average quantity bought in the category as a function of log of price divided by the average price paid in the category. The slopes of the functions depict price elasticity for each category. Table 2 presents the parameters of these functions, obtained with Equation 1.1, for each product category. The *F* statistics show that all regression analyses were significant ($p \leq .01$). The values of r^2 varied from .05 to .76, suggesting that there are wide differences across product categories with respect to the influence of variables other than price, which were not investigated here. The values of the intercept (α) were close to zero and ranged from -0.46 to -0.08 across product categories. These values indicate that at the average price of the category (i.e., $\log P_{it} = 0$) consumers tended to buy a little less than the average quantity for that category. Elasticity coefficient estimates (β) varied from -0.23 to -1.01 across product categories, indicating an inverse relationship between price and quantity demanded. These values also indicate that the demand for all the products was inelastic, that is, increases in prices were accompanied by decreases in quantity demanded, although the decreases in quantity were proportionally smaller than the correspondent increases in price.

Interconsumer Price Elasticities

Figure 2 presents the demand curve, calculated with one pair of data points from each consumer (Equation 1.2), for each product category. The graphs show log of quantity divided by the average quantity bought in the category as a function of log of price divided by the average price paid in the category. The slopes of the functions depict interconsumer price elasticity for each category. Table 3 presents the parameters obtained with Equation 1.2 for each product category. The *F* statistics obtained for interconsumer elasticities showed that seven of the nine regression analyses were significant ($p \leq .05$). The values of r^2 varied from .09 to .68, suggesting again that there are wide differences across product categories with respect to the influence of variables other than price, which were not investigated here. The values of the intercept (α) ranged from 0.20 to 2.55 across product categories. These values indicate that at the average price of the category (i.e., $\log P_i = 0$) consumers tended to buy a little more than the average quantity for that category. Elasticity coefficient estimates (β) varied from -0.31 to -0.91 across product categories, indicating an inverse relationship between price and quantity demanded. These values also indicate that the demand for all the products was inelastic, that is, increases in prices were accompanied by decreases in quantity demanded, although the decreases in quantity were proportionally smaller than the correspondent increases in price. These results demonstrate the occurrence of interconsumer elasticity in most product categories, showing that, within each product category, consumers who pay higher prices, on average, also tend to buy smaller quantities, on average.

Intraconsumer Price Elasticity

Table 4 shows the parameters of Equation 1.3, calculated for each consumer across all product categories, using measures of quantity and price observed on each shopping occasion relative to the average quantity and average price obtained for each consumer in each product category. Elasticity coefficients were negative for 93.4% of consumers. The estimates of elasticity were significantly different from zero for 57 of the 76 consumers, that is, for 75% of the consumers. For significant

Fig. 1. Log of quantity bought divided by the average quantity bought in the category as a function of log of price paid divided by the average price paid in the category, calculated with all data points from all consumers (Equation 1.1), for each product category. The slopes of the functions depict overall price elasticity for each category.

regressions, r^2 varied from .12 to .95, and the values of the elasticity coefficient (β) were all negative ranging from -0.27 to -1.23 , with the exception of one consumer (21174) for whom the slope was positive. With the purpose of illustrating the parameters presented in the

table, Figure 3 presents the demand curves for each of six consumers, calculated with all data points across all products for each consumer (Equation 1.3). The six consumers were chosen from among those who yielded significant regression analyses with the purpose of

Table 2

Parameters of Equation 1.1, including all data points from all consumers, calculated for each product category. See text for details.

Product	<i>r</i> ²	<i>F</i> *	α	β	Error	<i>t</i>
Baked beans	.05	14.39	−.12	−.23 ^c	.06	−3.79
Biscuits (Cookies)	.41	764.44	−.14	−.54 ^c	.02	−27.65
Breakfast Cereals	.32	326.66	−.07	−.55 ^c	.03	−18.07
Butter	.06	10.46	−.09	−.52 ^c	.16	−3.23
Cheese	.76	1399.79	−.46	−1.01 ^c	.03	−37.41
Fruit juice	.18	74.01	−.12	−.55 ^c	.06	−8.60
Instant Coffee	.35	76.33	−.11	−.58 ^c	.07	−8.74
Margarine	.15	69.78	−.08	−.31 ^c	.04	−8.35
Tea	.30	84.76	−.12	−.97 ^c	.11	−9.21

^c *p* ≤ .01.
^b *p* ≤ .05.
^a *p* ≤ .10.
* (1, *n*) degrees of freedom, where *n* = (Total purchases − 2); see Table 1.

showing the two highest elasticity coefficients (i.e., more negative; Consumers 86295 and 120582), the average (Consumer 133271) and median (Consumer 31639) coefficients, and the two lowest ones (i.e., less negative or positive; Consumers 132764, where two data points equal to log of Price = −0.85 and log of Quantity = 1.02 are not shown, and Consumer 21174). The slopes of the functions depict price elasticity for each consumer across all categories. These results, overall, suggest that the quantity individual consumers buy on each shopping occasion tends to decrease as prices increase, demonstrating the occurrence of intraconsumer elasticity. Such decreases, however, for the vast majority of consumers, are proportionately smaller than the respective increases in price, that is, most of the consumers show inelastic demand.

Individual Product Price Elasticities

With the purpose of comparing product price elasticities obtained from group data with those obtained from individual data, individual elasticity coefficients were calculated for each consumer for the three products that showed the highest frequency of purchase during the 16-week period, that is, biscuits (cookies), breakfast cereals, and cheese. The parameters of Equation 1.3 obtained with relative measures at the individual level were then calculated for each consumer for each of these three product categories. Table 5 shows the parameters obtained. As can be seen in the table, for 29 out of 33 consumers who bought both products more than four times during

the 16-week period, elasticity coefficients were higher (more negative) for cheese (*M* = −1.07, *SD* = 0.48) than for biscuits (*M* = −0.47, *SD* = 0.26). This difference was statistically significant (*t*(32) = 6.31, *p* < .001). These results replicated the tendency observed when group data were used, that is, a higher demand elasticity for cheese than for cookies, observed for overall product elasticities (i.e., Equation 1.1, cheese = −1.01 and cookies = −0.55) and interconsumer elasticities (i.e., Equation 1.2, cheese = −0.91 and cookies = −0.55).

As also shown in the table, regression analyses indicated higher demand elasticity for cheese than for breakfast cereals for 23 of the 31 consumers who bought both products four or more times. A *t*-test indicated that this difference was statistically significant (cheese: *M* = −1.05, *SD* = .53, cereals: *M* = −0.54, *SD* = .46; *t*(30) = −3.57, *p* = .001). This analysis replicated the tendency observed for overall product elasticities (cheese = −1.01 and cereals = −0.55) and interconsumer elasticities (cheese = −0.91 and cereals = −0.56).

As Table 5 shows, demand elasticity was higher (more negative) for cereals than for biscuits for 26 of the 42 consumers who bought both products at least four times. A comparison of mean elasticity coefficients, however, did not indicate significant differences in elasticity between these two products (cereals: *M* = −0.57, *SD* = 0.50, biscuits: *M* = −0.44, *SD* = 0.34; *t*(41) = 1.21, *p* = .235). Although a similar difference was observed for interconsumer elasticities (cereals = −0.56 and biscuits = −0.32), overall elasticities,

Fig. 2. Log of quantity bought divided by the average quantity bought in the category as a function of log of price paid divided by the average price paid in the category, calculated with one pair of data points from each consumer (Equation 1.2), for each product category. The slopes of the functions depict interconsumer price elasticity for each category.

which were identical and equal to -0.55 , also suggested that the two products did not differ.

To illustrate the type of function generated with the data presented in Table 5, Figure 4 shows demand curves for six consumers, two for each of the three products (i.e., cheese, biscuits, and cereals). Data were chosen on the

basis of similarities between individual elasticity coefficients and the average elasticity, calculated across consumers, obtained for each product. In the graph that appears at the right-hand corner at the bottom of the figure, two data points (both equal to $\text{Log Quantity} = -0.85$ and $\text{Log Price} = 1.02$) are

Table 3

Parameters of Equation 1.2, including one data point per consumer, calculated for each product category. See text for details.

Product	<i>r</i> ²	<i>F</i> *	α	β	Error	<i>t</i>
Baked beans	.09	3.68	2.55	−.31 ^a	.16	−1.92
Biscuits (Cookies)	.28	22.53	.33	−.32 ^c	.07	−4.75
Breakfast Cereals	.41	37.16	.47	−.56 ^c	.09	−6.10
Butter	.10	2.20	2.18	−.72	.48	−1.48
Cheese	.68	89.47	.29	−.91 ^c	.10	−9.46
Fruit juice	.19	7.48	.20	−.60 ^c	.22	−2.74
Instant Coffee	.29	7.01	1.17	−.55 ^b	.21	−2.65
Margarine	.18	10.55	.56	−.31 ^c	.10	−3.25
Tea	.38	18.24	.31	−.91 ^c	.21	−4.27

^c *p* ≤ .01.
^b *p* ≤ .05.
^a *p* ≤ .10.
* (1, *n*) degrees of freedom, where *n* = (Number consumers − 2); see Table 1

not shown in order to keep the same scale in all graphs.

With the purpose of testing the consistency of individual demand elasticity across products, correlation coefficients (Pearson), comparing elasticities across pairs of products, were calculated. Correlation coefficients between cheese and biscuits, cheese and cereals, and cereals and biscuits were equal to −.02 (*N* = 33, *p* = .927), −.25 (*N* = 31, *p* = .174), and −.24 (*N* = 42, *p* = .132), respectively. These coefficients indicate that there was no consistency in individual elasticities across products.

Split-Sample Individual Elasticities

Table 6 shows the parameters of Equation 1.3 calculated for each consumer across all product categories with data from Split-Sample 1 (1–8 weeks) and Split-Sample 2 (9–16 weeks). Elasticity coefficients were negative, indicating decreases in quantity with increases in prices, for 93.4% and 96% of consumers in Split-Samples 1 (76 consumers) and 2 (75 consumers), respectively. Regression analyses were significant (i.e., *p* ≤ .05) for 68.4% (*N* = 52) and 60.0% (*N* = 45) of consumers in Split-Samples 1 and 2, respectively. Elasticity coefficients (β) ranged from −44.14 to 1.38 (*M* = −1.16, *SD* = 5.04) and from −44.14 to 0.87 (*M* = −1.07, *SD* = 5.05) in Split-Samples 1 and 2, respectively. Excluding the largest and extreme value of elasticity (i.e., −44.14 for Consumer 40563 in both samples), coefficients ranged from −5.12 to 1.38 (*M* = −0.58, *SD* = 0.70) and from −1.22 to 0.87 (*M* = −0.49, *SD* = 0.36) in Split-Samples 1

and 2, respectively. With the purpose of testing for consistencies in demand elasticity across samples, a correlation coefficient (Pearson), relating elasticity coefficients in the two samples, was calculated. The obtained coefficient was equal to .99 (*p* < .001) when including data from Consumer 40563, and equal to .27 (*p* = .019) excluding those same data. These coefficients indicate that individual differences in demand elasticity were relatively consistent across samples; that is, those consumers who showed higher elasticity in Split-Sample 1 also tended to show higher elasticity in Split-Sample 2, whereas those with lower elasticity in one sample also tended to show lower elasticity in the other.

DISCUSSION

The present results point to four general empirical conclusions. First, they suggest that demand elasticity coefficients calculated for individual consumers purchasing supermarket food products are compatible with predictions from economic theory and research in behavioral economics. Second, overall analyses of demand elasticity (i.e., based on several purchases of many consumers), typically employed in marketing and econometric research, include effects of interconsumer and intraconsumer elasticities. Third, when comparing demand elasticities of different product categories, group and individual analyses yield similar trends. And fourth, individual differences in demand elasticity are relatively consistent across time, but do not seem to be consistent across products.

Fig. 3. Demand curves for each of six consumers, calculated with all data points across all products for each consumer (Equation 1.3). The six consumers showing the two highest elasticity coefficients (86295 and 120582), the average (133271) and median (31639) coefficients, and the two lowest ones (132764 and 21174) were selected.

Table 4

Parameters of Equation 1.3, including all data points for each consumer across product categories, calculated for each individual consumer. Consumers are listed in ascending order based on the value of p . Degrees of freedom = (1,n), where n = ((N in Split Sample 1 + N in Split Sample 2) - 2); see Table 6.

Consumer	r^2	α	β	Error	p
12347	.55	-.10	-.84	.09	< .000
21174	.60	.00	.70	.07	< .000
25927	.37	-.17	-.58	.08	< .000
31639	.54	-.12	-.59	.09	< .000
36968	.33	-.16	-.47	.10	< .000
48996	.13	-.04	-.34	.08	< .000
49461	.78	-.16	-.77	.08	< .000
55814	.36	-.17	-.82	.14	< .000
55815	.30	-.08	-.51	.09	< .000
58275	.19	-.11	-.57	.14	< .000
59984	.36	-.05	-.93	.21	< .000
60695	.48	-.15	-.69	.12	< .000
67380	.50	-.16	-.83	.13	< .000
74108	.37	-.09	-1.02	.21	< .000
78082	.43	-.06	-.48	.07	< .000
86240	.27	-.05	-.57	.10	< .000
86295	.41	-.06	-1.23	.19	< .000
90910	.46	-.09	-.79	.16	< .000
93182	.48	-.07	-.84	.11	< .000
98732	.31	-.05	-.56	.09	< .000
113815	.26	-.06	-.48	.13	< .000
120582	.68	-.17	-1.16	.21	< .000
120587	.25	-.09	-.58	.13	< .000
122718	.51	-.04	-.66	.06	< .000
122753	.20	-.05	-.46	.11	< .000
122990	.43	-.07	-.65	.16	< .000
124244	.41	-.02	-.57	.10	< .000
124559	.30	-.10	-.67	.14	< .000
124933	.47	-.05	-1.06	.20	< .000
126110	.68	-.06	-.61	.06	< .000
126874	.18	-.04	-.30	.07	< .000
127526	.45	-.03	-.80	.18	< .000
128130	.34	-.10	-.51	.08	< .000
130515	.95	-.38	-.98	.07	< .000
130953	.31	-.12	-.52	.09	< .000
131184	.68	-.22	-.72	.08	< .000
131294	.42	-.12	-.74	.11	< .000
131331	.22	-.04	-.47	.08	< .000
131357	.43	-.09	-.69	.11	< .000
132764	.19	-.12	-.27	.07	< .000
133271	.54	-.06	-.63	.06	< .000
600031	.30	-.12	-.97	.20	< .000
600817	.26	-.07	-.58	.10	< .000
27180	.14	-.08	-.39	.11	.001
75262	.33	-.06	-.89	.24	.001
106715	.44	-.06	-.72	.18	.001
130276	.47	-.15	-.51	.13	.001
130867	.38	-.14	-.66	.18	.001
126831	.21	-.09	-.59	.18	.002
600948	.29	-.05	-.60	.18	.002
29436	.30	-.06	-.69	.22	.004
61529	.13	-.11	-.48	.17	.005
126515	.55	-.06	-.53	.15	.006
26537	.18	-.01	-.52	.18	.007
76872	.12	-.07	-.59	.23	.013
36543	.14	-.03	-.44	.18	.018
10696	.25	-.06	-.43	.19	.036
122025	.12	-.01	-.38	.19	.051

Table 4
(Continued)

Consumer	r^2	α	β	Error	p
82032	.08	-.06	-.28	.15	.062
122404	.07	-.07	-.19	.11	.073
122016	.05	-.03	-.18	.11	.096
122934	.21	-.05	-.54	.32	.117
600469	.11	-.03	-.33	.21	.134
106627	.03	-.03	-.22	.15	.141
73779	.29	-.05	-.57	.36	.166
118278	.04	-.08	-.18	.14	.215
84030	.17	-.02	-.44	.35	.238
47278	.04	-.05	-.22	.21	.294
129274	.03	-.01	.18	.19	.342
29425	.07	-.04	.42	.44	.361
118411	.05	-.06	-.39	.43	.374
95606	.02	-.04	-.11	.18	.549
23527	.01	-.02	.13	.29	.670
40563	.01	.00	-44.14	149.97	.778
133272	.00	-.05	-.03	.26	.898
132207	.00	-.01	.00	.23	.999

From the Laboratory to National Economy

In the present investigation of consumers purchasing supermarket food products in a national economy, individual elasticity coefficients (i.e., Equation 1.3) were negative, indicating decreases in purchased quantity with increases in prices (purchasing the same or different brands). Moreover, the large majority of individual coefficients were within the range of 0.00 to -1.00 , that is, they indicated inelastic demand. This shows that despite the fact that individuals tend to buy smaller (than the average) quantities when paying higher (than the average) prices, they tend to increase their total spending when paying prices above the usual average price they pay. This inelastic demand for food products observed for individual consumers is in perfect agreement with that obtained using group data in the present paper (overall product elasticity, see Table 2) and those reported in the literature using different estimation methods (cf. U. K. National Food Survey, see Lechene, 2000; Walters & Bommer, 1996). Hence, our findings confirm that quantity demanded is a decreasing function of price and that this functional relationship holds at the level of the individual consumer, which is the fundamental unit of decision making in (economic) consumer theory.

With respect to the form of the function, it is generally accepted that the linear log-log equation adopted here does not describe well

experimental demand curves, for elasticity tends to increase when extreme values of prices are used. Hursh has proposed an alternative, two-parameter log-linear equation that has described experimental data quite well (cf. Hursh et al., 1988; Hursh & Winger, 1995). In order to examine the possibility of significant deviations from linearity in the present data, a quadratic term was included in Equation 1.1, and the modified equation was fitted to all data points (i.e., all purchases from all consumers) obtained from each product category. The results indicated significant effects of the quadratic term for only two products, breakfast cereals and cheese, suggesting that it is reasonable to assume linear elasticity for most product categories. This difference in the ability of the linear form of the equation to describe the demand function might be explained by the small price variations observed in the present study, which are typical of real market conditions, when compared to the extreme variations used in experimental settings. However, the fact that the large majority of intercept values obtained in the present study were smaller than zero might be interpreted as supporting a nonlinearity assumption. Considering that smaller-than-zero intercepts indicate that at the average price paid (by the group or by individuals), consumers tended to buy quantities a little smaller than the average quantity bought, this suggests that the demand curve is

Table 5

Parameters of Equation 1.3, calculated for each individual consumer for each of the following three product categories: biscuits (cookies), cheese, and breakfast cereals.

Cons.	Biscuits (Cookies)					Cheese					Breakfast Cereals				
	r^2	α	β	SE	p	r^2	α	β	SE	p	r^2	α	β	SE	p
10696	.20	-.07	-.44	.25	.110										
12347	.64	-.12	-1.02	.13	<.000	.80	-.23	-.95	.17	.001	.14	-.01	-.17	.13	.236
21174	.89	.01	.81	.05	<.000						.68	-.01	-1.81	.40	.001
25927	.75	-.42	-.89	.08	<.000						.30	-.02	-.27	.08	.002
26537											.22	-.01	-.54	.22	.02
27180	.14	-.11	-.37	.14	.010	1.00	-.17	-2.11	.00	<.000	.78	-.08	-.78	.17	.004
29425											.05	-.06	.66	1.25	.619
29436	.70	-.07	-.71	.14	<.000										
31639	.87	-.31	-.76	.09	<.000	.20	-.03	-.47	.54	.446	.86	-.01	-.65	.13	.008
36543	.24	-.05	-.50	.24	.054						.05	-.03	-.40	.61	.531
36968	.80	-.32	-.54	.07	<.000	.83	-.45	-2.11	.47	.011	.16	-.06	-.39	.44	.431
47278	.12	-.03	-.38	.35	.317	.71	-.18	-1.25	.57	.160					
48996	.18	-.04	-.30	.09	.002	.88	-.12	-1.07	.16	.001	.55	-.05	-.75	.17	<.000
49461	.77	-.10	-.78	.12	<.000	.91	-.27	-.81	.09	<.000					
55814	.06	-.15	-.45	.55	.431	.75	-.26	-1.04	.12	<.000	.04	-.09	-.34	.42	.426
55815	.44	-.09	-.55	.12	<.000	.87	-.44	-1.24	.20	.001	.56	-.02	-.43	.14	.017
58275						.85	-.80	-.98	.19	.003	.23	-.03	-.51	.18	.007
59984						.95	.00	.01	.00	<.000	.67	-.04	-.71	.13	<.000
60695	.51	-.12	-.58	.14	.001	.60	-.28	-.85	.24	.008	.90	-.03	-1.49	.23	.001
61529	.01	-.10	-.14	.32	.671	.47	-.25	-.86	.26	.005	.11	-.01	-.16	.19	.428
67380						.92	-.54	-1.32	.13	<.000	.57	-.10	-.53	.14	.003
74108	.46	-.03	-.57	.20	.016	.63	-.29	-1.38	.36	.004	.35	-.04	-.64	.51	.297
75262	.11	-.01	-.24	.48	.672	1.00	-.30	-1.35	.03	.001					
76872	.32	-.09	-.56	.34	.144	1.00	-.39	-1.42	.02	<.000	.19	-.01	.88	.90	.387
78082	.66	-.11	-.53	.09	<.000						.47	-.05	-.53	.14	.001
82032	.53	-.16	-.57	.17	.007										
84030											.74	-.03	-.70	.21	.029
86240	.69	-.07	-.99	.17	<.000						.39	-.05	-.63	.12	<.000
86295	.27	-.02	-.49	.28	.124	.79	-.23	-1.51	.30	.001	.64	.01	.16	.06	.032
90910	.44	-.06	-1.03	.44	.052						.22	-.06	-.45	.25	.093
93182	.29	-.06	-.61	.29	.059	.64	-.24	-1.35	.45	.031	.66	-.06	-.66	.10	<.000
95606	.03	-.02	.09	.21	.694						.03	-.02	-.15	.29	.615
98732	.48	-.06	-.65	.10	<.000	.20	-.06	-.80	.38	.050					
106627	.14	-.04	-.48	.20	.023	.51	-.01	-.94	.65	.286	.02	-.04	-.19	.47	.691
106715	.27	-.07	-.58	.33	.123						.94	-.07	-.97	.10	<.000
113815	.40	-.11	-.57	.15	.001						.08	-.02	.33	.64	.647
118278	.03	-.08	-.12	.39	.776	.01	-.02	-.04	.23	.880	.08	-.12	-.28	.21	.187
118411	.19	-.05	-.38	.45	.461										
120582						.86	-.24	-1.20	.19	<.000					
120587	.29	-.11	-.62	.14	<.000										
122016	.03	-.02	-.14	.24	.558	.32	-.09	-.60	.50	.318	.47	-.03	-.26	.08	.005
122025	.25	-.06	-.75	.65	.314						.02	-.00	-.08	.22	.739
122404						.50	-.15	-1.25	.38	.007	.77	-.03	-.88	.28	.049
122718	.60	-.06	-.63	.07	<.000						.57	-.04	-1.30	.27	<.000
122753	.03	-.06	-.16	.27	.574	.45	-.10	-.67	.19	.003	.95	-.03	-.72	.11	.024
122934											.12	-.03	-.44	.46	.367
122990	.60	-.09	-.76	.19	.002										
124244	.27	-.01	-.33	.32	.367						.85	-.12	-.78	.46	.009
124559	.81	-.13	-.49	.09	.001	.68	-.22	-1.62	.39	.003	.09	-.05	-.44	.41	.310
124933	.14	-.02	-.38	.36	.326						.45	-.01	-1.12	.39	.017
126110	.96	-.08	-.67	.04	<.000	1.00	-.17	-.85	.02	<.000	.08	-.00	-.08	.07	.262
126515						.65	-.09	-.62	.18	.015					
126831	.06	-.06	-.26	.28	.367	.84	-.22	-1.39	.19	<.000	.63	-.08	-.54	.29	.204
126874	.17	-.06	-.27	.10	.010						.31	-.03	-.49	.20	.026
127526	.69	-.02	-.54	.26	.171	.92	-.05	-1.06	.14	.001					
128130	.49	-.21	-.63	.13	<.000	.78	-.12	-.65	.11	<.000	.77	-.10	-1.47	.57	.124
129274											.02	-.01	.262	.658	.702
130276	.78	-.33	-.64	.15	.008	.60	-.14	-.79	.29	.041					

Table 5
(Continued)

Cons.	Biscuits (Cookies)					Cheese					Breakfast Cereals				
	r^2	α	β	SE	p	r^2	α	β	SE	p	r^2	α	β	SE	p
130515	.95	-.39	-.94	.11	.001	1.00	-.37	-1.04	.09	.001					
130867						.82	-.46	-.88	.18	.005					
130953	.58	-.19	-.59	.13	<.000	.00	-.04	.02	.32	.950	.78	-.48	-1.31	.26	.002
131184						.91	-.35	-.85	.06	<.000	.94	-.19	-.76	.14	.032
131294	.34	-.06	-.46	.24	.099	.67	-.32	-1.04	.22	.001					
131331	.57	-.05	-.59	.06	<.000						.49	-.04	-.85	.16	<.000
131357	.39	.00	.26	.19	.262	.92	-.33	-1.10	.09	<.000	.61	-.05	-.83	.27	.022
132207						1.00	-.03	-2.90	.00	<.000					
132764	.57	-.31	-.46	.08	<.000						.31	-.07	-1.00	.45	.050
133271						.93	-.24	-.81	.07	<.000	.63	-.08	-.93	.36	.061
133272	.33	.01	.21	.21	.429										
600031	.28	-.07	-.52	.26	.076	1.00	-.66	-1.84	.04	<.000	.47	-.03	-.63	.23	.028
600469											.18	-.03	-.30	.19	.144
600817	.01	-.01	-.05	.11	.624	.73	-.29	-1.19	.18	<.000	.40	-.06	-.38	.14	.027
600948	.12	-.02	-.28	.20	.178						.63	-.08	-.85	.25	.011

not symmetrically located at the average values of price and quantity. As most intercepts were smaller than zero, this asymmetry favors Hursh's equation indicating that elasticity might increase at extreme prices.

Separating Intraconsumer and Interconsumer Elasticities

Overall product price elasticity, calculated with data from several purchases by each of a large groups of consumers (e.g., Equation 1.1, Table 2), is similar to the most typical econometric analyses found in the marketing literature. This type of analysis of elasticity may be a combination of intraconsumer and interconsumer elasticities. The finding that, for the large majority of consumers, individual elasticity coefficients were negative and significant demonstrates the occurrence of intraconsumer elasticity (Table 4, Equation 1.3). This means that, on different shopping occasions, the same consumer tends to buy smaller (than the average) quantities of a product when paying higher (than average) prices.

Intraconsumer elasticity may be due to their paying different amounts for a given brand (e.g., during and after a price promotion) or buying a differently priced brand. According to typical buying patterns reported in the literature, which show that the vast majority of consumers tend to choose, on each shopping occasion, from a subset of three or four brands (e.g., Ehrenberg, 1988), the changes in prices consumers pay across shopping occasions are

most likely the result of a combination of paying different prices for a given brand and buying other, differently priced brands (cf., Foxall, Oliveira-Castro, & Schrezenmaier, 2004). Indeed, these results elucidate more generally the patterns of consumer brand choice identified in studies of aggregate buyer behavior in the marketing literature (cf. Ehrenberg, 1988; Ehrenberg, Uncles, & Goodhardt, 2004; Uncles, Ehrenberg, & Hammond, 1995). Although their research has identified several patterns of consumer choice that have been widely replicated across products and countries, they have not analyzed consumers' responsiveness to price differences outside promotions and have assumed that the quantity consumers buy on each shopping trip is relatively constant. The finding of intraconsumer elasticity demonstrates that consumers do change the quantity they buy according to the price they pay on each shopping trip, suggesting that some assumptions and conclusions stemming from this type of literature should be re-examined.

The present results also provide evidence for interconsumer elasticity, which was negative for all nine product categories and statistically significant for seven of them (Table 3, Equation 1.2). These negative interconsumer elasticities indicate that consumers who pay prices above the average price paid in the category tend to buy quantities that are smaller than the average quantity bought in the category. Such an effect may be related to demographic characteristics, such as family

Table 6

Parameters of Equation 1.3, calculated for each consumer using data from Split-sample 1 (weeks 1–8) and Split-sample 2 (weeks 9–16). Consumers are listed in ascending order of their identification numbers.

Cons.	Split Sample 1						Split Sample 2					
	N	r^2	α	β	SE	p	N	r^2	α	β	SE	p
10696	10	.51	−.04	−.57	.20	.020	8	.08	−.09	−.26	.35	.496
12347	31	.68	−.05	−1.04	.13	<.000	40	.55	−.14	−.77	.11	<.000
21174	37	.46	−.00	.68	.13	<.000	39	.71	−.01	.72	.08	<.000
23527	10	.01	−.06	−.07	.30	.833	8	.12	.05	.57	.66	.418
25927	48	.38	−.15	−.58	.11	<.000	48	.36	−.19	−.58	.11	<.000
26537	28	.18	−.01	−.55	.23	.024	12	.23	−.00	−.30	.17	.119
27180	23	.00	−.01	−.04	.24	.860	58	.21	−.10	−.48	.13	<.000
29425	9	.46	−.04	1.38	.57	.045	5	.36	.00	−.52	.40	.284
29436	13	.14	−.00	−.49	.36	.200	13	.37	−.11	−.71	.28	.028
31639	19	.59	−.13	−.73	.15	<.000	18	.44	−.08	−.42	.12	.003
36543	18	.30	−.02	−.71	.27	.020	21	.06	−.04	−.26	.23	.268
36968	14	.44	−.14	−.46	.15	.009	30	.29	−.18	−.49	.14	.002
40563	4	.01	.00	−44.14	449.91	.938	5	.02	.00	−44.14	193.61	.834
47278	17	.03	−.05	−.16	.24	.518	12	.06	−.05	−.30	.39	.463
48996	64	.09	−.06	−.25	.10	.016	64	.15	−.02	−.38	.12	.002
49461	14	.77	−.19	−.84	.13	<.000	12	.80	−.12	−.66	.11	<.000
55814	26	.47	−.11	−.82	.18	<.000	35	.30	−.21	−.80	.21	.001
55815	34	.32	−.09	−.48	.12	<.000	46	.30	−.07	−.53	.12	<.000
58275	36	.16	−.03	−.33	.13	.015	37	.30	−.17	−1.09	.28	<.000
59984	16	.52	−.07	−1.10	.28	.002	19	.18	−.04	−.68	.36	.073
60695	20	.27	−.14	−.56	.22	.019	15	.79	−.16	−.82	.12	<.000
61529	27	.18	−.13	−.51	.22	.029	30	.08	−.09	−.42	.28	.14
67380	27	.50	−.19	−.82	.17	<.000	20	.54	−.12	−.91	.20	<.000
73779	3	.99	.07	−5.12	.47	.058	5	.35	−.02	−.41	.32	.293
74108	27	.61	−.05	−1.84	.29	<.000	18	.23	−.10	−.60	.28	.044
75262	14	.06	−.03	−.66	.74	.395	15	.50	−.10	−.96	.268	.003
76872	31	.19	−.16	−.71	.28	.015	22	.05	−.05	−.34	.32	.305
78082	31	.22	−.02	−.33	.11	.008	32	.56	−.08	−.56	.09	<.000
82032	18	.00	−.00	−.03	.27	.903	27	.15	−.10	−.38	.18	.043
84030	5	.13	−.04	−.36	.54	.551	5	.30	−.01	−.77	.67	.337
86240	55	.28	−.08	−.58	.13	<.000	41	.28	−.02	−.60	.15	<.000
86295	29	.59	−.08	−1.56	.25	<.000	33	.19	−.04	−.78	.29	.010
90910	19	.55	−.14	−.84	.18	<.000	11	.35	.00	−.78	.35	.056
93182	50	.48	−.06	−.79	.12	<.000	21	.46	−.09	−1.01	.25	.001
95606	16	.00	.02	.01	.26	.964	11	.10	−.12	−.21	.21	.335
98732	43	.31	−.04	−.65	.15	<.000	51	.31	−.05	−.50	.11	<.000
106627	34	.00	−.02	−.00	.20	.999	31	.11	−.02	−.42	.22	.065
106715	8	.75	−.08	−1.16	.27	.005	15	.11	−.08	−.27	.22	.237
113815	27	.38	−.12	−.66	.17	.001	18	.19	−.02	−.29	.15	.071
118278	12	.02	−.03	−.11	.23	.639	31	.05	−.11	−.23	.18	.219
118411	6	.07	−.16	−.37	.71	.626	11	.00	.00	−.03	.60	.966
120582	8	.52	−.15	−1.03	.40	.043	9	.76	−.18	−1.22	.26	.002
120587	30	.18	−.05	−.40	.16	.018	33	.29	−.12	−.66	.18	.001
122016	37	.08	−.03	−.22	.13	.083	24	.01	−.03	−.08	.20	.703
122025	18	.19	−.03	−.46	.24	.071	15	.02	.03	−.16	.28	.582
122404	21	.03	−.09	−.08	.11	.445	24	.18	−.06	−.44	.20	.042
122718	55	.50	−.03	−.65	.09	<.000	49	.50	−.06	−.64	.09	<.000
122753	31	.62	−.04	−.94	.14	<.000	37	.06	−.05	−.21	.15	.162
122934	6	.06	−.12	−.34	.70	.650	7	.88	−.02	−.88	.14	.002
122990	15	.40	−.08	−.68	.23	.012	10	.48	−.06	−.63	.23	.025
124244	21	.04	−.01	−.28	.30	.363	26	.68	−.02	−.63	.09	<.000
124559	29	.37	−.11	−.78	.20	.001	26	.19	−.08	−.49	.21	.025
124933	18	.46	−.07	−1.18	.32	.002	16	.51	−.03	−.92	.24	.002
126110	17	.69	−.04	−.55	.09	<.000	32	.68	−.07	−.63	.08	<.000
126515	7	.55	−.10	−.54	.22	.055	5	.95	.02	−.29	.04	.005
126831	25	.20	−.11	−.62	.25	.023	21	.22	−.07	−.60	.26	.032
126874	41	.07	−.04	−.17	.10	.094	42	.45	−.04	−.54	.09	<.000

Table 6
(Continued)

Cons.	Split Sample 1						Split Sample 2					
	N	r^2	α	β	SE	p	N	r^2	α	β	SE	p
127526	17	.49	-.04	-.86	.22	.002	8	.30	-.03	-.62	.38	.160
128130	37	.23	-.07	-.47	.15	.003	38	.40	-.14	-.52	.11	<.000
129274	18	.02	-.00	.10	.21	.625	20	.14	-.03	.87	.51	.105
130276	14	.54	-.17	-.60	.16	.003	5	.25	-.09	-.22	.22	.390
130515	13	.95	-.38	-.98	.07	<.000						
130867	10	.29	-.12	-.55	.30	.105	14	.44	-.15	-.74	.24	.010
130953	40	.22	-.13	-.49	.15	.002	31	.49	-.11	-.56	.11	<.000
131184	15	.82	-.28	-.73	.09	<.000	30	.62	-.19	-.72	.11	<.000
131294	17	.65	-.10	-.56	.11	<.000	44	.39	-.12	-.93	.18	<.000
131331	67	.12	-.05	-.39	.13	.004	76	.32	-.03	-.57	.10	<.000
131357	23	.64	-.10	-.85	.14	<.000	31	.14	-.07	-.39	.18	.037
132207	22	.01	.03	.14	.35	.690	29	.01	-.04	-.15	.28	.594
132764	40	.26	-.14	-.30	.08	.001	30	.08	-.08	-.19	.12	.121
133271	38	.54	-.03	-.66	.10	<.000	51	.56	-.08	-.59	.08	<.000
133272	5	.00	-.02	-.04	.59	.955	10	.00	-.06	-.03	.35	.926
600031	18	.59	-.11	-1.11	.23	<.000	38	.14	-.13	-.77	.33	.023
600469	10	.75	-.04	-.84	.17	.001	12	.11	-.07	-.43	.39	.289
600817	65	.18	-.07	-.40	.11	<.000	37	.47	-.06	-1.01	.18	<.000
600948	14	.42	-.06	-.66	.22	.012	16	.13	-.04	-.51	.35	.169

size and income, which might determine the quantities consumers need to buy and the prices they can pay. As we did not have information concerning consumers' demographic characteristics, this hypothesis could not be tested. Moreover, interconsumer elasticity coefficients were all between -0.31 to -0.91 , indicating inelastic demand, and were very similar to those obtained for overall product categories and individual consumers.

Taken together, these results demonstrate that overall product elasticity obtained from group data, including several purchases by each consumer, is the result of two different behavioral patterns, namely, intra- and interconsumer elasticities. Considering that inter- and intraconsumer elasticities could, theoretically, add to each other to inflate overall elasticity coefficients based on disaggregate data, the finding that overall and interconsumer coefficients were similar should be tested using larger data sets (e.g., more consumers, longer time periods, and more products).

Group versus Individual Analyses of Elasticity

One of the main puposes of the present research was to examine possible differences between findings derived from individual data and those obtained from groups of people. This empirical test becomes particularly relevant in the present case in view of the observed

patterns of interconsumer and intraconsumer elasticities. As overall product elasticity coefficients, calculated with data from all purchases by all consumers, were the results of specific combinations of intra- and interconsumer elasticities, one cannot assume that individual elasticities across products followed the same trends as group elasticities.

Following this line of reasoning, overall product elasticity coefficients, based on all data from all consumers, were compared with those obtained for different individuals across three product categories. Comparisons of elasticity coefficients obtained for the same consumers across different product categories (i.e., Table 5) indicated similar trends in elasticity to those observed when elasticity coefficients were calculated with group data, that is, elasticity coefficient for cheese was larger than that for cereals, which in turn was similar to that for biscuits. These similar findings help validate both individual and group analyses of elasticity coefficients, any one of which may be used depending on research or managerial purposes.

Consistency of Individual Elasticities Across Products and Time

Individual elasticity coefficients obtained for each consumer purchasing each of three products (i.e., cheese, breakfast cereals, and

Fig. 4. Demand curves for six consumers, two for each of the three products, calculated with data points from each of the products for each consumer. Data were chosen on the basis of similarities between individual elasticity coefficients and the average elasticity, calculated across consumers, obtained for each product.

biscuits) were not significantly correlated, indicating that individual differences in elasticity were not consistent across product categories. Results from the literature are not totally clear on this point. Although some authors found significant similarities in consumer choice patterns across product categories, others did not (cf. Ainslie & Rossi, 1998; Andrew & Currim, 2002). Such contradictory results have been attributed to methodological differences across studies, because those that have reported significant differences adopted more complex statistical models, including information about consumer preferences, marketing mix effects, and consumer loyalty, than those that reported negative results (cf. Andrew & Currim, 2002). Considering that the methodology employed in the present paper is more similar to those used in studies that did not find behavioral consistency across categories, the present results are not totally surprising. The small sample size in the present study did not make possible the use of more complex statistical models.

Individual elasticity coefficients from the two split-sample analyses were significantly and positively correlated, indicating that individual differences in elasticity coefficients show some consistency across time. This finding opens new directions for research and applications using information concerning the behavior of individual consumers, and helps validate the new procedure adopted here to calculate individual elasticity coefficients that were based on relative measures from all product categories. The fact that relatively similar individual coefficients were observed in both split samples suggests that they are reliable measures of individual behavior. The reliability of this measure also is suggested by the fact that several different analyses of elasticity yielded similar results—that is, the large majority of coefficients ranged from -0.20 to -1.00 (although this range tended to increase when fewer data points were used, e.g., individual coefficients for specific products). Values predominantly within this range were observed for overall product elasticity, intra-consumer elasticity across all products with the entire sample, intraconsumer elasticity across all products with half samples, intraconsumer elasticity for individual products (only three products), and interconsumer elasticity.

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