
An ordinal regression analysis for the explanation of consumer overall satisfaction in the food-marketing context: The managerial implications to consumer strategy management at a store level

Received (in revised form): 26th September, 2006

George S. Spais

Ph.D., Panteion University of Social & Political Sciences, Greece is a lecturer of marketing at University of Ioannina, Department of Agribusiness Management (Greece). He has published works on marketing communications, strategic marketing and marketing education. His works have been published in international academic journals such as the *Journal of Strategic Marketing*, the *Journal of Business Case Studies*, the *Journal of Financial Services Marketing*, the *Journal of Korean Academy of Marketing Science* and elsewhere. He is an active member of the Academy of Marketing Science, the European Academy of Marketing, the Academy of Marketing (UK) and the Greek Marketing Academy.

Konstantinos Z. Vasileiou

Ph.D., Cranfield University, UK is a lecturer of supply chain management at University of Ioannina, Department of Agribusiness Management (Greece). His works have been published in international academic journals such as the *International Journal of Supply Chain Management*, *Journal of Business Case Studies*, *Journal of Farm Management* and elsewhere.

Keywords *consumer satisfaction, food-marketing context, ordinal regression method and consumer strategy management*

Abstract The ordinal regression method was used to model the relationship between the behavioural outcome variable: consumer overall satisfaction in the food-marketing context and the most discussed marketing constructs such as perceived quality and perceived value. Two alternative models were developed in order to lead to a better understanding of consumer satisfaction in the food-marketing context. Two new marketing constructs in the food-marketing literature (perceived technological risk and perceived environmental friendliness) were also included in the alternative models. The research results showed that consumer satisfaction items are better predicted by the 'third model (III)'. We believe that the final findings of our research try can advance retailers' strategic tries regarding to consumer strategy management at a store level.

Journal of Database Marketing & Customer Strategy Management (2006) **14**, 51–73.

doi:10.1057/palgrave.dbm.3250036

George S. Spais
Department of Agribusiness
Management
School of Natural Resource
& Enterprise Management
University of Ioannina
G.Seferis 2-30100 Agrinio,
Greece
Tel: +30 26410 47.151;
e-mail: gspais@cc.uoi.gr

INTRODUCTION

There has been an increasing emphasis on the study of consumer satisfaction in the food-marketing context. Some studies have concentrated on determining the basic antecedent variables to purchase intention for food products such as Tomlison's¹ study

has considered the critical encounters and relationships between these variables.

Furthermore, a consumer behaviour model, which holistically defines the processes by which consumers make a choice between several competing brands or producers, is still to be developed.

Some progress in this direction has been made by the evaluation of known alternatives being factored into consumer assessments (mostly in the service industry), via the disconfirmation of expectations.²⁻⁷ While this approach measures the difference between pre- and post-consumption assessments, it provides only a partial explanation of how consumer retention mechanisms might operate.

In this study, the ordinal regression analysis was implemented to explore and examine the relationship among the most discussed marketing constructs (consumer satisfaction, perceived quality and perceived value) in the food-marketing context and the two new food-marketing constructs: (a) perceived technological risk and (b) perceived environmental friendliness.

The research aim and contribution of this study

Through the study results we aim to lead to a better understanding of consumer satisfaction in the food-marketing context.

The alternative models

We adopt the following definition for *consumer overall satisfaction in a food-marketing context*: ‘The degree of overall pleasure or contentment felt by the consumer, resulting from the ability of the food product to fulfill the consumer’s desires, expectations and needs in relation to the food product’.^{8,9}

(I) *First model*:

$$CS = f(PEF, PTR, PQ)$$

where CS is the consumer satisfaction, PEF the perceived environmental friendliness, PTR the perceived technological risk and PQ the perceived quality.

Research Hypothesis 1 (H₁): Consumer satisfaction items are better predicted by the ‘first model (I)’.

(II) *Second model*:

$$CS = f(PEF, PTR, PV)$$

where CS is the consumer satisfaction, PEF the perceived environmental friendliness, PTR the perceived technological risk and PV the perceived value.

Research Hypothesis 2 (H₂): Consumer satisfaction items are better predicted by the ‘second model (II)’.

Research Hypothesis 3 (H₃): Consumer satisfaction items are better predicted by an other model.

Perceived value upon consumer satisfaction

Recently, conceptual frameworks have been developed that integrate consumer perceived value and consumer satisfaction.^{10,11} To date, however, only a small number of studies have provided empirical evidence of the causal links between perceived value and satisfaction.¹²

Perceived quality upon consumer satisfaction

The literature has thoroughly tested the positive effect that perceptions about a product quality exercise on satisfaction.¹³⁻¹⁵ The study of this relationship between perceived quality and satisfaction has been generally carried out in a global way so that the effects of the different perceived quality dimensions have not been analysed separately. The individual consideration of these effects involves a more comprehensive knowledge and, consequently, it will allow improving the decision making aimed at increasing consumer satisfaction. It seems reasonable to expect that each of the perceived quality dimensions will have a positive effect of different intensity on satisfaction. On the other hand, it is admissible that consumers may have different preferences with respect to which

The structural model

Constructs	Definition	References
1. <u>Consumer satisfaction</u>	The degree of overall pleasure or contentment felt by the consumer, resulting from the ability of the food product to fulfill the consumer's desires, expectations and needs in relation to the food product.	Mai and Ness ⁸ (1999); Connor ⁹ (1999)
2. <u>Perceived value</u>	The consumer's overall appraisal of the net worth of the food product, based on the consumer's assessment of what is received (benefits provided by the food product), and what is given (costs or sacrifice in acquiring and utilizing the food product).	Frewer ¹⁷ (1997); Steenkamp ¹⁸ (1989); Kyriakopoulos and Oude Ophuis ¹⁹ (1997)
3. <u>Perceived quality</u>	The consumer's overall assessment of food product's attributes (cues are used by the consumer to evaluate the performance of the food product).	Becker ²⁰ (2000)
4. <u>Perceived technological risk</u>	The consumer's overall assessment of possible negative consequences of technological advancements in the food product.	Frewer and Shepherd ²¹ (1998); Rozin et al. ²² , (1986)
5. <u>Perceived environmental friendliness</u>	The consumer's overall assessment of the environmental friendliness of the food product.	Reijnders ²³ (2004); Szmigielski and Sobiczewska ²⁴ (2000)

Figure 1: The structural model^{8,9,17-24}

aspects of a product quality need to be improved, and, to what extent, to obtain a more satisfactory product.

Nevertheless, there exist certain factors that may affect quality perceptions and their relationship with satisfaction. Some of them, like affects and mood states, are receiving considerable attention in the literature. But the effects of other possible elements related to previous attitudes towards a product category have not been sufficiently studied yet¹⁶ (Figure 1).

RESEARCH METHOD

We address the core research themes of our study using a survey. Our intention is to test consumers' perceptions in order to

investigate the potent influence of some set of perceptions, in order to analyse consumer satisfaction in the food-marketing context.

Participants, procedure and data collection

The stratified random sample included 800 Greek households. The sample size was determined with the goal of obtaining at least 100 respondents from each of the eight largest cities (Athens, Thessalonica, Patras, Larissa, Chania, Edessa, Volos and Agrinio). Our intention is to reach consumers with different experiences, attitudes and level of knowledge for technological advanced food products. Data were collected by means of face-to-face interviews during the 8.5-week

period. In total, 800 respondents (who were responsible for shopping meat products for their households) were asked to participate, and no one declined to take part in the study. Percent distribution of population by age groups has been considered (*source*: National Statistical Service of Greece).

A stratified random sample survey approach was adopted so that various subgroups according to the following contexts: (a) decision making and (b) information processing were adequately represented in the sample. To ensure that respondents with reasonable experience of consuming meat products were included in the survey, 50 per cent of those selected for survey were consuming meat every day. Conversely, 50 per cent of those selected for survey were consuming meat once a week. The survey was stratified by sex, to control for an over or under-representation of respondents (58 per cent women and 42 per cent men).

Measures

This study is measuring five constructs: *consumer satisfaction*, *perceived value*, *perceived quality*, *perceived technological risk* and *perceived environmental friendliness*. All constructs were measured using multiple items. All items were measured using a seven-point Likert-type scale (ranging from 1 = strongly disagree to 7 = strongly agree), in order to measure consumers' perceptions. Appendix A lists the variable questions constituting each factor measurement.

The construct and internal validity of each measurement scale is broadly supported by the research literature from which it is derived. With establishing content validity, the questionnaire was refined through rigorous pre-testing. The pre-testing was focused on instrument clarity, question wording and validity. During the pre-testing, ten undergraduate students, three doctoral students and three professors (of University of Ioannina) were

invited to comment on the questions and wordings. The comments of these 16 individuals then provided a basis for revisions to the construct measures.

Testing the items

The test of the validity of the items was based on a focus group methodology using the serial moderating technique.

Focus group methodology traditionally calls for an individual, trained moderator who personally elicits information in accord with some pre-defined purpose. The information is obtained from an assembled group, often comprised of 6–12 eligible participants. Group participants are selected to be sufficiently diverse to generate lively and innovative ideas, but sufficiently similar to bring common discourse to the session. Participants of focus groups are also expected to convene only once. Accordingly, participants are typically exposed to a single moderator or facilitator who engages one or several groups to discuss directed research topics. Since moderators vary in their training, personality and leadership styles, and interests, focus groups are open to moderator bias.

In order to test the process, we advocate several moderators in succession over two classes of the Agribusiness Management Department of University of Ioannina, using moderately scheduled interviews. For the opening of the interviews, we have stated the purpose. The criterion for moderator selection included the following demographic criterion: 'if students are raised to large urban centers, small towns or villages'. Previous focus group reviews (eg Tynan and Drayton²⁵) have not considered this. For many marketing research projects resting on semi-structured and ill-structured problem domains that require alternative perspectives of multiple experts for both facilitating knowledge elicitation and verification²⁶, it would seem particularly appropriate.

For this pilot test, three moderator teams have been employed for time intervals that

have been ranged from 20 to 40 minutes, sufficient to cover major sections of the overall focus interview guide. This overall guide was the joint product of all participating moderators.

The above process was prerequisite, in order to secure the success of the set of interviews (with focus groups) in Athens. The groups were structured according to the following demographic criteria: (a) where they are raised (urban centres, small towns, villages), (b) educational background (no education, high school, universities/colleges), (c) age (20–30, 31–41, 42–52, 53–63) (Table 1).

ANALYSES

Descriptive statistics

The goal of the descriptive analysis is to summarise the information about the sample characteristics and the distribution, variability and central tendency of the constructs and the measured items.

Bivariate correlations

The goal of the bivariate correlations procedure is to compute the correlation coefficients of Spearman's rho, and Kendall's tau-b with their significance levels. These correlations will measure how variables or rank orders are related.

Ordinal regression

The goal of the ordinal regression analysis is to model the dependence of a polytomous ordinal response on a set of predictors, which can be factors or covariates.

RESEARCH RESULTS

Sample characteristics

The response rate was 100 per cent. The participants in the study were 800 consumers, who were responsible for shopping meat products for their households. About 58 (57.8 per cent) were women and about 42 (41.5 per cent) were men. About nine (8.9 per cent) aged less than 20 years, about 37 (37.3 per cent) aged 21–30 years, about 22 (22 per cent) aged 31–40 years, about 16 (16.4 per cent) aged 41–50 years, about ten (10.3 per cent) aged 51–60 years, about five (5 per cent) aged more than 60 years. Fifty-three per cent were married and 47 per cent were single. Thirty-four per cent had a university/college degree and 48 per cent (48 per cent) were graduates of a high school and 18 per cent did not graduate from a high school (Table 2).

Descriptive statistics

Characteristics of the distributions of the answers were obtained by calculating means and standard deviations for each item (see Table 3).

Table 1: The items for the five constructs

Constructs	Items	Variables
1. <i>Consumer satisfaction</i>	CS1=retained in consumer's consideration set	(1)
	CS2=result of brand expectation–performance comparisons	(2)
	CS3=repurchase intention	(3)
2. <i>Perceived value</i>	PV1=health advantages	(4)
	PV2=taste	(5)
	PV3=user convenience	(6)
	PV4=competitive price	(7)
	PV5=design of the product	(8)
3. <i>Perceived quality</i>	PQ1=credence quality	(9)
	PQ2=search quality	(10)
	PQ3=experience quality	(11)
4. <i>Perceived technological risk</i>	PTR1=way that the food product it is produced	(12)
5. <i>Perceived environmental friendliness</i>	PEF1=packaging and food processing processes	(13)

Table 2: Sample's socio-demographic profile (N=800)

Frequencies		Percentages (%)										
1. Age groups (years)												
<20	71	21-30	31-40	41-50	51-60	>61	<20	21-30	31-40	41-50	51-60	>61
		298	176	131	82	40	8.9	37.3	22	16.4	10.3	5
2. Gender												
Male	332	Female	462				Male	Female				
							41.5	57.8				
3. Educational background												
None <	74	High school	High school	University/ college	University/ college	High school	None <	High school	High school	University/ college	University/ college	University/ college
		68	386	270	270	48.3	9.3	8.5	48.3	33.8	33.8	33.8
4. Income per year (€)												
Low income	<10,000	10,001 -20,000	20,001 -30,000	30,001 -40,000	40,001 -50,000	>60,001	Low income	High income				
		79	372	372	372	29	29	31.4	19.3	9.3	2.8	2.9
5. Marital status												
Married with children	346	Married without children	Single	Single	Single	Married with children	Married with children	Married without children	single	single	single	single
		79	372	372	372	43.3	43.3	9.9	46.5	46.5	46.5	46.5

Table 3: Descriptive statistics

Constructs and measured items	Mean (Standard deviation)
<i>Perceived value</i>	
Health advantages	5.38 (1.88)
Taste	5.86 (1.58)
User convenience	4.20 (2.11)
Competitive price	4.32 (2.24)
Design of the product	3.02 (1.98)
<i>Consumer satisfaction</i>	
Exists in consumer's consideration set	6.15 (1.27)
Result of brand expectation–performance comparisons	5.77 (1.61)
Purchase intention	6.23 (1.34)
<i>Perceived quality</i>	
Credence quality	4.70 (2.27)
Search quality	5.22 (1.98)
Experience quality	5.79 (1.38)
<i>Perceived technological risk</i>	
Way that food product is produced	5.19 (2.01)
<i>Perceived environmental friendliness</i>	
Packaging and food processing processes	4.86 (2.01)

Comparisons among the independent groups

Results based on Mann–Witney *U*-test show us that there are no significant statistical differences, for the grouping variable: ‘gender’

Results based on Kruskal–Wallis test show us that there are significant statistical differences for the grouping variable: ‘age’.

Results based on Kruskal–Wallis test show us that there are significant statistical differences for the grouping variable: ‘educational background’.

Results based on Kruskal–Wallis test show us that there are significant statistical differences for the grouping variable: ‘place of adobe’.

Findings of the survey

The measured items are presented in Table 3.

The results of the survey are summarised in Appendix A.

Interpretation of the questionnaire results

Based on the questionnaire results and without combining the questions with each other, we can interpret the responses as follows.

The relationship between consumer's attitudes with respect to a generic product and the evaluations they carry out of a specific product is double. On the one hand, a lot of consumers attitudes towards a product according to their perceptions (weighted or not), regard a set of relevant attributes of the particular offer or brand. On the other hand, the causal relationship between consumers' attitudes and evaluation may have the inverse direction. Thus, it is predictable that previous attitudes towards a product category may also affect the specific perceptions an individual obtains from a particular offer or brand.

Consumer satisfaction can influence attitudinal change (eg food product and food supplier preference), which in turn affects purchase intention. A high level of satisfaction is likely to increase the probability that the brand in question will be retained in the consumer's consideration set and will increase the consumer's preference for the brand.

Inter-item correlations

The goal of the bivariate correlations procedure is to compute the correlation coefficients of Spearman's rho, and Kendall's tau-b with their significance levels. These correlations will measure how variables or rank orders are related. The inter-item correlations are presented in Tables 4–7.

Test of independence

The construct of consumer satisfaction in the food marketing context is significantly influenced by the constructs of perceived environmental friendliness, perceived technological risk, perceived value and perceived quality, as the correlation coefficients values of inter-item correlations

Table 4: Identification of the significant relationships among the variables: (a) consumer satisfaction (CS) and (b) perceived value (PV)

		PV1=health advantages	PV2=taste	PV3=user convenience	PV4=competitive price	PV5=design of the product
<i>Kendall's tau_b</i>						
CS1=retained in consumer's consideration set	Correlation coefficient	0.219**	0.285**	0.072	-0.015	-0.152**
	Sig. (one-tailed)	0.000	0.000	0.014	0.606	0.000
	N	799	799	798	799	795
CS2=result of brand expectation-performance comparisons	Correlation coefficient	0.202**	0.202**	0.103**	0.026	-0.091**
	Sig. (one-tailed)	0.000	0.000	0.000	0.368	0.002
	N	798	798	797	798	794
CS3=purchase intention	Correlation coefficient	0.256**	0.291**	0.050	0.013	-0.164**
	Sig. (one-tailed)	0.000	0.000	0.085	0.646	0.000
	N	800	800	799	800	796
<i>Spearman's rho</i>						
CS1=retained in consumer's consideration set	Correlation coefficient	0.254**	0.321**	0.086	-0.020	-0.179**
	Sig. (one-tailed)	0.000	0.000	0.015	0.573	0.000
	N	799	799	798	799	795
CS2=result of brand expectation-performance comparisons	Correlation coefficient	0.238**	0.233**	0.125**	0.029	-0.109**
	Sig. (one-tailed)	0.000	0.000	0.000	0.407	0.002
	N	798	798	797	798	794
CS3=purchase intention	Correlation coefficient	0.295**	0.327**	0.060	0.015	-0.196**
	Sig. (one-tailed)	0.000	0.000	0.092	0.662	0.000
	N	800	800	799	800	796

**Correlation is significant at the 0.01 level (one-tailed).

are significant at 5 per cent level. So, we have found evidence of a link among consumer satisfaction, perceived environmental friendliness, perceived technological risk, perceived value and perceived quality (Tables 4–7).

Based on the computed correlation coefficients of Spearman's rho, and Kendall's tau-b with their significance levels, we can produce the following conclusions:

- 1 First, it seems that there is an interrelation among the constructs of consumer satisfaction, perceived value, perceived quality, perceived environmental friendliness and perceived technological risk.
- 2 There is a strong relationship between consumer satisfaction and perceived value.
- 3 There is a strong relationship between consumer satisfaction and perceived quality.
- 4 There is a strong relationship between consumer satisfaction and perceived environmental friendliness.

- 5 There is a strong relationship between consumer satisfaction and perceived technological risk.
- 6 We cannot identify which of the above relationships are the stronger. Finally, we cannot identify which parameters can predict better consumer satisfaction as behavioural outcome.

In terms of our research aim, an ordinal regression analysis could lead us to identify which parameters can predict better consumer satisfaction as a behavioural outcome. Such an analysis could lead to a better understanding of consumer satisfaction in the food-marketing context.

Ordinal regression analysis (steps)

The five steps that we have followed in order to construct the 'third model (III)' are presented below:

(III) *Third model:*

$$CS = f(PV, PQ, PTR, PEF)$$

Table 5: Identification of the significant relationships between the variables: (a) consumer satisfaction (CS) and (b) perceived environmental friendliness (PEF)

		PEF1=packaging and food processing processes
<i>Kendall's tau_b</i>		
CS1=retained in consumer's consideration set	Correlation coefficient	0.100**
	Sig. (one-tailed)	0.001
	N	799
CS2=result of brand expectation–performance comparisons	Correlation coefficient	0.135**
	Sig. (one-tailed)	0.000
	N	798
CS3=purchase intention	Correlation coefficient	0.140**
	Sig. (one-tailed)	0.000
	N	800
<i>Spearman's rho</i>		
CS1=retained in consumer's consideration set	Correlation coefficient	0.119**
	Sig. (one-tailed)	0.001
	N	799
CS2=result of brand expectation–performance comparisons	Correlation coefficient	0.162**
	Sig. (one-tailed)	0.000
	N	798
CS3=purchase intention	Correlation coefficient	0.166**
	Sig. (one-tailed)	0.000
	N	800

**Correlation is significant at the 0.01 level (one-tailed).

where CS is the consumer satisfaction, PV the perceived value, PQ the perceived quality, PTR the perceived technological risk and PEF the perceived environmental friendliness.

- 1 *Identification of the outcome variable:* The outcome variable of the research models is described in full detail above at the definition of the three models.
- 2 *Choosing predictors for the location model:* The predictors in each location model are described in full detail above at the definition of the research hypotheses.
- 3 *Choosing predictors for the scale model:* Next step to building an ordinal regression analysis model is to make a decision whether to include a scale component in the model at all or not. In many cases, the scale component is not necessary, and the location-only model provides a good summary of the data. Given that all dependent and independent variables

of our study were measured by the same (7-point Likert) scale, it was deemed that none of the independent should be included in the scale component and consequently a location-only model was preferred.

- 4 *Link function choice:* SPSS 13.0 provides five link functions to choose from, depending on the distribution of the dependent variable values. In all three dependent variables tested in our model (items (CS1, CS2 and CS3) that constitute the factor of consumer satisfaction), the higher categories were more probable (Appendix A), thus the link functions of Complementary log–log and Cauchit (inverse Cauchy) were selected to run the ordinal regression analysis of our models. Not surprisingly, the model fitting information and goodness-of-fit Tables provided by SPSS 13.0 Output revealed that the Complementary log–log link function, which is meant to deal with

Table 6: Identification of the significant relationships between the variables: (a) consumer satisfaction (CS) and (b) perceived quality (PQ)

		PQ1=credence quality	PQ2=search quality	PQ3=experience quality
<i>Kendall's tau_b</i>				
CS1=retained in consumer's consideration set	Correlation coefficient	0.115**	0.194**	0.387**
	Sig. (one-tailed)	0.000	0.000	0.000
	N	798	797	798
CS2=result of brand expectation-performance comparisons	Correlation coefficient	0.168**	0.174**	0.362**
	Sig. (one-tailed)	0.000	0.000	0.000
	N	797	796	797
CS3=purchase intention	Correlation coefficient	0.151**	0.200**	0.323**
	Sig. (one-tailed)	0.000	0.000	0.000
	N	799	798	799
<i>Spearman's rho</i>				
CS1=retained in consumer's consideration set	Correlation coefficient	0.137**	0.228**	0.434**
	Sig. (one-tailed)	0.000	0.000	0.000
	N	798	797	798
CS2=result of brand expectation-performance comparisons	Correlation coefficient	0.196**	0.204**	0.414**
	Sig. (one-tailed)	0.000	0.000	0.000
	N	797	796	797
CS3=purchase intention	Correlation coefficient	0.178**	0.235**	0.364**
	Sig. (one-tailed)	0.000	0.000	0.000
	N	799	798	799

**Correlation is significant at the 0.01 level (one-tailed).

models that the higher categories of the dependent variable are more probable, was found to be more suitable to analyse our data set than the Cauchit link function, which provides better predictions of the latent variable when this has many extreme values.

- 5 *Evaluation of the model:* A first measure to evaluate the model validity is the percentage of cells with zero frequencies. Running ordinal regression analysis for all models, a warning of SPSS 13.0 Output mentioned that there were 80–85 per cent cells (ie, dependent variable levels by combinations of predictor variable values) with zero frequencies, which made it difficult to interpret some of the fit statistics. Thus, a very careful evaluation of these models owned to be made, particularly when looking at chi-square-based fit statistics.

Ordinal regression analysis (findings)

- 1 *Model fitting information:* The significant chi-square statistic (Table 9) indicates that all models give a significant improvement over the baseline intercept-only model. This means that the models give better predictions than if somebody just guessed based on the marginal probabilities for the outcome categories (Table 10).
- 2 *Goodness-of-fit:* These statistics (Model Fitting Information and Goodness-of-Fit) can be very useful for models with a small number of categorical predictors. Unfortunately, these statistics are both sensitive to empty cells. When estimating models with continuous covariates, there are often many empty cells, as in our case. Therefore, we cannot rely on either of these test statistics with such models. Because of the empty cells, we cannot

Table 7: Identification of the significant relationships between the variables: (a) consumer satisfaction (CS) and (b) perceived technological risk (PTR)

		PTR1=way that the food product it is produced
<i>Kendall's tau_b</i>		
CS1=retained in consumer's consideration set	Correlation coefficient	0.231**
	Sig. (one-tailed)	0.000
	N	798
CS2=result of brand expectation-performance comparisons	Correlation coefficient	0.192**
	Sig. (one-tailed)	0.000
	N	797
CS3=purchase intention	Correlation coefficient	0.212**
	Sig. (one-tailed)	0.000
	N	799
<i>Spearman's rho</i>		
CS1=retained in consumer's consideration set	Correlation coefficient	0.269**
	Sig. (one-tailed)	0.000
	N	798
CS2=result of brand expectation-performance comparisons	Correlation coefficient	0.228**
	Sig. (one-tailed)	0.000
	N	797
CS3=purchase intention	Correlation coefficient	0.246**
	Sig. (one-tailed)	0.000
	N	799

**Correlation is significant at the 0.01 level (one-tailed).

be sure that these statistics will really follow the chi-square distribution, and the significance values would not be accurate.

3 *Pseudo R-square*: Because of the high number of empty cells, that do not allow us to rely on the information provided by the model fitting information and the goodness-of-fit Tables, the pseudo R-squares were used to assess the overall goodness of fit of our models. These measures attempt to serve the same function as the coefficient of determination in linear regression models namely to summarise the proportion of variance in the dependent variable associated with the predictor (independent) variables. For ordinal regression models, these measures are based on likelihood ratios rather than raw residuals. Three different methods are used to estimate the coefficient of determination. Cox and Snell's²⁷ R-square (1989) is a well-known generalisation of

the usual measure designed to apply when maximum likelihood estimation is used, as with ordinal regression. However, with categorical outcomes, it has a theoretical maximum value of less than 1.0. For this reason, Nagelkerke²⁸ proposed a modification that allows the index to take values in the full zero-to-one range. McFadden's²⁹ R-square (1973) is another version, based on the log-likelihood kernels for the intercept-only model and the full estimated model. All three items that constitute the factor of consumer satisfaction are better predicted by a 'third model (III)' than the initial two models. This means that the ordinal regression analysis models where the constructs of perceived value and perceived quality are separately included in the location model (first model (I) and second model (II)) cannot predict consumer satisfaction (outcome variable) as well as the third model (III) does where both constructs are taken into account.

The pseudo *R*-squares (Table 11) also reveal that the items of CS1 and CS3 are better predicted by the tested models than CS2. Although the pseudo *R*-squares values are respectable, their relatively low values indicate that the constructs of perceived value, perceived quality, perceived technological risk and perceived environmental friendliness cannot alone give sufficient predictions of consumer satisfaction. It will probably be worth the effort to revise the model including more predicting variables to improve consumer satisfaction predictions.

4 *Test of parallel lines:* For location-only models, the test of parallel lines can help assessing whether the assumption that the parameters are the same for all categories is reasonable. Table 12 shows that for all cases except for the third model (III) of item CS3 this is true, which means that the general model (with separate parameters for each category) gives a significant improvement in the model fit (Table 8).

DISCUSSION

The ordinal regression method was used to model the relationship between the behavioural outcome variable: consumer overall satisfaction in the food-marketing context and the most discussed marketing constructs such as perceived quality and perceived value. Two alternative models were developed in order to lead to a better understanding of consumer satisfaction in the food-marketing context. Two new marketing constructs in the food-marketing literature (perceived technological risk and perceived environmental friendliness) were also included in the alternative models. The

Table 8: Research results

Hypothesis		Support
H ₁	<i>H1=Consumer satisfaction's items are better predicted by the 'first model (I)'</i> .	Not supported
H ₂	<i>H2=Consumer satisfaction's items are better predicted by the 'second model (II)'</i> .	Not supported
H ₃	<i>H3=Consumer satisfaction's items are better predicted by an other model.</i>	Supported

Table 9: Model fitting information

Dependent variable	Model	Model	-2 Log Likelihood	Chi-Square	d.f.	Sig.
CS1	(1) CS=f (PQ, PTR, PEF)	Intercept only	1744.242	220.628	30	0.000
		Final	1523.614			
	(2) CS=f (PV, PTR, PEF)	Intercept only	1967.653	220.851	42	0.000
		Final	1746.803			
	(3) CS=f (PV, PQ, PTR, PEF)	Intercept only	1976.480	308.637	60	0.000
		Final	1667.843			
CS2	(1) CS=f (PQ, PTR, PEF)	Intercept only	2035.527	207.321	30	0.000
		Final	1828.205			
	(2) CS=f (PV, PTR, PEF)	Intercept only	2320.577	171.564	42	0.000
		Final	2149.013			
	(3) CS=f (PV, PQ, PTR, PEF)	Intercept only	2339.623	267.674	60	0.000
		Final	2071.949			
CS3	(1) CS=f (PQ, PTR, PEF)	Intercept only	1671.328	166.281	30	0.000
		Final	1505.047			
	(2) CS=f (PV, PTR, PEF)	Intercept only	1837.357	233.955	42	0.000
		Final	1603.402			
	(3) CS=f (PV, PQ, PTR, PEF)	Intercept only	1846.406	299.636	60	0.000
		Final	1546.770			

Link function: Complementary log-log.

Table 10: Goodness-of-fit

Dependent variable	Model		Chi-square	d.f.	Sig.
CS1	(1) CS=f (PQ, PTR, PEF)	Pearson	2963.604	3060	0.892
		Deviance	1402.534	3060	1.000
	(2) CS=f (PV, PTR, PEF)	Pearson	3953.086	4242	0.999
		Deviance	1727.629	4242	1.000
	(3) CS=f (PV, PQ, PTR, PEF)	Pearson	4429.529	4428	0.491
		Deviance	1661.116	4428	1.000
CS2	(1) CS=f (PQ, PTR, PEF)	Pearson	3495.296	3054	0.000
		Deviance	1683.222	3054	1.000
	(2) CS=f (PV, PTR, PEF)	Pearson	4515.074	4242	0.002
		Deviance	2121.460	4242	1.000
	(3) CS=f (PV, PQ, PTR, PEF)	Pearson	5107.860	4428	0.000
		Deviance	2065.438	4428	1.000
CS3	(1) CS=f (PQ, PTR, PEF)	Pearson	3073.478	3060	0.428
		Deviance	1401.015	3060	1.000
	(2) CS=f (PV, PTR, PEF)	Pearson	3863.126	4248	1.000
		Deviance	1589.296	4248	1.000
	(3) CS=f (PV, PQ, PTR, PEF)	Pearson	4878.734	4434	0.000
		Deviance	1542.611	4434	1.000

Link function: Complementary log-log.

research results showed that consumer satisfaction items are better predicted by the ‘third model (III)’ (Tables 13–15).

The results from the statistical analysis showed that there is an interrelation among the constructs of consumer satisfaction, perceived value, perceived quality, perceived environmental friendliness and perceived technological risk. The statistical analysis showed also that: (a) there is a strong relationship between consumer satisfaction and perceived value; (b) there is a strong relationship between consumer satisfaction and perceived quality; (c) there is a strong relationship between consumer satisfaction and perceived environmental friendliness and (d) there is a strong relationship between consumer satisfaction and perceived technological risk.

According to the descriptive statistics, the constructs of perceived environmental friendliness and perceived technological risk is of high value in our discussion for the overall consumer satisfaction of food products.

Health advantages, taste, user convenience and the design of the product are significant issues that affect significantly consumer

satisfaction. Search and experience quality issues related to the promotion at a store level are needed to be considered by marketers, as divergence may arise because of inadequacy of risk communication systems, as usually happens in developing economies.

Extensive research into the factors influencing consumer satisfaction has been conducted in consumer markets (eg, Spreng *et al.*³⁰; Swan and Oliver³¹; Oliver and Swan³²; Churchill and Surprenant³³), but relatively little such research has been conducted in the food-marketing context. In spite of this dearth of research, Sanzo *et al.*¹⁶, Andreassen and Lindestad¹² find that food consumers consider multiple attributes when evaluating overall satisfaction. In the expectancy-disconfirmation model of customer satisfaction, the most widely accepted and studied model³⁴, consumers compare their perceptions of performance (not objective actual performance) with their pre-purchase expectations to form judgments about the experience.³⁵ When expectations are met, that is, when perceived performance is close to expectations, little conscious thought is

Table 11: Pseudo *R*-squares

Dependent variable	Model		
CS1	(1) $CS=f(PQ, PTR, PEF)$	Cox and Snell	0.243
		Nagelkerke	0.264
		McFadden	0.110
	(2) $CS=f(PV, PTR, PEF)$	Cox and Snell	0.243
		Nagelkerke	0.264
		McFadden	0.111
	(3) $CS=f(PV, PQ, PTR, PEF)$	Cox and Snell	0.324
		Nagelkerke	0.352
		McFadden	0.155
CS2	(1) $CS=f(PQ, PTR, PEF)$	Cox and Snell	0.230
		Nagelkerke	0.242
		McFadden	0.088
	(2) $CS=f(PV, PTR, PEF)$	Cox and Snell	0.195
		Nagelkerke	0.205
		McFadden	0.073
	(3) $CS=f(PV, PQ, PTR, PEF)$	Cox and Snell	0.288
		Nagelkerke	0.303
		McFadden	0.114
CS3	(1) $CS=f(PQ, PTR, PEF)$	Cox and Snell	0.189
		Nagelkerke	0.209
		McFadden	0.090
	(2) $CS=f(PV, PTR, PEF)$	Cox and Snell	0.255
		Nagelkerke	0.282
		McFadden	0.126
	(3) $CS=f(PV, PQ, PTR, PEF)$	Cox and Snell	0.316
		Nagelkerke	0.349
		McFadden	0.162

Link function: Complementary log–log.

given to the process. But when perceived performance is higher (lower) than the expected level of performance, expectations are said to be disconfirmed. When expectations are lower (higher) than perceived performance, satisfaction (dissatisfaction) is experienced.

Managerial implications

For decades, researchers in food marketing have assessed consumer satisfaction in three different justifications. First, most researchers have measured solely the levels of consumer satisfaction in order to identify the most and the least satisfaction with food products. Secondly, some researchers have

examined consumer satisfaction to see if satisfaction ratings of food products associate with the satisfaction of the overall food company. Lastly, few researchers have investigated consumer satisfaction items related to the occurrence of the consumer events such as consumer retention and attrition.

The results of this study suggest that food-marketing managers should survey consumers and work to reduce dissatisfaction on all components of satisfaction. This is so regardless of the weighting given to any individual component of satisfaction, either through a statistical analysis such as multiple linear

Table 12: Test of parallel lines

Dependent variable	Model	Model	-2 Log Likelihood	Chi-square	d.f.	Sig.
CS1	(1) $CS=f(PQ, PTR, PEF)$	Null Hypothesis General	1523.614 1252.661 ^a	270.953 ^b	150	0.000
	(2) $CS=f(PV, PTR, PEF)$	Null Hypothesis General	1746.803 1448.953 ^a			
	(3) $CS=f(PV, PQ, PTR, PEF)$	Null Hypothesis General	1667.843 1313.223 ^a			
CS2	(1) $CS=f(PQ, PTR, PEF)$	Null Hypothesis General	1828.205 1214.492 ^a	613.713 ^b	150	0.000
	(2) $CS=f(PV, PTR, PEF)$	Null Hypothesis General	2149.013 1673.834 ^a			
	(3) $CS=f(PV, PQ, PTR, PEF)$	Null Hypothesis General	2071.949 1296.767 ^a			
CS3	(1) $CS=f(PQ, PTR, PEF)$	Null Hypothesis General	1505.047 1290.543 ^a	214.504 ^b	150	0.000
	(2) $CS=f(PV, PTR, PEF)$	Null Hypothesis General	1603.402 1337.422 ^a			
	(3) $CS=f(PV, PQ, PTR, PEF)$	Null Hypothesis General	1546.770 1222.091 ^a			

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

^aThe log-likelihood value cannot be further increased after maximum number of step-halving.

^bThe chi-square statistic is computed based on the log-likelihood value of the last iteration of the general model. Validity of the test is uncertain.

^cLink function: Complementary log-log.

regression or through surveying consumers to determine their perceptions of the importance of various components of satisfaction.

Understanding the factors that influence consumer satisfaction can have great value to marketing managers. This value may occur in the form of greater consumer loyalty or greater share of wallet. Marketing managers may find the results of this study applicable to many situations and should keep the results in mind when establishing policies and strategies. For example:

- 1 Marketers should understand that food choice is often influenced more by the psychological interpretation of product properties than the physical properties of products themselves. Perception of food safety risk is one such psychological interpretation, which influences the attitudes and behaviour of consumers with respect to the purchase of food products. Thus, perception of food safety

risk has consequences for both consumer and producer welfare, and the overall effectiveness and efficiency of the food supply chain. This is especially the case where there is considerable divergence between what might be called objective, technical assessments of risk and subjective, psychological assessments of risk. Such divergence may arise because of inadequacy of risk communication systems, as usually happens in developing economies.

- 2 Since there is a natural tendency to concentrate on the things they understand or have control over, marketing managers may spend more time and resources 'fixing' components of satisfaction that are not troublesome to consumers. Managers should guard against this tendency by examining the area that experiences the greatest negative disconfirmation.
- 3 Marketing managers should periodically survey consumers to assess levels of

Table 13: Parameter estimates for CS1 and the 'third model (III)'

		Estimate	Std. error	Wald	d.f.	Sig.	95% confidence interval		
								Lower bound	Upper bound
Threshold	[CS1=1.00]	-6.199	0.420	217.981	1	0.000	-7.022	-5.376	
	[CS1=2.00]	-5.568	0.372	224.011	1	0.000	-6.297	-4.839	
	[CS1=3.00]	-4.756	0.338	198.360	1	0.000	-5.418	-4.094	
	[CS1=4.00]	-4.167	0.324	165.582	1	0.000	-4.802	-3.533	
	[CS1=5.00]	-3.359	0.312	115.727	1	0.000	-3.972	-2.747	
	[CS1=6.00]	-2.118	0.300	49.772	1	0.000	-2.706	-1.530	
Location	[PV1=1.00]	-0.332	0.243	1.865	1	0.172	-0.809	0.145	
	[PV1=2.00]	-0.793	0.277	8.182	1	0.004	-1.337	-0.250	
	[PV1=3.00]	-0.607	0.232	6.838	1	0.009	-1.061	-0.152	
	[PV1=4.00]	-0.321	0.181	3.124	1	0.077	-0.676	0.035	
	[PV1=5.00]	-0.534	0.190	7.846	1	0.005	-0.907	-0.160	
	[PV1=6.00]	-0.335	0.181	3.410	1	0.065	-0.691	0.021	
	[PV1=7.00]	0 ^a			0				
	[PV2=1.00]	-0.882	0.306	8.313	1	0.004	-1.481	-0.282	
	[PV2=2.00]	-1.335	0.316	17.901	1	0.000	-1.954	-0.717	
	[PV2=3.00]	-1.012	0.323	9.845	1	0.002	-1.645	-0.380	
	[PV2=4.00]	-0.709	0.225	9.956	1	0.002	-1.150	-0.269	
	[PV2=5.00]	-0.364	0.188	3.767	1	0.052	-0.732	0.004	
	[PV2=6.00]	-0.281	0.157	3.199	1	0.074	-0.589	0.027	
	[PV2=7.00]	0 ^a			0				
	[PV3=1.00]	-0.564	0.239	5.573	1	0.018	-1.032	-0.096	
	[PV3=2.00]	-0.297	0.282	1.107	1	0.293	-0.850	0.256	
	[PV3=3.00]	-0.799	0.259	9.549	1	0.002	-1.306	-0.292	
	[PV3=4.00]	-0.566	0.238	5.672	1	0.017	-1.032	-0.100	
	[PV3=5.00]	-0.168	0.236	0.506	1	0.477	-0.631	0.295	
	[PV3=6.00]	-0.471	0.227	4.279	1	0.039	-0.916	-0.025	
	[PV3=7.00]	0 ^a			0				
	[PV4=1.00]	-0.031	0.205	0.023	1	0.880	-0.434	0.372	
	[PV4=2.00]	-0.044	0.257	0.029	1	0.865	-0.548	0.460	
	[PV4=3.00]	-0.410	0.245	2.796	1	0.094	-0.890	0.071	
	[PV4=4.00]	-0.006	0.215	0.001	1	0.978	-0.427	0.415	
	[PV4=5.00]	-0.167	0.208	0.642	1	0.423	-0.575	0.241	
	[PV4=6.00]	-0.176	0.190	0.851	1	0.356	-0.548	0.197	
	[PV4=7.00]	0 ^a			0				
	[PV5=1.00]	0.766	0.248	9.525	1	0.002	0.280	1.253	
	[PV5=2.00]	0.526	0.273	3.713	1	0.054	-0.009	1.061	
	[PV5=3.00]	0.561	0.284	3.915	1	0.048	0.005	1.117	
	[PV5=4.00]	0.579	0.277	4.386	1	0.036	0.037	1.121	
	[PV5=5.00]	0.161	0.258	0.390	1	0.532	-0.344	0.666	
	[PV5=6.00]	0.261	0.294	0.785	1	0.376	-0.316	0.837	
	[PV5=7.00]	0 ^a			0				
	[PQ1=1.00]	0.051	0.221	0.053	1	0.819	-0.383	0.485	
	[PQ1=2.00]	0.276	0.258	1.141	1	0.285	-0.230	0.782	
	[PQ1=3.00]	0.045	0.247	0.033	1	0.856	-0.439	0.529	
	[PQ1=4.00]	0.065	0.237	0.075	1	0.784	-0.399	0.529	
	[PQ1=5.00]	0.003	0.214	0.000	1	0.988	-0.417	0.423	
	[PQ1=6.00]	-0.221	0.209	1.116	1	0.291	-0.631	0.189	
	[PQ1=7.00]	0 ^a			0				
[PQ2=1.00]	-0.504	0.241	4.390	1	0.036	-0.976	-0.033		
[PQ2=2.00]	-0.289	0.268	1.167	1	0.280	-0.814	0.235		
[PQ2=3.00]	-0.289	0.273	1.120	1	0.290	-0.823	0.246		
[PQ2=4.00]	-0.503	0.202	6.180	1	0.013	-0.900	-0.106		
[PQ2=5.00]	-0.189	0.209	0.817	1	0.366	-0.600	0.221		
[PQ2=6.00]	-0.138	0.190	0.527	1	0.468	-0.509	0.234		
[PQ2=7.00]	0 ^a			0					
[PQ3=1.00]	-2.313	0.368	39.423	1	0.000	-3.035	-1.591		
[PQ3=2.00]	-1.261	0.365	11.911	1	0.001	-1.977	-0.545		
[PQ3=3.00]	-1.673	0.308	29.441	1	0.000	-2.278	-1.069		
[PQ3=4.00]	-1.394	0.236	34.957	1	0.000	-1.856	-0.932		
[PQ3=5.00]	-1.258	0.201	39.175	1	0.000	-1.652	-0.864		
[PQ3=6.00]	-0.996	0.177	31.599	1	0.000	-1.344	-0.649		

Table 13: Continued

	Estimate	Std. error	Wald	d.f.	Sig.	95% confidence interval	
						Lower bound	Upper bound
[PQ3=7.00]	0 ^a			0			
[PTR1=1.00]	-0.372	0.283	1.732	1	0.188	-0.926	0.182
[PTR1=2.00]	-0.528	0.264	4.009	1	0.045	-1.045	-0.011
[PTR1=3.00]	-0.461	0.248	3.465	1	0.063	-0.946	0.024
[PTR1=4.00]	-0.637	0.236	7.285	1	0.007	-1.099	-0.174
[PTR1=5.00]	-0.552	0.216	6.509	1	0.011	-0.977	-0.128
[PTR1=6.00]	-0.399	0.198	4.042	1	0.044	-0.787	-0.010
[PTR1=7.00]	0 ^a			0			
[PEF1=1.00]	0.047	0.251	0.035	1	0.851	-0.444	0.539
[PEF1=2.00]	0.400	0.260	2.358	1	0.125	-0.110	0.910
[PEF1=3.00]	0.537	0.256	4.404	1	0.036	.035	1.038
[PEF1=4.00]	0.636	0.224	8.029	1	0.005	0.196	1.075
[PEF1=5.00]	0.105	0.199	0.275	1	0.600	-0.286	0.496
[PEF1=6.00]	0.130	0.195	0.447	1	0.504	-0.251	0.512
[PEF1=7.00]	0 ^a			0			

Link function: Complementary log-log.

^aThis parameter is set to zero because it is redundant.

satisfaction. Of course, loyal consumers need to be satisfied but to the extent that factors influencing satisfaction differ between loyal and non-loyal consumers, concentrating on only the components of satisfaction important to loyal consumers will tend to ignore those components important to non-loyal consumers, to the extent that they differ.

- 4 Training should be provided to the employees at a store level, who are often the only face from the supplier that consumers see. Employees need to recognise signs of dissatisfaction before they run out of control and the employees need to be trained to (a) probe to find out the basis for the dissatisfaction, and (b) report those finding quickly to managers. If employees are penalised for reporting 'bad news', their tendency will be to hide that news until it can no longer be contained.

The results of this study demonstrate that the component manifesting the lowest level of satisfaction is cause for concern for marketers since it serves as a lower bound for overall satisfaction; decreased overall satisfaction, in turn, is correlated with decreased purchase and repurchase intention.

Limitations

The limitations of the study should be kept in mind when interpreting the results. First, national surveys raise the fundamental question with respect to ethnic identity: 'is it possible to study ethnic identity in general terms, or because each group setting is unique, must each be studied separately?' (Phinney³⁶, p. 507). This question raises important and obvious practical and theoretical issues for social science researchers with respect to the impact of ethnicity and, more precisely, changing ethnicity, on various outcomes (eg, acculturative stress in Berry and Annis³⁷).

What some consider an outcome of ethnic identity remains for others a component or factor of ethnic identity. This is quite evident in the case of food consumption. As consumer behaviour researchers, our ultimate interest lies in the antecedent and consequent conditions to consumption behaviour. Marketing research in the area of changing ethnicity has therefore portrayed consumption as a consequence of varying levels of ethnic identity and/or acculturation. It has tended to not include such occurrences as ethnic food consumption in models of ethnic identity and acculturation. On the other hand, psychologists and sociologists have

Table 14: Parameter estimates for CS2 and the 'third model (III)'

		Estimate	Std. error	Wald	d.f.	Sig.	95% Confidence interval	
							Lower Bound	Upper Bound
Threshold	[CS2=1.00]	-4.915	0.318	239.039	1	0.000	-5.538	-4.292
	[CS2=2.00]	-4.298	0.296	211.516	1	0.000	-4.878	-3.719
	[CS2=3.00]	-3.882	0.286	184.487	1	0.000	-4.443	-3.322
	[CS2=4.00]	-3.373	0.278	147.646	1	0.000	-3.917	-2.829
	[CS2=5.00]	-2.741	0.271	102.647	1	0.000	-3.271	-2.211
	[CS2=6.00]	-1.622	0.261	38.748	1	0.000	-2.133	-1.111
Location	[PV1=1.00]	-0.494	0.207	5.674	1	0.017	-0.900	-0.087
	[PV1=2.00]	-0.365	0.260	1.965	1	0.161	-0.874	0.145
	[PV1=3.00]	-0.358	0.215	2.769	1	0.096	-0.781	0.064
	[PV1=4.00]	-0.422	0.161	6.869	1	0.009	-0.737	-0.106
	[PV1=5.00]	-0.271	0.176	2.380	1	0.123	-0.615	0.073
	[PV1=6.00]	-0.317	0.162	3.815	1	0.051	-0.634	0.001
	[PV1=7.00]	0 ^a			0			
	[PV2=1.00]	-0.490	0.277	3.129	1	0.077	-1.033	0.053
	[PV2=2.00]	-0.569	0.306	3.461	1	0.063	-1.169	0.030
	[PV2=3.00]	-0.243	0.313	0.600	1	0.438	-0.857	0.371
	[PV2=4.00]	-0.417	0.205	4.128	1	0.042	-0.819	-0.015
	[PV2=5.00]	-0.250	0.168	2.202	1	0.138	-0.580	0.080
	[PV2=6.00]	-0.149	0.141	1.104	1	0.293	-0.426	0.128
	[PV2=7.00]	0 ^a			0			
	[PV3=1.00]	-0.509	0.204	6.245	1	0.012	-0.909	-0.110
	[PV3=2.00]	-0.316	0.239	1.740	1	0.187	-0.784	0.153
	[PV3=3.00]	-0.433	0.230	3.556	1	0.059	-0.883	0.017
	[PV3=4.00]	-0.242	0.207	1.376	1	0.241	-0.647	0.162
	[PV3=5.00]	0.018	0.204	0.008	1	0.930	-0.382	0.418
	[PV3=6.00]	-0.289	0.199	2.100	1	0.147	-0.680	0.102
	[PV3=7.00]	0 ^a			0			
	[PV4=1.00]	0.065	0.181	0.127	1	0.721	-0.291	0.420
	[PV4=2.00]	-0.379	0.223	2.894	1	0.089	-0.816	0.058
	[PV4=3.00]	-0.410	0.224	3.364	1	0.067	-0.849	0.028
	[PV4=4.00]	-0.508	0.184	7.595	1	0.006	-0.869	-0.147
	[PV4=5.00]	-0.145	0.191	0.576	1	0.448	-0.519	0.229
	[PV4=6.00]	-0.206	0.174	1.403	1	0.236	-0.547	0.135
	[PV4=7.00]	0 ^a			0			
	[PV5=1.00]	0.303	0.229	1.747	1	0.186	-0.146	0.752
	[PV5=2.00]	0.245	0.254	0.932	1	0.334	-0.253	0.743
	[PV5=3.00]	0.277	0.265	1.094	1	0.296	-0.242	0.797
	[PV5=4.00]	0.188	0.255	0.543	1	0.461	-0.312	0.688
	[PV5=5.00]	-0.139	0.240	0.334	1	0.563	-0.610	0.332
	[PV5=6.00]	0.142	0.282	0.254	1	0.615	-0.410	0.694
	[PV5=7.00]	0 ^a			0			
	[PQ1=1.00]	-0.072	0.196	0.136	1	0.712	-0.456	0.311
	[PQ1=2.00]	-0.290	0.228	1.621	1	0.203	-0.736	0.156
	[PQ1=3.00]	-0.574	0.219	6.861	1	0.009	-1.004	-0.145
	[PQ1=4.00]	-0.462	0.210	4.868	1	0.027	-0.873	-0.052
	[PQ1=5.00]	-0.459	0.191	5.771	1	0.016	-0.833	-0.084
	[PQ1=6.00]	-0.120	0.191	0.394	1	0.530	-0.494	0.254
	[PQ1=7.00]	0 ^a			0			
[PQ2=1.00]	-0.438	0.212	4.278	1	0.039	-0.853	-0.023	
[PQ2=2.00]	-0.044	0.245	0.033	1	0.856	-0.525	0.436	
[PQ2=3.00]	-0.371	0.239	2.411	1	0.120	-0.840	0.097	
[PQ2=4.00]	-0.176	0.187	0.881	1	0.348	-0.543	0.191	
[PQ2=5.00]	0.101	0.191	0.281	1	0.596	-0.273	0.475	
[PQ2=6.00]	-0.118	0.169	0.492	1	0.483	-0.449	0.212	
[PQ2=7.00]	0 ^a			0				
[PQ3=1.00]	-2.067	0.342	36.434	1	0.000	-2.738	-1.396	
[PQ3=2.00]	-1.680	0.313	28.795	1	0.000	-2.293	-1.066	
[PQ3=3.00]	-1.295	0.282	21.069	1	0.000	-1.848	-0.742	
[PQ3=4.00]	-1.287	0.206	39.080	1	0.000	-1.690	-0.883	
[PQ3=5.00]	-0.912	0.176	26.912	1	0.000	-1.256	-0.567	
[PQ3=6.00]	-0.739	0.148	24.744	1	0.000	-1.030	-0.448	

Table 14: Continued

		Estimate	Std. error	Wald	d.f.	Sig.	95% Confidence interval	
							Lower Bound	Upper Bound
	[PQ3=7.00]	0 ^a			0			
	[PTR1=1.00]	0.151	0.250	0.368	1	0.544	-0.338	0.641
	[PTR1=2.00]	0.118	0.241	0.239	1	0.625	-0.354	0.589
	[PTR1=3.00]	-0.101	0.222	0.207	1	0.649	-0.536	0.334
	[PTR1=4.00]	0.175	0.216	0.658	1	0.417	-0.248	0.599
	[PTR1=5.00]	0.024	0.198	0.014	1	0.905	-0.364	0.411
	[PTR1=6.00]	-0.097	0.174	0.313	1	0.576	-0.439	0.244
	[PTR1=7.00]	0 ^a			0			
	[PEF1=1.00]	-0.100	0.218	0.210	1	0.647	-0.527	0.328
	[PEF1=2.00]	0.159	0.236	0.457	1	0.499	-0.303	0.621
	[PEF1=3.00]	-0.094	0.223	0.179	1	0.672	-0.531	0.342
	[PEF1=4.00]	0.154	0.196	0.613	1	0.434	-0.231	0.538
	[PEF1=5.00]	0.056	0.181	0.094	1	0.759	-0.300	0.411
	[PEF1=6.00]	-0.065	0.174	0.137	1	0.711	-0.407	0.277
	[PEF1=7.00]	0 ^a			0			

Link function: Complementary log-log.

^aThis parameter is set to zero because it is redundant.

Table 15: Parameter estimates for CS3 and the 'third model (III)'

		Estimate	Std. error	Wald	d.f.	Sig.	95% Confidence interval	
							Lower bound	Upper bound
Threshold	[CS3=1.00]	-6.197	0.428	209.301	1	0.000	-7.037	-5.358
	[CS3=2.00]	-5.530	0.390	200.558	1	0.000	-6.295	-4.765
	[CS3=3.00]	-4.889	0.369	175.276	1	0.000	-5.613	-4.165
	[CS3=4.00]	-4.261	0.356	142.872	1	0.000	-4.960	-3.562
	[CS3=5.00]	-3.590	0.347	106.949	1	0.000	-4.271	-2.910
	[CS3=6.00]	-2.597	0.336	59.640	1	0.000	-3.256	-1.938
Location	[PV1=1.00]	-0.987	0.262	14.240	1	0.000	-1.499	-0.474
	[PV1=2.00]	-0.688	0.311	4.893	1	0.027	-1.298	-0.078
	[PV1=3.00]	-1.052	0.255	16.961	1	0.000	-1.552	-0.551
	[PV1=4.00]	-0.898	0.205	19.097	1	0.000	-1.301	-0.495
	[PV1=5.00]	-1.062	0.216	24.242	1	0.000	-1.484	-0.639
	[PV1=6.00]	-0.950	0.207	21.009	1	0.000	-1.356	-0.544
	[PV1=7.00]	0 ^a			0			
	[PV2=1.00]	-1.800	0.300	36.004	1	0.000	-2.388	-1.212
	[PV2=2.00]	-1.163	0.349	11.082	1	0.001	-1.847	-0.478
	[PV2=3.00]	-1.112	0.342	10.554	1	0.001	-1.782	-0.441
	[PV2=4.00]	-0.847	0.246	11.862	1	0.001	-1.329	-0.365
	[PV2=5.00]	-0.597	0.207	8.342	1	0.004	-1.001	-0.192
	[PV2=6.00]	-0.283	0.182	2.423	1	0.120	-0.639	0.073
	[PV2=7.00]	0 ^a			0			
	[PV3=1.00]	-0.260	0.261	0.992	1	0.319	-0.771	0.252
	[PV3=2.00]	-0.663	0.298	4.954	1	0.026	-1.246	-0.079
	[PV3=3.00]	-0.453	0.279	2.636	1	0.104	-0.999	0.094
	[PV3=4.00]	-0.093	0.259	0.128	1	0.721	-0.601	0.416
	[PV3=5.00]	0.085	0.252	0.114	1	0.736	-0.408	0.578
	[PV3=6.00]	-0.029	0.253	0.014	1	0.907	-0.525	0.466
	[PV3=7.00]	0 ^a			0			
	[PV4=1.00]	-0.416	0.228	3.328	1	0.068	-0.862	0.031
	[PV4=2.00]	-0.121	0.291	0.174	1	0.677	-0.691	0.449
	[PV4=3.00]	-0.093	0.278	0.112	1	0.737	-0.638	0.452
	[PV4=4.00]	-0.299	0.234	1.629	1	0.202	-0.758	0.160
	[PV4=5.00]	-0.307	0.231	1.763	1	0.184	-0.760	0.146
	[PV4=6.00]	-0.024	0.222	0.012	1	0.914	-0.458	0.411
	[PV4=7.00]	0 ^a			0			
	[PV5=1.00]	1.012	0.265	14.562	1	0.000	.492	1.532

Table 15: Continued

	Estimate	Std. error	Wald	d.f.	Sig.	95% Confidence interval	
						Lower bound	Upper bound
[PV5=2.00]	1.071	0.302	12.565	1	0.000	.479	1.663
[PV5=3.00]	0.943	0.310	9.243	1	0.002	.335	1.551
[PV5=4.00]	0.625	0.295	4.490	1	0.034	.047	1.203
[PV5=5.00]	0.178	0.269	0.438	1	0.508	-0.350	0.707
[PV5=6.00]	0.345	0.316	1.195	1	0.274	-0.274	0.964
[PV5=7.00]	0 ^a			0			
[PQ1=1.00]	-0.120	0.250	0.230	1	0.632	-0.610	0.370
[PQ1=2.00]	-0.153	0.276	0.305	1	0.581	-0.694	0.389
[PQ1=3.00]	-0.093	0.266	0.124	1	0.725	-0.614	0.427
[PQ1=4.00]	-0.300	0.252	1.409	1	0.235	-0.794	0.195
[PQ1=5.00]	0.039	0.245	0.026	1	0.873	-0.440	0.519
[PQ1=6.00]	-0.278	0.240	1.339	1	0.247	-0.748	0.193
[PQ1=7.00]	0 ^a			0			
[PQ2=1.00]	0.070	0.284	0.060	1	0.806	-0.487	0.626
[PQ2=2.00]	-0.257	0.292	0.773	1	0.379	-0.830	0.316
[PQ2=3.00]	-0.765	0.285	7.189	1	0.007	-1.325	-0.206
[PQ2=4.00]	-0.896	0.221	16.465	1	0.000	-1.329	-0.463
[PQ2=5.00]	-0.402	0.228	3.103	1	0.078	-0.850	0.045
[PQ2=6.00]	-0.257	0.218	1.394	1	0.238	-0.683	0.170
[PQ2=7.00]	0 ^a			0			
[PQ3=1.00]	-1.475	0.398	13.719	1	0.000	-2.256	-0.695
[PQ3=2.00]	-1.619	0.355	20.750	1	0.000	-2.315	-0.922
[PQ3=3.00]	-0.510	0.368	1.929	1	0.165	-1.231	0.210
[PQ3=4.00]	-0.924	0.250	13.701	1	0.000	-1.414	-0.435
[PQ3=5.00]	-0.804	0.216	13.794	1	0.000	-1.228	-0.380
[PQ3=6.00]	-0.498	0.193	6.670	1	0.010	-0.877	-0.120
[PQ3=7.00]	0 ^a			0			
[PTR1=1.00]	-0.176	0.340	0.270	1	0.604	-0.842	0.489
[PTR1=2.00]	-0.570	0.286	3.987	1	0.046	-1.130	-0.011
[PTR1=3.00]	-0.511	0.264	3.762	1	0.052	-1.028	0.005
[PTR1=4.00]	-0.266	0.265	1.006	1	0.316	-0.786	0.254
[PTR1=5.00]	-0.248	0.242	1.055	1	0.304	-0.722	0.225
[PTR1=6.00]	-0.236	0.223	1.125	1	0.289	-0.672	0.200
[PTR1=7.00]	0 ^a			0			
[PEF1=1.00]	-0.282	0.283	0.989	1	0.320	-0.836	0.273
[PEF1=2.00]	-0.244	0.290	0.708	1	0.400	-0.811	0.324
[PEF1=3.00]	0.048	0.281	0.030	1	0.863	-0.502	0.599
[PEF1=4.00]	-0.014	0.245	0.003	1	0.956	-0.494	0.467
[PEF1=5.00]	-0.052	0.237	0.048	1	0.827	-0.516	0.412
[PEF1=6.00]	-0.304	0.223	1.864	1	0.172	-0.740	0.132
[PEF1=7.00]	0 ^a			0			

Link function: Complementary log-log.

^aThis parameter is set to zero because it is redundant.

tended to be quite exhaustive in terms of the dimensions they have included in their models of ethnic identity and various models have been proposed which are partly based on food consumption/preference (see Phinney³⁶). These models do tend to vary from group to group and are based on the salient features of a particular ethnic group. From a marketing standpoint and from the perspective of researchers interested in studying ethnicity outcomes in a cross-cultural perspective or in a multicultural

context, it is therefore desirable and practical to develop a multidimensional model of ethnic identity that is general rather than specific and therefore applicable to a variety of ethnic groups. Such a model would enable cross-cultural comparability with respect to the differential impact of ethnic identity dimensions on outcome variables.

Second, while Drolet and Morrison³⁸ report that single item measures are commonly used in satisfaction research and are reliable, single item measures may not

fully capture the importance or emotion being measured. This study utilised single item measures for all components of satisfaction and for overall satisfaction. Second, three components of satisfaction (CS1, CS2 and CS3) are analysed in this analysis; these three components may not represent the full range of components that consumers evaluate when making overall satisfaction judgments.

CONCLUSION

Satisfied consumers represent 'an indispensable means of creating a sustainable advantage in the competitive environment of the 1990s'.³⁴ Highly satisfied consumers spread positive word of mouth, demonstrate readier acceptance of other products in the product line and exhibit brand loyalty or increased intentions to purchase and repurchase.^{39,40} Patterson *et al.*³⁴ find a strong link between customer satisfaction and repurchase intention, with consumer satisfaction explaining 78 per cent of the variance in repurchase intention. Thus, the investigation of overall consumer satisfaction has important managerial implications regarding to the consumer strategy management at a store level.

Acknowledgments

We would like to thank the anonymous reviewers and our colleagues from the Department of Agribusiness Management of the University of Ioannina for their detailed contributory comments.

References

- Tomlison, M. (1994) 'Do distinct class preferences for foods exist?: An analysis of class-based tastes', *British Food Journal*, Vol. 96, No. 7, pp. 11–17.
- Bearden, W. O. and Teel, J. E. (1983) 'Selected determinants of consumer satisfaction and complaint reports', *Journal of Marketing Research*, Vol. 20(February), pp. 21–28.
- Bolton, R. N. and Drew, J. H. (1991) 'A multistage model of customers' assessments of service quality and value', *Journal of Consumer Research*, Vol. 17, No. 4, pp. 375–384.
- Boulding, W., Kalra, A., Staelin, R. and Zeithaml, V. A. (1993) 'A dynamic process model of service quality: From expectations to behavioral intentions', *Journal of Marketing Research*, Vol. 30, No. 1, pp. 7–27.
- Cadotte, E. R., Woodruff, R. B. and Jenkins, R. L. (1987) 'Expectations and norms in models of consumer satisfaction', *Journal of Marketing Research*, Vol. 24, No. 3, pp. 305–314.
- Oliver, R. L. (1980) 'A cognitive model of the antecedents and consequences of satisfaction decisions', *Journal of Marketing Research*, Vol. 17(November), pp. 460–469.
- Oliver, R. L. and Bearden, W. O. (1985) 'Disconfirmation processes and consumer evaluations in product usage', *Journal of Business Research*, Vol. 13, pp. 235–246.
- Mai, L. W. and Ness, M. R. (1999) 'Canonical correlation analysis of customer satisfaction and future purchase of mail-order speciality food', *British Food Journal*, Vol. 101, No. 11, pp. 857–870.
- Connor, R. (1999) 'Is healthy eating only for the young?' *Nutrition & Food Science*, Vol. 99, No. 1, pp. 12–18.
- Liljander, V. and Strandvik, T. (1995) 'The nature of customer relationships in services' in: Swarz, T.A., Brown, D.E. and Brown, S.W. (Eds.) 'Advances in services marketing and management', Vol. 4, JAI Press, Greenwich, CT, pp. 141–167.
- Storbacka, K., Strandvik, T. and Grönroos, C. (1994) 'Managing customer relationships for profit: the dynamics of relationship quality', *International Journal of Service Industry Management*, Vol. 5, No. 5, pp. 21–38.
- Andreassen, T. W. and Lindestad, B. (1998) 'Customer loyalty and complex services', *International Journal of Service Industry Management*, Vol. 9, No. 1, pp. 7–23.
- Anderson, E. W. and Sullivan, M. W. (1993) 'The antecedents and consequences satisfaction for firms', *Marketing Science*, Vol. 12, No. 2, pp. 125–143.
- Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J. and Bryant, B. E. (1996) 'The American customer satisfaction index: Nature, purpose and findings', *Journal of Marketing*, Vol. 60(October), pp. 7–18.
- Spreng, R. A. and Mackoy, R. D. (1996) 'An empirical examination of a model of perceived service quality and satisfaction', *Journal of Retailing*, Vol. 72, No. 2, pp. 201–214.
- Sanzo, M. J., Belen del Rio, A., Iglesias, V. and Vazquez, R. (2003) 'Attitude and satisfaction in a traditional food product', *British Food Journal*, Vol. 105, No. 11, pp. 771–790.
- Frewer, L. (1997) 'Risk perception, social trust and public participation in strategic decision making: Implications for emerging technologies', *Ambio*, Vol. 28, No. 6, pp. 569–574.
- Steenkamp, J. B. E. M. (1989) 'Product quality: An investigation into the concept and how it is perceived by consumers', Van Gorcum Assen, Maastricht.
- Kyriakopoulos, K. and Oude Ophuis, P. A. M. (1997) 'A pre-purchase model of consumer choice for biological foodstuff', *Journal of International Food & Agribusiness Marketing*, Vol. 8, No. 4, pp. 37–53.

- 20 Becker, T. (2000) 'Consumer perception of fresh meat quality: A framework for analysis', *British Food Journal*, Vol. **102**, No. 3, pp. 158–176.
- 21 Frewer, L. and Shepherd, R. (1998) 'Consumer perceptions of modern food biotechnology' in: Roller, S. and Harlander, S. (Eds.) 'Genetic modification in the food industry', Blackie Academic and Professional, London.
- 22 Rozin, P., Pelchat, M. L. and Fallon, A. E. (1986) 'Psychological factors influencing food choice' in: Ritson, C., Gofton, L. and McKenzie, J. (Eds.) 'The food consumer', John Wiley & Sons Ltd., Chichester and New York, pp. 85–106.
- 23 Reijnders, L. (2004) 'Food safety, environmental improvement and economic efficiency in The Netherlands', *British Food Journal*, Vol. **106**, No. 5, pp. 388–405.
- 24 Szmigielski, S. and Sobiczewska, E. (2000) 'Cellular phone systems and human health — Problems with risk perception and communication', *Environmental Management and Health*, Vol. **11**, No. 4, pp. 352–368.
- 25 Tynan, C. A. and Drayton, J. L. (1988) 'Conducting focus groups — A guide for first time users', *Marketing Intelligence and Planning*, Vol. **6**, No. 1, pp. 5–9.
- 26 Grabowski, M., Massey, A. P. and Wallace, W. A. (1992) 'Focus groups as a group knowledge acquisition technique', *Knowledge Acquisition*, Vol. **4**, pp. 407–425.
- 27 Cox, D. R. and Snell, E. J. (1989) 'Analysis of binary data' 2nd edition, Chapman & Hall, London.
- 28 Nagelkerke, N. J. D. (1991) 'A note on a general definition of the coefficient of determination', *Biometrika*, Vol. **78**, No. 3, pp. 691–692.
- 29 McFadden, D. (1973) 'Conditional logit analysis of qualitative choices behavior' in: Zarembka, P. (Ed.) 'Frontiers in econometrics', John Wiley, New York, pp. 105–135.
- 30 Spreng, R. A., MacKenzie, S. B. and Olshavsky, R. W. (1996) 'A reexamination of the determinants of consumer satisfaction', *Journal of Marketing*, Vol. **60**, pp. 15–32.
- 31 Swan, J. E. and Oliver, R. L. (1991) 'Applied analysis of buyer equity perceptions and satisfaction with automobile salespeople', *Journal of Personal Selling and Sales Management*, Vol. **XI**, No. 2, pp. 15–26.
- 32 Oliver, R. L. and Swan, J. E. (1989) 'Equity and disconfirmation perceptions as influences on merchant and product satisfaction', *Journal of Consumer Research*, Vol. **16**(December), pp. 372–383.
- 33 Churchill, G. and Suprenant, C. (1982) 'An investigation into the determinants of customer satisfaction', *Journal of Marketing Research*, Vol. **19**(November), pp. 491–504.
- 34 Patterson, P. G., Johnson, L. W. and Spreng, R. A. (1997) 'Modeling the determinants of customer satisfaction for business-to-business professional services', *Journal of the Academy of Marketing Science*, Vol. **25**, No. 1, pp. 4–17.
- 35 Olshavsky, R. N. and Spreng, R. A. (1989) 'A desires as standard model of consumer satisfaction', *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, Vol. **2**, pp. 49–54.
- 36 Phinney, J. S. (1990) 'Ethnic identity in adolescents and adults: Review of research', *Psychological Bulletin*, Vol. **108**, No. 3, pp. 499–514.
- 37 Berry, J. W. and Annis, R. C. (1974) 'Acculturative stress: The role of ecology, culture and differentiation', *Journal of Cross-Cultural Psychology*, Vol. **5**, pp. 382–406.
- 38 Drolet, A. L. and Morrison, D. G. (2001) 'Do we really need multiple-item measures in service research?' *Journal of Service Research*, Vol. **3**, No. 3, pp. 196–204.
- 39 Rogers, H. P., Peyton, R. M. and Berl, R. L. (1992) 'Measurement and evaluation of satisfaction processes in a dyadic setting', *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, Vol. **5**, pp. 12–23.
- 40 Grewal, D. and Sharma, A. (1991) 'The effect of salesforce behavior on customer satisfaction: An interactive framework', *Journal of Personal Selling and Sales Management*, Vol. **9**, No. 3, pp. 13–23.

Appendix A

Frequencies for the tested variables

			Totally disagree 1	2	3	4	5	6	Totally agree 7
<i>Consumer satisfaction</i>	(CS1) 'I always purchase the particular brand when I am satisfied with it.'	Frequency	12	10	25	32	76	207	437
		Per cent	1.5	1.3	3.1	4.0	9.5	25.9	54.6
	(CS2) 'Purchasing the particular brand depends on the comparison between brand expectation and its performance.'	Frequency	33	26	27	48	90	220	354
		Per cent	4.1	3.3	3.4	6.0	11.3	27.5	44.3
	(CS3) 'I will purchase the particular brand if I am totally satisfied with it.'	Frequency	15	13	22	35	61	143	511
		Per cent	1.9	1.6	2.8	4.4	7.6	17.9	63.9
<i>Perceived value</i>	(PV1) 'I purchase the particular brand because it is good to my health.'	Frequency	55	28	46	110	100	108	353
		Per cent	6.9	3.5	5.8	13.8	12.5	13.5	44.1
	(PV2) 'I purchase the particular brand because I like the taste.'	Frequency	33	20	19	54	97	182	395
		Per cent	4.1	2.5	2.4	6.8	12.1	22.8	49.4
	(PV3) 'I purchase the particular brand because its use is convenient to me.'	Frequency	150	67	66	114	137	119	146
		Per cent	18.8	8.4	8.3	14.3	17.1	14.9	18.3
	(PV4) 'I purchase the particular brand because of its low price compared to other brands.'	Frequency	165	59	57	104	102	115	198
		Per cent	20.6	7.4	7.1	13.0	12.8	14.4	24.8
	(PV5) 'I purchase the particular brand because I like a lot its design (shape, colour, size, etc.).'	Frequency	291	94	90	108	107	51	55
		Per cent	36.4	11.8	11.3	13.5	13.4	6.4	6.9
<i>Perceived quality</i>	(PQ1) 'When I am going to purchase the particular brand I take into serious consideration the intangible ingredients (such as hormones and antibiotics) that contains.'	Frequency	124	63	61	83	88	113	266
		Per cent	15.5	7.9	7.6	10.4	11.0	14.1	33.3
	(PQ2) 'When I am going to purchase the particular brand I take into serious consideration the available information about the product (i.e. label).'	Frequency	71	44	43	90	95	140	315
		Per cent	8.9	5.5	5.4	11.3	11.9	17.5	39.4
	(PQ3) 'When I am going to purchase the particular brand I take into serious consideration my previous experience on this product.'	Frequency	15	18	24	65	119	256	302
		Per cent	1.9	2.3	3.0	8.1	14.9	32.0	37.8
<i>Perceived technological risk</i>	(PTR1) 'When I am going to purchase the particular brand I take into serious consideration the way that the product is produced and processed (for example, use of antibiotics and hormones, animal welfare, hygiene standards).'	Frequency	65	53	61	83	88	119	330
		Per cent	8.1	6.6	7.6	10.4	11.0	14.9	41.3
<i>Perceived environmental friendliness</i>	(PEF1) 'When I am going to purchase the particular brand I take into serious consideration the environmental friendliness of its production and process (i.e. risk of environmental pollution, prudent use of natural resources).'	Frequency	79	61	60	110	114	131	245
		Per cent	9.9	7.6	7.5	13.8	14.3	16.4	30.6