

A classification of Italian consumers based on a proposed measure of their attitudes towards food risks

Proposta di una misura dell'atteggiamento verso il rischio alimentare in grado di classificare i consumatori italiani

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Abstract. This paper aims to propose a measure of Italian consumers' attitudes towards food risks in order to distinguish *self-protective* consumers from *non-self-protective* consumers towards food risks. Through the survey method CATI (Computer Assisted Telephone Interviewing) a sample of 1,000 consumers, representative of the Italian population, was interviewed on the issues of risk perception and eating habits in general. Factor analysis combined into a single factor three variables: the consumers' propensity to read the label when buying a food product for the first time, the propensity to seek food-related information and the perceived level of exposure to food-borne diseases. This technique has allowed us to define the attitudes of Italian consumers towards food risks. The identification of characteristics that distinguish *self-protective* consumers from *non-self-protective* consumers represent important information for the authorities concerned to reduce exposure of consumers to food risks.

Abstract. *Il presente paper vuole proporre una misura dell'atteggiamento dei consumatori italiani nei confronti del rischio alimentare al fine di distinguerli in consumatori protettivi e consumatori non protettivi. Il metodo CATI (Computer*

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Assisted Telephone Interviewing) ha permesso di intervistare un campione rappresentativo della popolazione italiana composto da 1,000 consumatori sulla percezione del rischio e sulle abitudini alimentari in generale. Attraverso l'analisi fattoriale le variabili "propensione dei consumatori a leggere l'etichetta di un nuovo prodotto", "propensione ad informarsi sulle questioni alimentari" e "percezione del rischio di contrarre un'infezione alimentare", sono state combinate in un unico fattore. L'identificazione delle caratteristiche che distinguono i consumatori protettivi da quelli non protettivi costituiscono importanti informazioni per le autorità che mirano a ridurre l'esposizione dei consumatori ai rischi alimentari.

Key words: factor analysis, logistic regression, attitude towards food risks, Italian consumers' profiles.

1 Introduction

What are Italian consumers' attitudes towards food risks? What characteristics distinguish consumers with more self-protective attitudes towards food risks from those with less self-protective attitudes?

Providing accurate information on food risks, while avoiding unjustified alarmism, is not easy. Classifying consumers based on their attitudes and identifying the distinctive socio-demographic and behavioural characteristics of each consumer group is crucial for national and international health authorities to effectively target communication campaigns (Ministry of Health, EFSA – *European Food Safety Authority*, Istituti Zooprofilattici¹). Individual characteristics such as level of knowledge, behaviours and lifestyles, as well as socio-demographic characteristics, translate into different information needs and responses to communication [1]. Information tends to be more efficient and effective when it meets the target's specific needs and requests [2].

The present paper proposes to measure Italian consumers' attitudes towards food risks as a combination of the following variables:

- propensity to read the label when buying a food product for the first time;
- propensity to seek food-related information;
- perceived level of exposure to food-borne diseases.

Since it is not possible to define the direction of the correlation of the three variables, it is proposed to consider them as a whole: are some consumers more inclined to seek information and read food labels because of their higher risk perception, or is their higher risk perception a result of increasingly available information?

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The analyses performed aimed to classify consumers in terms of their attitudes towards risks and then to identify the characteristics that distinguish consumers with more self-protective attitudes from those with less self-protective attitudes.

2 Methodology

Data were collected through a national CATI (Computer Assisted Telephone Interviewing) survey conducted between June 6 and June 14, 2011 on a sample of 1,000 (I.C. 95%, +3.2%) Italian consumers. The sample was asked 37 questions on a wide range of subjects to investigate their habits, level of knowledge and views about food products and food-related risks. The sample, which was representative of the Italian population, was selected and stratified by gender, age, geographical area and size of the city of residence on the basis of data about the distribution of the Italian population provided by Italy's National Institute of Statistics, ISTAT [3].

Questions were selected from the existing literature [4, 5]. Only some of the investigated topics were included in the present study: risk perception, food purchasing behaviours, information seeking, attitude to cooking and eating, scientific knowledge and social and personal data.

The perceived level of exposure to food-borne diseases was measured by asking respondents to score their response to the following question on a scale of 1 (minimum) to 10 (maximum): "How exposed do you feel to the risk of food-borne disease?". Propensity to read food labels was assessed by asking: "When buying a food product for the first time, how often do you read the label seeking additional information besides the use-by date?" (Available responses: Always; Often; Seldom; Never). Finally, propensity to seek food-related information was probed with this question: "How frequently have you sought information about food-related issues in the past year?" (Available responses: Often; Sometimes; Seldom; Never).

As regards attitude to cooking and eating and food purchasing behaviours, respondents were asked, how often they ate out for either lunch or dinner (available responses: Every day; A few times a week; Never) and how often they shopped for food during the week (available responses: Every day; A few times a week). Finally, to investigate respondents' use of potential food-related information sources, the following question was asked: "What is your main source of food safety information?" (Mass media-radio/TV/newspapers; Internet; Specialist books/magazines; Family and friends; GP).

In order to assess respondents' knowledge of chemical and microbiological risks associated with food, a variable was developed which calculated, for each respondent, the number of correct answers to 7 "True/False/Don't know" items, thus providing a score range from 0 to 7. The variable was then divided into the following categories: good level of knowledge (score of 6 or higher), poor (score of between 3 and 5) and very poor (score of 2 or lower). The *self-assessed knowledge* variable (corresponding to the question: "How would you score your knowledge about food safety? Please use a scale of 1 to 10, where 1 is *poor* and 10 is *very*

good”) was divided into the following categories: excellent (score of 8 or higher), good (score of between 6 and 7) and poor (score of 5 or lower).

2.1 Statistical analyses

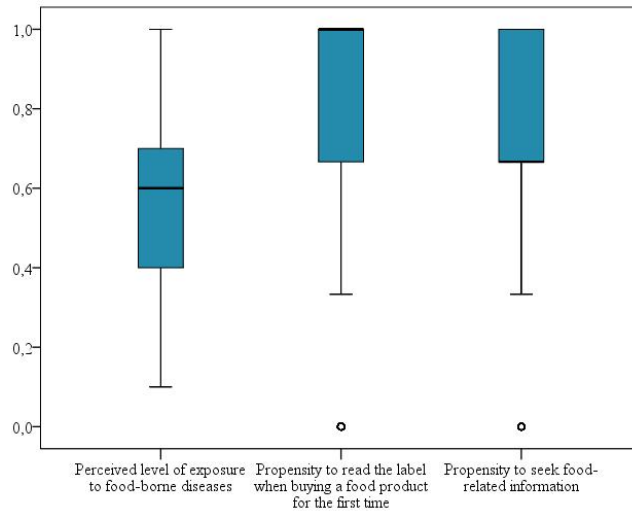
Correlations between the three variables (“propensity to read the label when buying a food product for the first time”, “propensity to seek food-related information” and “perceived level of exposure to food-borne diseases”) were investigated further using the Spearman correlation coefficient. The variables were combined into a single factor, “*attitude towards food risks*”, through factor analysis, which is often used as a method for grouping variables according to a similar correlation pattern [6]. On the basis of this new variable, *self-protective* and *non-self-protective* consumers were identified. Logistic regression analysis provided a description of the two groups of consumers in terms of their socio-demographic characteristics, behaviours, etc.

Data were processed using the SPSS (Statistical Package for Social Science) software (version 20.0) for Windows (SPSS Inc. Chicago, Illinois). The level of statistical significance was set at 5% ($\alpha=0.05$).

3 Results

The Spearman correlation coefficient allowed measuring the strength of the association between the three variables. The variables had been recoded into a 0-1 scale, where “0” indicates no propensity to seek food-related information or read food labels and no perceived risk of food-borne disease, while “1” indicates the highest propensity to seek food-related information and read labels and the highest perceived risk. Figure 1 shows the distribution of the recoded variables.

Figure 1: Distribution of the variables “perceived level of exposure to food-borne diseases”, “propensity to read food labels” and “propensity to seek information” recoded into a 0-1 scale.



The values in Table 1 show a strong correlation between the variables, which seems to confirm the assumption that the variables are all related to the same underlying (or latent) factor.

Table 1: strength of the association, measured using the Spearman correlation coefficient, between the three variables (propensity to read food labels when buying a food product for the first time, propensity to seek food-related information, and perceived level of exposure to food-borne diseases) recoded into a 0-1 scale.

		<i>Perceived level of exposure to food-borne diseases</i>	<i>Propensity to read the label when buying a food product for the first time</i>	<i>Propensity to seek food-related information</i>
Perceived level of exposure to food-borne diseases	Coefficient		.089	.179
	p		.005***	.000***
	N		1000	1000
Propensity to read the label when buying a food product for the first time	Coefficient	.089		.364
	p	.005***		.000***
	N	1000		1000
Propensity to seek food-related information	Coefficient	.179	.364	
	p	.000***	.000***	
	N	1000	1000	

*** statistically significant (p < 0.05)

The three variables, which reflect different aspects of *attitude towards food risks*, were combined into a single one. The presence of only one latent factor with an eigenvalue greater than 1 is shown in Table 2 and Table 3.

Table 2. Factor analysis: explained total variance.

<i>Component^a</i>	<i>Initial eigenvalue</i>		<i>Non-rotated factor loadings</i>	
	<i>Total</i>	<i>% of variance</i>	<i>Total</i>	<i>% of variance</i>
1	1.438	47.939	1.438	47.939
2	.957	31.907		
3	.605	20.153		

^a Extraction method: principal component analysis.

Table 3. Factor analysis: component matrix^a.

<i>Variables</i>	<i>Component 1</i>
Perceived level of exposure to food-borne diseases (0-1 scale)	.422
Propensity to read the label when buying a food product for the first time (0-1 scale)	.764
Propensity to seek food-related information (0-1 scale)	.823

^a 1 component extracted.

As can be seen from Table 3, the three variables have different loadings on the latent factor.

On the basis of factor score distribution, a threshold value of 0.7 was chosen to effectively isolate the distinctive characteristics of the two consumer groups. Scores greater than 0.7 identified consumers with *self-protective* attitudes, who were more inclined to read food labels, seek food-related information and feel exposed to the risk of food-borne disease (27.2% of the sample); on the other hand, scores lower than 0.7 identified consumers with *non-self-protective* attitudes, who were less inclined to read food labels, seek food-related information and feel exposed to the risk of food-borne disease (72.8% of the sample).

Logistic regression analysis (Table 4) allowed identifying the socio-demographic and behavioural characteristics that made respondents more likely to be classified into either of the two groups.

Table 4. Estimates of significant logistic regression coefficients.

	<i>Odds ratio Non-self-protective</i>	<i>Odds ratio Self-protective</i>	<i>Wald</i>	<i>d.f.</i>	<i>Sig.</i>
Gender ^a					
Female	0.654	1.528	6.298	1	0.012
Frequency of food shopping ^b					
A few times a week	1.736	0.576	12.015	1	0.001
Frequency of eating out for either lunch or dinner ^c					
A few times a week	0.296	3.375	4.870	1	0.027
Never	0.521	1.920	1.369	1	0.242
Level of knowledge (categories) ^d					
Good	0.359	2.787	16.176	1	0.000
Poor	0.609	1.642	6.558	1	0.010
Self-assessed knowledge (categories) ^e					
Excellent	0.352	2.845	15.161	1	0.000
Good	0.525	1.905	6.671	1	0.010
Sources of information					
Internet ^f	1.079	0.927	0.118	1	0.731
Specialist books/magazines	0.872	1.147	0.279	1	0.597
Family and friends	5.531	0.181	10.115	1	0.001
GP	0.758	1.318	1.027	1	0.001
Constant	18.163	0.055	21.526	1	0.000

^a *Baseline* category: male^b *Baseline* category: every day^c *Baseline* category: every day^d *Baseline* category: very poor^e *Baseline* category: poor^f *Baseline* category: mass media

As regards gender, for example, females have more chance than males to be *self-protective* consumers (odds ratio=1.528, $p=0.012$). It also emerged that people who ate out for either lunch or dinner a few times a week have more chance to be *self-protective* consumers (odds ratio=3.375, $p=0.027$) than those who reported doing so every day. Respondents who shopped for food a few times a week, rather than every day, and sought information mostly from informal sources (family and friends), rather than from the mass media, have more chance to be *non-self-protective* consumers (odds ratio=1.736, $p=0.001$ and odds ratio=5.531, $p=0.001$, respectively). Finally, respondents' actual and self-assessed levels of scientific knowledge were found to play an equally important role in distinguishing between the two groups of consumers: respondents with a poor or good level of scientific knowledge (odds ratio=1.642, $p=0.010$ and odds ratio=2.787, $p=0.000$), as opposed to a very poor level, and those who self-assessed their level of knowledge as good or excellent (odds ratio=1.905, $p=0.010$ and odds ratio=2.845, $p=0.000$), rather than poor, have more chance to be *self-protective* consumers.

4 Conclusions

The present paper proposed a method for studying consumers' attitudes towards food risks that allowed classifying respondents as either *self-protective* or *non-self-protective* consumers. The idea was to attempt an "objective" interpretation of what is, in itself, a "subjective" indicator. Attitudes, as well as opinions, intentions and perceptions, are subjective indicators in that they are based on individual experiences and self-assessments. The factor *attitude towards food risks* was created from three variables that are measures of self-reported (as opposed to directly observed) behaviours and, as such, could overestimate the respondents' actual behaviour. This is a limitation of the analysis performed.

To date, no studies have been conducted in Italy that propose to measure consumers' attitudes towards food risks as a combination of: their perceived risk of food-borne disease, their propensity to read the label when buying a food product for the first time, and frequency with which they had sought information in the past year.

Appropriate communication may affect the factors that contribute to shaping consumers' attitudes towards food risks. The identification of groups of consumers with different socio-demographic characteristics, levels of knowledge, perceptions and behaviours is the key to developing segmented communication strategies that are both efficient and effective [7].

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