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**Preferences, trust and willingness to pay for food information:
An analysis of the Italian market**

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Abstract

Lack of consumer trust and communication strategies are probably the main determinants of information failure in modern food markets. This study attempts to tackle these aspects affecting the quality of food information by investigating questions related to what topics are more relevant to consumers, who should disseminate trustful food information, and how communication should be conveyed.

Primary data were collected both through qualitative (in depth interviews and focus groups) and quantitative research. Quantitative research was conducted by means of a questionnaire administered in 2006-2007 to a sample of Italian respondents using both a web and a traditional mail survey. Reading preferences, willingness to pay and trust towards public and private sources conveying information through a hypothetical food magazine were assessed combining factor analysis, choice modelling and a criterion-based market segmentation.

The study shows that reading preferences of Italian consumers can be summarized along three dimensions: agro-food system, enjoyment and wellness. Furthermore, willingness to pay for receiving food-related information is influenced by trust towards the type of publisher, which plays also a key role in market segmentation together with socio-demographic and economic variables such as gender, age, presence of children and income. Policy implications of these findings are discussed.

Keywords: food information, trust, preference heterogeneity, segmentation, Italy.

JEL codes: D12, D18, D89, Q18.

1. Introduction

Despite the plethora of food information to which consumers are exposed from different sources (such as family, friends, colleagues, media, etc.), consumers' perception of the quality of such information is generally quite unsatisfactory especially when information comes from traditional mass media (i.e., TV, newspapers, radio) and even more from the Internet (European Commission, 2006 and 2010).

Consumer dissatisfaction seems to be partly determined by the inherent bias of food information delivered by private companies in contrast to information disseminated by governmental or non governmental institutions, whose objective would be to foster the public good (Swinnen, 2005). In pursuing their own interests and profits, private media companies pay more attention to specific topics such as recipes, foods that enhance beauty, and food fads, while completely neglecting information that is more related to the public nature of this good such as regulations or innovations in food products and production techniques. Moreover, food information is often characterized by sensationalism, over-amplifying both food safety incidents and controversial issues such as public acceptance of genetically modified food (Frewer *et al.*, 1996 and 1999). Under these circumstances, consumer response is misled by food information released by the media, which in turn affects their purchasing behaviour and welfare (Böcker and Hanf, 2000; Pennings *et al.*, 2002). As a consequence these situations lead to a low level of confidence towards information sources and/or

communication of messages, which is translated into consumer's poor response to food information.

Dissatisfaction may also be related to the effort that is necessary in order to process food information and thus to the transaction costs that consumers have to face to obtain this good (Ramsay, 2007). Difficulties to search for food information are hence related to markets failing to serve and to satisfy needs of specific segments of consumers who have different food reading preferences because of their diversity in terms of knowledge, trust, attitudes, and socio-economic demographic profiles (van Dillen *et al.*, 2004; Pieniak *et al.*, 2007). Therefore, this study attempts to tackle these aspects regarding quality of food information by investigating questions related to what topics are more relevant to consumers, who should disseminate trustful food information, and how communication should be conveyed.

The remainder of this paper is organized as follows. Section 2 synthetically reviews the recent debate on the relationship between information and consumer trust. Section 3 briefly describes data collection and sampling design, while section 4 explains the methods adopted to assess the consumers' reading preferences and trust for a hypothetical new food magazine. Finally, section 5 presents and discusses results, and section 6 summarizes main findings and future research directions.

2. Information and consumer trust

According to Earle and Cvetkovic (1995) two types of trust can be distinguished: 'interpersonal' trust and 'social' trust. The former (often referred to as 'source credibility', cf. Trumbo and McComas, 2003) is related to the perceived presence or absence of particular traits in the source of information, while the latter refers to trust in institutions that have risk management responsibility. Researchers have widely investigated how trust in information sources influences risk perceptions (see, among others, Frewer *et al.*, 1997; Frewer, *et al.*, 1999; Trumbo and McComas, 2003; Viklund, 2003; Rosati and Saba, 2004; Stefani *et al.*, 2008). Research on lifestyle hazards perceived as low risk by respondents (such as food contamination) show that trust is a cue to the quality of information sources. Conversely, in the case of technological hazards trust seems to covary with rather than predict risk attitudes (Frewer, 2003).

However, scarce research has been carried out so far on the way consumers select and value information from different sources. Frewer *et al.* (1996) list many potential sources of information on food-related hazards such as mass media, industry, scientists, medical sources, government, consumer organisation and friends. The trustworthiness of a source of information sources is likely to affect consumers' intended use of it (Savolainen, 2007). Sources may differ for how they are perceived by consumers. A recent EU survey (Mazzocchi *et al.*, 2008) found that consumers identify three institutional information sources according to their trustworthiness, namely: the industry and food chain actors; experts and independent authorities; and consumer groups/organisation, Government and political parties. Similar results hold for Italy (Stefani *et al.*, 2008).

The way people seek information through media is influenced by cognitive competences and affective orientation as well. When seeking information for every day life (known as 'orienting information') people often adopt a passive monitoring of events that can affect their life (such as food scares or flu epidemics). Cognitive skills play an important role in deciphering various messages, determining people cognitive orientation to media seen as instruments for pursuing personal goals through information gathering (Johnson, 2005). Besides cognitive orientation the role of an affective orientation has also been acknowledged.

In this case information is sought after to reach immediate gratification such as looking for crime news, entertainment and other emotional issues (Savolainen, 1995). However, this does not necessarily mean there is a partition between cognitive-oriented and affective-oriented food-related media communication (Kornelis *et al.*, 2007).

3. Data collection and data analysis

3.1. Survey design

Primary data for this study have been collected using an *ad hoc* questionnaire developed on the basis of information gathered with an in-depth interview with the marketing director of one of the largest Italian publisher and two focus groups aiming at exploring consumer reading preferences, trust towards potential publishers and marketing attributes of an hypothetical magazine. The final structure of the questionnaire includes sections on consumer food reading preferences towards topics to be included in the hypothetical magazine, reading habits and trust towards sources of information, and choice tasks for selecting the hypothetical food magazine as well as a section on socioeconomics and demographic characteristics of respondents.

The survey was administered both via internet and via traditional mail from November 2006 to April 2007. Twelve thousand respondents were contacted through two newsletters sent out randomly to a list of subscribers. Furthermore, to tackle the issue of the potential bias in using an internet survey, the web-based survey was coupled with a traditional mail survey (1,000 questionnaires)¹ and results were compared with those obtained with the on line survey (Vehovar and Lozar Manfreda, 2008).² The final sample size consists of 757 completed questionnaire, of which 90.5% were completed via the on line survey.

3.2. Elicitation strategy

Consumers reading preferences towards food information were evaluated informing respondents that a new food magazine containing different topics would be launched on the Italian market, and for this reason it was important to have a clear idea of potential readers' inclinations. Thus the idea of conveying food information on several domains in a specific magazine was further explored with focus groups identifying a final list of topics (Table 1). The level of importance of those topics was measured on a five-point itemized rating scale according to respondent's usual reading habits and preferences.

[Insert Table 1]

Trust towards food information was elicited hypothesizing a food safety shock context, in which consumers were exposed to alarming news provided by mass media. Respondents were asked to state to what extent they trusted information contained in the hypothetical magazine according to different publishers such as a consumer association, an independent publisher, the European Food Safety Authority (EFSA) and the association of the national food industry. Trust items were measured on a five-point Likert scale. Trust was also evaluated with reference to the way in which information is delivered (written vs. spoken), the source (public

¹ Mixed mode surveys are increasingly used in probability based sample surveys because they allow researchers to optimize the survey process from both the cost and quality point of view (Couper, 2000).

² Data analysis did not show statistically significant difference between web and mail respondents.

vs. private), and the type of mass media: television, radio, newspapers, magazines and internet.

Finally, a stated choice experiment (Louviere *et al.*, 2001) was used to elicit consumer purchasing behaviour for a hypothetical magazine conveying food information on the Italian market. This experiment was developed aiming at creating choice sets in an efficient way, combining attribute levels into profiles of alternatives and placing such profiles into choice sets and blocks (Batsell and Louviere, 1991; Hanley *et al.*, 2001).

Information from qualitative research indicated that Italian magazine publishers were interested in knowing who should deliver food information (Consumer association, Independent publisher, Food industry, European Food Safety Authority), the price range (€ 1.90, € 2.40, € 2.90), and the issue publishing frequency (weekly, monthly). Furthermore, it was suggested that advertisements should not be included in the experimental design because nowadays it would be impossible to sell a magazine without them. With three attributes having 4, 3, and 2 levels respectively, there were 24 alternatives or characteristics combinations of this hypothetical magazine. To avoid consumer fatigue (Hensher *et al.*, 2001), a *d*-efficient experiment design was constructed to optimize a fractional factorial design (Kuhfeld *et al.*, 1994; Huber and Zwerina, 1996; Zwerina *et al.*, 2004).

The final design contained 36 choice sets randomly distributed into six blocks to form six versions of the web questionnaire. In the web survey, respondents were addressed randomly by software to answer one of these six web questionnaires, each including 6 choice tasks. Each choice task contained four labeled alternatives (one for each publisher type) plus a no choice option, which represented the status quo.

3.3. Econometric and statistical analysis

The econometric estimate of food magazine choices under a random utility framework was performed employing a mixed logit model (McFadden, 2001; Greene, 2003). A mixed logit model allows the coefficient of observed variables (taste parameters) to vary randomly across individuals rather than being fixed. Probabilities of choosing an alternative are thus a weighted average of different logit probabilities where the weights are given by the density functions of the distributions of parameters (the mixing distributions).

Market segmentation was conducted employing a criterion-based approach i.e. the Chi-squared Automatic Interaction Detection (CHAID, cf. Kass, 1980; Magidson, 1994; Chen, 2003), because it has some advantages *vis-à-vis* other multivariate statistical techniques such cluster analysis (Wedel and Kamakhura, 2000). At each step, CHAID chooses the independent (predictor) variable that has the strongest interaction with the dependent variable.

In this study the dependent variables selected to identify different segments of consumers were factors summarizing respondents' reading preferences for food information contained in the hypothetical magazine. Thus in order to simplify marketing segmentation a factor analysis was performed as an intermediate technique to reveal underlining constructs of food information preferences. Factors were identified via principal component analysis using a varimax rotation method and their scores for each respondent were calculated through the equation of a straight line.

4. Results

The majority of respondents are male (59.3%), younger than 45 (52.6%), educated to secondary school level or less (67.4%), have children older than 15 (74%), and with an

average yearly income less than € 30,000 per year (63.1%). For gender and especially age these results are affected by the structure of the web sample where the number of males and respondents younger than 45 are substantially higher than those reported for the mail sample. Instead for education, households with children younger than 15 and income, these differences are negligible.³ Results show also that the majority of respondents (84.7%) read magazines purchased mainly without subscription (66%) with a monthly expenditure ranging between € 5 and € 19.99 (59.5%).

4.1. Reading preferences, quality and trust for food information

For each of the domains of food information listed in table 1 the level of importance was measured on a five-point rating scale. Results show that after collapsing ‘very important’ and ‘quite important’ into a single item, all the selected topics are considered to be of interest for the potential readers of a food magazine. In particular, *HEALT* and *FSAFE* represent the most important information for about 90% of respondents; *ANTIA*, *POLIC*, *TRADI* are also considered important for more than two thirds of respondents, while *AGRIC*, *PRIND*, *GLSTY*, *BEAUT* and *TREND* are considered less important.

A principal component analysis on the eleven items of table 1 produced three factors with eigenvalues greater than one explaining around 61.7% of total variance. The redistribution of variance determined by the varimax rotation produced three factors which summarize the underlying structure of the most important information for respondents to be included in a hypothetical magazine. The internal consistency of these three factors was assessed using the test of reliability whose results show Cronbach’s alpha coefficient values are satisfactory because they are above 0.6. The first factor explains 34.67% of the variance and it is strongly influenced by *PRIND*, *AGRIC*, *POLIC*, and *FSAFE* and so it could be named ‘*Agrofood system*’ (AFOSY). The second factor explains 14.42% of the variance and it is strongly influenced by *LISTY*, *COUIS*, *TREND*, and *TRADI* and thus may be labelled ‘*Enjoyment*’ (ENJOY) being an indicator of hedonistic motivations. The third factor explains 12.61% of the variance and it is strongly influenced by *ANTIA*, *HEALT*, and *BEAUT*, that are all pointing at well-being: as a result, this factor may be named ‘*Wellness*’ (WELLN). The first two factors could be related respectively to the cognitive and affective information seeking behaviour as described by Savolainen (1995) and Johnson (2005).

As far as trust is concerned, the majority of respondents (42.0%) trust both public and private sources of information, 26.8% trust only public sources, 10.9% merely private sources, and 20.3% neither public nor private sources. The slight trust preference towards public bodies is also confirmed by the fact that food information conveyed by the hypothetical magazine is trusted more when the publisher is closer to the public sector. In fact, the consumer association and the EFSA are the most trusted publishers, the group of independent publishers is trusted less and the national association of food industry is trusted very little. The distrust in the food industry is probably related to respondents’ perceived vested interests towards this association.

³ Despite these differences, a dummy variable used to explore the influence of the different type of survey on statistical analysis shows that results are not statistically significant.

4.2. Heterogeneity of preferences for a food magazine

Table 2 shows the estimates from the mixed logit model. A model with a triangular distribution for the price parameter and normal distributions for the remaining random parameters was specified. After a specification search based on the value of the simulated likelihood, trust in the publishers as source for the heterogeneity of tastes was selected.⁴

[insert Table 2]

The mean parameter for price is significant and negative as expected, i.e. *ceteris paribus* within proposed choice sets respondents prefer cheaper magazines. The negative mean parameter of the weekly frequency suggests that respondents prefer monthly magazines, a plausible choice considering that the topics covered do not require a prompt update of news. The mean parameters for the alternative specific constants are positive and significant, meaning that the consumer association, EFSA and independent publisher are preferred to the food industry association as publisher of the food magazine. Interestingly, the magnitude of coefficient decreases from consumer association to independent publisher passing through EFSA, suggesting that respondents rely mainly on sources that represent their own interests or shows some form of independence and authoritative nature such as EFSA. Not surprisingly food industry association is the least preferred publisher of a food magazine. This pattern of choice confirms previous research on Italian consumers' attitudes toward source of information (Stefani *et al.*, 2008).

Trust in information sources influences respondents' choice in the expected direction. Those that show a higher value for the trust scale in a given source like more the corresponding publisher vis-à-vis other publishers. Such evidence may suggest that trust is a driver of consumer choice in the magazine market segment under investigation. In other words trust is an important asset that might influence the market performance of food magazines. Noticeably, trust in information sources shows a positive impact on the price coefficient (significant for EFSA and food industry) thus lowering the individual price coefficients of those who trust more. This suggests that people with higher levels of trust are generally less price sensitive confirming the role of trust as a valuable asset.

WTP distributions across respondents for the three publishers are shown in Figure 1. Amounts should be interpreted as the sum that respondents are willing to pay in addition to what they would pay for a magazine published by the food industry association. The ranking of WTP for different publishers reflects the ranking of preferences emerging from the model estimates. Indeed, consumer association is the more valued publisher (mean = € 1.80, median = € 1.24). The second highest valued publisher is EFSA (mean = € 1.80, median = € 1.24). Conversely, additional WTP for the independent publisher is distributed around zero suggesting that this publisher does not enjoy a price premium vis-à-vis the food industry publisher (mean = € 0.05, median = € 0.32). However, the three distributions overlap to a certain extent and no clear-cut distinction can be made across different publishers.

[Insert Figure 1]

4.3. Market segmentation

Market segmentation was conducted using a criterion-based approach, where factors summarizing reading preferences for food magazine topics (dependent variables) were linked

⁴ The type of publisher and magazine frequency are dummy coded; thus food industry association and monthly frequency were left out to avoid multicollinearity.

to descriptors such as socio-economic and demographic characteristics of respondents (independent variables) and choice modeling. The link between the dependent variables and the choice experiment was obtained including in the classification tree the frequency of attendance (that is the frequency of choice) that respondents expressed for the different type of publishers.

The scores for the factors AFOSY, ENJOY and WELLN (cf. section 5.1) were calculated: they have a mean of 14.86 ($s=2.32$), 13.45 ($s=2.37$) and 12.68 ($s=1.70$), respectively. The tree diagram in Figure 2 shows that choice towards consumer association is the best predictor of the *Agrofood System* factor. Respondents who choose this publisher show an average factor score higher ($\bar{x}=15.08$; $s=2.18$) than those who did not choose this attribute in the choice magazine tasks ($\bar{x}=14.31$; $s=2.56$). The next best predictor is age, where respondents older than 45 have a higher preference for AFOSY ($\bar{x}=15.31$; $s=2.15$) than younger respondents ($\bar{x}=14.86$; $s=2.19$).

In the case of *Enjoyment*, Figure 3 shows that gender is the best predictor with females ($\bar{x}=13.81$; $s=2.22$) preferring topics related to enjoyment more than males ($\bar{x}=13.21$; $s=2.44$). The male segment is predicted well by trust towards source of information in case of market crisis and by the terminal node choice towards independent publishers. These nodes show that males' reading preferences for ENJOY are characterized by a segment of respondents who trust both public and private information ($\bar{x}=13.64$; $s=2.28$) and selected the independent publishers in their choice task ($\bar{x}=14.12$; $s=2.09$). Node 5 also shows that males trusting private information ($\bar{x}=12.41$; $s=2.59$) consider items related to enjoyment less important than respondents identified in the other segments of this classification tree.

Finally, Figure 4 shows that gender is also the best predictor for the WELLN factor with females gaining a higher average score ($\bar{x}=13.09$; $s=1.45$) than males ($\bar{x}=12.40$; $s=1.80$). The female segment is predicted by the terminal node income, where reading preferences for wellness items are considered more important by females with a monthly income of less than € 30,000 ($\bar{x}=13.39$; $s=1.24$) in comparison to the female category earning € 30,000 or more ($\bar{x}=12.89$; $s=1.53$). The male segment is predicted well by age, the EFSA publisher and households with children under 15 years of age. In particular these nodes indicate that males aged 45 or younger ($\bar{x}=12.15$; $s=1.81$) and who did not choose the EFSA publisher ($\bar{x}=11.78$; $s=1.94$) are those who have the lowest reading preferences for WELLN.

5. Conclusions

Results show that Italian consumers have heterogeneous preferences towards food information topics and trust food information publishers differently. Reading preferences towards food topics can be summarized along three dimensions: (i) people showing a prominent interest in agro-food production process information (i.e. more cognitive-oriented), (ii) people who show a more hedonistic attitude towards food (i.e. more affective-oriented), and (iii) people who are interested most in their own well-being.

CHAID analysis shows that market segments are influenced by a mix of factors, ranging from socio-demographics (e.g. gender for the last two dimensions, or age important for the first and the third dimension) and economics (income for the third dimension) characteristics of respondents to trust towards the publisher conveying food-related information, which is important especially when a food safety incident occurs.

Italian consumers show a clear ranking of trust towards media. Generally speaking, there is a slightly higher trust towards public sources. This has also been confirmed by the choice

experiment carried out in this study, showing that in the case of a food safety incident people tend to have more trust in food information sources closer to the ‘public’ interest – or at least not bringing vested interests – such as consumer associations and the EFSA. Probably this aspect is linked to the fact that information has the properties of a public good (Ramsey, 1984) and thus the consumer associations and the EFSA are more appropriate to address problems of information failure regarding health risks related to the consumption of food products.

The choice experiment results show not only that trust matters but also that people are willing to pay for receiving food-related information from more trusted sources in the event of a crisis. Noticeably, trust in information sources shows that people with higher levels of trust are generally less sensitive to the cost of accessing food information, confirming the role of trust as a valuable asset.

The main policy implication from this study is that, given the preference heterogeneity towards food information, food communication campaign managers should use different sources to reach different segments of the population. This is particularly important for Italy where the institutional architecture to protect and empower consumers in modern food markets is not well developed yet. The crucial role played by consumer associations, already stressed by Mazzocchi *et al.* (2008), has been confirmed by this study but only for those respondents whose reading preferences are summarised along the cognitive dimension. This means that other sources of information such as EFSA and independent publishers should be taken into account when channelling food information on the Italian market according to the cognitive or affective orientations of specific segments of readers.

From the practical viewpoint these findings represent a call for regulators to reflect thoroughly on the role that governmental, non-governmental or private organizations might play to respond to information failure problems in modern food consumer markets. Information remedies conveyed using trusted sources of information can provide policy makers a soft alternative to the classic way of regulating markets through standards. This is because a less interventionist approach will leave markets the freedom to respond better to changes in production technologies having a less damaging impact if the regulator turns out to have been mistaken (Beales *et al.*, 1981; Ramsey, 2007).

From the research viewpoint further studies are needed to explore linkages and possible cross-fertilisation between choice experiments and criterion based segmentation in the domain of consumer choice for food related information. This will allow policy makers to better understand problems of information failure and consumers confidence in modern food markets using information remedies in order to attempt to redistribute power and resources from producers to consumers employing a less interventionist and paternalistic approach.

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Table 1: Selected topics to explore consumer reading preferences for food information

Abbreviations	Selected topics
<i>AGRIC</i>	Information about production techniques used in the primary sector (agriculture, horticulture and animal husbandry)
<i>ANTIA</i>	Information about foods containing anti ageing properties, including latest developments and future prospects to prolong life expectancy
<i>BEAUT</i>	Information about foods related to health and beauty that help skin and body look youthful and beautiful
<i>COUIS</i>	Information about Italian and international cuisine, food culture and good living (e.g. entertaining friends with fine wines and the correct foods)
<i>FSAFE</i>	Information about food safety issues caused by bacteria (e.g. salmonella and lysteria) or other substances (e.g. additives, chemical residuals) harming consumers' health
<i>HEALT</i>	Information about health risks (cardiovascular diseases, diabetes, etc.) caused by obesity, anorexia nervosa, bulimia and other illnesses linked to food (allergenic diseases, food intolerances, etc.)
<i>LISTY</i>	Information about life style, food tourism and eating out
<i>POLIC</i>	Information about food regulations affecting consumer choices and the food industry (e.g. genetically modified food, labeling etc.)
<i>PRIND</i>	Information about the food processing industry and innovations in terms of products and processes
<i>TRADI</i>	Information about tradition, regional typical products and quality foods that are disappearing from the Italian market
<i>TREND</i>	Information about trends, consumptions evolution, food fads, and underscoring ethnicity, cultural, social diversity of Italian population

Figure 1: WTP for food Magazines with respect to a Food Industry Magazine

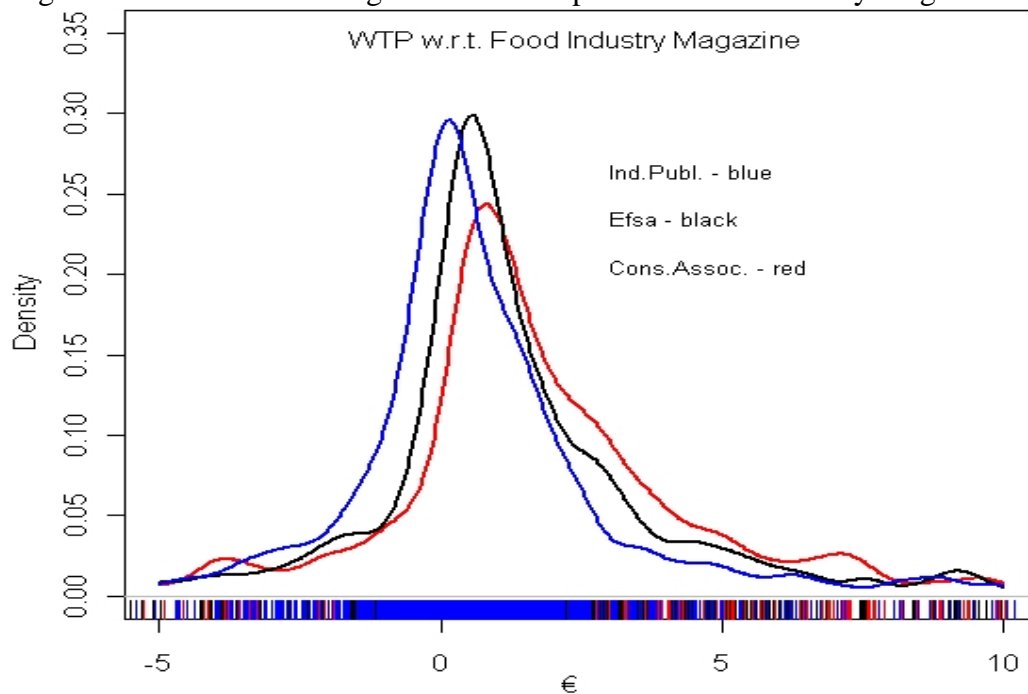


Table 2: Random Parameters Logit model for a food magazine

	Coefficient	Standard error	t- value
Random parameters			
Price	-3.50	0.19	-18.48
Weekly	-1.19	0.09	-12.55
Consumer Association	3.20	0.77	4.17
EFSA	2.94	0.75	3.93
Independent Publisher	2.57	0.87	2.96
Nonrandom parameters			
Constant	-2.58	0.26	-9.91
Heterogeneity in mean			
<i>Price</i>			
Trust in consumer association	0.14	0.13	1.11
Trust in independent publisher	0.08	0.11	0.78
Trust in EFSA	0.15	0.07	2.02
Trust in food industry	0.25	0.07	3.64
<i>Weekly</i> (fixed)			
Trust in consumer association	0.84	0.17	5.01
Trust in independent publisher	0.10	0.12	0.85
Trust in EFSA	-0.56	0.13	-4.45
Trust in food industry	-0.58	0.11	-5.09
<i>EFSA</i>			
Trust in consumer association	-0.42	0.19	-2.23
Trust in independent publisher	-0.07	0.15	-0.44
Trust in EFSA	0.54	0.13	4.19
Trust in food industry	-0.27	0.12	-2.20
<i>Independent Publisher</i>			
Trust in consumer association	-0.62	0.19	-3.30
Trust in independent publisher	1.10	0.15	7.18
Trust in EFSA	-0.41	0.08	-4.91
Trust in food industry	-0.41	0.08	-4.91
Distributions of Random Parameters Standard Deviations			
Price	3.50	0.19	18.48
Weekly	1.74	0.11	15.75
Consumer association	2.00	0.13	14.81
EFSA	1.84	0.13	14.30
Independent publisher	1.95	0.18	10.72
LogLikelihood	-4382		

Figure 2: AFOSY classification tree

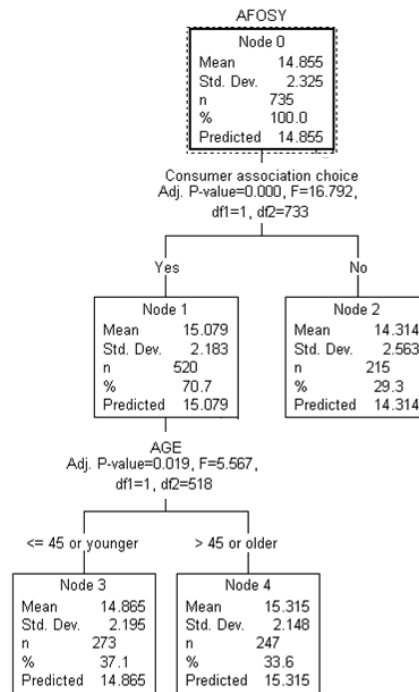


Figure 3: ENJOY classification tree

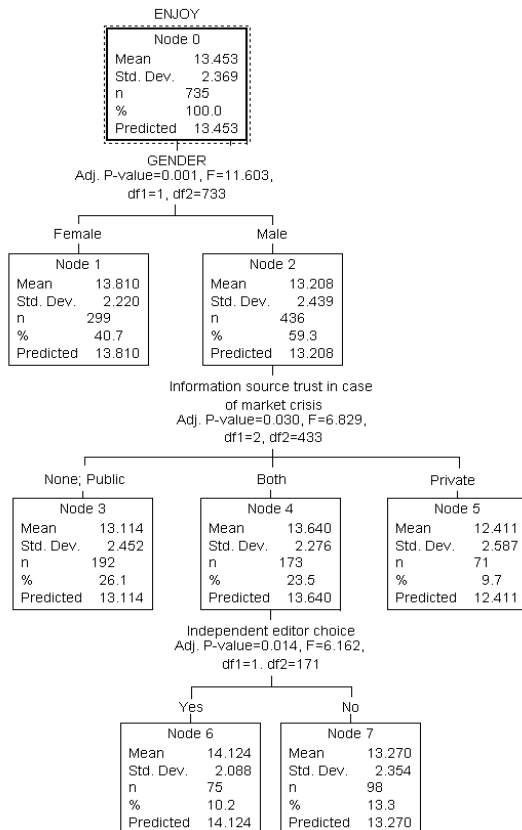


Figure 4: WELLN classification tree

