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Analysis of Media Agenda-Setting Effects on Consumer Confidence in the Safety of the U.S. Food System

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Analysis of Media Agenda-Setting Effects on Consumer Confidence in the Safety of the U.S. Food System

By Abhishek Bharad, R. Wes Harrison, Jean Kinsey, Dennis Degeneffe, and Gustavo Ferreira

Abstract

Results from continuous tracking of consumer confidence and media coverage of food safety events over a 67 week period between May 2008 and August 2009 are reported. An ordered probit model is used to test the hypothesis that media coverage of food safety events affects consumer confidence in the safety of the U.S. food system. The results show that media coverage significantly and negatively affected consumer confidence in the safety of nation's food supply during the sample period. Socioeconomic and demographic factors such as geographic region, use of media source, household size, age, ethnicity, education, and gender also had significant affects on consumer confidence in the safety of United States food supply.

Introduction

Recent food recalls and food scares in the United States have increased consumers' risk perceptions about food borne illness and decreased their confidence in the safety of the U.S. food supply. Traditionally, consumers in the United States have trusted the safety of the food supply chain, more than 80 percent of consumers showed their confidence in the safety of food they purchase in grocery stores; but this percentage fell to 66 percent in 2007 (Food Marketing Institute June 2008). The USDA and FDA are entrusted to protect the American public from unsafe food and the accompanying illnesses and death. But, in recent years, that trust appears to have eroded as the number of food recalls increased 135 percent from 240 to 565 between 2006 and 2008 (Food Industry Report, 4/14/09). Numerous surveys and studies have been conducted to measure

consumers' confidence in the safety of food (Stinson et al. 2008; Degeneffe et al. 2009), but very few try to find linkages between media and consumer confidence.

A notable exception is a study that authors of this paper published in 2009 (Kinsey et al., 2009). In the 2009 study, we constructed two continuous food safety tracking (CFST) indices that measure consumer confidence in food safety and consumer perceptions regarding how prepared the food system is in dealing with food safety events. The indices were constructed by aggregating frequency counts of individual responses from an ongoing weekly survey. A media tracking index (MTI) was also constructed (Kinsey et al. 2009). We found that changes in media coverage significantly affect consumer confidence in the U.S. food supply. In the present study we use the most recent data from the CFST survey to conduct an individual-level analysis (rather than aggregate) of the media agenda-setting effects on consumer confidence in the U.S food supply. This allowed us to analyze the affects of socioeconomic factors on consumer confidence.

Previous Literature

According to Ajzen and Fishbein (1980) information plays a vital role in altering consumers' beliefs, attitudes, and choices. The notion that the media frames the way people think about certain issues, and in doing so, influences the public's attitudes about said issues is referred to as the agenda setting effect (McCombs and Shaw 1972; Kinsey et al. 2009). Studies have been conducted to estimate the impact of negative TV coverage and advertising on consumption habits (Verbeke and Ward 2001). Currently, less than two percent of the U.S. population is engaged in agricultural production, and the average consumer has little knowledge of agriculture and food production systems. As a result, consumers often rely on mass media for relevant information about food safety (Kalaitzandonakes et al. 2004). It has been argued that the mass

media can play an important role in building or undermining consumer confidence in the safety of foods, particularly because consumers have limited ability to assess food safety prior to consumption (Verbeke et al. 1999).

Media coverage of food safety issues has primarily been studied in relation to specific food incidents and food product (Verbeke et al. 1999; Jonge et al. 2010). Jonge et al, addressed how daily media reporting about the totality of food safety events may accumulate to affect consumer confidence in the safety of food. This was accomplished by monitoring actual newspaper coverage about food safety issues in parallel to evidence about consumer recalls of the food safety incidents (Jonge et al. 2010). These studies demonstrated that information-processing strategies substantially mediated the relationship between local news media and the public's perception of food safety, with elaborative processing being more influential than active reflection in people's learning from the news media (Kenneth et al. 2006).

Data and Methodology

Consumer Survey Design

The survey design was patterned after earlier surveys conducted by The Food Industry Center at the University of Minnesota, with funding from the National Center for Food Protection and Defense (Stinson et al. 2008). The survey asked questions about consumers' attitudes towards terrorism in general and about food defense and food safety, after defining the difference to the respondents. These surveys and the current continuous survey are administered via the internet with respondents selected from Taylor Nelson Sofres' TNS national online panel of more than two million U.S. consumers. Respondents are contacted by TNS and invited to come to a website to complete a survey. The sample of respondents is selected in such a way that it comprises a nationally representative cross section of consumers by geographic region,

income, household size, and age of respondent. A six point likert scale is used to indicate the strength of positive and negative attitudes for each question. This article uses consumer survey data collected over 67 weeks, from May 2008 to August 2009.

Media Tracking

A food safety media tracking index (MTI) was constructed during the same 67 week period by investigators at the Louisiana State University Agcenter. The MTI is constructed from article counts associated with food safety events from selected news papers and/or television programs in the United States. The reach of media intensity is not fully reflected by article counts as media exposure varies by media type and nature of the event. These shortcomings are addressed by constructing a media index. The media index incorporates the respondents' use of selected media types and normalizes article/transcript counts across media types. The formula used for normalizing media counts is,

$$Z_{kt} = \frac{X_{kt} - \mathrm{Min}(X_k)}{\mathrm{Max}(X_k) - \mathrm{Min}(X_k)} \qquad (1)$$

where Z_k is the standardized score for media source k during week t, X_{kt} is the article/transcript count for media source k during week t, and $\mathrm{Min}(X_k)$ and $\mathrm{Max}(X_k)$ are the minimum and maximum counts for the kth media source over the sample period (Kinsey et al. 2009). The X's are the article or transcript counts of news stories containing at least one of the following key words: *food safety, food defense, food terrorism, agricultural terrorism or agterrorism, food poisoning, food contamination, food borne illnesses, food-borne diseases,* and *food recall*. The media sources included for keyword searches were: *national and local newspapers, network and cable TV, radio, news magazines,* and *the internet*.

The next step in construction of the media tracking index involves aggregation of standardized scores using the following formula:

$$MTI_t = \sum w_k Z_{kt,} \qquad (2)$$

where MTI is the media tracking index value for week t and wk is the weight assigned to the kth media source where $\sum wk = 1$ and $0 \leq wk \leq 1$. Each respondent in the survey was asked to indicate which of the selected media outlets they considered their primary source of news. Frequency counts from these questions were used as estimates for the weights in equation 2.

Ordered Probit analysis

Since the dependent variables are ordinal an ordered probit model is for the analysis. The Kinsey et al., 2009 study identified two primary indicators of consumer's confidence. The first measures consumer's current confidence in the safety of U.S. food system, and the second measures their belief regarding how better prepared the food system is regarding food safety relative to a year ago. This was accomplished using factor analysis separate attitudinal questions in the survey into two sets of questions (appendix). All the questions included in these two sets use a likert scale that ranges from 1 to 6. The first set of questions measures level of concern about food safety, or inversely their confidence in the safety of food (1 being Not At All Concerned to 6 being Extremely Concerned). In order to measure the consumer confidence, the scale for these four questions is reversed (1 being Extremely Concerned to 6 being Not At All Concerned). Responses for these four questions are aggregated to obtain a new aggregated variable to measure respondents' confidence in the safety of our food, and it is scaled from 4 to 24.

The second set of questions obtained from factor analysis measures respondents' attitudes regarding how prepared we are for food safety/defense events compared to a year ago. Responses for questions in the second set were aggregated together to obtain a new aggregated variable to measure respondents attitudes regarding how prepared we are for food safety/defense events compared to one year ago, and it is scaled from 2 to 12.

The ordinal regression model is commonly presented as a latent variable model with a structural equation specified as, $y_i^* = x_i \beta + \varepsilon_i$, where y_i^* is a latent variable ranging from $-\infty$ to ∞. This model is derived from a measurement model in which y_i^* is mapped to an observed variable y which is thought of as providing incomplete information about an underlying y* according to the following measurement equation (Long 1997).

The use of an ordered probit model provides two primary advantages over the OLS model. First, the ordered probit model provides a solution to the problem of heteroskedasticity, which occurs when a regression model is used to analyze a categorical dependent variable; and second, maximum likelihood estimates are, under general conditions, consistent, asymptotically efficient, and asymptotically normal (Hamath et al. 1997).

This research uses several explanatory variables in the model, like demographic variables and media source variables; but the variable of primary interest is the Media Tracking Index(MTI). As described above, the media tracking index is constructed from daily article counts and is a continuous variable.

To be consistent with the previous study done by authors of this article, and according to theory of media agenda setting, we hypothesize that media coverage has a negative effect on consumer's confidence. Higher media coverage is expected to induce decline in consumers' confidence in the safety of our food.

Results

The use of an ordered probit model allows for the calculation of predicted probabilities for each category of dependent variable and of the marginal effects, but since the ordered probit model is a non-linear model, the estimated coefficients are not the marginal effects. Thus, the estimated coefficients and marginal effects are discussed separately.

Table 1 shows the results for the ordered probit model with the aggregated variable measuring respondent's confidence in the safety of our food as the dependent variable. The media tracking index (MTI) and age are the only continuous variables in the model. All other independent variables are categorical, and a dummy variable was created for each category. One category from each of the variables is used as a reference category and is left out of the model.

The log likelihood statistic indicates that the model is significant at greater than the 99 percent level of confidence. The continuous variable for MTI is significant and negative, which means a larger MTI value decreases consumer confidence in food safety as measured by the ordered probit's index function. In other words, a higher MTI increases the probability of a person to be more concerned. Thus, greater media coverage about food safety events reduces consumer confidence in food safety. These results are consistent with the hypothesis of media agenda-setting effect, as described earlier in the paper.

The coefficient for East South Central has a negative sign and is significant, while coefficients for the West North Central and Pacific regions are significant and positive (Table 1). This means that confidence in food safety decreases if a person lives in the East South Central region of the U.S. relative to the omitted New England region. On the other hand, a person living in the West North Central or Pacific regions of the country indicate higher confidence relative to the New England region.

The coefficients for all media sources are also significant and positive, except for the local church (Table 1). If a person uses newspapers, radio, internet, magazines or other sources as their primary media source, the person's confidence in food safety increases relative to a person who uses television (the reference category) as their primary media source. This suggests that individuals who rely on television as their primary media source have generally less confidence in the safety of the food system over the sample period. Moreover, greater than 50 percent of the respondents in the sample indicated that television is there primary news source, implying that television coverage of food safety events is an important driver of the public's opinion regarding food safety.

The coefficients for age are negative and significant in the model. The respondent's age variable indicates that ages greater than or equal to 30 are generally less confident about food safety, relative to the reference category of under ages less than 30. The results suggest people older than 30 are more concerned about food safety.

The dummy variables for household income categories are significant and positive (Table 1). The positive direction of the categories indicates that a person with higher household income will be more confident about food safety, relative to the reference category of household incomes under $30,000. These results suggest that households with higher incomes are less concerned about food safety, perhaps because the higher income allows them a wider variety of food choices relative to lower income households.

The variables measuring the number of household members have a negative and significant sign (Table 1). These results are in accordance with the expectation that persons with larger families are more concerned about their food safety. Along with the number of members in his or her household, the education of the person significantly affects the probability of that

person being confident in food safety, and it has a negative effect in the model (Table 1). Having higher education decreases the probability of that person being confident about food safety. These results are in line with expectations of a person with higher education being knowledgeable and concerned about the safety of his or her food. Finally the variable gender shows significance in the model and has a negative direction (Table 1). The results show that women are generally less confident about food safety relative to men.

Table 2 shows the results for the ordered probit model with the dependent variable being the aggregated variable measuring respondent's attitudes regarding how prepared we are for food safety/defense events compared to one year ago. The model uses all of the same independent variables as the first model and the log likelihood statistic indicates the model is significant at greater than 99 percent confidence.

The negative direction of the MTI shows that an increase in media coverage increases the probability of a person believing the food supply is less prepared for a terrorist attack or a natural or accidental food contamination relative to a year ago (Table 2). Similar to the confidence questions; the media agenda- setting theory has a significant impact on consumer perceptions of the preparedness of United States food supply.

If a person resides in the East North Central, West North Central, and West South Central regions of the country, then there is increased probability of that person thinking that the United States food supply is better prepared for a terrorist attack or a natural or accidental food contamination (again keeping in mind that changes are relative to the person residing in the New England region of the country).

The age variable indicates that older households have a higher probability (relative to households under 30 years) believing that the United States food supply is less prepared against a

terrorist attack or a natural or accidental contamination relative to a year ago. Along with age, ethnicity also has a impact. A person with an Asian or Pacific Islander background or an American Indian or Aleut Eskimo background has a higher probability (relative to person with white origin) to believe that United States food supply is better prepared against terrorist attack or natural or accidental contamination relative to a year ago.

Marginal Effects of MTI

By definition, marginal effects across all categories of depended variable must sum to zero - since the probabilities must sum to one (Cranfield and Magnusson 2003). When interpreting marginal effects for a continuous variable, all other things equal, a unit change in the explanatory variable will result in an increase or decrease in the predicted probability equal to the size of the marginal effect. In the case of a categorical dummy variable, the marginal effect is the change in the predicted probability based on whether the observation falls in that category or not. Since while calculating marginal effects all the remaining variables assume their average values, the marginal effect shows the change in the predicted probability for each category for an average respondent. Since the dummy variable in the models result in an unusually onerous number of marginal effects, they are not presented in this paper. Readers interested in the dummy variable marginal effects are encouraged to contact the authors. Only MTI marginal effects are reported.

Table 3 shows the marginal effects across 21 categories for the dependent variable measuring consumer confidence and Media Tracking Index (MTI). The lower categories of the dependent variable have a positive sign, while the higher categories have negative signs. The marginal effects for MTI imply that increases in media coverage of food safety events decreases the probabilities that a subject's response falls in the higher categories for the dependent

variable. This consistent with the finding that MTI negatively impacts consumer confidence in food safety. For example, if a person indicates Category 17 of the dependent variable, an additional unit increase in media coverage will result in decreasing that person's probability of being confident and of being in Category 17 by 0.007, holding all other variables constant at their mean.

Similar to Table 3, Table 4 shows the marginal effects across 11 categories of the dependent variable measuring a respondent's attitude regarding how prepared we are for food safety/defense events compared to one year ago, and the Media Tracking Index (MTI). The lower categories of the dependent variable have positive signs while the higher categories have negative signs. The coefficient for MTI bears a negative sign, meaning that an increase in media coverage decreases a respondent's probability of believing that the United States food supply is not prepared for a terrorist attack or a natural or accidental food contamination.

Conclusion

This study was conducted using data collected from a consumer survey and from a constructed Media Tracking Index (MTI) for a 67 weeks period that goes from May 2008 to August 2009. The use of ordered probit analysis allowed the testing of two aggregated dependent variable, one measuring change in consumer confidence and other measuring consumer attitudes regarding preparedness of United States food supply. Both models have used a number of demographic variables, along with the Media Tracking Index as independent variables. More specifically, this study tested the hypothesis that media coverage has an impact on the consumer attitudes regarding the safety of the food system. In accordance with the results found by Kinsey et al. (2009), this article shows that the media coverage has a significant and negative impact on consumer confidence in the safety of United States food supply system, and consumer attitudes

regarding the preparedness of the food system in dealing with food safety events. In other words, an increase in mass media coverage on food safety events leads to a decline in consumer confidence in national food supply chain, and strengthens consumer belief that the nation is not prepared for safety of its food supply system. Finally, most of the selected demographic variables have also a statistically significant effect. In conclusion this paper demonstrates the importance and influential role that mass media plays in changing consumers attitudes. This may provide additional information to food industry and government agencies so they can better manage food scare crisis and food safety events.

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Table 1. Ordered Probit Model for Consumer Confidence[a]

Variable name	Variable	Coefficient	Standard Error	Z	P> z
mti	Media Tracking Index	-0.1784379***	0.0572741	-3.12	0.002
_s1	Age	-0.0024857	0.0019974	-1.24	0.213
region2[c]	Middle Atlantic	-0.037069	0.0460529	-0.8	0.421
region3	East North Central	0.0597404	0.0456612	1.31	0.191
region4	West North Central	0.1501621***	0.0524268	2.86	0.004
region5	South Atlantic	-0.0601188	0.0450385	-1.33	0.182
region6	East South Central	-0.1858147***	0.0572825	-3.24	0.001
region7	West South Central	0.0586638	0.0493167	1.19	0.234
region8	Mountain	0.0932485*	0.0526727	1.77	0.077
region9	Pacific	0.1523043***	0.0467373	3.26	0.001
mediause2	Newspapers	0.2146972***	0.0277575	7.73	0
mediause3	Magazines	0.4197515***	0.1508445	2.78	0.005
mediause4	Radio	0.2248526***	0.0434082	5.18	0
mediause5	Internet	0.0929101***	0.0231567	4.01	0
mediause6	Local Church	-0.0955758	0.1781646	-0.54	0.592
mediause7	Other	0.405625***	0.1164247	3.48	0
marketsize2	100,000 - 499,999	0.0019554	0.0352182	0.06	0.956
marketsize3	500,000 - 1,999,999	0.0222409	0.0330006	0.67	0.5
marketsize4	2,000,000 or More	-0.0345833	0.0309068	-1.12	0.263
householda~2	30 through 39 Years	-0.1745376***	0.0441459	-3.95	0
householda~3	40 through 49 Years	-0.2781123***	0.0540292	-5.15	0
householda~4	50 through 59 Years	-0.3333976***	0.0679353	-4.91	0
householda~5	60 Years and Over	-0.3347903***	0.0898138	-3.73	0
householdi~2	$30,000 - $49,999	0.076056***	0.028017	2.71	0.007
householdi~3	$50,000 - $74,999	0.0847936***	0.029465	2.88	0.004
householdi~4	$75,000 and Over	0.143748***	0.0290732	4.94	0
housemembe~2	2 Members	-0.0873096***	0.0301105	-2.9	0.004
housemembe~3	3 Members	-0.1425822***	0.035899	-3.97	0
housemembe~4	4 Members	-0.1559493***	0.0403004	-3.87	0
housemembe~5	5 or More Members	-0.1269177***	0.0444111	-2.86	0.004
race2	Black/African-American	0.2101109**	0.0921031	2.28	0.023
race3	Asian or Pacific Islander	0.0007215	0.1012212	0.01	0.994
race4	American Indian, Aleut Eskimo	-0.0844088	0.1088977	-0.78	0.438
race5	Other	0.2335204	0.1599295	1.46	0.144
race6	No Answer	0.12831	0.1143529	1.12	0.262
education2	Some High School	-0.8333116***	0.2498736	-3.33	0.001
education3	Graduated High School	-0.76163***	0.2393766	-3.18	0.001
education4	Some College	-0.6952094***	0.2391719	-2.91	0.004
education5	Graduated College	-0.6511371***	0.2402961	-2.71	0.007
education6	Graduated College	-0.4797933**	0.239336	-2	0.045
education7	Post Graduate Degree	-0.3317143	0.2399584	-1.38	0.167

Table 1. Ordered Probit Model for Consumer Confidence[a]

Variable name	Variable	Coefficient	Standard Error	Z	P> z
maritalsta~2	Now Married	-0.0810891	0.1881037	-0.43	0.666
maritalsta~3	Never Married	0.0196238	0.1876961	0.1	0.917
maritalsta~4	Divorced, Widowed	-0.0911748	0.1867932	-0.49	0.625
gender2	Female	-0.2716706***	0.0232697	-11.67	0
Ordered Probit Thresholds					
/cut1		-2.375209	0.3286273		
/cut2		-2.128035	0.3285315		
/cut3		-1.871289	0.3284668		
/cut4		-1.644846	0.3284251		
/cut5		-1.426911	0.3283966		
/cut6		-1.208908	0.3283782		
/cut7		-0.9850982	0.3283677		
/cut8		-0.7735501	0.3283617		
/cut9		-0.554606	0.3283561		
/cut10		-0.3209948	0.3283511		
/cut11		-0.0836078	0.3283621		
/cut12		0.1185921	0.3283898		
/cut13		0.3533044	0.3284436		
/cut14		0.5622946	0.3285064		
/cut15		0.7479593	0.3285813		
/cut16		0.9771829	0.3287253		
/cut17		1.188613	0.3289341		
/cut18		1.395957	0.3292393		
/cut19		1.569345	0.329608		
/cut20		1.736262	0.3303229		

Log likelihood = -33404.967

Number of obs = 12236

LR chi2(45) = 1152.23

Prob > chi2 = 0.0000

Pseudo R2 = 0.0170

[a] The coding for questions measuring respondents current level of concern is reversed in order to measure respondents confidence in the safety of our food.

*: significant at 0.10 level, **: significant at 0.05 level, ***: significant at 0.01 level

[C] The selected reference variables are: region1- New England; mediause1- Television; marketsize1- under 100,000; householdage1- under 30 year; householdincome1- under $30,000; housemembers1- 1, race1 – white, education1- grade school, marital status1- no answer.

Table 2. Ordered Probit Model for Consumer Preparedness

Variable name	Variable	Coefficient	Standard Error	Z	P> z
mti	Media Tracking Index	-0.2828945***	0.0577176	-4.9	0
_s1	Age	0.0008666	0.002008	0.43	0.666
region2	Middle Atlantic	0.0578328	0.0464948	1.24	0.214
region3	East North Central	0.0955199**	0.0461017	2.07	0.038
region4	West North Central	0.1618258***	0.0529084	3.06	0.002
region5	South Atlantic	0.0654098	0.0454718	1.44	0.15
region6	East South Central	0.0323136	0.0576946	0.56	0.575
region7	West South Central	0.1605128***	0.0497574	3.23	0.001
region8	Mountain	-0.0417781	0.0532436	-0.78	0.433
region9	Pacific	0.0867281*	0.0472123	1.84	0.066
mediause2	Newspapers	0.0711801**	0.0279565	2.55	0.011
mediause3	Magazines	-0.0036541	0.1533522	-0.02	0.981
mediause4	Radio	-0.0498618	0.0437788	-1.14	0.255
mediause5	Internet	-0.106932***	0.0233747	-4.57	0
mediause6	Local Church	-0.03637	0.1787066	-0.2	0.839
mediause7	Other	-0.222807*	0.1186385	-1.88	0.06
marketsize2	100,000 - 499,999	0.0202488	0.0354461	0.57	0.568
marketsize3	500,000 - 1,999,999	-0.0122471	0.0332335	-0.37	0.712
marketsize4	2,000,000 or More	0.0071137	0.0311044	0.23	0.819
householda~2	30 through 39 Years	-0.1656017***	0.0444842	-3.72	0
householda~3	40 through 49 Years	-0.2417369***	0.0543782	-4.45	0
householda~4	50 through 59 Years	-0.2863936***	0.0683375	-4.19	0
householda~5	60 Years and Over	-0.300814***	0.0903255	-3.33	0.001
householdi~2	$30,000 - $49,999	-0.0014303	0.0281834	-0.05	0.96
householdi~3	$50,000 - $74,999	0.0000303	0.0296572	0	0.999
householdi~4	$75,000 and Over	-0.0076466	0.0292524	-0.26	0.794
housemembe~2	2 Members	0.0075839	0.0303277	0.25	0.803
housemembe~3	3 Members	0.0654568*	0.0361226	1.81	0.07
housemembe~4	4 Members	0.0457591	0.0405418	1.13	0.259
housemembe~5	5 or More Members	0.1045383**	0.0447146	2.34	0.019
race2	Black/African-American	0.0575872	0.0931498	0.62	0.536
race3	Asian or Pacific Islander	0.2140731	0.1021272	2.1	0.036
race4	American Indian, Aleut Eskimo	0.3316437***	0.1099083	3.02	0.003
race5	Other	0.044475	0.161914	0.27	0.784
race6	No Answer	0.1145674	0.1154911	0.99	0.321
education2	Some High School	-0.2339803	0.2531209	-0.92	0.355
education3	Graduated High School	-0.2098319	0.2428307	-0.86	0.388
education4	Some College	-0.3237534	0.242642	-1.33	0.182
education5	Graduated College	-0.2983963	0.2437616	-1.22	0.221
education6	Graduated College	-0.3316463	0.2428279	-1.37	0.172
education7	Post Graduate Degree	-0.3722659	0.2434675	-1.53	0.126

Table 2. Ordered Probit Model for Consumer Preparedness

Variable name	Variable	Coefficient	Standard Error	Z	P> z
maritalsta~2	Now Married	0.1383217	0.1892721	0.73	0.465
maritalsta~3	Never Married	0.1264049	0.1888727	0.67	0.503
maritalsta~4	Divorced, Widowed	0.1239233	0.1879481	0.66	0.51
gender2	Female	-0.1519191***	0.0234522	-6.48	0
Ordered Probit Thresholds					
/cut1		-1.5632	0.3321113		
/cut2		-1.264053	0.3320621		
/cut3		-0.8513563	0.3319941		
/cut4		-0.5025012	0.3319426		
/cut5		-0.0011753	0.3319172		
/cut6		0.4003979	0.331945		
/cut7		0.9628912	0.3320494		
/cut8		1.320429	0.3322083		
/cut9		1.758083	0.3326905		
/cut10		1.945347	0.3331246		

Log likelihood = -26151.206

Number of obs = 12236

LR chi2(45) = 269.12

Prob > chi2 = 0.0000

Pseudo R2 = 0.0051

*: significant at 0.10 level, **: significant at 0.05 level, ***: significant at 0.01 level

[C] The selected reference variables are: region1- New England; mediause1- Television; marketsize1- under 100,000; householdage1- under 30 year; householdincome1- under $30,000; housemembers1- 1, race1 – white, education1- grade school, marital status1- no answer.

Table 3. Marginal Effects for Consumer Confidence

Variable	Category 4	Category 5	Category 6	Category 7	Category 8	Category 9	Category 10	Category 11	Category 12	Category 13	Category 14
MTI	0.029286	0.0102021	0.011002	0.008883	0.006741	0.004093	0.000863	-0.00241	-0.00546	-0.00832	-0.00992
Variable	**Category 15**	**Category 16**	**Category 17**	**Category 18**	**Category 19**	**Category 20**	**Category 21**	**Category 22**	**Category 23**	**Category 24**	
MTI	-0.0086719	-0.0094051	-0.00723	-0.00531	-0.00507	-0.00335	-0.00227	-0.00129	-0.00085	-0.0015	

Table 4. Marginal Effects for Consumer Preparedness

Variable	Category 2	Category 3	Category 4	Category 5	Category 6	Category 7	Category 8	Category 9	Category 10	Category 11	Category 12
MTI	0.0564417	0.0203139	0.0245201	0.0108193	-0.007290	-0.021962	-0.037401	-0.019123	-0.014985	-0.003879	-0.007452

Appendix

Consumer confidence questions used in ordered probit model:

- How concerned are you about the safety of the food that you buy?
- How concerned are you about a terrorist attack on the food system?
- How serious do you think the impact of a terrorist event regarding a common food product would be on your household?
- How concerned are you about food defense?

Consumer Preparedness questions used in ordered probit model:

- In thinking about food safety, that is the natural or accidental contamination of food, do you think the U.S. food supply is safer than it was a year ago?
- In thinking about food defense, do you think the United States is better prepared for a terrorist attack on the food supply than it was a year ago?