Animal Welfare, Information and Consumer Behaviour

Luiza Toma, Beata Kupiec-Teahan, Alistair W. Stott and Cesar Revoredo-Giha

Land Economy and Environment Group, Scottish Agricultural College, UK, Luiza.Toma@sac.ac.uk; Beata.Kupiec@sac.ac.uk; Alistair.Stott@sac.ac.uk; Cesar.Revoredo@sac.ac.uk

Abstract: *This paper analysed the impact of access to welfare information and perception of welfare labelling alongside socio-demographic determinants (education, occupation and children) and welfare responsibility on welfare friendly consumption behaviour of consumers in nine European countries. We used Eurobarometer data (2006) and structural equation models with observed and latent variables. The results show that the ranking of determinants' impact on behaviour is similar in the majority of models, with access to information as strongest determinant, followed by perceived responsibility of consumers and education with strong influence, then by labelling with lower impact and ending with children, with the lowest influence on behaviour. The only determinant with a very different influence on behaviour between the different models was found to be occupation.*

Keywords: *animal welfare, information, labelling, consumer behaviour, structural equation models*

Introduction

Findings from national and pan-European consumer surveys and the growth in the demand for animal welfare-friendly food products indicate a high level of consumers' concern for animal welfare. Nevertheless, stated welfare concern does not always develop into behaviour and two of the reasons for this discordance are the access to welfare information and perceptions of welfare labelling. Access to information and perceptions of labelling, amongst other determinants (*e.g.*, socio-demographic and attitudes) of consumption of welfare-friendly food products have been the research topic of many studies and several aspects were analysed either through the use of stated or revealed preferences methods, theory of planned behaviour or other quantitative and qualitative methods (Bennett and Blaney, 2003; Burgess *et al*., 2001; Chilton *et al*., 2006; Moran and McVittie, 2008; Toma *et al*., 2010).

This paper analyses some of the factors identified in the literature as influencing consumers' behaviour with regard to animal welfare and makes a comparison between nine European countries. The paper is organised as follows: next section briefly reviews the literature on some determinants of welfare friendly consumer behaviour. The third section describes data and methods, the fourth presents and discusses results and the final section presents some conclusions.

Welfare information, labelling and other determinants of welfare friendly consumer behaviour

The literature mentions socio-demographic (*e.g.*, education, occupation, number of children in the household), access to information on welfare issues, trust in the information provided on food product labels, and perceptions of welfare responsibility amongst the main determinants of consumers' welfare-friendly behaviour.

Perceived responsibility for ensuring a satisfactory treatment of animals in food production is a main determinant of behaviour as, according to Blandford et al. (2002), consumers will purchase products associated with animal welfare if they feel personally responsible for ensuring that animals are well treated in the production process and/or that their purchasing behaviour will make a difference for the welfare of these animals. Harper and Henson (2001) state perception of own insignificant influence over animal welfare standards amongst the perceived barriers to ethical choice.

Lack of information is another determinant of the gap between attitude and behaviour (Harper and Henson, 2001). Because of the credence nature of animal welfare, trust in the information provided about the ways in which animal-based foods are produced is another key factor influencing consumer behaviour. The level of trust is determined by the perceived reliability of the information source and the means of certification employed by that source to ensure that the food products comply with the asserted welfare standards. There is evidence that EU consumers are sceptical about labels on food products and that this may act as a barrier to changes in their food purchasing behaviour (Harper and Henson, 1999).

As regards impact of socio-demographic information on behaviour, Vermeir and Verbeke (2006), as quoted in Vanhonacker and Verbeke (2009) defined the ethical consumer (concept related to welfare friendly consumer) as "a middle-aged person with a higher income, who has an above average education, with a prestigious occupation" (p.2703). There are contradictory findings in the literature regarding the relationship between consumption of welfare friendly food and children in the household; on the one hand, as welfare-friendly food products are viewed as safer, families with children in the household would exhibit stronger welfare behaviour. On the other hand the number of children in the household might have a negative impact on welfare behaviour (Gracia *et al*., 2009) potentially due to income issues (as welfare friendly products are more expensive).

Data and methods

Data

The data used in this study were extracted from the Dataset Eurobarometer 66.1: European Values and Societal Issues, Mobile Phone Use, and Farm Animal Welfare. The Eurobarometer survey was carried out by TNS Opinion & Social, interviewing face-to-face 29,152 citizens in the 25 Member States and four accession and candidate countries between 6 September and 10 October 2006 (European Commission, 2007).

The original database includes data on stated knowledge and willingness to be more informed about the conditions under which animals are farmed; stated access to sources of information (television, radio, newspapers, magazines, internet, books, brochures, information leaflets) to learn more about the conditions under which animals are farmed; animal welfare attitudes ('how important is it to you that the welfare of farmed animals is protected?'; 'do you believe that in general the welfare–protection of farm animals needs to be improved; 'do you believe that farmers should be financially compensated for any higher production costs linked to farming animals under more welfare-friendly conditions'; 'do you believe that imported foods from outside the European Union should respect the same conditions of animal welfare protection as those applied in the European Union'); perceptions of changes in animal welfare level over the last ten years; animal welfare responsibility ('who do you believe can best ensure that food products have been produced in an animal welfare friendly way'); stated reasons to buy food products produced in a more animal friendly way; access to information (perceived easiness to find information on products sourced from animal welfare friendly production systems in shops and supermarkets); perception of usefulness of labelling information ('do you think that current labels of food products allow you to identify those products sourced from animal welfare friendly production systems'); stated intentional behaviour as regards animal welfare ('would you be willing to change your usual place of shopping in order to be able to buy more animal welfare friendly food products'). The database also included socio-demographic and economic information about the respondents (e.g., age, gender, education, occupation, children living in the household, religion, nationality, long-term goods owned, etc.).

We selected datasets for nine countries (Great Britain, Finland, Ireland, Lithuania, Malta, The Netherlands, Poland, Portugal and Spain). The countries have a good geographical coverage (Western, Northern, Southern and Central-Eastern Europe) and include old and new European Union (EU) member countries. Eight of the datasets have about 950 observations, while one of them (Malta) has about 500 observations. The variables included in the analysis are socio-demographic

(education, occupation and children) and animal welfare related (information – knowledge and labelling issues, perception of responsibility and intentional behaviour).

Structural equation modelling with observed and latent variables

To test the influence of animal welfare knowledge, perception of labelling, responsibility, together with socio-demographic variables (education, occupation and children) on intentional behaviour we use a structural equation model (SEM) with observed and latent variables. SEM is a statistical technique for testing and estimating causal relationships amongst variables, some of which may be latent (variables not directly observed but inferred from other variables that are observed and directly measurable; Bollen, 1989) based on a combination of statistical data and qualitative causal assumptions. While the idea of causality may be controversial (Mueller, 1996), SEM is not intended to discover causes but to assess the soundness of the causal relationships. The basic SEM consists of two parts, namely the measurement model specifying the relationships between the latent variables and their constituent indicators, and the structural equation model designating the causal relationships between the latent variables.

The model is defined by the following system of three equations in matrix terms (1) (Jöreskog and Sörbom, 2007):

The structural equation model: $\eta = B\eta + \Gamma\xi + \zeta$

The measurement model for y: $y = \Lambda_y \eta + \varepsilon$

The measurement model for x: $x = \Lambda_x \xi + \delta$ (1)

Where: η is an mx1 random vector of endogenous latent variables; ξ is an nx1 random vector of exogenous latent variables; B is an mxm matrix of coefficients of the η variables in the structural model; Γ is an mxn matrix of coefficients of the ξ variables in the structural model; ζ is an mx1 vector of equation errors (random disturbances) in the structural model; y is a px1 vector of endogenous variables; x is a qx1 vector of predictors or exogenous variables; Λ_y is a pxm matrix of coefficients of the regression of y on η; Λ_x is a qxn matrix of coefficients of the regression of x on ξ; ε is a px1 vector of measurement errors in y; δ is a qx1 vector of measurement errors in x.

This study estimates SEM with the normal-theory maximum likelihood (MLE) method using the statistical package Lisrel 8.80 (Jöreskog and Sörbom, 2007).

Latent variables and indicators

Seven latent variables were identified and extracted in each of the nine models, expressing the intentional behaviour and the underlying determining factors. The variables are: education ('educs'), occupation ('occupats'), number of children younger than 14 years old living in the household ('childs'), perceived responsibility of consumers in ensuring that food products have been produced in an animal welfare friendly way ('responsb'), access to animal welfare information ('know'), perception of animal welfare labelling ('label') and stated intentional behaviour as regards consumption of animal welfare friendly food products (*i.e.*, willingness to change usual place of shopping in order to be able to buy more animal welfare friendly food products) ('intbehav').

The seven latent variables are built in the model as single-indicator variables for the following reasons: (1) variables 'educs', 'occupats' and 'childs' are observed variables and measured by indicators 'educ', 'occupat' and 'child'; they are built as single-indicator latent variables as specified by the software used (Lisrel); (2) variables 'know' and 'label' were built as averages of two indicators each. Namely, variable 'know' is measured by indicator 'knowavg', which was built through averaging 'willingness to be more informed about the conditions under which animals are farmed' and 'access to sources of information (television, radio, newspapers, magazines, internet, books, brochures,

information leaflets) about the conditions under which animals are farmed'. Variable 'label' is measured by indicator 'labelavg', which was built through averaging 'perceived easiness to find information on products sourced from animal welfare friendly production systems in shops and supermarkets' and 'perceived usefulness of labelling in allowing one to identify products sourced from animal welfare friendly production systems'; (3) variables 'responsb' and 'intbehav' are single-indicator latent variables as their indicators, 'respons' and 'intbhv' state the exact intended meaning of the chosen latent variables.

Table 1 presents a series of descriptive statistics for the indicators of the latent variables included in the nine models.

Table 1. Descriptive statistics.

	Great Britain		Finland		Ireland		Lithuania		Malta		Netherlands		Poland		Portugal		Spain	
	Mean	StdD	Mean	StdD	Mean	StdD	Mean	StdD	Mean	StdD	Mean	StdD	Mean	StdD	Mean	StdD	Mean	StdD
educ	2.37	1.03	1.77	1.13	2.17	1.05	2.02	1.21	2.77	1.17	1.73	.99	1.83	1.07	3.21	1.30	2.77	1.43
occupat	4.88	2.18	5.04	2.27	4.50	1.98	5.21	2.13	4.96	1.71	4.47	2.20	5.22	2.24	5.08	2.08	4.82	1.99
child	.53	.95	.46	.92	.70	1.04	.40	.78	.48	.84	.48	.89	.54	.89	.38	.75	.33	.66
respons	1.86	.34	1.90	.31	1.86	.35	1.96	.20	1.96	.20	1.86	.35	1.95	.23	1.89	.31	1.97	.18
knowavg	2.49	.81	2.36	.77	2.28	.89	2.50	.81	2.13	.82	2.51	.79	2.47	.75	2.08	.73	2.48	.86
labelavg	2.80	.82	2.73	.70	2.82	.96	3.24	.81	2.95	.88	2.69	.84	3.24	.78	2.83	.90	3.17	.82
intbhv	1.43	.50	1.58	.49	1.48	.50	1.46	.50	1.29	.45	1.56	.50	1.40	.49	1.24	.43	1.33	.47
Sample Size	936		980		961		936		487		990		972		975		937	

Indicator 'educ' is a categorical variable taking value 1 for continuing education after the age of 18 years, value 2 for 16-18 years, value 3 for 14-16 years, value 4 for up to 14 years and value 5 for no full-time education. Indicator 'occupat' is a categorical variable taking value 1 for 'self-employed', value 2 for 'managers', value 3 for 'other white collars', value 4 for manual workers, value 5 for house persons, value 6 for unemployed, value 7 for retired and value 8 for students. Indicator 'child' is a categorical variable taking values from 0 (no children) to 4 (four or more children). Indicator 'respons' is a dichotomial variable taking value 1 for perceived responsibility of consumers in ensuring that food products have been produced in an animal welfare friendly way and value 0 otherwise. Indicator 'knowavg' is built through averaging indicators 'willingness to be more informed about the conditions under which animals are farmed', which is an ordinal variable using a four-point Likert scale from 'yes, certainly' to 'no, certainly not'; and 'access to sources of information', which is a categorical variable taking value 1 for access to three information sources, value 2 for two sources, 3 for one source, and 4 for none. Indicator ‚labelavg' is built through averaging indicators 'perceived easiness to find information on welfare friendly products', which is an ordinal variable using a four-point Likert scale from 'totally agree' to 'totally disagree'; and 'perceived usefulness of welfare labelling', which is an ordinal variable using a four-point Likert scale from 'yes, certainly' to 'no, certainly not'. Indicator 'intbhv' is a dichotomial variable taking value 1 for willingness to change usual place of shopping in order to be able to buy more animal welfare friendly food products and value 0 otherwise.

Results and discussion

We tested the nine models and the path diagrams for the estimated models are presented in Fig. 1 (below) and Fig. 2-9 (Annex).

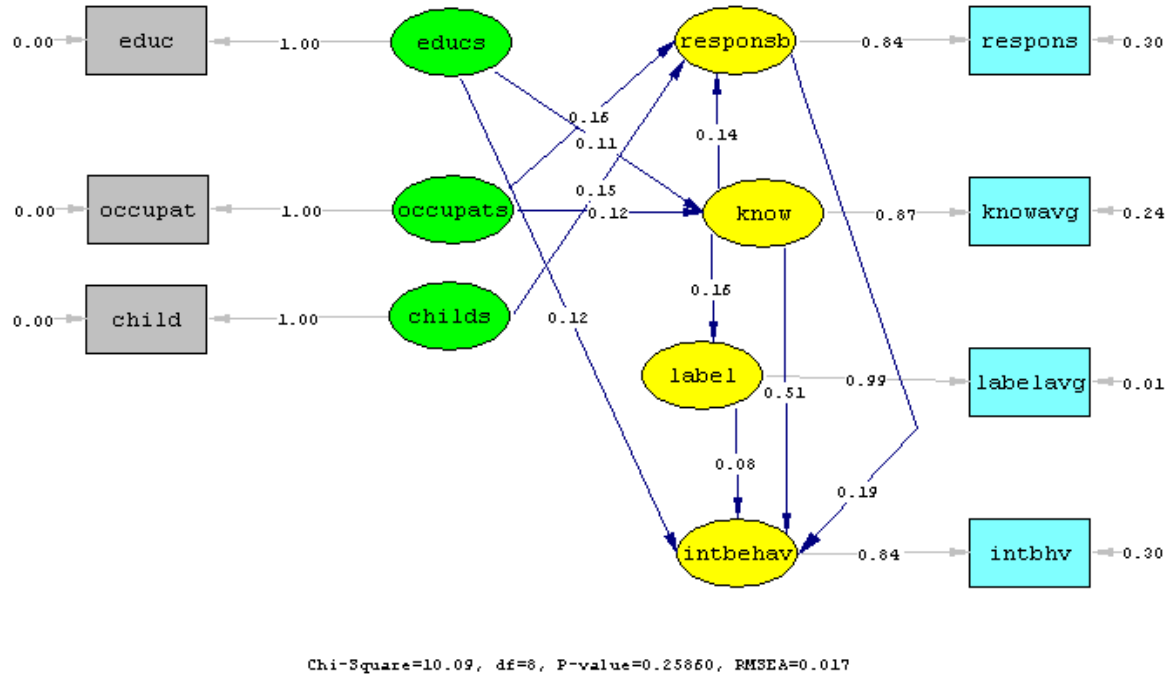

Figure 1. Path diagram for the estimated model 'Great Britain' (standardised solution).

We describe in more detail the 'Great Britain' model, however the other eight models are very similar (see path diagrams in Annex). The estimated model includes three exogenous latent variables, three variables with alternating roles (exogenous in some equations and endogenous in some others) and one endogenous variable (intentional behaviour). The exogenous latent variables are: education ('educs') as predictor of intentional behaviour as regards consumption of animal welfare friendly food products ('intbehav') and access to animal welfare information ('know'); occupation ('occupats') as predictor of perceived responsibility of consumers in ensuring that food products have been produced in an animal welfare friendly way ('responsb') and access to animal welfare information ('know'); and number of children younger than 14 years old living in the household ('childs') as predictor of perceived responsibility of consumers in ensuring that food products have been produced in an animal welfare friendly way ('responsb'). The variables with alternating roles are: 'responsb', endogenous as predicted by 'occupats' and 'childs' and exogenous as predictor of 'intbehav'; 'know' predicted by 'educs' and 'occupats' and predictor of 'intbehav'; and perception of animal welfare labelling ('label') predicted by 'know' and predictor of 'intbehav'. The behavioural variable, willingness to change usual place of shopping in order to be able to buy more animal welfare friendly food products ('intbehav') is endogenous as predicted directly or indirectly by all the other latent variables.

All the nine models have a very good fit according to the measures of absolute, incremental and parsimonious fit (Hair *et al*., 2006) (Table 2). Namely, all models exhibit low chi-square values; normed chi-square (ratio between the chi-square and number of degrees of freedom) values are within the recommended interval of 1 to 3; root mean square error of approximation (RMSEA) values are safely below the threshold maximum value of 0.10; standardised root mean residual (SRMR) values are lower than the threshold of 0.08; normed fit index (NFI), non-normed fit index (NNFI), comparative fit index (CFI), incremental fit index (IFI), relative fit index (RFI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI) values are all above the cut-off values for fit indices, the 'magic 0.90 or 0.95' (Hair *et al*., 2006). Values of the Hoelter's critical N (largest sample size at which the model is accepted at the .05 or .01 levels) are safely above sample size in all nine models. The main goodness of fit (GoF) indicators for the nine estimated models are presented in Table 2.

Table 2. Goodness of fit indicators.

GoF indicators	Great Britain	Finland	Ireland	Lithuania	Malta	Netherlands	Poland	Portugal	Spain
Degrees of Freedom	8	7	5	8	8	7	9	7	4
Normal Theory Weighted Least Squares Chi-Square	10.09 (P=0.26)	17.43 (P=0.015)	9.90 (P=0.078)	13.33 (P=0.10)	11.04 (P=0.20)	9.66 (P=0.21)	20.50 (P=0.015)	8.50 (P=0.29)	7.40 (P=0.12)
Root Mean Square Error of Approx. (RMSEA)	0.017	0.039	0.032	0.027	0.028	0.020	0.036	0.015	0.030
P-Value Test Close Fit (RMSEA<0.05)	0.98	0.76	0.82	0.94	0.81	0.97	0.85	0.98	0.81
Normed Fit Index (NFI)	0.98	0.97	0.98	0.98	0.96	0.98	0.96	0.99	0.99
Non-Normed Fit Index (NNFI)	0.99	0.95	0.96	0.97	0.97	0.98	0.94	1.00	0.97
Comparative Fit Index (CFI)	0.99	0.98	0.99	0.99	0.99	0.99	0.97	1.00	1.00
Incremental Fit Index (IFI)	0.99	0.98	0.99	0.99	0.99	0.99	0.97	1.00	1.00
Relative Fit Index (RFI)	0.94	0.92	0.93	0.94	0.91	0.93	0.90	0.98	0.95
Critical N (CN)	1853	1027	1460	1398	871	1896	1022	2112	1684
Standardized RMR	0.020	0.025	0.021	0.023	0.027	0.019	0.027	0.022	0.017
Goodness of Fit Index (GFI)	1.00	0.99	1.00	1.00	0.99	1.00	0.99	1.00	1.00
Adjusted Goodness of Fit Index (AGFI)	0.99	0.98	0.98	0.99	0.98	0.99	0.98	0.99	0.98

Additional testing of the appropriateness of the models was achieved by comparing each of the estimated models with three other models that acted as alternative explanations to the proposed models, in a competing models strategy (we used a nested model approach, in which the number of constructs and indicators remained constant, but the number of estimated relationships changed). The results across all types of goodness-of-fit measures favoured the estimated models in most cases. Therefore, we confirmed the accuracy of the proposed models and discarded the competing ones. Additional testing was achieved through running the models on sub-samples of each of the nine samples.

An acceptable level of overall goodness-of-fit does not guarantee that all constructs meet the requirements for the measurement and structural models. The validity of the SEM is assessed in a two-step procedure, the measurement model and the structural model.

In the measurement model we tested the reliability of the single-indicator latent variables, namely we tested the 'theory-testing extremes' of reliability within the range of 0.7 to 1 (Ping, 2008) and determined that none of the structural coefficients became non-significant at these extremes. The reliability of the single-indicator latent variables was assumed the value of 0.99 for the observed variables (built in the model as single-indicator latent variables), namely 'educs', 'occupats' and 'childs' with the corresponding loadings (square root of reliability value) of 'educ', 'occupat' and 'child' on 'educs', 'occupats' and 'childs' of 0.99 and the standardised measurement error variance of 0.01; value of 0.7 for 'responsb' with the corresponding loading of 0.84 and the standardised measurement error variance of 0.3; value of 0.7 for 'intbehav' with the corresponding loading of 0.84 and the standardised measurement error variance of 0.3. As variables 'know' and 'label' were built into single-indicator variables through averaging two indicators (Ping, 2008), their loadings are equal to the square root of the reliability of the average of the initial two indicators. For instance, in the 'Great Britain' model the reliability of variable 'know' was estimated at 0.76 (with the corresponding loading of 'knowavg' on 'know' of 0.87 and the standardised measurement error variance of 0.24) and the reliability of variable 'label' was estimated at 0.99 (with the corresponding loading of 'labelavg' on 'label' of 0.99 and the standardised measurement error variance of 0.01). The reliability values for 'know' and 'label' for the other eight models are shown in Fig. 2-9.

After assessing the overall model and aspects of the measurement model, the standardised structural coefficients for both practical and theoretical implications were examined. The significance tests for the structural model parameters represent the basis for accepting or rejecting the proposed

relationships between exogenous and endogenous constructs. Table 3 shows that all variables in five models ('Great Britain', 'Ireland', 'Poland', 'Portugal' and 'Spain') have statistically significant coefficients. Variable 'occupats' does not significantly influences behaviour in one of the nine models ('Finland'); 'childs' does not significantly influences behaviour in two models ('Lithuania' and 'Malta'); 'responsb' does not significantly influences behaviour in two models ('Lithuania' and 'The Netherlands'); and 'label' does not significantly influences behaviour in two models ('Finland' and 'The Netherlands'). Table 3 presents the standardised total effects on the behavioural latent variable of all the other latent variables in the nine models.

Table 3. Standardised total, direct and indirect effects on behavioural latent variable (t-values in parentheses).

Observed/ latent variables	Total effects								
	intbehav								
	Great Britain	Finland	Ireland	Lithuania	Malta	Netherlands	Poland	Portugal	Spain
educs	0.07 (4.69)	0.03 (2.83)	0.16 (6.71)	0.17 (7.61)	0.09 (5.13)	0.05 (3.01)	0.11 (4.35)	0.09 (8.66)	0.07 (5.57)
occupats	0.05 (4.29)	-0.02 (-1.38)	0.04 (3.06)	0.11 (4.11)	0.10 (3.07)	-0.03 (-3.69)	0.00 (2.05)	0.04 (4.79)	0.03 (4.16)
childs	0.01 (2.87)	0.08 (6.31)	0.03 (3.15)	0.00 (0.80)	0.00 (0.85)	0.06 (4.30)	-0.01 (-2.09)	0.05 (3.06)	-0.05 (-2.55)
responsb	0.18 (4.28)	0.37 (8.67)	0.18 (4.50)	0.07 (1.65)	0.15 (2.54)	0.01 (0.21)	0.16 (3.60)	0.30 (6.49)	0.08 (2.03)
know	0.46 (12.80)	0.54 (11.82)	0.41 (16.10)	0.50 (10.73)	0.30 (9.62)	0.24 (10.98)	0.42 (10.65)	0.29 (9.21)	0.47 (16.25)
label	0.02 (2.15)	0.01 (0.51)	0.07 (7.35)	0.10 (8.79)	0.04 (2.48)	0.00 (0.21)	0.12 (7.84)	0.08 (10.33)	0.02 (2.64)

Five of the models predict around 50% of the variance in intentional behaviour (i.e., 55% in Ireland, 45% in Lithuania, 48% in Portugal, 49% in Spain and 48% in Finland), three of them predict around 40% of the variance in intentional behaviour (i.e., 38% in Great Britain, 35% in Poland and 40% in Malta) and one of them shows a lower value (i.e., 22% in The Netherlands).

In terms of individual effects, access to animal welfare information ('know') has the strongest impact on willingness to change the usual place of shopping in order to be able to buy more animal welfare friendly food products ('intbehav') in eight out of the nine models with values from 24% to 54%. The only exception is the 'Portugal' model, where perceived responsibility of consumers in ensuring that food products have been produced in an animal welfare friendly way ('responsb') has the highest impact on behaviour (30% compared to 29% explained by information). Similar to information, responsibility has a strong impact on intentional behaviour in most models and comes second after information in six out of nine models (Great Britain, Finland, Ireland, Malta, Poland and Spain) with values from 8% in Spain to 37% in Finland. Education comes third in five of out nine models as determinant of behaviour, while occupation, number of children and perception of labelling are third in the other four models respectively. Perception of labelling, while significantly influencing behaviour in seven out of nine models has a lower impact on behaviour with values from 1% in Finland to 12% in Portugal. Lowest influence on behaviour is had by the number of children (in six out the nine models) and occupation (in three out of nine models).

Overall, the ranking of determinants' impact on behaviour is similar in the majority of models, with access to information as strongest determinant, followed by perceived responsibility of consumers and education with strong influence, then by labelling with lower impact and ending with children, with the lowest influence on behaviour. The only determinant with a very different influence on behaviour between the different models is occupation.

Access to information has a significant positive impact on behaviour and that confirms findings from the literature. Namely, access to information on welfare issues significantly impact welfare attitudes and responsibility, will influence perception of labelling issues and, directly and indirectly, the

behaviour; that is, the stronger the access to information, the stronger their perceived responsibility and the stronger the welfare-friendly consumption behaviour.

Perceived responsibility of consumers towards animal welfare significantly impact behaviour in a positive relationship, that is, the stronger the perceived responsibility the stronger the willingness to change the usual place of shopping in order to be able to buy more animal welfare friendly food products. This confirms other findings from the scientific literature. Blandford et al. (2002) state that consumers will purchase products associated with animal welfare if they feel personally responsible for ensuring that animals are well treated in the production process and/or that their purchasing behaviour will make a difference for the welfare of these animals.

Education has a significant positive impact on stated intentional behaviour in all models, which shows that more educated people are more likely to intend to enhance their animal welfare friendly behaviour.

The relationship between perception of labelling and intentional behaviour is positive, namely the stronger the perceived easiness to find information on welfare friendly products and perceived usefulness of welfare labelling, the stronger the willingness to change the usual place of shopping in order to be able to buy more animal welfare friendly food products. Findings in the literature support this, for instance Harper and Henson (1999) found that European consumers are sceptical about labels on food products and that this may act as a barrier to changes in their food purchasing behaviour.

Occupation, which can be considered a proxy for income has a significant positive impact on stated intentional behaviour in all models except for Finland and the Netherlands (where the impact is negative - further investigation is needed to explain this). This again confirms the literature, which has demonstrated that people with higher income tend to behave more welfare friendly as regards food consumption.

The impact of number of children in the household on intentional behaviour is positive in most models with the exception of 'Poland' and 'Spain' (issue needs further investigation). Children impact behaviour directly and indirectly through perceived responsibility, the more children, the stronger the welfare responsibility and, implicitly, the stronger the behaviour. There are contradictory findings in the literature regarding the relationship between consumption of welfare friendly food and children in the household; on the one hand, as welfare-friendly food products are viewed as safer, families with children in the household would exhibit stronger welfare behaviour. On the other hand the number of children in the household might have a negative impact on welfare behaviour due to income issues (as welfare friendly products are more expensive).

Conclusions

This paper analysed the impact of access to welfare information and perception of welfare labelling alongside socio-demographic determinants (education, occupation and children) and welfare responsibility on welfare friendly consumption behaviour of consumers in nine European countries using structural equation models with observed and latent variables.

The results show that the ranking of determinants' impact on behaviour is similar in the majority of models, with access to information as strongest determinant, followed by perceived responsibility of consumers and education with strong influence, then by labelling with lower impact and ending with children, with the lowest influence on behaviour. The only determinant with a very different influence on behaviour between the different models was found to be occupation.

This study provides some information on the relationship between welfare friendly consumption behaviour and information and labelling issues in the EU. As both access to information and perception of welfare labelling were found to significantly influence behaviour, this might suggest the need for the EU to invest more in improving the welfare labelling system, enhance the welfare

information available to the public and improve access to it through measures such as welfare education campaigns.

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Annex

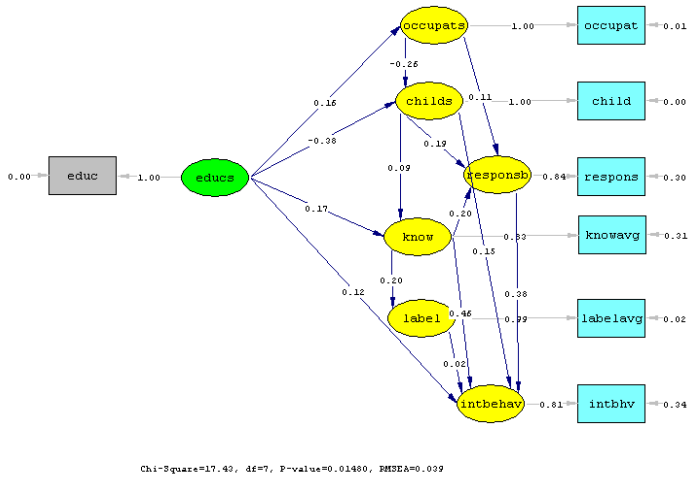

Figure 2. Path diagram for the estimated model 'Finland' (standardised solution).

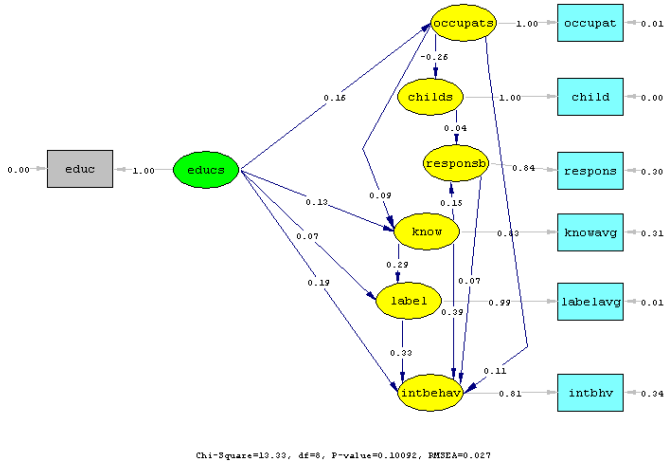

Figure 4. Path diagram for the estimated model 'Lithuania' (standardised solution).

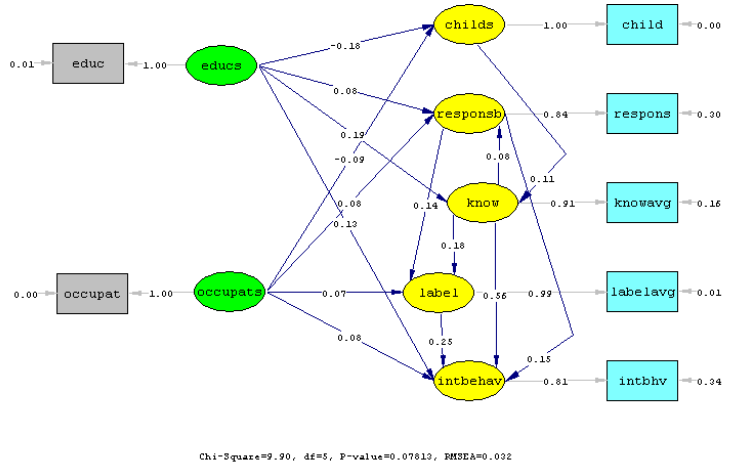

Figure 3. Path diagram for the estimated model 'Ireland' (standardised solution).

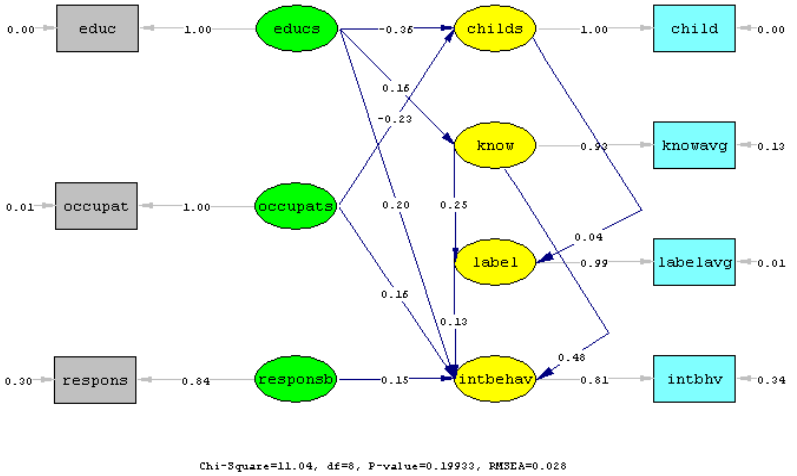

Figure 5. Path diagram for the estimated model 'Malta' (standardised solution).

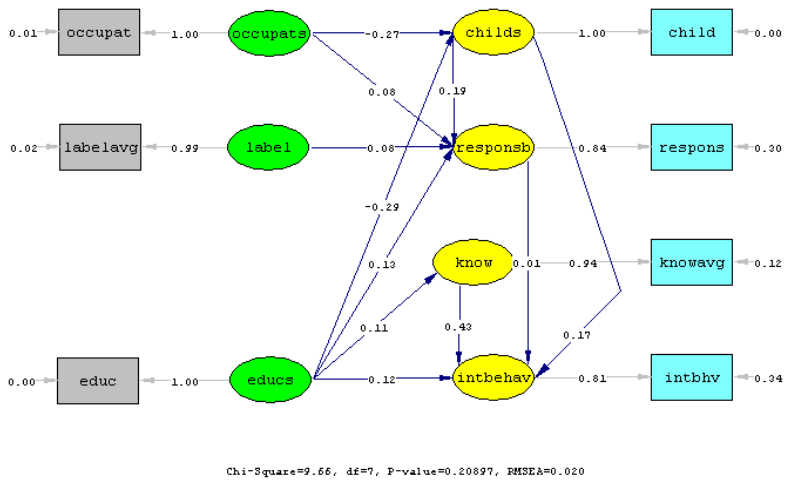

Figure 6. Path diagram for the estimated model 'The Netherlands' (standardised solution).

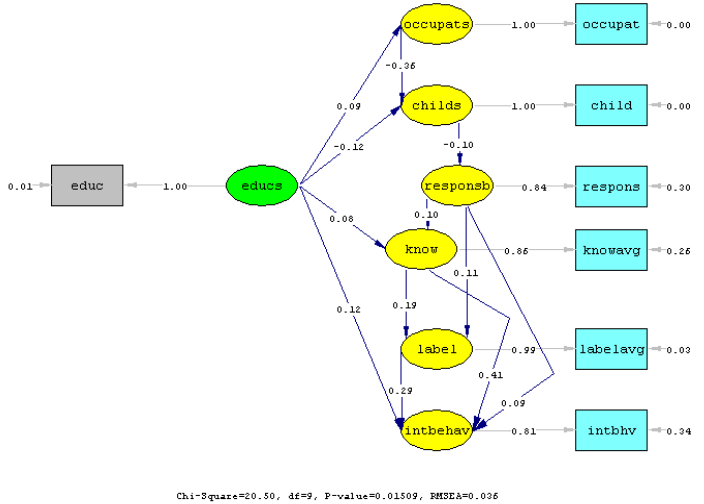

Figure 7. Path diagram for the estimated model 'Poland' (standardised solution).

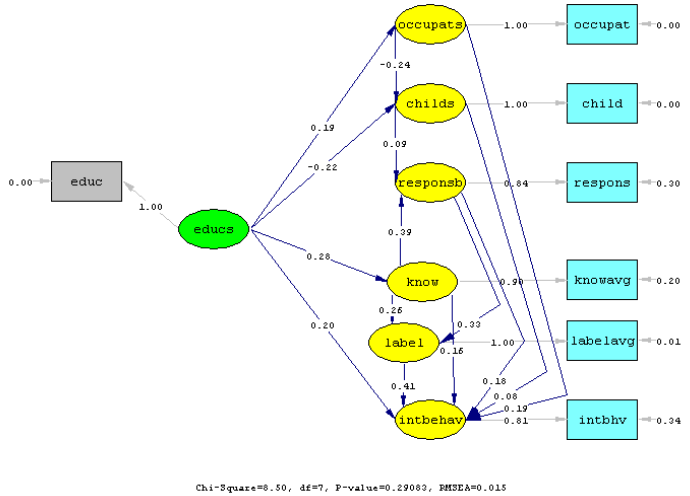

Figure 8. Path diagram for the estimated model 'Portugal' (standardised solution).

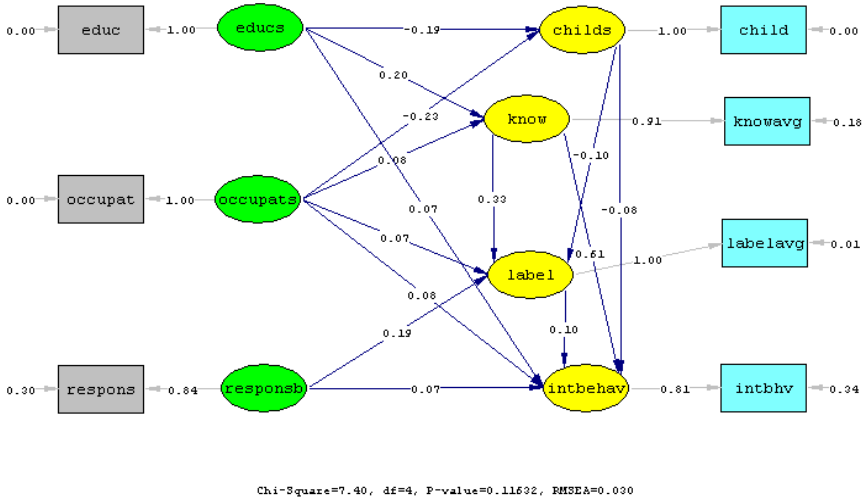

Figure 9. Path diagram for the estimated model 'Spain' (standardised solution).