Analysing Consumers' Behaviour towards Genetically Modified Food by a Variance-Based Structural Equation Modelling Method

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Introduction

Knowledge is one of the most unsteady variables influencing in consumers' GM food acceptance. It shows positive (Moerbeek and Casimir, 2005), negative (Grunert et al., 2001) and no relations (Priest, 2000) on GM food acceptance. Priest (2000) states the role played by people literacy and the relevance of studying "science literacy" effects.

But, which is the potential role of people literacy in determining consumers' acceptance towards GM foods?

The research is performed in Southern Spain by 169 face-to-face surveys –from January to April 2008.

Method

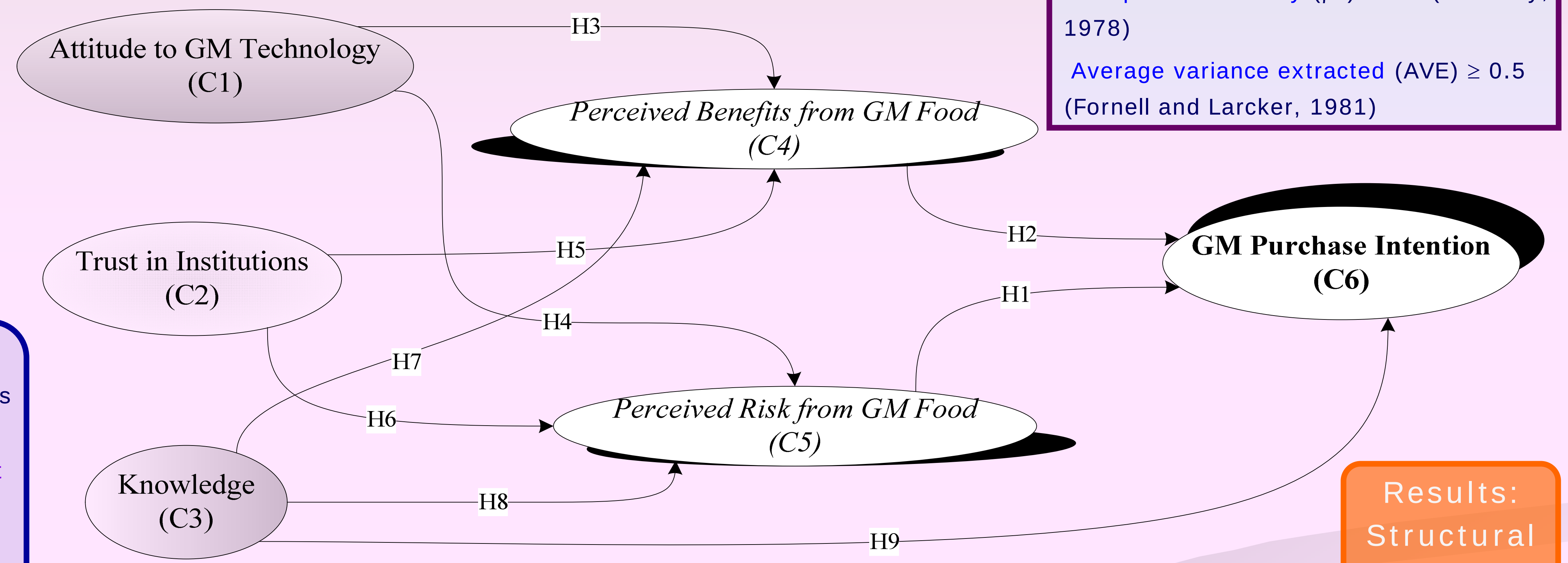
Structural Equation Modelling is a multivariate technique. Relations are: among theoretical constructs –unobserved variables (structural model), and theoretical constructs with indicators –observed variables (measurement model). We apply Partial Least Squares (PLS), variance method. Multi-group comparison –scientific-technical (S1) and social-humanistic fields (S2)– follows Chin (2000) parametric method.

C	Indicators
C1	Applying gene tech is X1: ethically unacceptable; X2: naturally unacceptable; X3: worst than conventional-tech
C2	X4: EU monitors GM tech correct use in food sector; X5: I trust in scientist reports about GM food safety; X6: I can distinguish GM food by labels
C3	X7: Scoring in test knowledge ; X8: Self-knowledge level
C4	Applying gene tech in food production will X9: increase yields; X10: solve ecological problems; X11: improve functional issues
C5	Applying gene tech in food production X12: proves harmful to environment; X13: causes allergy in humans; X14: only serves big companies interests
C6	I would buy a precooked meal if X15: chicken was GM; X16: vegetables were GM; X17: preservatives were GM; X18: chicken fed with GMO

Indicators: 5 point-Likert scale, except C6 = 10 point-Likert scale

Theoretical Framework and Model Development

Based on multi-attribute approach developed originally by Fishbein (1963), cognition and attitudinal features are relevant variables to explain GM food purchase intention (Bredahl, 2001; Verdurme and Viane, 2003).



H1: Consumers' purchase intention to GM food is decreased by GM food perceived risks; H2: Consumers' purchase intention to GM food is increased by GM food perceived benefits; H3: Perceived benefits from GM food is decreased by consumers' negative attitude to GM tech; H4: Perceived risks from GM food is increased by consumers' negative attitude to GM tech; H5: Perceived benefits from GM food is increased by consumers' trust in institutions; H6: Perceived risks from GM food is decreased by consumers' trust in institution; H7: Perceived benefits from GM food are influenced by knowledge; H8: Perceived risks from GM food are influenced by knowledge; H9: Consumers' GM purchase intention is influenced by knowledge.

Results: Measurement Model

Loadings over 0.5 (Duxbury and Higgins, 1991)

Composite reliability (ρc) ≥ 0.7 (Nunnally, 1978)

Average variance extracted (AVE) ≥ 0.5 (Fornell and Larcker, 1981)

	X: Loadings; C: ρc and AVE				
	S1	S2		S1	S2
C1	0.80 | 0.57	0.80 | 0.58	C2	0.87 | 0.69	0.86 | 0.69
X1	0.81***	0.70***	X4	0.71***	0.79*
X2	0.75***	0.78***	X5	0.86***	0.80*
X3	0.70*	0.80***	X6	0.90***	0.88*
C3	0.89 | 0.81	0.90 | 0.82	C4	0.79 | 0.56	0.86 | 0.67
X7	0.89***	0.85***	X9	0.81***	0.86***
X8	0.91***	0.96***	X10	0.74***	0.85***
			X11	0.69***	0.75***
C5	0.82 | 0.61	0.86 | 0.67	C6	0.95 | 0.83	0.96 | 0.87
X12	0.79***	0.76***	X15	0.91***	0.92***
X13	0.67***	0.69***	X16	0.94***	0.95***
X14	0.87***	0.77***	X17	0.91***	0.93***
			X18	0.88***	0.92***

Results: Structural Model

	S1		S2		Hypothesis	Multi
	β	t	β	t		t
H1	-0.30***	-3.35	-0.42***	-6.40	Support	1.38 ns
H2	0.43***	5.21	0.44***	6.14	Support	-0.02 ns
H3	-0.43***	-3.33	-0.44***	-5.27	Support	0.04 ns
H4	0.53***	5.16	0.51***	7.21	Support	0.13 ns
H5	0.03 ns	0.25	0.30***	3.82	Part Support	-1.97*
H6	-0.19*	-1.67	-0.21**	-2.52	Support	0.17ns
H7	0.03 ns	0.23	0.16*	2.04	Part Support	-0.92 ns
H8	0.22*	1.99	-0.06 ns	-0.77	Part Support	2.11 *
H9	0.08 ns	0.69	-0.08 ns	-1.20	Not Support	--

*** p < 0.001; ** p < 0.01; *p < 0.05; n.s. non significative

Conclusions

Consumers' risk and benefit perceptions play a key role in purchase intention; though for scientific-technical people, risks loss relevance, because the self-confidence from this training may reduce risk impact in a cognitive level.

Attitude to GM technology is the main key driver in consumer's risk and benefit beliefs. Trust in institutions reduces perceived risks and vice versa, but scientific-technical literacy people is only influenced in risk perceptions.

Knowledge, for social-humanistic literacy people, does not have a significant relation with the risks; but existing with the benefits which may be easier to assimilate. In scientific-literacy group, higher knowledge means a higher risk perceptions. No direct influence from knowledge to purchase intention may be owing to the consumers' ability to absorb the hodgepodge of conflicting information.

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