

Personal predictors of consumers' food and health concerns

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Three surveys were conducted of 429 supermarket shoppers in Canberra, Australia, in order to examine factors that may influence their concerns about food and health. In each survey, a 28 item food and health concerns inventory was administered along with selected personality trait, personal values or shopping style scales. Principal components analysis of the ratings of the food and health concerns derived eight components. In order to test a number of hypotheses, a series of multiple regression analyses were carried out in which the psychological variables were entered along with demographic variables as predictors of the respondents' scores on the concerns components. Response rates for the surveys averaged 72%. The psychological variables accounted for more variance in the food and health concern scores than the demographic variables. Examples of the observed relationships showed that: (i) safety and quality concerns were positively related to social activism and nature values and to anomy, but were negatively related to age of the respondent and neuroticism; (ii) concerns about hidden additives in foods were directly linked to the quality-seeking shopping style; (iii) concerns about general food system problems were positively linked to the nature value orientation, and negatively to the self-monitoring and neuroticism personality traits; (iv) empathy for vulnerable people was positively linked to the social activism and nature values and negatively to the fashion-seeking shopping style; concern about animal welfare was directly related to the nature value. The findings show that individual difference variables have some utility in predicting responses to food and health issues. They have implications for food communicators, nutrition educators, food label designers as well as consumer and industry groups, all of whom need to recognize consumers' varied orientations.

Key words: consumers, attitudes, food, health, surveys, Australia

Introduction

Consumers' expressed concerns about food and health issues appear to cluster around several themes that have self and community orientation links.¹ These themes relate to food additives, non-communicable disease, safety and quality, general food system problems (e.g. the amount of food packaging; the concentration of ownership of food retailers), regulatory problems (e.g. the enforcement of food regulations) as well as concerns about vulnerable people (e.g. starvation in other countries), animal welfare (e.g. animal cruelty in food production) and food imports.

It might be expected that some issues are grounds for more concern than others, for example, microbiological pathogens are recognized by food technologists to be greater causes for public health concern than food additives.^{2,3} However, it has been frequently observed that members of the public may have quite different, even opposing, perceptions of the potential harmfulness of food system phenomena compared with those of knowledgeable experts.^{2,3}

In part, the degree of exposure, familiarity and control that consumers have over events may influence their concerns.⁴ For example, unfamiliarity and lack of control over events such as toxic waste spills often lead to public outrage.⁵ This may partly explain the greater concern expressed by less educated people (who presumably have less control over, and greater exposure to, noxious events in the food system than more educated, affluent people), about many food and health issues.¹ Nevertheless, demographic associations with food and health concerns tend to be relatively weak.¹

An understanding of the factors that influence consumers' food and health concerns appears to be an essential prerequisite for several areas of community health and health promotion as well as for other areas such as social and food marketing.⁶ Nutrition and food safety education necessarily involve the negotiation of the views of consumers with those of 'experts'. The latter require insights into consumer epistemology if they are to respond to consumers' needs.

Recent initiatives in the general area of lay models of epistemology include examinations of scientific concepts,⁷ obesity^{8,9} as well as the rapidly developing social representations speciality.^{10,11} However, most studies of consumers' views of food and health have been restricted to nutrition-centred attitudes (e.g. surveys reviewed by McNutt¹²). Broader issues like food safety have often been excluded, and the overwhelming majority of nutrition opinion studies have used demographic categories to examine differences between groups of consumers. Thus, apart from knowing that different social groups may hold different nutritional beliefs, we have little knowledge of the ways consumers think about the health issues implicit in the larger food system.

Following the basic communications model (source–medium–receiver),¹³ we report on the use of the

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individual differences (or psychometric) paradigm¹⁴ in an attempt to improve the prediction of food and health concerns. The assumption underlying this view is that a proportion of the concern expressed by a person about a food issue is accounted for by influences which vary between individuals. Thus we might expect anxious people to be more worried about events in general, including food issues, than less anxious individuals; that is, information processes within individuals (message receivers) are likely to be partly responsible for their levels of expressed concern about food and health issues.

Three broad sets of variables from the psychological and marketing literatures may be relevant. First, as alluded above, personality traits may guide people to behave in characteristic ways across many situations.¹⁵ Second, cultural and personal values are important predictors of consumers' opinions about products and issues.^{16–19} For example, people who value hedonism may be less concerned about microbiological risks than those who value security. Third, because food in a consumerist society is closely related to the acquisition of objects,^{20,21} it is likely that shopping motivations may be closely connected to the cognitive salience of food and health concerns. For example, someone who shops mainly for pleasure may be less interested in health concerns than someone who seeks high quality products. Thus, we aimed to examine the likely influence of certain personality traits, personal values, and shopping style variables, on expressed food and health concerns.

In a related report we described in detail how these three sets of predictor variables and 28 food and health concerns were operationalized (A. Worsley *et al.*, unpubl. data, 1994). More specifically, this antecedent study identified, through principal components analyses, eight food and health concern factors, five self-monitoring components, six personal value factors, and five shopping style components (Tables 1 and 2). Our working hypotheses, below, link the food and concern factors.

Modern personality theory suggests that human personality traits can be represented along five major dimensions (the 'big five' factor theory)^{15,22} including: surgency (extroversion–introversion), agreeableness, conscientiousness, emotional stability (inverse of neuroticism) and intellect (or openness to information). In these exploratory studies we chose to investigate the possible relationship of two of the major factors, and three trait-related concepts: self-monitoring, conservatism and anomy.

We hypothesized:

(1) Extraversion (H1), related to surgency, was expected to be negatively related to most of the concerns factors, since extraverts are known to be less sensitive to environmental stimuli in general, and less ruminative.^{23,24} We postulated that extraversion would predispose people to a lower interest in food issues in general.

(2) Neuroticism (H2), a measure of anxiety proneness (inversely related to emotional stability),^{22–24} was hypothesized to be positively related to concerns in general, but especially those that represented more direct effects to individual well-being, such as concerns about safety/quality, hidden additives, and non-communicable diseases.

(3) Conservatism (H3) has been considered to be a defensive strategy against perceived threats to the self.^{25,26}

Table 1. Summary of principal components analysis (with varimax rotation) of the food concerns data.

Principal component	loading (x100)
Safety–quality	
The storage of dairy products	77
The quality of fruit sold in shops	72
Clean handling of food in shops	63
The safety of drinking water	60
Lack of vitamins in food	59
The cost of basic foods	56
The quality of processed foods	49
The waxing of oranges and apples	44
Eigen value (% variance)	6.98 (24.9)
Cronbach's Alpha	0.79
Hidden additives	
Chemical additives in foods	76
The irradiation of foods	68
Uncertainty about what is in foods	62
The safety of imported foods	54
The quality of processed foods	51
The safety of takeaway foods	46
The waxing of oranges and apples	40
Eigen value (% variance)	2.33 (8.3)
Cronbach's Alpha	0.76
Disease concerns	
The links between food and heart disease	88
The links between food and cancer	82
Eating too many fatty foods	42
Eigen value (% variance)	1.62 (5.8)
Cronbach's Alpha	0.66*
*Alpha = 0.88 if last item omitted	
Food system problems	
The amount of food packaging	77
The ownership of retail food company	65
The transport of foods over long distance	44
Importing of foreign food products	40
Eigen value (% variance)	1.48 (5.3)
Cronbach's Alpha	0.66
Regulatory concerns	
Enforcement of food regulations	62
Harmful bacteria in food (e.g. salmonella)	53
The honesty of food labels	52
Eigen value (% variance)	1.18 (4.2)
Cronbach's Alpha	0.52
Empathy with the helpless	
Starvation in other countries	75
TV advertising of junk foods to children	64
Poverty in Australia	51
Eigen value (% variance)	1.15 (4.1)
Cronbach's Alpha	0.51
Animal Welfare	
Driftnet fishing	81
Animal cruelty in food production	78
Eigen value (% variance)	1.06 (3.8)
Cronbach's Alpha	0.62
Food imports	
Importing of foreign food products	64
Poverty in Australia	45
Eigen value (% variance)	1.01 (3.5)
Cronbach's Alpha	0.42

Hence we thought that more conservative individuals would be more concerned about safety/quality, hidden additives, disease concerns and especially regulatory concerns, since regulations help to maintain the safety and security of food.

Table 2. Factors derived from principal components analysis

Factors
SELF-MONITORING^a
Factor 1: Entertainer The person believes he/she is a good actor
Factor 2: Ego dependence The person tends to follow their own beliefs rather than the demands of the social situation
Factor 3: Behavioural inflexibility The person finds it hard to imitate others or alter their usual behaviour pattern
Factor 4: Situation dependence The person tends to follow the demands of the social situation
Factor 5: Unsociability A tendency to be truthful but tactless
PERSONAL VALUE FACTORS^b
Factor 1: Religion e.g. Trusting in God for the direction of one's life; having strong religious beliefs that really exert an important influence in one's life
Factor 2: Materialism e.g. Having an income ample enough to cover the basic needs with enough left over for acquiring things that make life easier, more fun, and more worth living
Factor 3: Social activism e.g. Losing oneself in a good cause and pursuing that cause with vigour and commitment
Factor 4: Nature e.g. Having many opportunities to enjoy and be close to nature
Factor 5: Reason in life e.g. Living in such a way as to exemplify reason, order and restraint
Factor 6: Having a good job e.g. Working hard to achieve a fairly high standard of living for oneself and one's family
SHOPPING STYLES^c
Factor 1: Quality seeking (brand loyalty) e.g. Getting very good quality is very important to me. Once I find a brand I like I stick with it
Factor 2: Confused shopper e.g. I often feel confused when choosing from so many brands
Factor 3: Fashion seeker e.g. I usually have one or more outfits of the very latest style
Factor 4: Recreational shopping e.g. Going shopping is one of the enjoyable activities of my life
Factor 5: Bargain hunting e.g. I buy as much as possible at sale prices

^aItems from Snyder, 1974 (ref. 27); ^bItems from Mikhell 1984 (ref. 35); ^citems from Sproles 1987 (ref. 31)

We thought they might be less concerned about others, as expressed on the animal welfare and concern for the vulnerable components.

(4) Self-monitoring (H4): The extent to which people fit in with the demands of the social situation in contrast to those of their ego-related beliefs,²³ was predicted to be more positively related to social issue factors like (concerns about) animal welfare and concern for the vulnerable, since these tend to be socially desirable ('politically correct') issues. The self-monitoring construct has been criticised recently,²⁹ so we also examined the influence of five sub-scales derived from principal components analysis.

(5) Ego dependence (H4A): We expected respondents who scored highly on this factor to score highly on the self-related concerns such as safety/quality, hidden additives, and non-communicable disease, and lower on the other-orientated components: food system problems, empathy with the helpless and animal welfare.

(6) Situation dependence (H4B): We expected higher scorers to be more interested in regulatory problems, since they are about the control of those (social) situations in which food is traded or stored.

(7) Unsociability (H4C): We expected high scorers to be less interested in the problems of others such as concern for the vulnerable and animal welfare.

(8) Anomy (H5) is a measure of perceptions of rulelessness in the world.³⁰ Hence it was expected to be positively related to concern about general food system problems, safety/quality and food imports, since these represent perceptions of disorder in the food system.

Personal values are abstract concepts which can be defined as the guiding principles in people's lives. They are believed to serve a variety of community, social and self-related functions.¹⁹ We expected that:

(9) Religion (H6) would be positively related to concern about regulatory problems, concern for the vulnerable and animal cruelty, because they involve overtly ethical elements.

(10) Because self-interest is at the heart of materialism,^{20,21,30} materialism and having a good job (H7) were expected to be directly related to the self-orientated concerns: safety/quality, hidden additives, disease concerns, and negatively related to concerns about others: empathy for the helpless, animal welfare, and food system problems.

(11) Social activism (and perhaps reason in life; H8) would be positively related to safety/quality, food system problems, and concern for the vulnerable, because it is essentially an anti-status quo and community orientated value.

(12) Nature (H9) was expected to be directly associated with concern about animal welfare and possibly with food system problems and hidden additives (as these are usually perceived to be artificial or unnatural).

The Consumer Styles Inventory was designed to assess the various interests and motivations which influence shopping behaviour.³¹ Shopping styles and scripts have been implicated in food choice.⁶ In relation to the five shopping styles derived (Table 2), the following relationships were proposed:

(13) Quality-seeking (brand loyal) shoppers would be more likely to have higher levels of safety/quality concerns and possibly greater concerns about hidden additives (H10).

(14) Conversely, bargain hunting was likely to be negatively related to safety/quality concerns (H11).

(15) Recreational shopping was predicted to be negatively related to most concerns especially safety/quality, hidden additives and disease concerns since these represent direct threats to family and self security, things that are likely to make shopping less than enjoyable (H12).

(16) Fashion seeking: The self-orientation of fashion and its emphasis on appearance and illusion rather than substance, might predispose fashion seekers to underestimate the importance of fundamental issues unrelated to themselves, such as food system problems, concern for the vulnerable and animal welfare (H13).

Finally, in view of other food lifestyle⁶ and psychographic research^{32,33} it was expected that demographic variables would account for smaller proportions of concerns variance than the above psychological variables.

Method

Three short questionnaires were given to 600 shoppers at Canberra supermarkets following a survey protocol which has been described elsewhere.¹ The questionnaires were taken by the respondents, completed in their homes and returned to the investigators by mail. Postal reminders were sent to non-respondents 1 week after initial contact. The response rate was 72%, and consistent with our interest in food shoppers, approximately 85% of the respondents were women.

In all three studies a list of 28 food and health concern items was included. Respondents were asked to rate how concerned they were about these issues using four point response scales (not, quite, very, not sure). In addition, the first questionnaire (study 1: $n = 141$) included eight, three point (yes, no, not sure) item conservatism scales²⁵ from which a conservatism score was computed by scoring the yes answers as unity, summing them, and converting the totals to z-scores. The questionnaire also contained the 15 item consumer styles inventory³¹ from which five standardized shopping style scores were produced via principal components analysis³³ of the correlations between the responses to the items (A. Worsley *et al.*, unpubl. data). Finally, emotional stability or neuroticism (N) and extraversion (E) were assessed via the 22 item version of the Eysenck Personality

Inventory.^{23,24} The N and E scores were converted into z-scores for analytic purposes.

The second questionnaire (study 2: $n = 149$) included 23 statements from the Life Values Inventory,³⁵ which were assessed on five point strongly agree/strongly disagree response scales. Principal components analyses of the response intercorrelations yielded six standardized scores (Table 2) for subsequent regression analyses.

The third questionnaire (study 3: $n = 139$) included a 15 item (true/false) self-monitoring scale.²² The scale was converted into a z-score version of the summed score²⁷ and the respondents' scores on the five components (Table 2) were calculated. Anomy was assessed via the z-score of the sum of nine five-point items.³⁰

Demographic information collected from all respondents included: sex, age in years, highest level of education (primary school, left school at age 14, 15, 16, 17, 18, technical or trade certificate, or tertiary qualifications), employment status (in full time, part time or not in paid employment; pensioner; retired).

Data analysis

Stepwise regression analysis was used to test the relationships between each of the eight food and health concerns factors (the dependent variables) and the various psychological variables (the predictor variables).³⁷ These analyses were run with and without the demographic variables in the prediction equations to test their relative influence on the concerns factors. The results of the regression analyses are summarized in Table 3.

Table 3 Regression analyses of food and health concerns

SAFETY-QUALITY			
Values	0.19 social activism + 0.18 nature	$R^2 = 8.1\%$	$P < 0.004$
Personality	0.19 anomy - 0.19 age	$R^2 = 8.2\%$	$P < 0.007$
	-0.18 neuroticism - 0.23 age	(age = 4.3%) $R^2 = 7.6\%$	$P < 0.005$
		(age = 3.9%)	
HIDDEN ADDITIVES			
Shopping style	0.25 quality seeking	$R^2 = 6.8\%$	$P < 0.002$
Disease	No statistically significant predictors		
FOOD SYSTEM PROBLEMS			
Values	0.21 nature	$R^2 = 4.4\%$	$P < 0.02$
Personality	-0.23 self monitoring	$R^2 = 5.5\%$	$P < 0.009$
	-0.26 ego dependence (SM)	$R^2 = 6.7\%$	$P < 0.004$
	-0.20 neuroticism	$R^2 = 14.0\%$	$P < 0.02$
REGULATORY PROBLEMS			
Personality	0.25 situation dependence (SM)	$R^2 = 6.7\%$	$P < 0.004$
EMPATHY FOR HELPLESS			
Value	0.25 social activism + 0.23 nature	$R^2 = 11.3\%$	$P < 0.0005$
Shopping styles	-0.19 fashion seeking	$R^2 = 3.6\%$	$P < 0.03$
ANIMAL WELFARE			
Values	0.17 nature	$R^2 = 3.6\%$	$P < 0.05$
FOOD IMPORTS			
Values	0.18 having good job - 0.15 educational level	$R^2 = 7.8\%$	$P < 0.006$
		(age = 4.6%)	
Personality	-0.26 unsociability (SM) + 0.14 employment status	$R^2 = 9.4\%$	$P < 0.003$
		(emp stat = 3.1%)	

Unstandardized regression coefficients are shown before the independent variables; SM, self-monitoring component.

Results

Table 1 shows the composition of the eight components derived from the ratings of the 28 food and health items. For convenience, the regression findings are described according to the main sets of psychological variables (i.e. personality traits, personal values, shopping styles and food and health concerns), rather than study by study (Table 3).

Extraversion was not related to any of the concerns factors. Thus H1 was refuted.

Neuroticism was related to several concerns. Both age and neuroticism were negatively associated with safety/quality (i.e. younger and more emotionally stable people expressed *more* concern about safety/quality issues). Neuroticism was also negatively related to food system problems (i.e. the more emotionally stable (less neurotic) consumers were, the *more* concern they expressed about issues like long distance transport, concentration of retail ownership, etc.). These findings strongly refute H2.

Conservatism was not related to any of the concerns factors (refuting H3).

The full self-monitoring scale was negatively related to food system problems. Thus people who tend to fit their behaviours to social situations were more likely to express concern about food system problems like the concentration of retail ownership. This was contrary to our expectation in H4. However, the relationship was clarified by the finding that the ego dependence component was also negatively related to concern about food system problems (i.e. people who tend to be self-orientated worry less about food system problems). Thus H4A was partly supported.

Situation-dependent respondents tended to be more concerned about regulatory problems than others (i.e. people whose behaviour is reported by them to depend to a large degree on the demands of the social situation tended to be more concerned about problems in the ways the (social) situations in which food is imported, sold or stored are regulated or controlled (supporting H4B)).

Finally, unsociability was inversely related to concerns about food imports. These tend to be related to social problems like threats to jobs and safety. This is not altogether surprising since respondents scoring high on this factor might be expected to be less aware of the threats posed to others by imports.

To a degree these last two findings support the expectation expressed in H4 that sociability/situational 'fit' would be positively related to community-related issues.

Anomy was positively related to safety/quality concerns (as predicted in H5) in conjunction with age, which was negatively related to these concerns. Thus younger people, and people who perceive the world as a ruleless place, had lesser concerns about safety/quality.

Personal values

Religion and materialism were not related to any of the concerns factors, refuting H6 and H7. However, having a good job was linked with educational level in predicting concerns about food imports; the more people valued having a good job, and the lower their level of education, the more they worried about food imports.

Social activism together with nature (but not reason in life) was positively related to safety/quality and concern for the vulnerable. This substantially supports H8.

In addition, nature was directly associated with concern about animal welfare and food system problems and hidden additives (supporting H9).

Shopping styles

Quality-seeking was positively related to hidden additives but not safety/quality. Quality-seeking shoppers were more concerned about additives than others (partly supports H10).

Bargain hunting and recreational shopping were unrelated to the concerns factors (i.e. H11 and H12 were unsupported).

Fashion seeking was negatively related to concern for the vulnerable; fashion seekers were less concerned about the 'underdog' (support for H13).

As expected, the psychological variables related to more concern factors and generally accounted for more factorial variance than the demographic variables (Table 3).

Discussion

The findings show that individual difference variables may have an important role in predicting people's concerns about food and health issues. Furthermore, they suggest that certain personality traits, personal values and shopping styles may be more effective predictors of concerns than membership of social demographic categories. Grunert *et al.* (1993) have taken this approach in their food lifestyle model by considering the variety of variables which influence food opinions.⁶ The present findings with clear links between values, shopping style and food and nutrition concerns, verify parts of this model.

The observed relationships between neuroticism and concerns about safety/quality and food system problems were contrary to our working hypotheses. At first glance it seems somewhat counter-intuitive that calmer, more stable individuals expressed *more* concern about these two sets of issues. However, it may be that a more detached, less emotional viewpoint is required before people can attempt to appreciate the wider, less self-orientated, problems which beset food safety and the food system in general. This finding requires further confirmation. It strongly suggests that consumers' concerns about major food and health issues are unlikely to be due to emotional disturbances.

The relationships between self-monitoring variables and concerns about food system problems, regulatory problems and food imports suggest that people who are swayed by their self-related beliefs (ego dependence) are less likely to be aware of the wider problems of the food system. Instead it is those who are situationally dependent that appear to be more aware of problems to do with the regulation of food buying and storage situations. This supports the observed neuroticism–safety/quality relationship; self-orientated (and 'less social') people appear to be less concerned about the conditions of the wider food system. Conversely, the greater the focus on the fit between the self and the social situation, the more concerned people are likely to be about those factors that regulate the social situations in which food is traded or stored. These two findings suggest the importance of differentiation of the self from the situation or context of the food system.

The links between anonymity, age and safety/quality suggest that younger respondents and those who feel confused about the workings of society, were less interested in safety/quality issues. Several explanations of this relationship are possible. For instance, younger people may have lower expectations of safety and quality than older people or they may have less reason to value these concerns. Jussame and Judson's observation of heightened concerns about food safety among Japanese and American parents suggests that responsibility for children and families highlights such concerns.³⁷ People who are confused by societal ways are also quite likely to be uncertain about what constitutes quality and security. Clearly the finding needs more confirmation and examination.

Social activism and appreciation of nature were two values that broadly related to the concerns factors in the manner suggested by our working hypotheses. Together they explained more variance of one of the variables (concern for the vulnerable) than any other combination of predictor variables. To an extent they seem interchangeable, being linked to similar concerns which focus on empathy for others (humans or animals) but they were both also linked to critical views of food and health issues. Social activism seemed to focus on the every day life concerns of safety/quality, while the nature value was linked to the deeper food system problems. This suggests that these values may be sources of radical criticism of the food system. It is noteworthy that in a previous study, graduates expressed a greater concern than other respondents about only two issues: animal cruelty and TV fast food advertising aimed at children, both of which strongly contribute to the concern for the vulnerable factor.¹ These are also two key campaign issues for consumers' and ecological organizations.

The related study of trust of sources of nutrition information showed that respondents who scored high on nature placed more trust in alternative sources (e.g. naturopaths, health food shops) while social activists distrusted orthodox nutrition sources but trusted food industry sources (e.g. label information, supermarket information) more.²² Thus it seems that high nature scorers are exposed more to alternative sources of nutrition (and other) information which may contribute to their awareness of food system problems, and, the greater concerns about safety/quality of the 'social activists' may be fuelled in part by information provided by the food industry on food packages, etc.

The relationship between quality-seeking and hidden additives suggests that additives, irradiation, etc., reduce perceived quality in the minds of quality-conscious shoppers. We have the sense that if a product needs additives then it is considered to be something less than the 'true article'.³⁸ So part of the current disapproval of 'additives' (and cheap imported processed foods) appears to be rooted in the desire for quality. The lack of a relationship between quality-seeking and quality/safety was unexpected; it may be that the safety aspects of these concerns are perceived to be distinct from those of quality. Hidden additives may represent a more direct attack on quality since products with additives, in a sense, pretend to be something they are not; the opposite of true, genuine quality (e.g. between raspberry-flavoured cordial vs genuine raspberry juice).³⁹

Fashion-seeking represents, par excellence, concern about the self and self-expression. In direct contrast, concern

for the vulnerable represents concern with others, not the self. This negative relationship receives some support from Schwartz's Values Circumplex.¹⁹ Fashion-seeking can be classified as a hedonistic value which lies on the circumplex in an opposite position to benevolence and universalism; an 'empathy for others' value. The relations of the present nature and social activism values with wider food system problems and with the fate of the vulnerable also parallel the universalism/benevolence values in Schwartz's circumplex.

The combination of having a good job and educational level in predicting concern about food imports looks complex until recent press furor over imported food products is recalled. These products are presented as taking away local jobs in food manufacturing. Australia is in the midst of a vigorous debate about the best ways to label the Australian or foreign content of food and other products.^{39,40} In light of this it is not surprising that people who strive for a good job and less well educated people (who are likely to be unemployed, especially in the recent recession) would be more concerned about food imports.

Implications

These findings have several implications for health promoters and nutrition educators, as well as consumer organizations, food marketers and food industry public relations professionals. First, consumers' opinions about food issues are likely to be more adequately explained and predicted if 'psychographic' variables (similar to those examined here) are considered in addition to demographic variables. Indeed, better market segmentation may be achieved on the basis of 'psychographic' criteria than through more traditional demographic criteria.^{17,41}

Food industry professionals need to anticipate the expression of concerns about food issues which emanate from different values orientations. Rather than assuming that criticisms emerge only from a few 'malevolent' individuals, it is probably wiser to assume that criticisms come from the diverse sets of values and opinions that exist in post-modern society. These viewpoints require recognition and accommodation.

Consumer advocates run parallel risks to those of food industry lobbyists in that they may inadvertently assume that all consumers share their own value positions. It would be possible to check the extent to which their current campaigns represent the values and aspirations of various consumer segments.

Nutrition educationists could also note the complexity of consumers' views and their root values, personality traits and behaviours. It seems likely that self-oriented education programmes about the health benefits of particular food consumption behaviours, for example, are unlikely to receive much attention from people who are more interested in the plight of vulnerable people and animals.

Both food marketers and nutrition educators may have to cater for 'psychographic' differences between individuals, in addition to their different information processing capacities and social category membership.

The generally high levels of statistical significance associated with these relationships strongly suggest that they were unlikely to be due to chance events. It might be objected that the amounts of variance explained by the predictor vari-

ables were small, but the dependent variables are of such an open nature that they are likely to be influenced by a wide variety of variables in addition to those examined in the present studies. Limits to the predictive power of values, personality traits and attitudes might reasonably be expected; Greenwald for example, claims that attitudes account for between 10 and 50% of behavioural variance.⁴²

Because of the survey nature of these studies the operationalization of the variables was relatively crude, especially that of the response scales. Population surveys have to be straightforward and easy to complete. Similarly, the sample sizes were relatively modest, so the levels of statistical significance are likely to have been underestimated. The selection of some of the measures, especially the values variables, was influenced by the need to provide survey items that were relatively concrete and easy to understand. Again, because of the exigencies of survey logistics, we were unable to examine the interrelationships between the personality traits, values, shopping styles (motivations) and the food and health concerns. Hence any causal modelling of these data is precluded.

Future studies should include a wider range of values variables as well as other variables suggested by the food lifestyle model.⁶ The use of more differentiated response scales would also be desirable from a psychometric point of view. Despite these caveats, the present research strongly supports the view that psychographic variables like those

examined here are essential ingredients of a predictive model of food and health concerns, and by extension, food and health behaviours.

It would be particularly useful to examine the nutrition information needs of consumer segments based on psychographic variables similar to those of the present study, for example, in relation to the optimal design of food product label information. The limits of these psychographic variables in the prediction of food and health opinion and behaviour need to be examined and their relationships with social conditions (such as social health inequities) explored.

Conclusions

Values orientations, certain personality traits and shopping styles, appear to be important predictors of consumers' food and health concerns. They need to be considered along with familiarity, outcome control and social demographic category membership.

The present findings warrant systematic examination of the links between personality traits, personal values, shopping and cooking scripts, and food and nutrition beliefs and behaviours.

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消費者關心食品 and 健康的個體預測指征

摘要

在澳大利亞的堪培拉 429 名超級市場購物者進行了三次調查，以便了解影響他們關心食品與健康的因素。每次調查收集了對 28 種食品的種種健康顧慮和人的個性，個體價值或購物類型的選擇級別。

主要將有關食品健康顧慮的八項內容分成等級，使用一系列多元回歸分析，將心理學和人口統計學變量作為食品健康顧慮記分的預測指標，以便檢驗各種假設。

平均有 72% 的調查對象回答了這一調查。在食品健康顧慮記分上，心理學變量的影響要比人口統計學變量大。例如：

(a) 注重食品安全與生活行動主義，自然價值論和頹廢論呈正比，但與調查對象的年齡和精神過敏呈反比。

(b) 擔心食品內隱藏的添加劑直接與質量尋求型購物相關聯。

(c) 關心一般性食品系統的問題是與自然價值論正相關，與自我監測和精神過敏個性呈反比。

(d) 容易受騙和生活行動主義呈正比；自然價值論與時髦購買型呈反比；關心自然動物直接與自然價值論相關聯。

結果表明，這些個體變量的差異在預測對食品與健康問題的反應很有利用價值。同時對食品新聞記者，營養教育人員，食品標籤設計者，消費者以及食品廠商均有很大的用途。因為所有這些機構和人員都必須考慮不同類型消費者的要求。

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