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Research report

Determinants of fast-food consumption. An application of the Theory of Planned Behaviour☆

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ABSTRACT

This study applied and extended the Theory of Planned Behaviour (TPB; Ajzen, 1988) in an examination of the variables influencing fast-food consumption in an Australian sample. Four hundred and four participants responded to items measuring TPB constructs and retrospective and prospective measures of fast-food consumption. Additional independent variables included: Consideration of Future Consequences (Strathman, Gleicher, Boninger, & Edwards, 1994), Fear of Negative Evaluation (Leary, 1983), and Self-Identification as a Healthy Eater Scale (Armitage & Conner, 1999a). Structural Equation Modeling (SEM) was used to examine predictors of consumption. SEM indicated that the TPB successfully predicted fast-food consumption. Factor analyses assisted in the definition of constructs that underlay attitudes towards fast foods. These constructs were included in an 'extended' TPB model which then provided a richer source of information regarding the nature of the variables influencing fast-food consumption. Findings suggest that fast-food consumption is influenced by specific referent groups as well as a general demand for meals that are tasty, satisfying, and convenient. These factors reflect *immediate* needs and appear to override concerns about longer-term health risks associated with fast food. Results are discussed in the context of possible applications.

Introduction

The structure and function of the family in developed countries such as Australia has changed considerably over the past sixty years with more women in the workforce and more people working longer hours (Australian Bureau of Statistics, 2006). By necessity, food and mealtimes have changed as well, as reflected in the rapid growth of the fast-food industry. Diet is a significant contributor to overweight (Nielsen & Popkin, 2003; Rodriguez & Moreno, 2006; Swinburn, 2003; Woods, 2005) and energy-dense fast foods have been implicated in particular.

The factors that predict differences in fast-food intake remain to be understood although correlational data suggest that age, relative indifference to the health consequences of behaviour, exposure and receptiveness to advertising, and use of time do have some relationship to intake levels (Mohr, Wilson, Dunn, Brindal, & Wittert, 2007). However, an attitudinal model that successfully explains variance in consumption is yet to be validated.

The Theory of Planned Behaviour and food consumption

The Theory of Planned Behaviour (TPB; Ajzen, 1988) is one of the most widely applied and accepted models of the belief-attitude–behaviour relationship within the health literature (Ogden, 2003). It is a cognitive theory, established on the assumption that most conscious behaviour is rational and goal-oriented (Conner & Armitage, 1998). Essentially, the model implies a causal link between attitudes and behaviour that is mediated by intentions.

According to the TPB, behaviour is directly influenced by behavioural intentions which are, in turn, shaped by three sets of considerations (Ajzen, 1988). First, beliefs about the outcome of the behaviour, as well as evaluations of these outcomes produce an 'attitude towards the behaviour'. Second, the beliefs an individual holds regarding the expectations of others (about the behaviour) as well as the individual's motivation to comply with these expectations give rise to a 'subjective norm' (SN). These perceptions may be further divided into what other people *think*

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(injunctive norms) and how other people *behave* (descriptive norms). Third, beliefs about any factors that may either impede or facilitate completion of the behaviour (such as skills, resources, opportunities, etc.), as well as the strength of each of these beliefs, determines 'perceived behavioural control' (PBC), that is, beliefs about the levels of personal control over the specified behaviour. In addition to control, perceptions of self-efficacy may also influence PBC. The TPB model also allows for 'actual behavioural control' (ABC) or external factors that may be beyond the immediate control of the individual to be captured as these, in addition to intention, are likely to influence behaviour.

There is a good deal of empirical validation for the TPB, with research indicating that the model reliably explains between 40 and 50% of the variance in intention, with intention consequently explaining between 20 and 40% of the variance in behaviour (Armitage & Conner, 2001). There is some suggestion that the model predicts healthy food choices (Bogers, Brug, van Assema, & Dagnelie, 2004; Conner, Norman, & Bell, 2002; Nejad, Wertheim, & Greenwood, 2004; Payne, Jones, & Harris, 2004), although it has been shown to explain more of the variance in other health-related behaviours such as condom-use, drug-use, cigarette-smoking, and exercise. A small number of researchers have applied the theory to examine the consumption of ready-meals or take-away (Bagozzi, Wong, Abe, & Bergami, 2000; Mahon, Cowan, & McCarthy, 2006), with results indicating some validity for the theories in this area. However, the predictive power of the TPB is generally weaker when applied to dietary and weight loss behaviour (Bogers et al., 2004; Margetts, Martinez, Saba, Holm, & Kearney, 1997; Reid & Hammersley, 2001; Williams et al., 1993) than for other behaviours. This may be explained, in part, by the complex nature of food consumption—in reality it often involves a range of behaviours such as purchasing, preparing, and cooking the foods. Therefore, although the TPB is well accepted as an important framework for predicting behaviour generally, and health behaviour especially, it may not necessarily capture all of the predictors of more complex behaviour (including food choices). Some explanation for this may be due to the fact that much of the related research has not incorporated an exploratory study to examine the nature of the behavioural beliefs held (as recommended by Aizen (2002). That is, Aizen argued that measuring underlying beliefs is of utmost importance as attitudes, intentions, and behaviour are most successfully altered when such beliefs are thoroughly understood. Similarly, in order to be meaningful and relevant, psychometric tools designed to measure attitudes should contain items that reflect the beliefs held by the population of interest.

Beliefs about fast food and fast-food consumption

Results from a qualitative investigation of beliefs about fast food and its consumption (Dunn, Mohr, Wilson, & Wittert, 2008) indicated that people believed fast food to be that which is purchased from major franchises and unhealthy to the extent that it was differentiated from all other types of convenience food. Specifically, participants defined fast food as burgers, hot chips/French fries, fried chicken, and certain mass-produced pizzas. Participants reported consuming fast food because of attributes including perceived convenience, taste, and immediate satiation. The beliefs identified in this study form the basis of measures employed in the present investigation.

Additional potential influences on fast-food consumption

A number of studies have measured individual differences on other variables hypothesised to moderate, mediate, or add to the variance explained by the variables incorporated in the TPB. Self-identity is one of these, with Armitage and Conner (1999b) reporting that a tendency to identify one's self as a 'healthy eater' was a significant predictor of intention to follow a low-fat diet.

The extent to which self-identity determines attitudes or attitudes define one's identity remains to be determined although there is certainly a suggestion of a strong association between the two. For example, it has been shown that the predictive ability of attitude may be reduced with the inclusion of self-identity in regression models (Cook, Kerr, & Moore, 2002; Smith et al., 2007). Nonetheless, the overall predictive validity of these reported models was improved with the inclusion suggesting that identification as a healthy eater may add to measures of attitude in the prediction of fast-food intake.

Some have argued that emotional or affective responses are as influential in assessment and decision-making as are more rational, cognitive responses (Damasio, 1994; Zajonc, 1980). Finucane, Alhakami, Slovic, and Johnson (2000) suggested that the role of affect is of particular importance in attitude formation as it directs judgements about risk and benefit associated with a behaviour, especially where cognitive effort is low or restricted, such as when decision-making is rushed or automatic.

Furthermore, it has been proposed that affect and cognition may act in opposition on any one behaviour, resulting in the experience of ambivalence and a weakening of the association between attitude, intention, and behaviour (Thompson, Zanna, & Griffin, 1995). Earlier findings indicate a widespread knowledge of the high fat-content of fast foods which, together with a general appreciation of its taste and convenience, implies that consumption of fast food is likely to lead to ambivalence for many (Dunn et al., 2008). That is, a trade-off in decision-making is made between short-term rewards, as captured by affective responses (taste and convenience) and the potential long-term costs as reflected in the realisation of the associated cumulative health risk.

The manner in which this ambivalence is resolved is likely to be influenced by the extent to which people give consideration to future consequences when making decisions. Strathman et al. (1994) have argued that people who give consideration to the future consequences of their behaviour are more likely to forgo immediate reward, whereas those less likely to give consideration tend to have trouble delaying gratification and display little concern about the longer-term effects of their behaviour.

This is a particularly important issue for health-promoting behaviours, such as diet and exercise, that tend to produce negative outcomes in the short-term, and it has been argued that an ability to foresee and value the future consequences of health-related behaviour is likely to play a part in the formation of related intention (Sirois, 2004). For many, eating fast food has a positive short-term consequence of providing an immediate feeling of satiation as well as hedonic pleasure (Dunn et al., 2008), although the long-term consequences of regular energy-dense food consumption are generally assumed to be negative.

Fear of Negative Evaluation (FNE) refers to individual differences in concern or anxiety about being judged by others in a disapproving way (Carleton, McCreary, Norton, & Asmundson, 2006; Leary, 1983). This fear may span many social situations, including those where food consumption is involved. Research among non-clinical populations has shown positive correlations between increased fear and restricted eating (Gilbert & Meyer, 2005). Similarly, Latimer and Martin-Ginis (2005) reported that subjective norms were a predictor of exercise behaviour only among those with a high Fear of Negative Evaluation and suggested that perceptions of attitudes held by others may influence intention, depending upon the extent to which the individual fears being judged. Thus, in the context of the TPB, it is possible that the path from social norms to intentions to consume fast food is moderated by fear of being evaluated negatively by others.

Summary

The TPB has been applied widely with findings indicating that attitudes, subjective norms, and perceived behavioural control explain much of the variance across a number of behaviours (Armitage & Conner, 2001), although the model is less adequate in its explanation of food choices and eating behaviour (e.g. Bogers et al., 2004; Reid & Hammersley, 2001). The current study attempts to improve model fit for the prediction of fast-food consumption through two means. First, it aims to better operationalise the variables that constitute the TPB model by measuring the beliefs that underlie attitude to the behaviour, subjective norms, and perceived behavioural control. Second, it extends the TPB model by incorporating variables that may moderate or mediate the path between attitude, subjective norms, and perceived behavioural control and intention to consume fast food and fast-food consumption. These incorporate measures of emotional reactions to fast food, the degree to which individuals fear being evaluated negatively by others, and the extent to which individuals both identify as being healthy eaters and consider the future consequences of their behaviour. These are combined in a model tested against both prospective and retrospective reports of fast-food consumption.

Method

Participants

Ethics approval for this study was granted by the University of Adelaide, School of Psychology Human Ethics Subcommittee, the CSIRO Human Research Ethics Committee, and the Ethics of Human Research Committee, Queen Elizabeth Hospital and Lyall McEwn Hospital. A sample of South Australian participants was drawn from the North West Adelaide Health Study (NWAHS) participant group (Grant, Chittleborough, Dal Grande, & Taylor, 2005). All households in the north-western area of Adelaide with a telephone number listed in the Electronic White Pages were eligible for selection in the NWAHS, and the last person within the household to have had a birthday was interviewed. For the present study, 914 people (22.5% of the NWAHS group) between the ages of 18 and 45 years were randomly selected and invited to take part. Invitations were restricted to this age group because this cohort has been shown to have relatively high fast-food consumption rates (Dunn et al., 2008; Mohr et al., 2007). A letter of introduction detailed the confidentiality with which all responses would be treated and advised participants that they were free to withdraw from the study at any stage without prejudice. A total of 404 people took part for a response rate of 44.2%. Although there were no significant demographic differences between respondents and non-respondents, the sample did differ from the full NWAHS group; they were better educated, had a higher income, and were less likely to be overweight. Table 1 provides a comparison of demographic details between the groups. Participants were encouraged to complete and return the questionnaire to make them eligible for a draw of a one-in-twenty chance to win an AUD20 shopping voucher.

Table 1
Comparison of demographic information between study participants and NWAHS group.

	Participants in current study *N* (%)	NWAHS participant group (%)
Sex		
Female	247 (61)	(51)
Male	157 (39)	(49)
Education		
Secondary	149 (36.9)	(43.1)
TAFE[a]	158 (39.1)	(40.4)
University degree	95 (23.5)	(11.7)
Income[b]		
Under $30,000	72 (17.9)	(22.2)
$30,000–$50,000	78 (19.3)	(24.8)
$50,000–$80,000	146 (36.1)	(22.2)
Over $80,000	101 (25)	(24.4)
Body mass index (BMI)[c]		
Normal	169 (42.2)	(35.3)
Overweight	136 (33.9)	(36.6)
Obese	96 (23.9)	(28)

[a] Or other accredited qualification.
[b] Some participants in both groups chose not to disclose.
[c] BMI was divided according to the following criteria; normal weight <24.9, overweight 25–29.9, and obese >30.

Procedure

Measures

Theory of Planned Behaviour

Both retrospective (self-report) and prospective (diary) measures of the outcome behaviour were included. In the retrospective measure, participants were asked to report the frequency of fast-food consumption on a scale including responses: 'never', 'occasionally', 'once a month', 'once a fortnight', 'once a week', '2–3 times a week', '4–6 times a week', 'once a day', and 'more than once a day'. The prospective measure asked participants to keep a diary, recording the type and amount of fast food consumed each day for one week. The diary also contained the above frequency measure which allowed diary records to be cross-checked and participants who reported being 'infrequent' consumers of fast food to be included without the need for diaries to be kept for longer periods of time. Each meal or snack recorded was considered to be a single point of consumption.

Intention to consume was also assessed using two items. The first, 'Given my lifestyle and/or taste preferences, it is likely that I will eat fast food regularly over the next four weeks' was measured on a scale from 1 (strongly disagree) to 7 (strongly agree). The second, 'I am likely to eat fast food regularly over the next month' was measured on a scale from 1 (definitely false) to 7 (definitely true). Cronbach's α was .79. The key predictors of intention were: attitude, subjective norms, perceived behavioural control, and actual behavioural control, as detailed below.

Attitude

Affective and cognitive attitudes were measured with 17 items on two separate semantic differential response formats. In order to measure cognitive attitude, participants were presented with the sentence 'To me, eating fast food frequently is …' followed by five pairs of adjectives rated on a 7-point scale; harmful–beneficial, quick–time consuming, convenient–inconvenient, unpleasant–pleasant, and cheap–expensive. The mean of the five scores was used as a composite index of cognitive attitude. In order to measure affective attitude, participants were presented with twelve pairs of adjectives rated on a 7-point scale; happy–unhappy, self-conscious–self-assured, inadequate–capable, enticed–disgusted, guilty–carefree, lethargic–energetic, unashamed–ashamed, disappointed–gratified, well–unwell, content–discontent, worried–calm, and unenthusiastic–enthusiastic. The mean of the twelve scores was used as a composite index of affective attitude. A composite variable reflecting overall attitude was created by totalling scores on both the cognitive and affective scales. Cronbach's α for the overall scale was .83.

Subjective norms (SN)

Normative beliefs were captured with 4 items measuring injunctive norms (what others think) and descriptive norms (how others behave). Each item was presented on a 7-point scale from 1 (definitely false) to 7 (definitely true). Injunctive items were; 'Most people who are important to me think that I should eat fast food regularly' and 'Those close to me expect me to eat fast food regularly'. Descriptive items were; 'The people in my life whose opinions I value eat fast food regularly' and 'Those who are close to me eat fast food regularly'. A composite variable reflecting overall SN was created by totalling scores on both the injunctive and descriptive scales. Cronbach's α for the overall scale was .78.

Perceived behavioural control (PBC)

Perceptions of control were measured with 4 items reflecting control and self-efficacy. In order to capture perceptions of control, two items, both on a 7-point scale between 1 (definitely false) and 7 (definitely true) were used They were; 'I have complete control over the number of times I will eat fast food over the next month' and 'How often I will eat fast food over the next month is mostly up to me'. Cronbach's α for the scale was .76.

In order to capture self-efficacy, two items, both on a 7-point scale between 1 (definitely false) and 7 (definitely true) were used They were; 'It would be impossible for me not to eat fast food regularly over the next month' and 'If I wanted to, I could avoid eating fast food regularly over the next month'. A composite variable reflecting overall PBC was created by totalling scores on both the self-efficacy and control scales. Cronbach's α for the scale was .73.

Actual behavioural control (ABC)

Two items were included to capture resource constraints or the actual control participants had over fast-food consumption rates. These items were; 'I am unable to prepare my own food because of an illness or disability' and 'Because of where I live, I have no access to fast-food outlets'. All items were measured on a 7-point scale between 1 (strongly disagree) and 7 (strongly agree). As these two items would not be expected to be related, internal consistency was not measured.

Belief strength

Finally, a further 55 items were included to assess the beliefs and belief strengths underlying the TPB variables. For each of these measures, Cronbach's α varied between .73 and .86.

Consideration of Future Consequences (CFC)

The 12-item CFC Scale (Strathman, Gleicher, Boninger, & Edwards, 1994) was employed. Two additional items were added to enable a specific examination of CFC in terms of attitudes to diet. These items were 'I often avoid certain foods because I am concerned about my health' and 'I usually choose food because it is convenient or tasty rather than because it is good for my health'. Cronbach's α was .84.

Brief Fear of Negative Evaluation (FNE) Scale

This 12-item measure (Leary, 1983) has been shown to correlate highly with the original scale as well as offering good reliability. The scale includes items such as; 'I am unconcerned even if I know people are forming an unfavourable impression of me' and 'I am usually worried about what kind of impression I make'. Cronbach's α was .93.

Self-Identification Scale

This 4-item scale (Armitage & Conner, 1999a) was designed to measure the extent to which an individual self-identifies as being a healthy eater. The items were; 'I think of myself as a healthy eater', 'I think of myself as someone who is concerned with healthy eating', 'I think of myself as someone who is concerned with the health consequences of what I eat', and 'I think of myself as someone who enjoys the pleasures of eating'. Cronbach's α was .87.

Interaction effects

In order to investigate the influence of possible interaction effects, attitude, subjective norm, FNE, and self-identification variables were all centred by subtracting individual scores from the overall mean (Aiken & West, 1991). Interaction variables were then created by multiplying the centred scores (FNE $\times$ subjective norm, and attitude $\times$ self-identification).

Results

All data analyses were performed using SPSS version 14.0 with an alpha level of .05. Structural equation models were specified and tested using AMOS version 5. A summary of mean responses on all variables is presented in Table 2.

Predicting fast-food consumption: application of the 'traditional' TPB model

The relationships between the TPB variables and the outcomes were examined; the first two were 'traditional' models as suggested by Aizen (2002) and the third was an 'extended' analysis of the interactions between a number of variables added to the TPB. Fig. 1 shows the TPB applied to predict retrospective recall of consumption. The analysis indicated that subjective norms in particular, attitude, and perceived behavioural control were all significant independent predictors and combined to explain 50% of the variance in intention. In turn, intention, ABC, and perceived behavioural control were significant predictors of retrospective behaviour, combining to explain 50% of the variance. The fit of the model was good with the chi-square test non-significant, χ^2 (5) = 7.44, p = .190, GFI = .99, NFI = .99, RMSEA = .04.

A second analysis was conducted applying the model to prospective behaviour as captured by the fast-food diaries. The model was similar, although it explained only 41% of the variance

Table 2
Mean scores and standard deviations.

Variable	Range	*N*	Mean (*SD*)
Intention	1–7	401	2.03 (1.51)
Behaviour[a]			
Prospective	0–10	401	1.12 (1.44)
Retrospective	0–8.5	401	.84 (0.96)
Attitude[b]	2–14	401	7.73 (1.38)
Affective	1–7	401	3.77 (.81)
Cognitive	1–7	400	3.95 (.91)
Subjective norm[c]	2–14	401	3.85 (2.44)
Injunctive	1–7	401	1.79 (1.09)
Descriptive	1–7	401	2.06 (1.42)
Perceived behavioural control[d]	2–14	401	12.24 (1.98)
Controllability	1–7	401	6.08 (1.19)
Self-efficacy	1–7	401	6.17 (1.25)
Actual behavioural control	1–7	401	1.51 (1.08)
Consideration of Future Consequences	1–7	401	4.78 (.86)
Fear of Negative Evaluation	1–7	401	4.05 (1.30)
Self-Identification	1–7	401	5.33 (1.11)

[a] Number of times fast food consumed per week.
[b] Sum of affective and cognitive scores.
[c] Sum of injunctive and descriptive scores.
[d] Sum of controllability and self-efficacy scores.

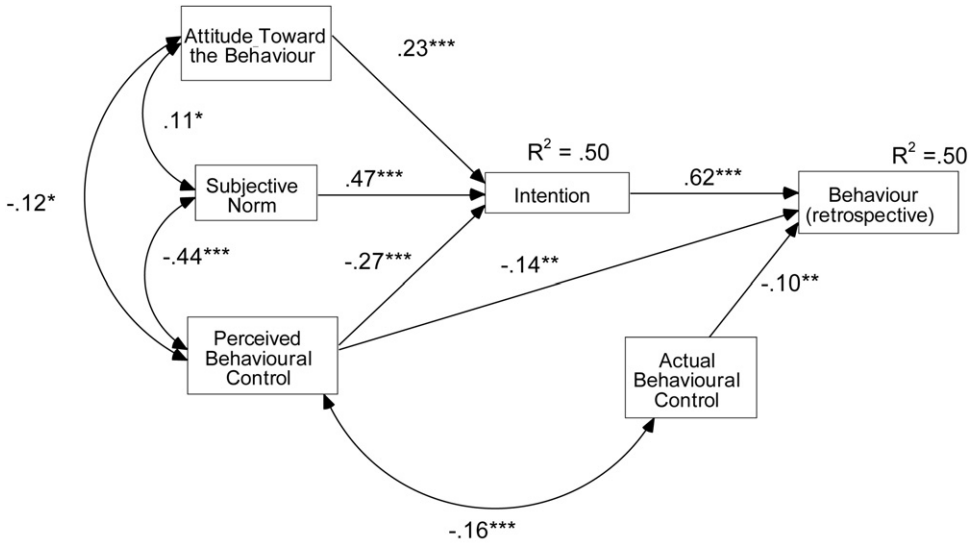

Fig. 1. Path analysis for the TPB predicting retrospective behaviour. Relationships between attitude, SN, PBC, and ABC (shown by double-arrows) are correlations. All other relationships are beta coefficients. $^{*}p < .05$, $^{**}p < .01$, and $^{***}p < .001$.

in prospective behaviour. The fit of the model was again strong with the chi-square test non-significant, χ^2 (5) = 2.992, p = .701, GFI = .99, NFI = .99, RMSEA < .001.

Results from these two analyses indicated that the TPB appears to have superior ability to explain variance in self-reported estimates of behaviour rather than prospective behaviour. Comparison between the retrospective and prospective measures using a paired-samples t-test indicated that recall of consumption (M = .84, SD = 0.96) was significantly lower than actual consumption (M = 1.12, SD = 1.44; t = 5.37, $p < .001$), indicating that participants underestimated the amount of fast food that they consumed.

Structural examination of attitudes and perceived behavioural control

One of the aims of this study was to specify factors that might underlie the development and maintenance of attitudes, perceptions of normative influence, and perceptions of control related to fast-food consumption. In order to obtain a clearer view of the individual factors influencing attitude and perceived behavioural control, behavioural beliefs and control beliefs were examined using two separate factor analyses. As the goal of the analyses was to obtain theoretically meaningful constructs, principal axis factor analyses were conducted. Varimax rotation was used as item correlations were not strong (up to r = .4). Factor loadings are detailed in Tables 3 and 4. The previous research (Dunn et al., 2008) indicated that subjective norms are generated on the basis of beliefs about the perceived reactions of three groups: family, friends, and health-experts. These constructs were utilised in the current study.

Although the eigenvalue >1 rule suggested a five-factor solution for the behavioural beliefs, a four-factor solution was preferred on the grounds of intepretability. The four factors explained a total of 34.12% of the variance and represented perceptions of convenience, social conscience, feelings of satisfaction associated with consumption, and concerns about physical/psychological health.

Table 3
Factor loadings for behavioural beliefs.

Item number and description	Factor loadings			
	1	2	3	4
1. Convenience				
21. Fast food saves me time	.787			
19. Fast food reduces the amount of work I have to do	.692			
17. Fast food is very convenient	.629			
23. Fast food allows me to eat wherever I want	.539			
2. Social conscience				
33. Fast food is habit forming		.615		
31. Fast food reduces opportunities children have to learn about food		.580		
29. Fast food disrupts traditional family meal times		.524		
35. Fast food encourages an inactive lifestyle		.456		
37. Fast food is detrimental to the environment		.392		
3. Satisfaction				
5. Fast food tastes good			.636	
9. I feel satisfied after eating fast food			.596	
7. I get good value for money from fast-food meal deals			.402	
11. I treat/reward myself with fast food			.380	
4. Health (physical and psychological)				
27. Eating in fast-food restaurants allows me to 'get out'				.538
13. Fast food is good for my health		−.304		.439
15. Fast food is likely to result in weight gain				.324

Table 4
Factor loadings for control beliefs.

Item number and description	Factor loadings	
	1	2
1. Facilitating factors		
57. I am more likely to eat fast food if I have cravings	.750	
53. I am more likely to eat fast food if I have little spare time	.735	
59. Eating alone makes it easier for me to choose fast food	.586	
61. I eat fast food as I cannot cook	.374	
2. Impeding factors		
66. Concern about my weight prevents me from eating fast food		.828
69. Concern about my health prevents me from eating fast food		.618
55. I feel guilty if I eat fast food		.469
63. The cost of fast food prevents me from eating it		.330

Two factors describing the beliefs underlying perceived behavioural control, perceptions of impediments to consumption and perceptions of imperatives to consume, returned eigenvalues greater than one with the rotated factors explaining a total of 38.45% of the variance.

Predicting fast-food consumption: application of the 'extended' Theory of Planned Behaviour model

Final analyses examined the extended TPB model, including the belief-based predictors of attitude, subjective norms, and perceived behavioural control, and the significant interaction terms. Two models were created to examine both prospective and retrospective reports of behaviour. For the sake of brevity and as the two models were very similar, only the retrospective model is presented here. This model was selected as it produced a slightly better fit than did the prospective model. Exploratory analyses revealed that, as an individual variable, FNE did not add significantly to the variance in intention or behaviour and therefore, it was not included in the final model. Fig. 3 shows the extended TPB applied to fast-food consumption as measured by retrospective recall. The variables that were not significantly predictive are represented in grey.

The fit of the model was poor with the chi-square test significant, χ^2 (203) = 1686.79, $p < .001$, GFI = .73, NFI = .50, RMSEA = .144. Although the traditional TPB models are obviously the best fit, the extended model reveals important information regarding the inter-relationships between the component parts of the variables. However, as this explanation comes at the expense of parsimony, the extended model cannot be regarded as a development of the theory *per se*.

The model suggests that cognitive attitude, injunctive subjective norms, and self efficacy were all predictive of intention to consume fast food along with the additional variables of CFC and self-identification. The interaction variables were also predictive and, following recommendations by Aiken and West (1991), the nature of these interactions was examined by simple slope analysis.

Interaction between attitude and self-identification as a healthy eater

Regression lines were examined at two levels of self-identification (one standard deviation above and below the mean), and simple slope analyses showed that when identification as a healthy eater was low, attitude was more strongly positively predictive of intention ($B = .679$, $t = 3.467$, $p = .001$) than when self-identification as a healthy eater was high ($B = .505$, $t = 3.889$ $p < .001$), indicating that with greater identification as a healthy eater, attitude became less predictive of intention to consume fast food.

Interaction between Fear of Negative Evaluation and subjective norms

Again, regression lines were examined at two levels of FNE. Simple slope analyses showed that when FNE was high, subjective norm more strongly positively predicted intention ($B = 1.003$, $t = 6.47$, $p < .001$) than when FNE was low ($B = .819$, $t = 9.38$, $p < .001$). That is, for participants who were less concerned about being evaluated negatively, subjective norm was less predictive of their intention to consume fast food.

Discussion

The models in Figs. 1 and 2 suggest that the traditional TPB model has strong explanatory value for fast-food consumption. Consistent with other research (Armitage & Conner, 1999a), the fit

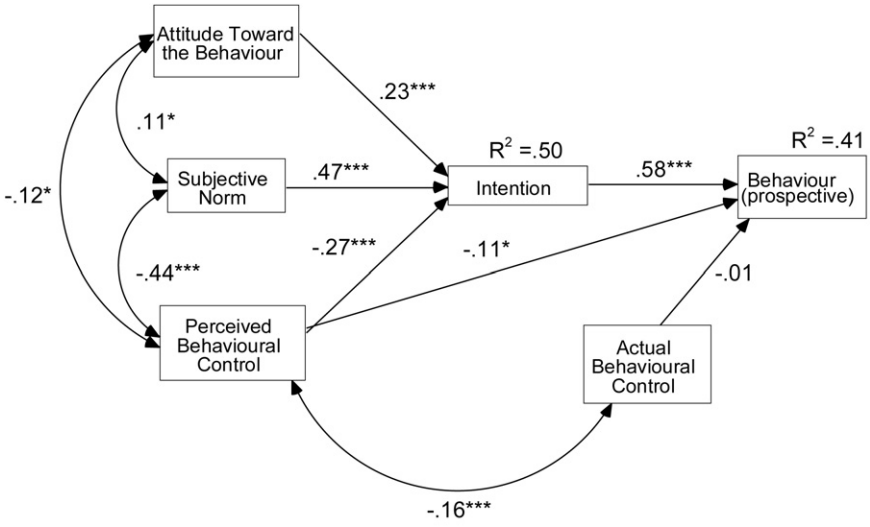

Fig. 2. Path analysis for the TPB predicting prospective behaviour. $^{*}p < .05$ and $^{***}p < .001$.

was slightly improved when behaviour was measured retrospectively rather than prospectively, although the retrospective measures actually underestimated real consumption. That participants underestimated the amount of fast food that they consumed is of concern, particularly when considered with other research findings indicating that people tend to both overestimate the amount of fruit and vegetables that they eat (Bogers et al., 2004) and rate their own personal dietary-related health risks as below average (Hahn & Renner, 1998). The present findings appear to be a further example of the tendency that people have to be optimistically biased when making judgements about their health-related behaviour and expected outcomes.

The extended model described in Fig. 3, which accounted for 43% of variance, demonstrated that intention to consume fast food was predicted by cognitive (conscious, rational) beliefs about fast food, injunctive subjective norm (perceptions of what others think), factors facilitating consumption, self-efficacy, the extent to which consideration is given to future consequences, self-identification as a healthy eater, and two interaction terms. Together, these results show that participants reported that their intention to consume fast food had a rational basis and that attitudes were positively influenced by the convenience and satisfaction provided by fast-food consumption and negatively influenced by concerns about related social issues. Affective attitudes were notably non-significant in their prediction of both intention and behaviour and, as both cognitive and affective mean scores indicated slightly negative attitudes, there was no indication of ambivalence between the two aspects of attitude. Some context for this finding is provided by Payne et al. (2004) and Payne, Jones, and Harris (2005) who found that affective attitudes were predictive of healthy eating but not of sweet or snack-food consumption. The opposite was true of their measures of cognitive attitude. It is possible that social desirability bias may have an impact on participant reports; that is, it is acceptable to report that one experiences pleasure when eating healthy foods, but similar admissions regarding the consumption of unhealthy foods may be hidden for fear of appearing hedonistic. It is also possible that attitudes may, to some extent, have been implicit in nature and that a tool more sophisticated than the semantic differential is required to successfully capture this construct.

Participant intentions were predicted by perceptions of social influence residing in the attitudes of friends and family. However, neither the opinions held by health experts nor the behaviour modelled by significant others were significantly predictive. Facilitating factors, such as the experience of cravings and perceptions of having little spare time, were significantly positively related to intention. Finally, self-efficacy, CFC, and self-identification as a healthy eater were negatively related to intention, indicating that intention to eat fast food was reduced with greater confidence in ability to avoid fast food, stronger propensity to consider the longer-term consequences of behaviour (generally), and identification with healthy-eating. Consistent with the observations of Armitage and Conner (1999b), it was worth differentiating between the 'external' control factors and 'internal' self-efficacy, as the internal factors appeared to play a much stronger part in influencing intentions.

Intention to consume fast food was a significant predictor of retrospective behaviour, combining with actual behavioural control, beliefs about convenience, and social conscience to explain 38% of the variance. However, affective measures of attitude failed to explain the variance in either intention or behaviour. Again, it is not known to what extent this result might reflect difficulties with operationalising affect. Although Aizen (2002) recommended use of the semantic differential, he has also suggested that affect is not always a simple bipolar construct. Rather, positive moods and emotions may be orthogonal to their negative counterparts. This may be an important aspect to note when acknowledging that people may experience ambivalence

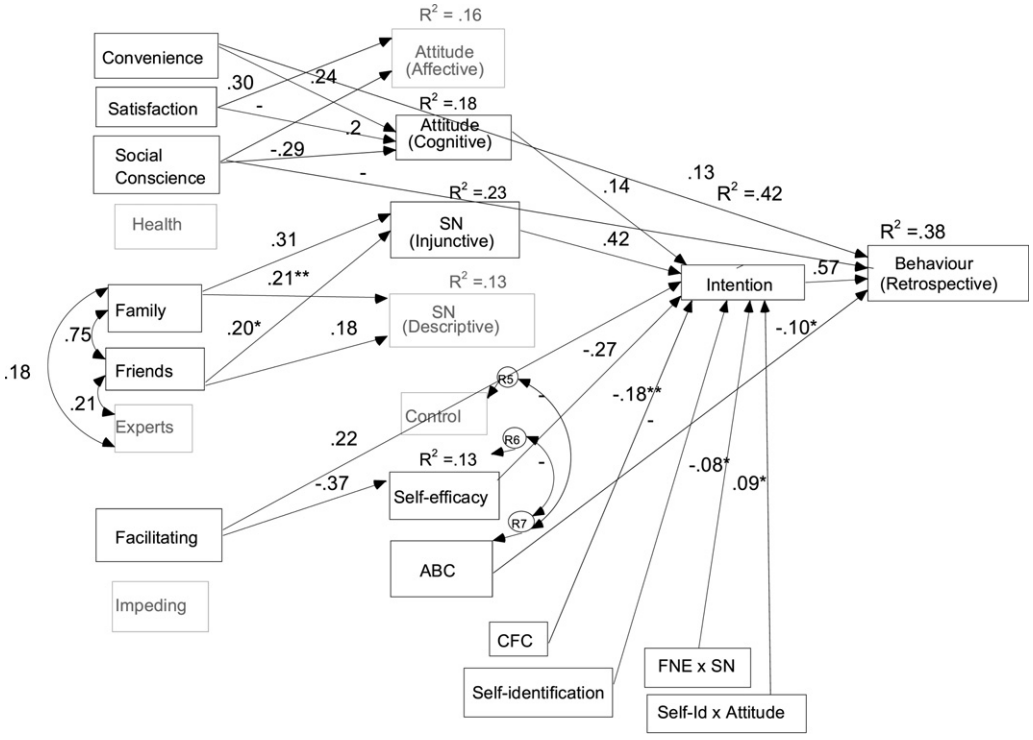

Fig. 3. Path analysis for the extended TPB model predicting retrospective behaviour. All correlations and beta coefficients significant at the $p < .001$ level except where an asterisk appears. Then, $^{*}p < .05$ and $^{**}p < .01$.

within the *affective* component of their attitudes towards fast foods; they may experience anxiety and guilt about eating fast food, and yet enjoy the experience of eating and the related satiation.

Both the tendency to consider the future consequences of behaviour and to identify as a healthy eater were associated with fewer intentions to eat fast food on a frequent basis, although behaviour was not similarly influenced. In other words, although participants appeared to be aware that the longer-term consequences of frequent fast-food consumption were likely to be negative, this knowledge did not have a significant impact on fast-food consumption rates. A form of self-serving bias may have been influential here, mediating the relationship between intention and behaviour. Similarly, if people perceive that they generally eat healthily, this may allow them greater license to consume fast food as they believe their future health risks are low. Consistent with Cook, Kerr, and Moore (2002), self-identification was correlated with measures of attitude and a small interaction effect was also found between the two variables. Therefore, although self-identification was a significant individual contributor for intention, these findings should be interpreted with caution.

Similar to findings by Latimer and Martin-Ginis (2005), the results here indicate that subjective norm was a stronger predictor of intention to consume fast food for those with strong fears of being evaluated negatively. This suggests that social influence and the need to comply with group norms in particular, influence fast-food consumption. It is worth noting that the earlier qualitative study identified perceptions of being overweight as a particular source of Fear of Negative Evaluation.

Overall, the findings show that the basic TPB model (as specified by Aizen) can be successfully applied to fast-food consumption behaviour explaining up to 50% of the variance in both intention and behaviour. Although the SEM fit was not good for the extended model, the model still explained 42% of the variance in intention and 38% in behaviour. Although the overall explanatory ability is somewhat reduced, the exercise was valuable, allowing greater understanding of the key factors influencing attitude, subjective norm, and perceived behavioural control as well as showing the contribution made through the inclusion of additional variables Consideration of Future Consequences and self-identification.

One of the key aims of this study was to examine the attitudinal factors influencing fast-food choices. Although there were some useful outcomes in terms of clarifying the components of cognitive attitudes, the results associated with the affective attitudes were unanticipated, and it is possible that the semantic differential was not the most effective tool to use. It may be that in a society where lean is considered the ideal in terms of both health and attractiveness, concerns arising from social desirability influenced participant responses. It is also possible that the affective attitudes may have been outside awareness and were therefore, not captured effectively through semantic methods. Some literature has differentiated between attitudes as being either explicit or implicit. Specifically, implicit attitudes are said to be those that influence the individual's behaviour in a spontaneous, automatic, affective manner without conscious cognitive processing (De Houwer, 2002; Greenwald, McGhee, & Schwartz, 1998) with explicit attitudes being much more considered and rational. Typically, explicit attitudes are captured by direct questioning and can be predictive of intention to engage in particular behaviours. However, explicit attitudes can also be susceptible to biases such as self-presentation and social desirability or they may fluctuate, particularly if the individual is not motivated to make conscious cognitive assessments of the outcomes of their behaviour. In these situations, it is quite likely that behaviour is influenced in a much less considered and more automatic way by underlying, or implicit attitudes (Craeynest, Crombez, De Houwer, Deforche, & De Bourdeaudhuij, 2006). Therefore, it is recommended that future research examining attitudes towards foods include a measure that captures both explicit and implicit associations that may be held.

Conclusion

Although nutritional literacy appears to be at a good level within this participant group, knowledge was not enough to dissuade individuals from eating fast food altogether. Participants reported being most influenced to eat fast food by the convenience, the satisfaction, family and friends, and facilitating factors (such as busy lifestyles, experiencing cravings for fast food, not knowing how to cook, working long hours, and eating alone). Factors that inhibited fast-food consumption were feelings of self-efficacy and concern about social issues, such as loss of traditional family mealtime, children not learning about food and food preparation, the habit forming nature of frequent consumption, and associated sedentary lifestyle. Notably, concern about personal health and the influence of heath experts were not predictive although this finding must be understood in the context of the predictive value added by both Consideration of Future Consequences and self-identification as a healthy eater; both of these variables may be linked with concern about health and were negatively related to intention to eat fast food.

Key issues related to growing obesity include lifestyle and diet; Australians are living and eating differently. Although Australians may hold concerns about the longer-term health risks associated with fast-food consumption, it is clear from these findings that demand for meals that are tasty, satisfying, and convenient is sufficiently high that it overrides much apprehension. Therefore, in terms of changing eating behaviour, success may develop from strategies that focus on increasing perceptions of self-efficacy, or ability to avoid fast foods. In particular, a focus that allows for day-to-day work and family demands in a realistic and meaningful way is most likely to be embraced and incorporated as a long-term lifestyle change. Environmental factors, such as associations with social or support groups who promote healthy eating may also provide positive influence. Similarly, it should be noted that family and friends are also likely to act as powerful referent groups as this is important information for individuals wishing to change dietary habits. Self-serving biases appear to be common and need to be addressed; those with poor diets could be encouraged to realistically and accurately analyse the longer-term health risks of frequent fast-food consumption. Changes in consumer beliefs and attitudes to benefit health need to occur over time. In the meantime, the convenience, taste, and satisfaction that a fast-food meal affords may need to be countered with healthy alternatives that are just as accessible and gratifying as a burger with fries on the side.

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