COGNITIVE DISSONANCE IN FOOD AND NUTRITION – THE DEVELOPMENT AND INITIAL EFFICACY TEST OF THE FOOD COGNITION DISSONANCE FRAMEWORK

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ABSTRACT

The study of cognitive dissonance in food and nutrition has been relatively neglected and under-developed. The Food Cognition Dissonance (FCD) conceptual framework is theoretically derived to address current gaps and critical issues underlying cognitive dissonance research in food and nutrition. Integrating the basics of cognitive dissonance theory and the tri-partite model of attitude, in the context of food and nutrition, the proposed FCD conceptual framework provides a novel perspective of structural food-related cognitive dissonance in relation to the examination of food-related attitudes and behaviours. The basic tenets and predictions of the FCD framework are tested in three studies that examine the viability of the proposed intra- and inter-attitudinal dimensions of food-related cognitive dissonance, including their measurement, as well as, the structural pathways via which these would impact upon food-related attitudes and/or behaviours. The perennial public health challenge of promoting the consumption of vegetables for a healthier diet provides the context for the main structural pathway test. Overall, multiple-group confirmatory factor analyses supported the intra- and inter-attitudinal dimensions of cognitive dissonance as proposed by the FCD framework. Structural equation modelling analyses further showed differential pathways via which measured food-related attitudinal and/or behavioural outcomes were impacted, depending on whether cognitive dissonance was aroused at the level of a superordinate attitude object (i.e., healthy eating), subordinate attitude object (i.e., attitude towards vegetable consumption) or both. Implications, along with suggested future cognitive dissonance research in food and nutrition, are discussed.

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Chapter 1. Introduction

1.1 Disease/Illness and Lifestyle

Global statistics on chronic and non-communicable diseases provided by the World Health Organization (WHO) in 2005 and 2011 respectively showed a stark increasing trend in the incidence rates of diseases such as cardiovascular disease, cancer and diabetes world-wide. The reports noted that chronic and non-communicable diseases on average accounted for more than 60% of global deaths. The urgency and severity of such a global phenomenon prompted the Singapore Prime Minister, Mr. Lee Hsien-Loong, to talk about the problem of diabetes facing the country as one of the focus issues in his 2017 National Day rally message since the disease is a known precursor to other illness conditions (Lee, 2017). Much of his message on diabetes matched the alert put out by WHO in 2016 on the challenge of combating increasing incidence rates of diabetes globally, which showed low- and middle-income earners emerging as increasingly vulnerable groups to getting the disease. Lifestyle factors that run the gamut from physical activity frequency to work-life balance were identified to play a crucial role in the onset of chronic and non-communicable diseases. Considering the staggering current (and projected) expenditure on treatment and management of such diseases (e.g., Zhang et al., 2010), the wisdom is to move away from such secondary and tertiary prevention strategies respectively to the primary prevention strategy of modifying lifestyle factors in order to avert disease onset in the first place.

1.2 Food/Food-related Attitudes and Behaviours

One of the lifestyle factors that can contribute to the onset of chronic and/or non-communicable disease(s) is dietary behaviour. Research evidence arising from both developed and developing countries show that poor food choices can lead to increased risks of developing such diseases (Willett, 2012; World Health Organisation & Food and Agriculture Organisation of the United Nations, 2003) – for instance, high consumption of salt, saturated fats and trans-fatty acids, and low consumption of fruits and vegetables, have all been shown to increase risks of hypertension, heart or cardiovascular disease, and stroke (WHO, 2011).

Given the link between nutrition and health/illness (Ross, Caballero, Cousins, Tucker & Ziegler, 2012), many government and public health bodies have increased their efforts over the years in defining and promoting healthy diets (Dibsdall, Lambert & Frewer, 2002), in the hope that the impact of numerous later-life diseases such as cardiovascular diseases, diabetes, obesity, osteoporosis, and certain cancers may be reduced with greater compliance to such healthy diets (Miller & Cassady, 2012). Understanding how and why individuals choose their foods is essential in order to motivate them to modify their dietary habits toward healthier recommendations (Zandstra, de Graaf & van Staveren, 2001).

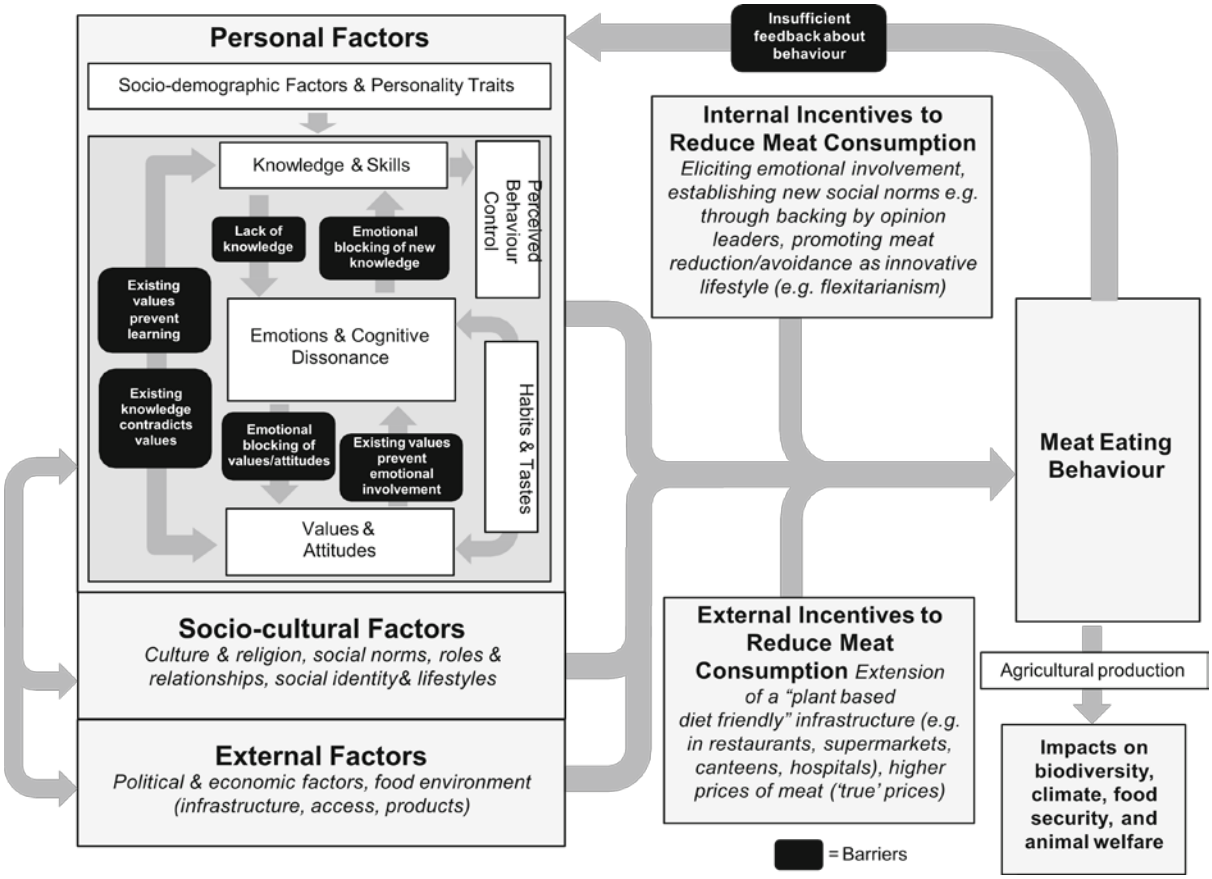
The study of attitude is a means by which an understanding of food choice and behaviour may be achieved (Ajzen & Fishbein, 1980; e.g., Dahm, Samonte & Shows, 2009; Roininen & Tuorila, 1999), particularly when it occurs in the context of nutrition intervention programs that incorporate attitudinal elements en route to instituting appropriate dietary behaviour(s) (e.g., Tavakoli, Dini-Talatappeh, Rahmati-Najarkolaei & Fesharaki, 2016). In this regard, attitudes have been found to affect and/or be related to eating and food behavioural outcomes – whether independently (e.g., Harvey et al., 2001; Zandstra et al., 2001) or as part of a larger theoretical framework such as the health belief model (e.g., Becker & Rosenstock, 1984; Deshpande, Basil & Basil, 2009) – in a positive direction, as exemplified by Lechner and Brug's (1997) study where a positive attitude towards fruit and vegetable consumption (based on the outcomes individuals expect from eating fruits and vegetables) was found to predict higher self-ratings of fruits and vegetables consumption.

1.3 Attitude/Behaviour Change and Cognitive Dissonance Theory

It is generally acknowledged by researchers interested in optimising food choices in the direction of health that a change in dietary behaviour might occur through changing food-related attitudes (Aikman, Crites Jr. & Fabrigar, 2006; Contento, 2012; Nestle et al., 1998; Worsley, 2002). One of the theories that have been most frequently implicated in the study of attitude change is the theory of cognitive dissonance (Festinger, 1957; Harmon-Jones & Harmon-Jones, 2007). Its central tenet states that when individuals possess two or more inconsistent cognitions, they experience an aversive, psychological state of tension or discomfort called cognitive dissonance. They then seek to remove this unpleasant tension state (i.e., reduce dissonance) through altering one or more of the cognitions, typically those least resistant to change (Harmon-

Jones, 2002). Cognition, in this context, may be broadly defined as any belief, opinion, attitude, perception, or knowledge about persons, objects, issues, and so forth (Aronson, 2004; Littlejohn & Foss, 2005; O'Keefe, 2002).

The potential application of cognitive dissonance to eating/food attitude and behaviour may be extrapolated from the writings of some food/nutrition researchers. For instance, in a qualitative study of consumers of organic food products, Hjelmar (2011) reported that "Respondents expressed the view that television documentaries can be so unpleasant that they make you change your behaviour instantly; you simply cannot continue to eat conventional pork after having seen how pigs are treated" (p. 342), prompting him to suggest that reflexive shopping practices "can be sparked by life events (e.g., having children), "shocking news" about conventional food products and similar events, and news capable of creating a "cognitive dissonance" among consumers" (p. 336). More directly, in another qualitative research conducted in the domain of meat consumption, Šedová, Slovák and Ježková (2016) reported the existence of dissonance amongst environmental students dealing with attitude-behaviour incongruity regarding meat consumption, who sought to resolve the "feelings of guilt" (p. 416) using certain coping strategies. Specifically, whilst their specialised knowledge and awareness precluded them from using the strategies of *denying mind to animals* (Bastian, Loughnan, Haslam & Radke, 2012; Bratanova, Loughnan & Bastian, 2011; Loughnan, Haslam & Bastian, 2010; Rothgerber, 2014) and/or *functional ignorance* (cf. McEachern & Schröder, 2002; te Velde, Aarts & van Woerkum, 2002), the students, nonetheless, utilised methods like *detachment* and *concealment* (Serpell, 1996; Schröder & McEachern, 2004; te Velde et al., 2002), as well as *perceived behavioural change* and *promises for improved future behaviour* (p. 421). The latter two coping mechanisms hint at the promise and potential of the role that cognitive dissonance plays in the attitude-behaviour milieu, which Stoll-Kleemann and Schmidt (2017) formalized into their model of factors influencing meat-eating behaviour (see Figure 1.1).



(Source: Stoll-Kleemann & Schmidt, 2017)

Figure 1.1: Model of factors influencing meat-eating behaviour

In the model, Stoll-Kleemann and Schmidt (2017) described how cognitive dissonance might present both a barrier as well as an opportunity to reducing meat consumption. They contended that although "people tend to avoid or resist information about the negative consequences of meat-eating because they contradict or threaten basic perspectives on fairness and ethical behaviour" (p. 1267), the cognitive dissonance aroused as a result of such encounters with contradictory information, nonetheless, could lead to the use of *denial* and *delegation* (i.e., refusal to accept personal responsibility and to blame others) as strategies to remove the negative feelings experienced, thereby sustaining the meat-eating behaviour. The solution, according to the authors, was to activate appropriate social norms, established through associating with individuals of the right attitude towards food and personal integrity, to pressure the enactment of the correct response to cognitive dissonance instead, which was to reduce meat consumption. In this way, therefore, Stoll-Kleemann and Schmidt (2017) argued that cognitive dissonance might be turned from being a barrier to reducing meat-eating behaviour into an opportunity to do precisely the opposite.

Despite the acknowledgement of cognitive dissonance as a construct with great potential application value to food and nutrition being shared by others (e.g., Bergmann, von der Heidt & Maller, 2010; Onwezen & van der Weele, 2016; Pettigrew & Pescud, 2013), the study of cognitive dissonance related to eating/food attitudes and behaviours has been relatively neglected and under-developed. This is particularly true with respect to the use of cognitive dissonance to influence non-clinical, healthy food behaviours in the area of public health (Freijy & Kothe, 2013; Worsley, 2002).

1.4 Scope and Outline of Thesis

In sum, with a view to facilitate primary prevention of disease/illness via targeting the dietary behaviour lifestyle factor, the primary, specific aim of the research presented in this thesis is:

- To investigate the utility of cognitive dissonance in influencing food-related attitudes and/or behaviour.

The achievement of this specific aim will, in turn, allow the attainment of broader aims, which are:

- To understand the potential impacts of cognitive dissonance in the promotion of healthy eating behaviours
- To identify potential applications of cognitive dissonance in the development of policies designed to promote healthy eating.

Chapters in the thesis are organized according to the steps needed to be taken in service of the primary objective (see Figure 1.2), and are described herewith.

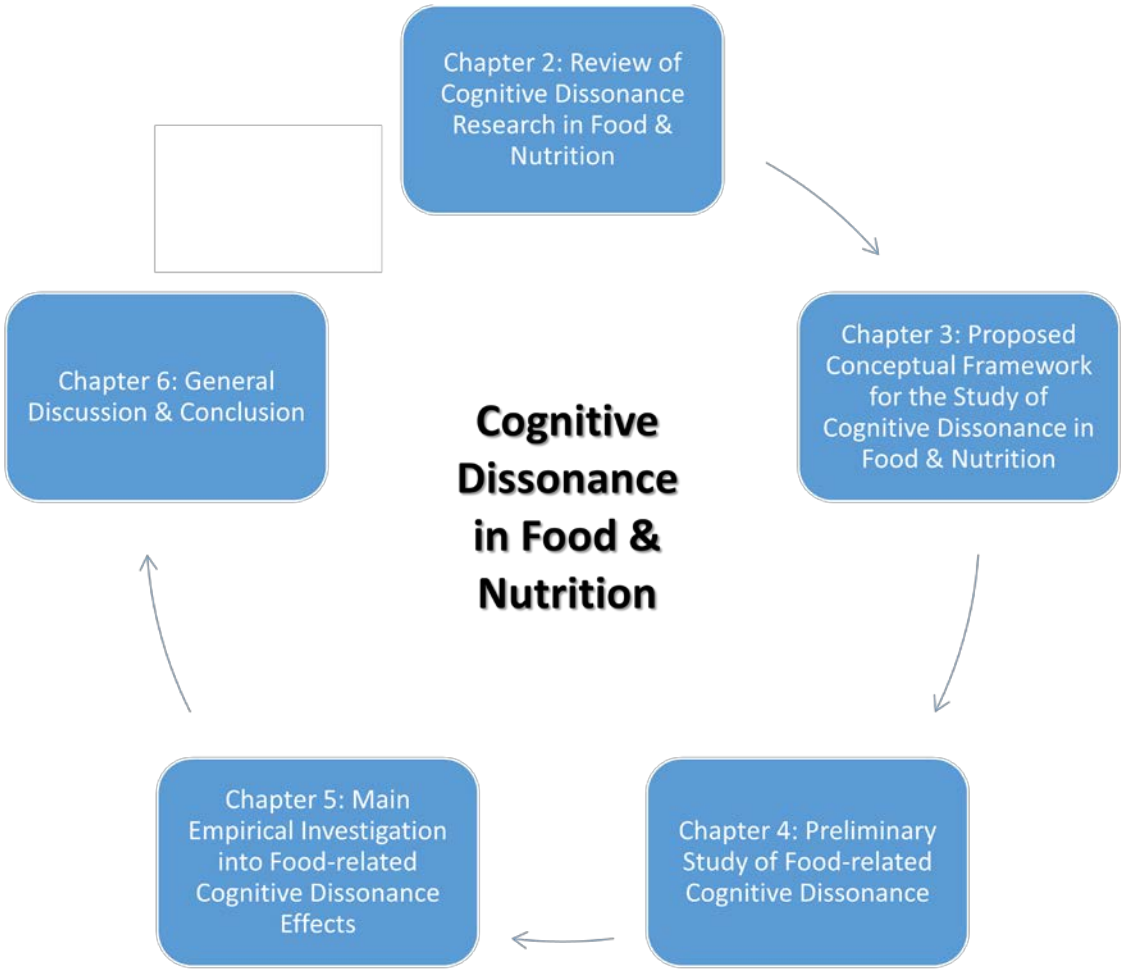


Figure 1.2: Outline summary of scope of thesis

1.4.1 Review existing level of cognitive dissonance scholarship in food and nutrition

A review of current literature related to cognitive dissonance in food and nutrition is conducted to assess the existing level of cognitive dissonance scholarship in the domain. Crucial to the accuracy of the review is the selection of appropriate studies, which is based on a definitive set of conceptually-driven, evidence-supported criteria primarily necessitating the use of cognitive dissonance as a central investigative construct and in a way that befits its central focus. The selected studies are categorised according to relevant topical areas within the food and nutrition domain, with the encapsulated research assessment involving the identification of any prevailing conceptual and/or methodological issues. The review of cognitive dissonance research in food and nutrition, with all the details afore-listed, forms the basis of content for Chapter 2.

1.4.2 Address conceptual and methodological issues identified in research review

In response to the theoretical, and corresponding methodological, issues uncovered in the review of food-related studies with cognitive dissonance as a focal construct, a conceptual framework to guide systematic cognitive dissonance research in food and nutrition is proposed in Chapter 3. The proposed framework is an amalgamation of cognitive dissonance theory and selected attitude theories taken in a food and nutrition context, and introduces the novel notions of intra- and inter-attitudinal dimensions of cognitive dissonance. Details of the framework's development, together with the framework's theoretical underpinnings, is described in detail in Chapter 3.

1.4.3 Empirically investigate the role of cognitive dissonance in influencing food-related attitudes/behaviours

Based on the proposed conceptual framework, hypotheses regarding the potential effects of cognitive dissonance on food-related attitudes and/or behaviours are then explored in empirical investigation. Due to the novelty of the main constructs (namely, the intra- and inter-attitudinal dimensions of cognitive dissonance) in the proposed framework, a preliminary study of primarily a qualitative nature is first conducted to ascertain the existence of such cognitive dissonance dimensions. Tagging along with this is an initial examination of possible measurements of these dimensions. Details of the preliminary study, along with a discussion on the insights gained from its results, is contained in Chapter 4 of the thesis.

From the results and lessons learnt in the preliminary study, the specific objective(s) and study design, which include variable measurement, of the main empirical investigation into cognitive dissonance effects in food and nutrition are then determined. Preceding the main study is a small pilot study conducted to test out the methods of experimentally manipulating the arousal of cognitive dissonance and measurements of its intra- and inter-attitudinal dimensions. After final methodological tweaks has been made following the pilot study, the main study is formally implemented. The pilot and main studies, with specific points of discussion taking place within study after each has been completed, are reported in Chapter 5 of the thesis. A broader, general discussion of the thesis research, including suggestions for future studies, is included in the closing Chapter 6.

Chapter 2. Cognitive Dissonance in Food and Nutrition – A Review

2.1 Cognitive Dissonance in Food and Nutrition – Study Selection for Review

In order to assess the current level of cognitive dissonance scholarship in the food and nutrition domain, it is necessary to review relevant existing research in this specific area, examining the construct's usage and its corresponding effect(s) on food-related outcomes, and critically evaluating the conceptual and methodological issues in such studies.

To meet this objective, a literature search was conducted using (1) Newcastle University Library's search engine that encompassed databases (including major databases like Compendex, EBSCO, JSTOR, Medline, Ovid, ProQuest, Scopus and Web of Knowledge, as well as others like Oxford University Press, Library of Congress, etc.), E-journals and E-books, and (2) Google Scholar. The search terms used were (a) "COGNITIVE DISSONANCE", (b) "EATING", (c) "FOOD" and (d) "NUTRITION", in which (a) was combined separately with (b), (c) and (d) before all search terms were combined in a single search, for a total of four search cycles. The search results were sieved by the first author for duplication and relevance through title and abstract screening, after which the full texts of short-listed articles were downloaded and scanned through to further ascertain the relevance of each article for the review. When applied, the original set of inclusion and exclusion criteria – the core inclusion requirement being cognitive dissonance having been *explicitly manipulated*, *measured* and *examined* as a *primary investigative construct* (used in *a priori theorization* and *hypothesis-formulation* as a *focal concept*) with *food attitudinal outcomes* – returned nil appropriate studies. Thus, a modified set of inclusion and exclusion criteria – the core inclusion requirement being cognitive dissonance having been *examined* as a *primary investigative construct*, and used in *a priori theorization* and *hypothesis-formulation* as a *focal concept*, with *food-related outcomes* – was eventually adopted instead (see Figure 2.1).

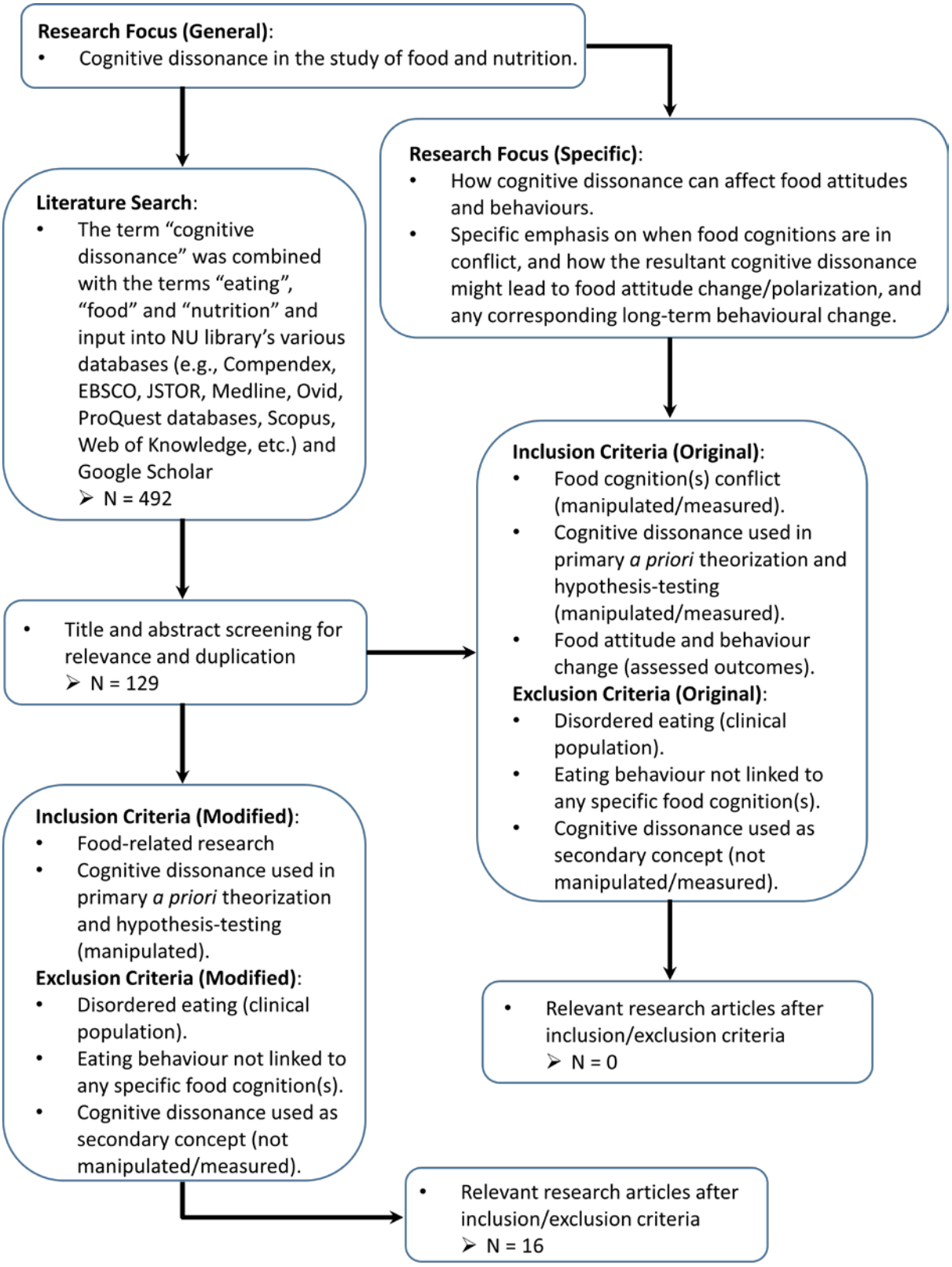


Figure 2.1: Schematic of literature search via various database(s) using specific parameters

Based on the less stringent parameters set out, 16 studies were identified for this review (see Table 2.1 for a summary) [1].

[1] The original review was conducted from 1st Mar 2014 to 1st Oct 2014, covering all related published work up to that point (i.e., 1st Oct 2014) and resulted in 14 relevant studies selected. From that time to 18th Aug 2016 (around which time data collection for the main study had already proceeded for about 2-3 months, since May 2016), two more relevant food-related cognitive dissonance studies were found by the author – one related to food risk/safety (Gaspar et al., 2016) and one related to meat consumption (Tian, Hilton & Becker, 2016). From 18th Aug 2016 to the current period of thesis writing (6th Aug 2017), no other relevant food-related cognitive dissonance-based studies was found. The latter two relevant studies found subsequent to the original review period are included in the thesis but 6th Aug 2017 serves as the terminal point beyond which any further relevant studies will not be included in the thesis.

Topic Area	Authors	Brief description of study	Sample characteristics	Main result(s)	Cognitive dissonance measurement	Implications for use of cognitive dissonance theory in research into dietary choice and public health
Food risk/safety	Cao & Just (2010)	An experiment to investigate individuals' risk assessment and willingness to pay for familiar food (beef sausage) *vs.* unfamiliar food (smoked salmon) after food consumption, given negative information about the foods.	Undergraduate students in the United States of America (N=54).	Across different intensities of potential risk information about beef, beef users reported lower risk estimates and willingness to pay higher prices for the meat than non-users (but these were statistically non-significant) relative to salmon.	Cognitive dissonance arousal was experimentally manipulated although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	To reduce cognitive dissonance aroused due to discrepancy between eating beef and hearing the food risk of beef, users lowered their risk perception of beef consumption and increased their perception of the quality of the meat via their willingness to bid higher prices for it.
	Cao, Just & Wansink (2010)	A quasi-experiment to investigate if individuals would continue consuming chicken wings from a local store if they believed that the chicken wings were potentially tainted with Avian-Influenza (AI), after having already started eating the food.	Undergraduate students in the United States of America (N=61).	The more chicken that was consumed, the less study participants agreed that the chicken was AI tainted and the more they attempted to justify their behaviour (e.g., by reducing the risk perception of consumption).	Cognitive dissonance arousal was experimentally manipulated (indirectly at best) although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	Cognitive dissonance caused the individuals to change their perceptions of food risk in the direction of their consumption patterns.
	Cao, Just, Turvey & Wansink (2015)	An experiment to investigate individuals' risk perceptions and willingness to pay for	Undergraduate students in the United States of America	Presented with food risk information, individuals who freely chose one chocolate type were	Cognitive dissonance arousal was experimentally manipulated	Cognitive dissonance caused the individuals to change their perceptions of food risk in the

	chocolates (with Aflatoxin) when given a freedom of food choice in the context of food risk information provision.	(N=116).	willing to bid a higher price for the chocolate and had attenuated risk perceptions of the food than individuals who were not given a choice of the chocolates.	although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	direction of their food choice patterns and sustain their willingness to pay for such food.
Fischer, van Dijk, de Jonge, Rowe & Frewer (2013)	Experimentally investigated whether providing risk and benefit information to individuals with attitudinal ambivalence towards nanotechnology in food production would cause some of them to become less ambivalent.	General population (nationally representative sample) in the United Kingdom (n=307; n=311).	Via two experiments, individuals exposed to both health or health and environmental risk and benefit information on the use of nanotechnology in food production showed reduced attitudinal ambivalence. For many study participants, attitudinal ambivalence actually increased.	Cognitive dissonance arousal was experimentally manipulated (indirectly at best) although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	Cognitive dissonance lessened some individuals' food-related attitudinal ambivalence, and moved attitudes toward a more negative direction in the face of health risk and benefit information.
Gaspar et al., (2016)	Investigated how the provision of risk and benefit information to red meat consumers, who was assumed to possess a natural propensity to avoid such information, would relate to their attitudes toward red meat and knowledge regarding red meat risks.	International participants from the United Kingdom (n=80), Belgium (n=80) and Portugal (n=84).	Using a longitudinal design, when exposed to both health-nutritional or non-health risk and benefit information on red meat, individuals who had a higher tendency to avoid such information showed more positive attitude towards red meat and greater experienced cognitive dissonance, lower risk information seeking behaviour, and lower systematic	Cognitive dissonance arousal was manipulated (indirectly at best) but not controlled. Cognitive dissonance was assessed through a proxy measure that is study discontentment.	Cognitive dissonance is positively related to risk information avoidance and negatively related to information seeking, therein posing a potential barrier to effective health risk communication.

				processing of information.		
	Heiman & Lowengart (2011)	In a field experiment, studied the effects of health hazard information in food (consumption of chicken) on consumers' choice process.	Supermarket shoppers in Israel (N=330).	Positive health information regarding chicken consumption resulted in low cognitive effort and low involvement in food choice decision where individuals simply based their decision merely on taste. Slightly negative health information resulted in the use of both taste and convenience for food choice decision whilst very negative health information resulted in the use of taste, convenience and health considerations for making a food choice decision.	Cognitive dissonance arousal was experimentally manipulated (indirectly at best) although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	Cognitive dissonance from conflicting health information about the consumption of a food was considered to cause individuals to avoid confronting the health aspect of consuming said food.
Food-related consumer behaviour	Nordvall (2014)	Investigated if the choice between organic and non-organic groceries would lead to cognitive dissonance for the consumer.	Undergraduate students in Sweden (N=50).	Consumer preference for organic and non-organic groceries was measured before and after purchase, and results showed that preference ratings for the non-organic item increased after selection while ratings for the organic alternative decreased. after rejection.	Cognitive dissonance arousal was experimentally manipulated although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	Individuals' motivation to reduce post-purchase dissonance might be capitalized by marketers in providing appropriate *ex ante* information to support consumer purchase decision towards healthier food choices (i.e., purchase promotion).

	Olson & Dover (1979)	An experiment was conducted to investigate the effects of disconfirming consumer expectations about the bitterness of coffee ground on post-product trial hedonic evaluation.	Married women in the United States of America (N=38).	Although the post-product trial bitterness ratings of the experimental group did change according to the taste test, they still registered higher "not bitter" and lower "slightly bitter", "fairly bitter" and "very bitter" ratings compared to the control group.	Cognitive dissonance arousal was experimentally manipulated although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	Cognitive dissonance caused by a disconfirmation of expectations led individuals to assimilate post-product trial ratings in a manner that was closer to the pre-product trial ratings in order to reduce dissonance.
	Stern, Haas & Meixner (2009)	A quasi-experiment to investigate the effects of information provision about wood-based food additives on attitude change in the context of individuals' prior attitudes toward, and pre-knowledge about, the additives.	Consumer population in Austria (N=263).	The provision of additional (neutral) information about the use of wood lignin in vanilla aroma production led to an improvement in the evaluations of such additives across all experimental groups. However, significant improvement occurred only for those who had pre-knowledge of the additives but was not able to provide an example ("divergent" group) and those who completely did not know about the additives at all ("uninformed" group).	Cognitive dissonance arousal was experimentally manipulated (indirectly at best) although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	Cognitive dissonance caused a change in individuals' food-related attitudes in the event that prior attitudes were weak and not definitive.

Health/Nutrition communication	Albarracín, Cohen & Kumkale (2003)	Experimentally investigated whether individuals would heed health messages (regarding the consumption of an alcohol-like product) if they consumed the alcohol-like substance following the health messages.	Undergraduate students in the United States of America (N=99).	Participants who consumed a simulated alcohol product expressed stronger intentions to use the product in future if they had been exposed to an abstinence-promoting preventive message than a message that urged moderated use.	Cognitive dissonance arousal was experimentally manipulated although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	Cognitive dissonance due to conflict between behaviour and health message, led to a resistance of the health message, especially one that adopted a total-abstinence stance than a moderate-consumption stance, as a means of reducing dissonance.
	Knobloch-Westerwick, Johnson & Westerwick (2013)	Examined experimentally how health behaviour (consuming organic food, coffee, fruits and vegetables, and exercising) might be self-regulated through selective exposure to online health messages.	Undergraduate students in the United States of America (N=419).	The more individuals engaged in certain health behaviours, the more time they would spend accessing the messages promoting those health behaviours.	Cognitive dissonance arousal was experimentally manipulated (indirectly at best) although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	The threat of cognitive dissonance was assumed to cause individuals to approach health messages consistent with their health behaviours and to avoid those messages in conflict with their health behaviours.
Meat consumption	Bastian, Loughnan, Haslam & Radke (2012)	Examined experimentally if there was denial of mind to food animals by individuals to sustain their meat-eating behaviour and to protect culinary practices.	Undergraduate students in Australia (n=71; n=66; n=128)	In the last of three studies, participants who expected to eat meat denied mind to food animals when they were asked to think about the origins of meat. Also,	Cognitive dissonance arousal was experimentally manipulated although actual cognitive dissonance onset was not	Cognitive dissonance elicited by the conflict between meat consumption and concern for animals caused a denial of mind to food animals, thereby

				denying minds to animals reduced negative emotions aroused by dissonance between concern for animals and meat eating.	directly measured but implicitly inferred from the outcome variables instead.	sustaining meat eating behaviour.
	Rothgerber (2014)	Examined experimentally the strategies used by meat eaters to reduce vegetarian-induced dissonance.	Working adults primarily from the United States of America (n=90; n=77; n=77; n=68; n=78)	Via four experiments, participants showed different dissonance-reducing strategies when exposed to vignettes depicting various types of vegetarians. In a final fifth study, participants were shown to feel negative emotions if they anticipated moral reproach from the vegetarians.	Cognitive dissonance arousal was experimentally manipulated although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables in the first four studies. In the fifth study, cognitive dissonance onset was linked to a single measure that combined the emotional states of anxiety, nervousness, tension and discomfort.	Cognitive dissonance elicited by the conflict between meat consumption and vegetarianism concerns (e.g., animal suffering, etc.) evoked dissonance-reducing strategies to excuse, and therefore sustain, meat eating behaviour.
	Tian, Hilton & Becker (2016)	Examined experimentally how the connection between meat and its animal origin would affect individuals' willingness to consume meat and their mind perceptions of the concerned animal.	Young adults from two different countries – France (n=243; n=301) and China (n=277; n=217).	Via two experiments, in which one focused on the stage of meat production and the other on meat consumption, participants were exposed to stimuli that depicted varying levels of dissociation between meat and its animal	Cognitive dissonance arousal was experimentally manipulated although actual cognitive dissonance onset was not directly measured but implicitly inferred from the	Cognitive dissonance elicited by the association between meat and its animal origin might increase willingness to consume the meat for individuals from certain cultures, particularly if these individuals are not asked about animal mind

				origin. Only in the first study was a clear, statistically significant result obtained that showed French participants indicating less willingness to eat beef when this was measured first before mind perception of cows than when it was measured following the assessment of mind perception of cows.	outcome variables in the two studies.	perception prior.
Dietary health behaviour	Rotenberg, et al., (2005)	Examined experimentally the effect of priming thoughts about control on anxiety and food intake and if this was moderated by dietary restraint.	Undergraduate students in the United Kingdom (N=80).	Participants high in dietary restraint showed greater anxiety when primed for control than when primed for lack of control whereas participants low in dietary restraint showed greater anxiety when primed for lack of control than when primed for control due to cognitive dissonance. The moderating effect of dietary restraint did not occur for food intake.	Cognitive dissonance arousal was experimentally manipulated although actual cognitive dissonance onset was not directly measured but implicitly inferred from the outcome variables instead.	Cognitive dissonance elicited from inducing incongruence in control thoughts among restraint eaters caused anxiety in them but did not affect food intake.
	Stellefson, Wang & Klein (2006)	Investigated experimentally if cognitive dissonance created about current physical activity and dietary habits would affect risk/worry about	Undergraduate students in the United States of America (N=126).	When cognitive dissonance was created in terms of health thoughts about diet and physical activity, a higher intention to change diet and physical	Cognitive dissonance arousal was experimentally manipulated although actual cognitive dissonance onset was not	Cognitive dissonance was found to influence the relationship between risk perceptions and intentions for health behaviours (namely, physical activity and

		those health behaviours, and exercise/diet intentions for the future.		activity was associated with a higher perceived risk of health problems whereas when cognitive dissonance was created in terms of appearance thoughts on diet and physical activity, a higher intention to change diet and physical activity was associated with a lower perceived risk of health problems.	directly measured but implicitly inferred from the outcome variables instead.	dietary habits) differentially, depending on whether cognitive dissonance was based on health or appearance thoughts.

Table 2.1: Summary of food-related studies that had explicitly/directly used cognitive dissonance in *a priori* theorization and hypothesis-testing

2.2 Current State of Cognitive Dissonance Scholarship in Food and Nutrition

2.2.1 Limited cognitive dissonance focused research

The literature search shows that there is limited food and/or food-related research that have examined/used cognitive dissonance as a primary, focal construct in *a priori* theorization and hypothesis-formulation; none of these studies involved examining the utility of cognitive dissonance in influencing healthy food attitudes and behaviours in particular. As evidenced by the 16 selected studies, such primary focus is very frequently, if not always, reflected methodologically through the use of experimental manipulation to evoke cognitive dissonance and then assessing its effects via how the dissonance is resolved. This is that which largely distinguishes the 16 studies from the numerous other studies that had used cognitive dissonance solely as (1) *a posteriori* explanation for research findings (e.g., Hjelmar, 2011; Pettigrew & Pescud, 2013), (2) a non-focal part of a larger theoretical framework in *a priori* theorization without hypothesis-formulation, particularly in exploratory qualitative research (e.g., Jabs, Devine & Sobal, 1998; van Dijk, van Kleef, Owen & Frewer, 2012) or (3) a non-focal part of a larger theoretical framework in *a priori* theorization and hypothesis-formulation, in which the basis for experimental manipulation (if any) did not relate directly to dissonance (e.g., Schifferstein, Kole & Mojet, 1999; Quick & Heiss, 2009). By relegating the status of cognitive dissonance to a secondary level of importance, these latter studies' capacity to contribute to an understanding of the nuances of cognitive dissonance effects in food and nutrition (if any) becomes skewed and diminished, thus precluding them from being classified in the same category of studies used for the current review. At best, these studies provide only supplementary, rather than primary and direct evidence for cognitive dissonance research in food and nutrition. For example, Lin, Lee & Yen's (2004) study on fat intake and the search for nutrient information on food labels had often been cited as support for the effects of cognitive dissonance even though the authors themselves had unequivocally acknowledged that the parameters of their study were insufficient to allow for "a test of the cognitive dissonance theory itself" (p. 1962).

2.2.2 Fragmented cognitive dissonance focused research

The diversity of the 16 selected studies, in terms of topical foci and investigated outcomes, suggests potential conceptual (and methodological) fragmentation in the study of cognitive dissonance in the food and nutrition domain. Indeed, in the process of organizing and classifying these studies, it was found that they covered a spectrum of (at

times overlapping) topical areas that encompassed food risk/safety, health/nutrition communication, dietary health behaviour, food-related consumer behaviour, and meat consumption, without a unified theoretical framework to guide and/or logically link the study of cognitive dissonance (in these areas) together. This is exacerbated by partial adherence to only certain aspects of the cognitive dissonance theory across the studies. In particular, although the basic cognitive dissonance process comprises the stages of dissonance arousal and dissonance resolution, only the latter has been meticulously studied, with the former being largely and substantially neglected; the major paradigms associated with dissonance arousal, which include *free choice*, *induced compliance*, *belief disconfirmation*, *hypocrisy* and *effort justification* (Harmon-Jones, 2002; Harmon-Jones & Harmon-Jones, 2007), have therefore almost always been overlooked in the manipulation of cognitive dissonance arousal in these food and/or food-related studies (see Table 2.2 for paradigm descriptions).

Paradigm	Assumption
Free choice	Assumes that once a decision is (freely) made, dissonance may be aroused.
Induced compliance	Assumes that dissonance is aroused when an individual does or says something that contradicts a prior belief or attitude.
Belief disconfirmation	Assumes that dissonance is aroused when persons are exposed to information inconsistent with their beliefs.
Hypocrisy	Assumes that dissonance is aroused whenever individuals are induced to publicly make statements consistent with some normative standards and thereafter, reminded of times when they did not act in accordance with such standards as depicted in the statements made.
Effort justification	Assumes that dissonance is aroused whenever individuals voluntarily engage (i.e., put in effort) in an unpleasant activity to achieve some desired goal.

(Source: Harmon-Jones, 2002; Harmon-Jones & Harmon-Jones, 2007)

Table 2.2: The major paradigms of cognitive dissonance (arousal)

Without a logical, unified conceptual framework in place, the approach to studying cognitive dissonance in food and nutrition is necessarily less systematic and consistent. The end result is fragmented and disparate research findings that do not effectively provide a complete, and integrated, picture (if at all) of the underlying cognitive dissonance mechanics in affecting food/eating attitudes and/or behaviours. The existing diverse research warrants that these, and other related issues, be elaborated upon and discussed through relatively detailed descriptions of the studies within each identified topical area in order to obtain a clearer overall picture.

1. Food risk/safety

Cao and Just (2010) conducted arguably the first known, formal research in which cognitive dissonance was centrally studied and examined in terms of how it might affect risk perceptions of and willingness to pay for familiar versus unfamiliar foods through direct experimental manipulation of the cognitive dissonance construct. They set up an experiment in which participants either consumed a familiar food (beef sausage) or an unfamiliar food (smoked salmon), and then completed a survey afterwards about their risk assessments of beef and salmon as well as their willingness to pay for these two types of foods. The survey had three sections that were successively filled sequentially – section 1 was completed right after food consumption, section 2 was completed after the participants were provided with additional information regarding the food-borne risk of eating beef and salmon (i.e., the percentage of US individuals who got sick from eating the food, the potential bacteria, the related symptoms, sickness and resulting consequences) and section 3 was completed after intensified food-borne risk information was further related to participants (i.e., details of a specific batch of beef sausage/smoked salmon recently recalled by USDA). Section 3 included the same questions on risk assessments but instead of willingness to pay, participants were asked to indicate if they would immediately discontinue eating if the food that they had consumed (during the experiment) was the recalled food, and/or if the recalled food was one that they had at home but not yet consumed. The reported results were mostly, if not all, on beef rather than salmon, and although statistically non-significant, showed that whilst there was no difference in the initial risk assessment of the beef between those who ate it and those who did not, beef users tended to register lower perceived risk and higher willingness to pay a high price for beef after exposure to food-borne risk information than non-users. Beef users were also found to be less likely to stop eating beef immediately even if they found it to be part of the recalled food as compared to non-users. Cao and Just (2010) attributed such behaviours of the beef users to confirmatory bias in a bid to reduce cognitive dissonance.

In another similar study, Cao, Just and Wansink (2010) conducted a lab experiment to investigate if individuals would proceed to consume potentially Avian-Influenza (AI) tainted chicken wings from a local store in full knowledge of the fact. Separated into either a group that had prior eating experience (users) at the local store or a group that had no prior eating experience (non-users) at the same store, participants were

given normal chicken wings or chicken wings prepared with fish sauce (simulating AI tainting). In the fish sauce condition, users were found to be able to better detect, and had higher tolerance of, taste anomalies than non-users. More pertinently, the more of the fish sauce chicken wings the users consumed, the more they rated the food positively (and the less they rated it negatively) and the lower they rated the perceived risk in consumption, as compared to the non-users. Using the notions of cognitive dissonance and confirmatory bias, the researchers explained that the users had sought to reduce the high cognitive dissonance they experienced as a result of consuming high amounts of the "tainted" chicken wings by changing their ratings of food acceptability and perceived risk to be in line with their consumption patterns.

More recently, Cao, Just, Turvey and Wansink (2015)[2] reported another experimental study where in the control condition, individuals were presented with three different flavoured (plain, peanut or almond) chocolates and asked to indicate their willingness to pay for each type (through placing a bid) across three stages of differential exposure to risk information (Aflatoxin – food-borne pathogen) – stage 1, where there was no information given; stage 2 where some qualitative information about Aflatoxin, its relation to common food (especially peanut and almond) and health/illness was given; and stage 3 where some quantitative information about Aflatoxin concentrations in different products (especially peanut and almond) was provided. Risk perception of the chocolates was the other outcome assessed across the three rounds of bidding. In the treatment condition, individuals were asked to select just one of the three flavoured chocolates and indicate their bids and risk perceptions only for this chocolate type across the three stages. The authors reasoned that the cognitive dissonance experienced by individuals who had committed to just one type of chocolate would lead them to be willing to pay more for it (despite the risk information) and, via selective information processing due to confirmatory bias, have attenuated perceptions of its food risk/safety level as compared to individuals who had not committed to any single chocolate type. The hypotheses were generally confirmed.

In summary, Cao and colleagues' experiments show that cognitive dissonance, via confirmatory bias, has the effect of lowering food risk/safety perceptions to sustain food attitudes and behaviours in the direction of the risk – a finding that seems to be in line with results obtained in field studies of food risk/safety that had used cognitive

[2] This was originally reported as a conference paper by Cao, Just and Wansink (2014).

dissonance only as *a posteriori* explanation (e.g., Frewer, Scholderer & Bredahl, 2003; Harvey et al., 2001). It should be noted, nonetheless, that their work focused more on the workings of dissonance resolution (i.e., confirmatory bias) than equitably on the intricacies of both dissonance arousal and resolution – a paradigm of cognitive dissonance arousal was only referenced in Cao et al.'s (2015) study whilst the actual cognitive dissonance aroused, subsequent to its experimental trigger, was not explicitly measured across the three studies reviewed.

Fischer, van Dijk, de Jonge, Rowe & Frewer (2013) investigated the effects of contradictory information about nanotechnology applications on attitudes and attitudinal ambivalence towards nanotechnologies. Specifically, the authors hypothesised that providing both risk and benefit information to individuals with attitudinal ambivalence towards the use of nanotechnology in food production would cause some of them to become more positive and some more negative in their attitude towards the issue (i.e., become less ambivalent). This would be the result of cognitive dissonance resolution where a more definitive stand in either a positive or negative direction was adopted in order to reduce the dissonance triggered by conflicting risk and benefit information. Via two experiments, it was found that individuals exposed to both health (plus environmental in the second experiment) risk and benefit information on the use of nanotechnology in food production showed reduced attitudinal ambivalence, in particular in the negative direction, although average attitude did not change. However, for a number of participants, attitudinal ambivalence increased, rendering the cognitive dissonance reduction explanation somewhat problematic. A limitation in this study would be the assumption of cognitive dissonance resolution based on changes in attitudinal ambivalence without an explicit assessment of actual cognitive dissonance aroused at the outset. It has been argued that attitudinal ambivalence itself represents an instance of internal attitudinal inconsistency that entails negative psychological effects similar to cognitive dissonance (Costarelli & Colloca, 2007; Cong, Osen & Tuu, 2013). Thus, the attitudinally ambivalent individuals in this study might have already attempted, or at least have an implicit preference, to resolve their dissonant feelings in some way prior to being exposed to both risk and benefit information, thereby accounting for why some of them became more positive, some more negative and some more ambivalent towards food production nanotechnology after exposure to the contradictory information.

Gaspar et al. (2016) examined the effects of presenting red meat risks information to red meat consumers, who were assumed to possess a natural propensity to avoid such information, on their attitudes toward red meat and knowledge regarding red meat risks. The researchers hypothesized that avoidance of risk information would be positively related to attitudes toward red meat and cognitive dissonance, and negatively related to additional risk information seeking and both systematic and heuristic processing. It was further anticipated that individuals who avoided risk information would show less change in attitudes toward red meat and perceived risk knowledge than those who did not avoid risk information. Using a longitudinal design, measures of red meat risks information avoidance, attitudes toward red meat, and perceived knowledge about red meat risks were taken from study participants at time 1. Immediately after, the participants were presented with information regarding both health-nutritional (e.g., chronic disease) as well as non-health (e.g., environmental, socioeconomic, etc.) risks and benefits of red meat consumption. After information exposure, measures of attitudes toward red meat, perceived knowledge of red meat risks, systematic and heuristic processing were taken (time 2). Two weeks following the information exposure (time 3), participants were asked to complete a final questionnaire set measuring attitudes toward red meat, perceived knowledge of red meat risks and overall satisfaction with the study. The hypothesized correlations between avoidance of risk information and red meat attitude, cognitive dissonance, risk information seeking and systematic processing were confirmed but the remaining hypotheses were not confirmed. Whilst Gaspar et al.'s (2016) use of a longitudinal study design and the conscious assessment of cognitive dissonance were a credit to the research, a major flaw lied in the authors' use of overall satisfaction with study (i.e., study discontentment) as operationalization of the cognitive dissonance construct. Such operational definition misalignment aside, the assessment of cognitive dissonance would also have been more appropriately carried out immediately following (at time 2) rather than two weeks after (at time 3) risk information exposure.

In another study, Heiman and Lowengart (2011) examined the effects of health hazard information in food on consumers' choice process. Here, a between-subjects design was used in which participants were placed into a group that received either (1) positive, (2) slightly negative, (3) very negative or (4) no health (hazard) information about the consumption of chicken and then asked to rate chicken, turkey and beef (along with their ready-to-eat versions) on 10 food attributes that were factor-analysed into three

dimensions (health, taste-value and convenience) after data collection for analysis. The researchers hypothesised that positive and slightly negative health information would result in low cognitive effort and low involvement in food choice decision where individuals would base their decision on taste alone. It was reasoned that when new information conflicted with prior beliefs, reducing dissonance would be most easily accomplished by ignoring the health information. However, with increasing severity of health information, individuals ought to become more involved and use more cognitive efforts to consider all relevant dimensions for their food choice decision. Results showed that all hypotheses were verified except for the slightly negative information group where convenience was used as another significant dimension for food choice decision. In this case, the authors suggested that the participants looked to the convenience dimension as a means of avoiding confronting the conflict between health and taste in the slightly negative health information condition but could not avoid confronting it when the information became severe. This observation challenged the researchers' original cognitive dissonance-based postulations and underscored the importance of the need for a systematic assessment of cognitive dissonance, beyond its experimental manipulation, to facilitate greater precision in hypothesis-testing.

2. Food-related consumer behaviour

Cognitive dissonance has been linked to consumer behaviour since the 1960s (e.g., Kassarjian & Cohen, 1965), particularly in terms of post-purchase dissonance (e.g., Gbadamosi, 2009) and expectancy-disconfirmation (e.g., Schifferstein et al., 1999) studies. Although there appears to be a larger number of food-related studies associated with consumer behaviour (particularly expectancy-disconfirmation studies) compared to some of the other topical areas, it must be noted that the goal(s) of the consumer behaviour studies are necessarily different and disparate from that of the other topical areas – for instance, in consumer behaviour, the primary goal is generally and largely commercial in nature (e.g., building brand loyalty, influencing and/or sustaining re-purchase behaviour, etc.) whilst in food and nutrition, the primary goal is health-focused (e.g., developing healthy dietary choices/practices, etc.).

In post-purchase dissonance consumer research, cognitive dissonance is seen to inevitably occur as purchase decisions often entail some degree of compromise (Bose & Starker, 2012). It is notable that food has been infrequently studied in this way compared

to other products. Nordvall's (2014)[3] study that examined consumer choice in relation to the purchase of organic and non-organic groceries is an exception. Here, consumer preference for organic and non-organic groceries was measured before and after food selection. Results showed that preference ratings for the non-organic item increased after it was selected while ratings for the organic alternative decreased after it was rejected. Nordvall (2014) attributed the post-decision changes in ratings to cognitive dissonance reduction and proposed that marketers provide appropriate information to capitalize on the post-decision dissonance experienced by non-organic food consumers to get them to switch to the organic alternative before actual purchase. This proposal holds promise given that in a recent non-experimental, survey study designed to statistically test a conceptual model of understanding consumer health information-seeking behaviour in relation to a food product (salad dressing), rather than finding post-purchase dissonance supporting and sustaining current purchase practices, Hansen, Thomsen & Beckmann (2013) found post-purchase health-related dissonance to predict the intentions to avoid repeat purchase of the food product. A novel spin on the typical post-purchase dissonance study in which the aim is to support realized (rather than unrealized) purchase decisions, there was, nonetheless, no mention of a formal assessment of cognitive dissonance itself in Nordvall's (2014) study. It is noteworthy that post-purchase dissonance consumer research is perhaps the only area that has seen attempts being made to develop formal measurements of the cognitive dissonance (i.e., post-purchase dissonance) construct (Montgomery & Barnes, 1993; Sweeney, Hausknecht & Soutar, 2000).

In contrast, cognitive dissonance has often been referenced in the expectancy-disconfirmation model, originally used in the investigation of consumer satisfaction (e.g., Hansen, 2008) but subsequently employed more frequently in relation to food (product) acceptability (e.g., Behrens, Villanueva & da Silva, 2007) studies. A typical study involves looking at the match/mismatch between consumer expectations and (subsequent) presented product properties/characteristics that include the sensory/hedonic qualities of the product. Olson and Dover (1979) exposed individuals to advertisements that emphasised the non-bitterness of a type of ground coffee before giving them a product trial some days later. Indices of the participants' beliefs and evaluations of the bitterness levels of the ground coffee were taken after exposure to the advertisements (pre-product trial) and after the ground coffee was tasted (post-product trial). A control group that

[3] This was originally reported as a conference paper by Nordvall (2012).

tasted the ground coffee without prior exposure to the advertisements was included to contribute a set of only post-product trial bitterness scores. Results showed that although the post-product trial bitterness ratings of the experimental group did change according to the taste test, they still registered higher "not bitter" and lower "slightly bitter", "fairly bitter" and "very bitter" ratings (although only the difference in "fairly bitter" ratings were statistically significant) compared to the control group. It appeared that the experimental group tried to reduce cognitive dissonance due to disconfirmed expectations, by assimilating the post-product trial ratings in a manner that was closer to the pre-product trial ratings. Olson and Dover's (1979) study represented the one early expectancy-disconfirmation research on a food product to have separated the notions of cognitive dissonance and assimilation. Indeed, Zeithaml (2012), whilst noting that both cognitive dissonance theory and assimilation theory predicted the same effect on expectations, had acknowledged the separateness of the two theories. Lamentably, however, cognitive dissonance theory became largely subsumed under, and indeed, superseded by, assimilation theory in later research (e.g., Behrens et al., 2007; Korgaonkar & Moschis, 1982; Schifferstein et al., 1999) – reflecting, once again, partiality towards dissonance resolution and marginalization of dissonance arousal itself. Furthermore, Zeithaml (2012) noted that it was doubtful that the conditions necessary for dissonance to occur (i.e., firm conviction or volition, public and irrevocable commitment to the product, possibility of unequivocal disconfirmation and occurrence of disconfirmation) were met in typical disconfirmation experiments, "where inconsequential expectations are induced by experimenter-provided product information, little public commitment is made, and rather equivocal evidence is offered" (Zeithaml, 2012, p. 85).

In a slightly different study related to consumer food acceptance, Stern, Haas & Meixner (2009) investigated the effects of additional information provision about wood-based food additives on attitude change in the context of individuals' prior attitudes toward, and pre-knowledge about the additives. Classifying the participants as "expert", "divergent", "misbeliever", "believer" and "uninformed" in terms of their pre-knowledge about wood-based food additives, the authors found prior attitude to be more positive for those with accurate pre-knowledge ("expert" group) than those with inaccurate pre-knowledge ("misbeliever" group). More importantly, although the provision of additional (neutral) information about the use of wood lignin in vanilla aroma production led to an

improvement in the evaluations of such additives across all groups, significant improvement occurred only for those who had pre-knowledge of the additives but was not able to provide an example ("divergent" group) and those who completely did not have any idea about the additives at all ("uninformed" group). The prior attitude of the "misbeliever" group remained the most negative. In the context of improving the marketing of wood-based additives (particularly in contrast to additives in general), it was concluded that providing information to attempt to change attitudes would be easier for those who did not yet possess a definitive prior attitude as those with strong prior attitudes would block off dissonant information. The strength of Stern et al.'s (2009) findings would have been enhanced if cognitive dissonance had been explicitly measured following its experimental arousal.

3. Food health/nutrition communication

Food health/nutrition communication is an area into which food risk/safety and food-related consumer behaviour research may often cross over in terms of cognitive dissonance centric scholarship. In one of two experiments conducted, Albarracín, Cohen & Kumale (2003) investigated whether individuals would follow a health message if they engaged in contradictory behaviours after hearing the health message. Participants were first informed that the study related to an alcohol-substitute product that had similar effects as alcohol but was not legally considered to be alcohol and thus was going to be made available to individuals of all ages. They were then assigned to either a group exposed to a short advertisement with a long elaborated message promoting abstinence or one that promoted moderate use of the product. After message exposure, each group was further divided into a group that tried the product and another that did not. Participants who consumed the simulated alcohol product expressed stronger intentions to use the product in future if they had been exposed to an abstinence-promoting preventive message than a message that promoted moderate use. The authors argued that the conflict between behaviour and message led to a resistance of the abstinence-promoting message as a means of dissonance reduction, and recommended that in order to be effective, health messages needed to tread a moderate path rather than take a total-abstinence route. The interesting findings obtained aside, this study did not directly measure cognitive dissonance subsequent to its experimental trigger but merely inferred its arousal from the dissonance resolution outcomes.

Knobloch-Westerwick, Johnson and Westerwick (2013) examined how health behaviour might be self-regulated through selective exposure to online health messages. In this within-subjects experiment, the researchers presented participants with four health topics online (organic food, coffee, fruits and vegetables, and exercise), each with a promoting and an opposing stance from a high and low credibility source. Participants were told to browse through the topics and read whatever interested them. Several hypotheses were made, of which the following related to the notion of cognitive dissonance: (1) The more individuals partook in certain health behaviours, the more time they would spend on the messages promoting those health behaviours, and (2) the more individuals failed to meet perceived standards for health behaviours, the less time they would spend on the messages promoting those health behaviours. The researchers further hypothesised that these effects would be stronger for those messages linked to high than low credibility sources. Results showed the first, but not the second, hypothesis to be supported, regardless of source credibility, and that individuals who engaged in certain health behaviours also spent less time on messages that opposed those behaviours. To account for the two different findings, the researchers suggested that the first hypothesis involved an instance of situational dissonance and the second hypothesis one of pre-existing dissonance. However, it could be argued that there was a higher plausibility that the first hypothesis represented an instance of consistency maintenance and the second hypothesis one of dissonance reduction (which did not materialise). The existence of alternative explanations to the findings highlighted the current lack of a systematic approach to the study of cognitive dissonance in food and/or food-related research.

4. Meat consumption

Research into meat consumption has risen in recent times, particularly in terms of cognitive dissonance investigation. In one such research, Bastian et al., (2012) investigated if people would continue to eat meat if they ascribed mental capacities (minds) to food animals. The researchers hypothesised that being reminded of the origins of meat would raise dissonance for meat eaters, leading them to deny minds to food animals, especially if they expected to eat the meat in the near future, therein lessening their moral concern for those animals and reducing negative affect about meat consumption. Across three studies that employed a mix of experimental and questionnaire self-report approaches, the authors assessed (1) participants' perceptions of 32 animals in terms of mental capacities and edibility, as well as, their moral concern and affect about

eating each animal in the first study, (2) participants' perceptions of the mental capacities of a cow and sheep after exposure to pictures of the two animals that either depicted and described the animals as merely grazing in a herd in paddocks (control condition) or as being bred to be slaughtered in an abattoir for consumption (experimental condition) in the second study and (3) participants' affective response to the expectation of eating beef/lamb (high dissonance condition) or apple (low dissonance condition) after being presented with the same picture stimuli as in study 2 and asked to write an essay about "the processes involved in raising cattle/sheep on the farm right through to the eventual packaging of meat for human consumption" (p. 251) in the third study. Generally, a negative correlation was observed between mental capacities and edibility such that animals considered appropriate for consumption were rated as having lesser mind. At the same time, it was found that the more individuals attributed mind to animals, the worse they felt about eating them and the more morally wrong they perceived the consumption to be. Collapsing the data in study 2 to form the categories of "food animal" and "non-food animal" (since no significant differences were found between cow and sheep), results showed meat eaters significantly denying mind to animal when reminded that the animal would be used as food as compared to when they were not reminded of it. With the data similarly collapsed in study 3, results showed that participants denied minds to food animals when thinking about animal food origins but only in the event that they expected to consume meat (and not when they expected to consume apple). The authors also reported that "denying minds to animals we are about to eat reduces negative emotions aroused by dissonance between our concern for animals and our meat-eating behaviour" (p. 253). The novel results obtained notwithstanding, Bastian et al.'s (2012) research did not explicitly measure cognitive dissonance following its arousal via experimental manipulation.

In a similar vein, more recently, the awareness of the "meat paradox" (i.e., "liking to eat meat but not wanting to kill animals", p. 186) and the strategies used to reduce the resultant cognitive dissonance amongst individuals from different cultural backgrounds was examined by Tian et al. (2016) in two survey-based experimental studies. Adapting from Bastian et al.'s (2012) methodological procedure, the first study focused on cognitive dissonance arousal at the meat production stage whereby Chinese and French participants were exposed to one of four conditions that varied in "the transparency of the connection between meat and its animal origin" (p. 188). Specifically, with the exception

of the control condition, in increasing level of dissociation between meat and its animal origin, a picture of a cow was shown in two of the experimental conditions accompanied either by the statement that it would be sent to the abattoir (abattoir condition) or another pasture (pasture condition) the next day, whilst in the remaining experimental condition, the same picture was diagrammatically dissected into the different kinds of beef that derived from the various parts of the cow (meat condition). In all conditions, participants had to subsequently indicate their willingness to eat meat and their mind perception of cows as dependent measures, for which the presentation order was varied and factored as a second independent variable. The researchers reported that participants in the abattoir condition were less willing to eat beef than those in the meat condition, even though the difference in terms of study conditions was not statistically significant. A significant interaction, however, was found between participant nationality and order of dependent measures presentation, in which French participants indicated less willingness to eat beef when this was measured first before mind perception of cows than when it was measured following the assessment of mind perception of cows; no such difference was found for the Chinese participants. In terms of mind perceptions of cows, whilst a significant interaction between participant nationality and study condition was indicated, the reported simple main effects analyses showing that French participants in the pasture and meat conditions attributed less mind to cows than those in the control condition was not statistically significant. The same dependent variables were used in the second study that focused on cognitive dissonance arousal at the meat consumption stage, where the connection between meat and its animal origin was now represented descriptively as a dish recipe (in which beef was the main ingredient) instead. Apart from the control condition in which no stimulus was presented, in increasing level of dissociation between meat and animal origin, one condition presented the meat recipe together with an animal image, another presented the recipe with a dish image – much like that depicted in restaurants' menus – and the last experimental condition presented the recipe alone. Although the researchers specifically reported that participants in the recipe alone condition were more willing to eat beef compared to those in the control condition, this was not statistically significant. Likewise, whilst it was reported that less mind was attributed to cows by (1) French participants compared to Chinese participants, and (2) those in the recipe with animal and dish image conditions compared to the recipe alone condition, these were not statistically significant. Aside from the shortcoming of using and reporting results that, by and large, did not meet the minimum $p \leq .05$ level of

statistical significance but were merely “marginally significant” (p. 189), Tian et al.’s (2016) failure to explicitly measure cognitive dissonance is problematic in a “meat paradox” study such as this (and to the same extent, Bastian et al.’s (2012) study as well) as it fails to separate cognitive dissonance from guilt, a potential affect experienced by meat eaters due to moral conscience (Bastian et al., 2012; Šedová et al., 2016; Graca, Calheiros & Oliveira, 2016), which is distinct from (albeit related to) cognitive dissonance (Breslavs, 2013). In a situation like this, any effects on outcome variables might then be erroneously attributed to cognitive dissonance when they could in reality be due to feelings of guilt instead.

In a somewhat different study, Rothgerber (2014) examined the strategies used by meat eaters in reducing vegetarian-induced dissonance. Using online surveys across four studies, meat eaters were hypothesized to experience cognitive dissonance when exposed to various vignettes depicting different types of vegetarians (a pair in each between-subjects study) and had their responses to statements designed to capture various types of dissonance-reducing strategies recorded. In study 1, individuals exposed to a vignette depicting a vegetarian were more likely to attribute lower mind and emotion ratings to animals than those exposed to a vignette depicting a gluten-free person. In study 2, participants exposed to a vignette depicting an authentic vegetarian reported higher consumption of vegetarian meals per week and lower consumption of beef than those exposed to a vignette depicting a fake vegetarian. In study 3, individuals exposed to a vignette describing a freely choosing vegetarian (vegetarianism by choice) denied animals’ capacity to feel pain more and believed more in the necessity of consuming meat than those exposed to a vignette describing a restricted-choice vegetarian (vegetarianism by force). In study 4, participants who were exposed to a vignette describing a consistent vegetarian used more meat-eating justification tactics than those exposed to a vignette describing an inconsistent vegetarian. Recognising that these four studies did not provide direct evidence of cognitive dissonance experienced, the researcher conducted a final fifth study in which individuals’ emotional responses (anxiety, nervousness, tension and discomfort) to anticipated moral reproach from vegetarians (to their meat consumption) and their ratings of human-animal emotional similarity were measured. Here, it was found that compared to a control group (in which no moral reproach from vegetarians was anticipated), those individuals who expected moral reproach registered higher scores on negative emotions (reflecting dissonance) and lower scores on perceived human-animal

emotional similarity. Rothgerber's (2014) work is creditable for recognising the importance of assessing cognitive dissonance and attempting an indicative measure of it through measuring "emotional states such as anxiety and tension that are associated with the experience of cognitive dissonance" (p. 39). The omission of cognitive discrepancy assessment (Harmon-Jones, 2002; Harmon-Jones & Harmon-Jones, 2007) in such ad-hoc, proxy measures of cognitive dissonance, however, highlight the need for precise, theoretically-based measures of the construct to be formally developed.

5. Dietary health behaviour

This is a key area that most, if not all, health agencies have been focusing their efforts in but yet very little work to date has been done to examine how cognitive dissonance may be used to effect adaptive eating behaviours since Worsley's observation of this same fact back in 2002. Exceptionally, Stellefson, Wang and Klein (2006) attempted to link cognitive dissonance with intentions to change specific lifestyle behaviours by investigating if individuals would be more likely to assume healthier diets and exercise habits when made to experience cognitive dissonance regarding their diet and exercise behaviours for physical appearance or health reasons. In this study, college students were each asked to complete a questionnaire assessing their (1) physical activity behaviours, (2) dietary habits, (3) perceived risk/worry about health and appearance associated with their diet and exercise habits and (4) diet/exercise intentions for the future. The questionnaire was completed after they had written an essay on why healthy diet and physical activity were important either to maintaining one's health (dissonance-health condition), or for maintaining an attractive physical appearance (dissonance-appearance condition) or an essay about their favourite movie (control condition). Results showed that while cognitive dissonance had no effect on intentions and risk perceptions, differences were found between the three conditions in terms of the relationship between risk perceptions and intentions. Specifically, an increase in perceived risk of health problems was associated with increased intentions to diet and exercise in the dissonance-health condition but was associated with decreased intentions in the dissonance-appearance and control conditions. In comparison, an increase in perceived risk of appearance issues was associated with increased intentions to diet and exercise for all conditions, with the highest per-unit increase occurring for the dissonance-appearance group. The authors suggested that efforts to influence healthy diet and exercise behavioural intentions via risk perceptions would be facilitated by evoking cognitive

dissonance that matched the specific risk type, especially for physical appearance concerns. The results and interpretations, however, must be taken with caution as these were predicated on the differentiation of appearance- versus health-based dissonance, such that "dissonance would be more apparent when college students were encouraged to think about how their health habits influenced their appearance rather than their health" (p. 221), which Stellefson et al. (2006) did not explicitly measure, beyond experimental manipulation.

On a slightly different note, Rotenberg et al., (2005) examined the effects of activating thoughts about control on anxiety and food intake, as well as, the moderating role of dietary restraint on such effects. Female undergraduates were first put through a priming task where they were either primed for control or lack of control thoughts, after which they completed a questionnaire that encompassed measures of dietary restraint and perceptions of control over consumption before being finally presented with a taste test that required them to consume different brands of ice-cream (and rating these on several hedonic attributes) as a means of measuring food intake. Pre-test state anxiety was measured at the start of the experiment (before the priming task) and measured again after the completion of the questionnaire (post-test state anxiety). Results showed that (1) individuals primed for lack of control thoughts perceived less control over consumption than those primed for control thoughts, (2) higher levels of dietary restraint were associated with lower perceived control over consumption, (3) individuals with high levels of dietary restraint showed greater anxiety when primed for control than lack of control thoughts (the reverse was true for low dietary restraint participants), and (4) individuals primed for lack of control thoughts had higher food intake than those primed for control thoughts. The pattern of results obtained prompted the authors to suggest that women who were high in dietary restraint might not respond well to clinical interventions that emphasised the adoption of control cognitions over food consumption. The failure of the researchers to find an effect of priming incongruity in control cognitions in restraint eaters on actual food intake, however, weakens the practical value of such a recommendation.

2.2.3 Main issues – Summary and consolidation

As evidenced from the literature review, not only is there a lack of cognitive dissonance focused research in the food and nutrition domain currently, but the existing, limited studies also appear conceptually fragmented due to the absence of a logical,

unified theoretical framework – one that integrates the basics of cognitive dissonance theory with the domain-specific features and realities of food and nutrition – to guide and facilitate systematic, consistent research. This has resulted in disparate findings where, in particular, two possible but completely opposite responses to cognitive dissonance emerge – (i) individuals ignore contradictory information and instead, seek out congruent information to support their pre-existing food and/or food-related inclinations; (ii) individuals confront important health considerations in food (or related to food) and in certain situations, particularly in the absence of a strong, initial stance, change their pre-existing food and/or food-related inclinations in the direction of the health considerations. These two opposing patterns of results exist within and across the various topical areas – the first is seen in food risk/safety, food-related consumer behaviour, food health/nutrition communication and meat consumption and the second in food risk/safety, food-related consumer behaviour and dietary health behaviour. It has to be noted that all findings obtained in the reviewed studies must be taken in the context of the fact that actual cognitive dissonance aroused was rarely directly assessed or measured but instead inferred from "observable manifestations of attempts to reduce it" (Carlsmith & Aronson, 1963, p. 151), following experimental manipulation. Aforementioned, "While important, these demonstrations only offer indirect support for a dissonance-based explanation" (Rothgerber, 2014, p. 38), additionally highlighting the inequitable focus on dissonance resolution at the expense and neglect of dissonance arousal in the study of cognitive dissonance in food and/or food-related research. It is likely that the disparate findings achieved within and across the various topical areas are partly due to this. Specifically, on closer examination, the opposite cognitive dissonance effects obtained between the aforementioned studies in food risk/safety and meat consumption might be traced to the fact that cognitive dissonance was associated with anxiety/worry in the former but guilt in the latter. The failure to consciously and explicitly measure cognitive dissonance had led to differential and inconsistent treatment of the construct, therein highlighting the conceptual negligence that was inherently undertaken by researchers in those studies. A fundamental truth and logic is ignored in this situation – a specific construct should be conceptually and operationally defined in the same (i.e., consistent) way, regardless of the context in which it is examined, whilst acknowledging that its application might differ across contexts.

2.3 Directions for Cognitive Dissonance Research in Food and Nutrition

Consistent with Worsley's (2002) position on the potential applicability of cognitive dissonance to changing dietary beliefs, Hamilton-Ekeke and Thomas (2011) proposed using cognitive dissonance to aid children to rethink their "prior views concerning healthy eating" (p. 70). In a series of studies that possibly captures how Worsley (2002) probably envisioned the utility of cognitive dissonance to be (in influencing adaptive dietary health behaviours), Stice and colleagues (Stice, Mazotti, Weibel & Agras, 2000; Stice, Chase, Stormer & Appel, 2001) developed a dissonance-based eating disorder prevention program through which disordered eaters were made to experience dissonance in terms of their thin-ideal by critiquing it. The researchers' rationale that the dissonance aroused would reduce the idealisation of female thinness, leading subsequently to decreases in body dissatisfaction, dieting, negative affect, and ultimately, bulimic symptoms, were largely borne out in their studies (e.g., Stice et al., 2000; 2001; Stice, Trost & Chase, 2003; Stice, Shaw, Burton & Wade, 2006; Stice, Presnell & Gau, 2007; Stice, Marti, Spoor, Presnell & Shaw, 2008; Stice, Rohde, Gau & Shaw, 2009; Stice, Rohde, Shaw & Gau, 2011; Stice, Rohde, Durant & Shaw, 2012; Stice, Butryn, Rohde, Shaw & Marti, 2013; Stice, Marti & Cheng, 2014) and in the extension studies of others (e.g., Becker et al., 2010; Ramirez, Perez & Taylor, 2012). However, in a recent systematic review of dissonance-based interventions for *non-clinical* health behaviours, Freijy and Kothe (2013) reported no peer-reviewed, published study that related to dietary health behaviours[4].

In order to develop similar dissonance-based programs to alter non-clinical dietary health behaviours through changing food and/or food-related attitudes, a clear understanding of the mechanisms underlying cognitive dissonance within a food and nutrition context is required. To this end, there are two recommendations for future cognitive dissonance scholarship in food and nutrition going forward. First, there is a need to give equitable attention to the dissonance arousal portion of the cognitive dissonance process beyond just focusing on dissonance resolution. This not only means making appropriate references to the various cognitive dissonance paradigms when attempting to evoke dissonance but more importantly, developing direct measures of

[4] The reported study closest to being relevant was from an unpublished thesis (Hammons, 2010) on dissonance-based intervention for high risk alcohol use, which the thesis author felt bordered on being a clinical behaviour similar to disordered eating rather than a clear, non-clinical dietary-related health behaviour.

cognitive dissonance beyond relying on proxy emotional measures. It is only through a direct measure of cognitive dissonance that potential dissonance evoking situations may be precisely identified and the subsequent dissonance resolution processes/strategies be suitably contextualized, leading to increased accuracy in attained findings. In other words, it is necessary to understand, and be able to assess, the basic, preceding event of dissonance arousal comprehensively before a precise understanding of how dissonance is resolved (i.e., specific dissonance resolution strategy) may be attained; it is possible that the specific dissonance resolution strategy adopted may depend on how the dissonance has been aroused in the first place (i.e., paradigms of cognitive dissonance) and the extent that dissonance is then felt or experienced.

Second, in order to derive a direct cognitive dissonance measure that is relevant to the food and nutrition domain, there is a prior need to construct a logical, unified theoretical framework based on the basic principles of cognitive dissonance theory and relevant domain-specific theorizations in food and nutrition (e.g., conceptual model for understanding factors influencing food choice – Krebs-Smith & Kantor, 2001). Beyond guiding the development of a direct, domain-specific measure of cognitive dissonance, it is only through the use of such a unified and integrated theoretical framework that cognitive dissonance research in food and nutrition can proceed in a more systematic manner, potentially resolving the apparent disconnect amongst studies across the various topical areas. A more precise understanding of the nuances of the workings of cognitive dissonance in food and nutrition may consequently be achieved.

Chapter 3. Cognition Dissonance in Food and Nutrition – A Conceptual Framework

3.1 Need for Unified Cognitive Dissonance Theorization in Food and Nutrition

To recap, the review of cognitive dissonance research in the food and nutrition domain showed that whilst the potential of cognitive dissonance to influence attitudes and behaviours in food and nutrition has been acknowledged, it has yet to be fully explored and exploited. Specifically, the 16 reviewed studies rarely examined the utility of cognitive dissonance in influencing or altering food and/or food-related attitudes. It is thus in the interest of food science and nutrition scholars to become more engaged in cognitive dissonance research applied in the area of food choice and dietary practice, with the ultimate goal of optimizing the utility of cognitive dissonance in the design of effective policies and promotional strategies in public health.

Across those 16 studies, the review further found (1) disparities in how cognitive dissonance was used in research conceptualization, (2) variations in how cognitive dissonance arousal was experimentally evoked without clear adherence to established cognitive dissonance paradigms, and (3) the general lack of explicit measurement of cognitive dissonance itself (subsequent to its arousal). It was suggested that the unsystematic and disconnected approach taken in the examination of cognitive dissonance in food-related studies could have resulted in inconsistent findings vis-à-vis the effects of cognitive dissonance across those studies. The interim conclusion was that a conceptual framework integrating the basic principles of cognitive dissonance theory with the relevant attitude and context-specific theorizations associated with food and nutrition was required to facilitate systematic research in this area as a precursor to application. The purpose of this chapter is to propose such an integrated theoretical framework.

3.2 Developing an Integrated Conceptual Framework for the Study of Cognitive Dissonance in Food and Nutrition – Insights from Cognitive Dissonance, Attitude and Food-related Research

The primary core of the proposed conceptual framework for the study of cognitive dissonance in food and nutrition should rightly be founded on the construct of cognitive dissonance and its conceptualization. In this instance, the proposed framework adopts the basic principle underlying cognitive dissonance theory *as a consistency theory of attitude*

change in assuming the importance of cognitive consistency maintenance[5]. The proposed framework primarily seeks to expound on the dissonance arousal process that is potentially invoked when individuals experience conflicting food-related cognitions. In the current context of the proposed framework, a more precise definition of cognition as *attitude*[6] is taken as its secondary core, given the proposed framework's ultimate application as a tool to inform and guide efforts in influencing attitude change via cognitive dissonance. The proposed framework's focus on the dissonance arousal process is predicated on the premise that its understanding will provide the context for a more precise prediction of the dissonance resolution process that follows, which includes attitude change. The constructs and workings of the proposed framework will be elaborated and developed based on insights drawn from relevant research and literature related to cognitive dissonance, attitude, and food choice.

3.2.1 The cognitive dissonance construct and the basic cognitive dissonance process

The review into current existing cognitive dissonance research in food and nutrition has shown that it is important to establish a formal, and consistent, definition of the construct of cognitive dissonance. In this regards, although "Festinger's early explanation of dissonance did not clearly identify whether *dissonance* is cognitive or emotional" (Sweeney et al., 2000, p. 373), dissonance theorists generally agree that *both* cognitive as well as affective aspects to cognitive dissonance exist. In the original version of cognitive dissonance theory, Festinger (1957) emphasized the importance of, and need for, cognitive consistency by individuals, stating that "*x* and *y* are dissonant if not-*x* follows from *y*" (p. 13), with *x* and *y* being "any knowledge, opinion, or belief about the environment, about oneself, or about one's behaviour" (p. 3). This essentially specifies a cognitive dimension to the cognitive dissonance construct. Cognitive consistency is defined by the logical links between cognitive elements, and the explicit nature of bringing specific cognitive elements into conscious evaluation "implies that these elements have to be understood as propositions about states of affairs that are regarded as true or false by the individual" (Gawronski, 2012, p. 653, citing Gawronski & Strack,

[5] Although there were attempted reformulations of the precise mechanisms underlying cognitive dissonance effects, particularly that which related to ego-defence (e.g., Aronson, 1968; Steele & Liu, 1983; Cooper & Fazio, 1984; Stone & Cooper, 2001), purist dissonance theorists maintain that Festinger's (1957) original version focusing on cognitive consistency maintenance continues to be viable, and can explain the evidence generated by the revisions (Gawronski, 2012; Harmon-Jones, 2002; Harmon-Jones & Mills, 1999).

[6] Food-related attitude in the proposed framework includes attitude towards food (e.g., attitude towards pasta, broccoli, etc.) and attitude towards food activity/event (e.g., attitude towards dieting, sensory eating, etc.).

2004). Thus, an individual who holds, and is simultaneously aware of, the propositions "Margarine is healthier than butter" and "Margarine has been found to contain harmful trans fat" is facing a situation of cognitive inconsistency. A situation of cognitive inconsistency would evoke a psychological state of tension or discomfort (Carlsmith & Aronson, 1963; Elliot & Devine, 1994) within the individual, and it is this psychological discomfort that motivates individuals to change attitudes (Metin & Metin-Camgoz, 2011) as a means of resolving cognitive inconsistency. This psychological state of tension or discomfort represents the affective dimension of the cognitive dissonance construct, and has been referred to as an aversive motivational state (Harmon-Jones, 2002).

Thus, a conceptualization of cognitive dissonance must take into account both its cognitive and affective aspects (Sweeney et al., 2000; Harmon-Jones, 2002). Harmon-Jones (2002) provided a taxonomy to distinguish the affective motivational state (i.e., *dissonance*) from the cognitive inconsistency that produces it (i.e., *cognitive discrepancy*), and the cognitive and behavioural changes that result from the affective motivational state of dissonance (i.e., *cognitive discrepancy reduction*). Based partially on such taxonomy, a figure to clarify the basic cognitive dissonance process is presented in Figure 3.1.

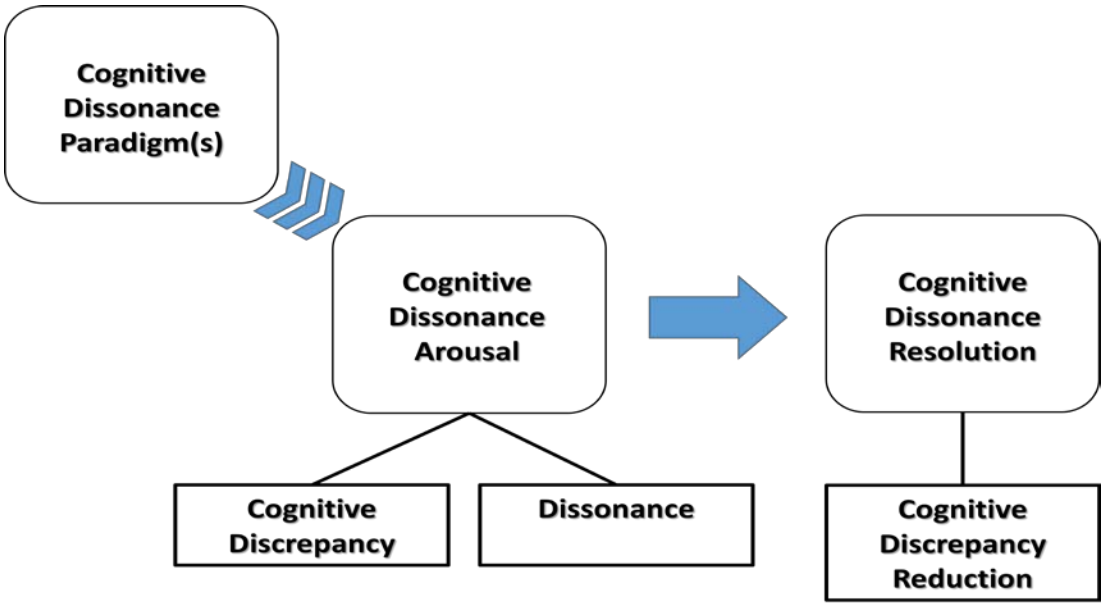


Figure 3.1: Basic cognitive dissonance process

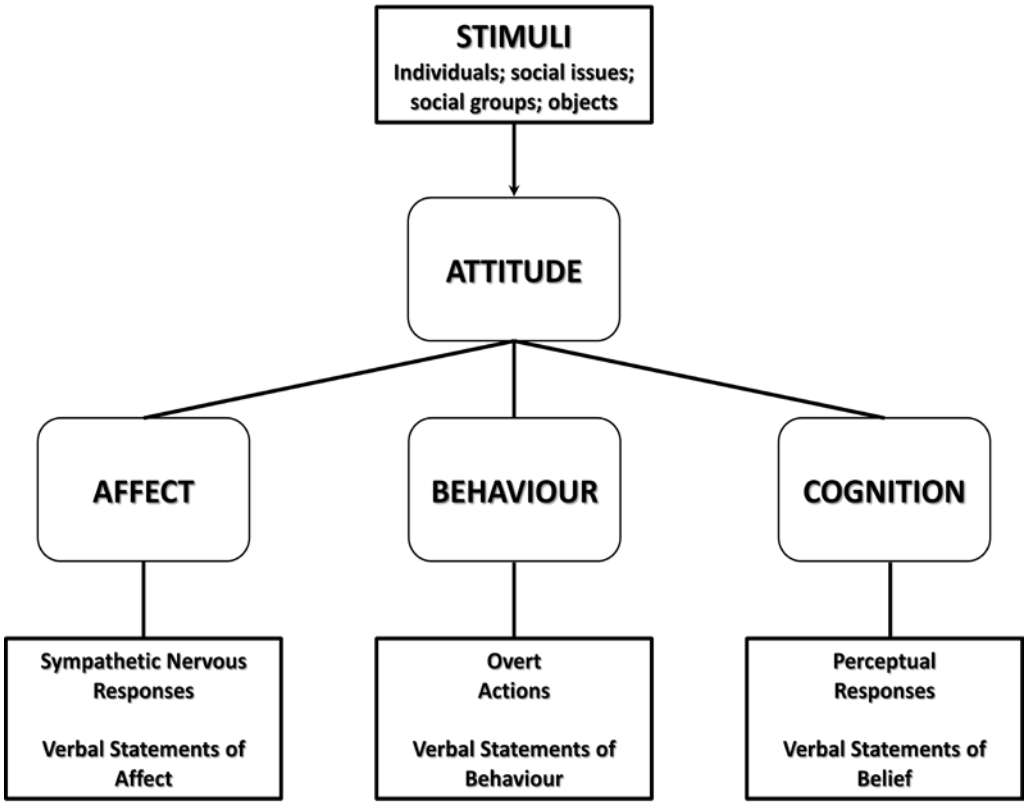
In summary, any study that looks at cognitive dissonance would need to consider the use of specific cognitive dissonance paradigm(s) to elicit cognitive dissonance arousal.

The actual arousal itself needs to be assessed in terms of its cognitive discrepancy and dissonance make-up before any subsequent motivated efforts at cognitive discrepancy reduction may be accurately attributed to the dissonance (Elliot & Devine, 1994). Current food-related studies that have examined cognitive dissonance as a focal construct, have largely neglected the cognitive dissonance arousal process such that neither the exact cognitive dissonance paradigm(s) used (if any) to elicit cognitive dissonance arousal was accurately specified nor the actual cognitive dissonance arousal explicitly measured thereafter. The latter, in particular, has been quantitatively and qualitatively limited in cognitive dissonance research generally across domains (Sweeney et al., 2000).

Correspondingly, in additional recognition of the importance of assessing actual cognitive dissonance arousal after it has been triggered, the cognitive and affective distinctions underlying the conceptualization of the cognitive dissonance construct will be reflected within the proposed framework as *food-related cognitive discrepancy* (i.e., inconsistency between two or more food-related attitudes) and *food-related dissonance* (i.e., psychological tension/discomfort experienced as a result of food-related cognitive discrepancy) respectively. These two together define *food-related cognitive dissonance*.

3.2.2 Attitude, attitudinal structures and cognitive dissonance

An attitude may be defined as a psychological, evaluative response towards a particular person, place, thing, event, etc. (*attitude object*) in positive and/or negative terms based on affective, behavioural and cognitive information (Eagly & Chaiken, 1995; Minami, 2009; Schwartz, 2012; Schwarz & Bohner, 2001). This definition of attitude adopted by the proposed framework is founded on a contemporary view of the tripartite model of attitude (Breckler, 1984; see Figure 3.2).



(Source: Breckler, 1984)

Figure 3.2: Tripartite model of attitude structure (after Rosenberg & Hovland, 1960)

In this model, attitude is seen as a response to an antecedent stimulus or attitude object alongside affective, behavioural and cognitive tendencies toward the attitude object. In this instance, affect essentially refers to an emotional response to an attitude object, which may be measured physiologically (e.g., heart rate, galvanic skin response) or through self-reports of feelings or mood. Behaviour includes overt actions and behavioural intentions, which may be similarly gauged via verbal, self-statements regarding behaviour. Lastly, beliefs, knowledge structures, perceptual responses, and thoughts make up the cognitive component that likewise could be assessed through verbal self-reports. In the traditional view of the model, all three components are seen as constituents of the "anatomy" of an attitude (Smith, 1947, p.508). In the contemporary view of the model, however, the three components are seen as bases of an attitude (Fabrigar, MacDonald & Wegener, 2005). Whilst all three components, varying on a common evaluative continuum, may be sufficiently distinct from each other to preclude high inter-componential correlation, there is normally some degree of positive correlation amongst the three components that establishes a situation of triadic consistency. This is particularly so when attitude measurement may be derived from cognitive representations of each component, a

provision allowed for in the tripartite model. This fits in well with the focus of cognitive dissonance theory on cognitive consistency, and its propositional-thoughts-based analysis. Thus, although the moderate inter-correlation amongst the components means that it is plausible for them to operate in partial, or even complete independence (Breckler, 1984; Greenwald, 1982; Zajonc, 1980), the proposed framework will appeal to the tripartite model's allowance for an assumption of tendency towards triadic consistency amongst the attitudinal components in alignment with the assumptions underlying its central cognitive dissonance core.

The definition of attitude premised on the tripartite model essentially captures what has been termed as the internal structure of attitude, i.e., *intra-attitudinal structure*, which comprises attitude, with its tri-componential cognitive, affective, and behavioural dimensions, towards an attitude object (Fabrigar & Wegener, 2010). Attitude objects may be delineated in terms of relative concreteness or abstraction (Eagly & Chaiken, 1998), in which a less concrete (and thus, more abstract) object may be termed a *superordinate* attitude object, and a more concrete (and thus, less abstract) object termed a *subordinate* attitude object. In this case, it is possible for attitudes toward superordinate attitude objects to subsume attitudes toward subordinate attitude objects in a way that is generally consistent with each other. For example, an individual who holds a positive attitude towards environmentalism is also likely to possess a positive attitude towards organic food (e.g., Nordvall, 2014) and a negative attitude towards meat consumption (e.g., Hjelmar, 2011). Such linkages or associations between attitudes constitute what has been termed as the external structure of attitude, i.e., *inter-attitudinal structure* (Fabrigar & Wegener, 2010; Dreezens, Martijin, Tenbuilt, Kok & de Vries, 2005a; 2005b; Eagly & Chaiken, 1998), which may also include attitudinal links between subordinate-subordinate and superordinate-superordinate attitude object pairings.

Evidence from food and/or food-related research suggests that instances of food-related cognitive dissonance may occur within and/or across attitude structures. In terms of the internal attitude structure, for instance, in their food risk/safety study, Cao et al. (2015) reported that individuals who had committed to, and placed purchase bids for, a specific type of chocolate, demonstrated a willingness to increase their bids for the chocolate despite being given food risk information about the chocolate after they had placed their initial bids. The authors reasoned that confirmatory bias via selective information processing was engaged to narrow the discrepancy between what the

individuals knew about the chocolate from the new food risk information given, and their prior behaviour of having placed purchase bids for the chocolate. Evidence for a similar occurrence of cognitive discrepancy amongst the evaluative tri-components of an attitude (typically between the behavioural and cognitive components) have been found in expectancy-disconfirmation studies in food-related consumer research (e.g., Olson & Dover, 1979), and nutrition communication research (e.g., Albarracín et al., 2003). Separately, food-related research in attitudinal ambivalence, which may be defined as the simultaneous possession of both positive and negative evaluations of an object (Riketta, 2000; Thompson, Zanna & Griffin, 1995), provide further evidence for incongruity at the intra-attitudinal level (e.g., Berndsen & van der Pligt, 2004; Cong et al., 2013; Povey, Wellens & Conner, 2001).

In the analysis of the external attitude structure, it is important to first understand the potential link between attitude and value, particularly since individuals are hypothesized to appeal to values in a personal food system when making food choice decisions (Connors, Bisogni, Sobal & Devine, 2001; Falk, Bisogni & Sobal, 1996; Furst, Connors, Bisogni & Falk, 1996), *ceteris paribus*. It has been postulated that attitudes derive from values (Dreezens et al., 2005a; 2005b; Eagly & Chaiken, 1995; Verplanken & Holland, 2002), which (1) often comprise central/core, affect-laden beliefs embodying abstract ideals/principles that provide general orientation and organization for life (Austin & Vancouver, 1996; Maio, Olson, Bernard & Luke, 2003; Rohan, 2000; Rokeach, 1968; 1973; Schwartz, 2012), (2) may be global or domain-specific, and (3) are measured in terms of perceived importance to the individual (Schwartz, 1992; 2012). Values may be considered part of an extended intra-attitudinal structure where they place hierarchically above attitude, such that causality runs from values through attitudes to behaviour (Dreezens et al., 2005a; Bernard, Maio, & Olson, 2003; Homer & Kahle, 1988; Luzar & Cosse, 1998; Maio & Olson, 1994; Stienstra, Ruelle, & Bartels, 2002; Thøgersen & Ölander, 2002). By serving as standards or archetypes for attitude development (Homer & Kahle, 1988; Luzar & Cosse, 1998; Rokeach, 1973), values have implications for attitudinal consistency insofar as qualitative similarities and differences amongst the values exist.

To elaborate, linkages between attitudes may be formed on diverse bases but typically involve links between attitudes toward different entities[7] (Eagly & Chaiken, 1995; 1998). In the context of an extended intra-attitudinal structure, these may be conceptualized in terms of associations between attitudes toward different but related attitude objects stemming from (a) the same value(s), and/or (b) different values. All things being equal, it is in the latter instance that inconsistencies in food-related attitudes are likely, and indeed, have been found, to occur[8]. For example, researchers have found that in making food choices, consumers are frequently caught in a trade-off of opposing values such as cost versus quality, or taste versus health considerations (Connors et al., 2001; Hauser, Jonas & Riemann, 2011; Shepherd, 1999). The corresponding affect-based belief(s) underlying values also become conflicted, as illustrated, for example, in studies related to meat consumption and/or vegetarianism where beliefs pertaining to the values of health, taste/hedonism and universalism clash. This often translates to cognitive incongruence at the attitude level either between same- (i.e., superordinate-superordinate or subordinate-subordinate) or different-level (i.e., superordinate-subordinate) attitude object pairings (e.g., Berndsen & van der Pligt, 2004; Lea & Worsley, 2002; Rothgerber, 2014).

To summarise, evidence from food-related research indicates that food-related cognitive dissonance may occur intra-attitudinally and inter-attitudinally. The evidence suggests that an alternative perspective to analysing cognitive dissonance, not yet formally recognized in cognitive dissonance research generally, much less its study in the domain of food and nutrition, is needed. The proposed framework will ensure that this evidence-based, alternative structural view of food-related cognitive dissonance is addressed.

3.3 The Food Cognition Dissonance (FCD) Conceptual Framework

Integrating the insights gathered from cognitive dissonance and attitude studies both generally as well as specifically in a food-related context, the proposed theoretical framework for the study of cognitive dissonance in food and nutrition – the food

[7] Some researchers consider multiple attitudes toward the same object (that stem from different values) as inter-attitudinal structure since these are evaluations based on many specific (and different) attributes or emotions associated with the attitude object – each evaluation technically considered as an attitude based on a specific attribute and/or emotion (Fabrigar & Wegener, 2010; Fabrigar et al., 2005).
[8] This pertains particularly to instances of disparate and incompatible/incongruent values and excludes instances of different but compatible/congruent values.

cognition dissonance (FCD) conceptual framework – is presented and illustrated in Figure 3.3.

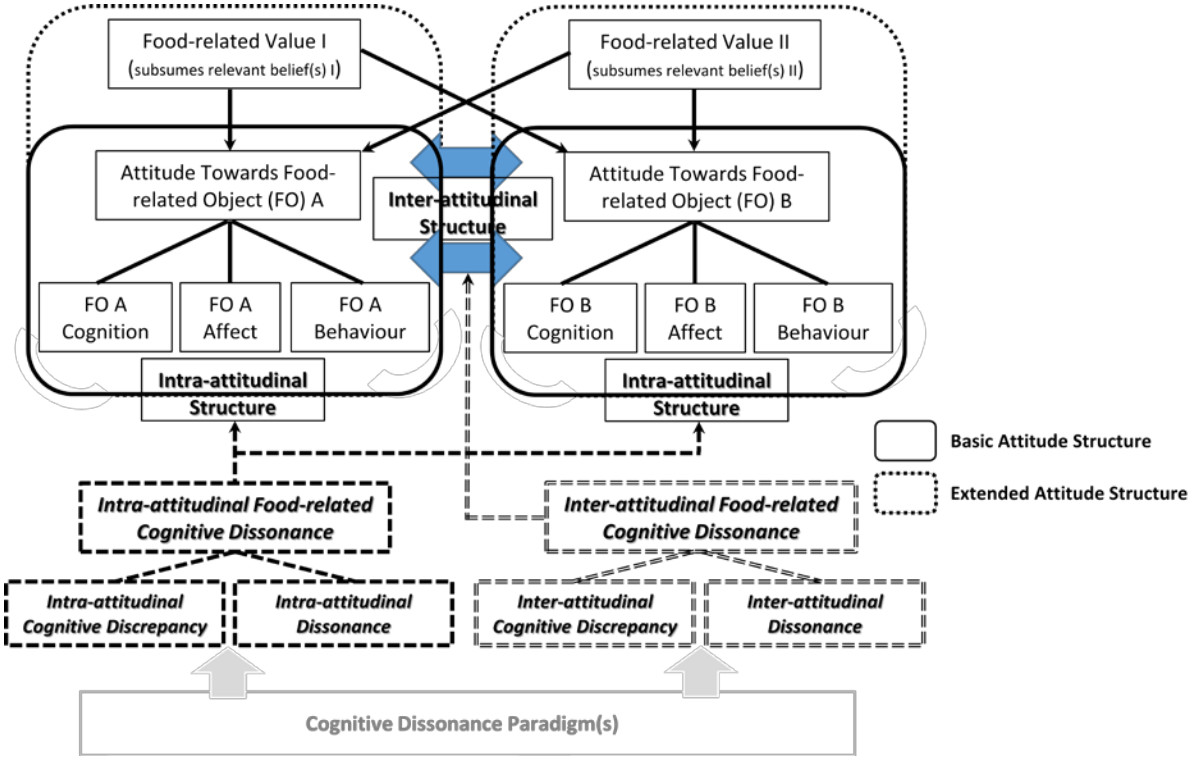


Figure 3.3: Proposed food cognition dissonance (FCD) conceptual framework

Formally, the FCD conceptual framework is proposed as an integrated theoretical framework that could serve to guide systematic cognitive dissonance research in the food and nutrition domain, particularly with regards to investigating cognitive dissonance effects on food-related attitudes. In acknowledgement of the basic course through which cognitive dissonance progresses, the FCD framework focuses on the cognitive dissonance arousal process predicated on the logic that its understanding would facilitate a better gauge of the cognitive dissonance resolution process that follows, which includes attitude change. In this regard, the FCD framework stipulates that food-related cognitive discrepancy in food-related attitude(s) would lead to a psychological state of tension or discomfort, i.e., food-related dissonance. The latter serves as an aversive motivational state that would then set in motion efforts to reduce the food-related cognitive discrepancy to restore cognitive consistency. Within the FCD framework, recognition is given to the fact that food-related cognitive dissonance may occur within and/or across food-related attitudinal structures. Any cognitive discrepancy amongst the evaluative tri-

components within the internal structure of a food-related attitude is termed *intra-attitudinal, food-related cognitive discrepancy* (*Intra-FCDp*). The aversive state of tension or psychological discomfort that results from *Intra-FCDp* is correspondingly *intra-attitudinal, food-related dissonance* (*Intra-FD*). These two terms collectively define *intra-attitudinal, food-related cognitive dissonance* (*Intra-FCD*). Any cognitive discrepancy that occurs in the external linkages between food-related attitudes of different attitude objects is termed *inter-attitudinal, food-related cognitive discrepancy* (*Inter-FCDp*). The aversive state of tension or psychological discomfort that results from *Inter-FCDp* is correspondingly *inter-attitudinal, food-related dissonance* (*Inter-FD*). These two terms collectively define *inter-attitudinal, food-related cognitive dissonance* (*Inter-FCD*).

Based on the illustration of the FCD framework presented in Figure 3.3, some hypotheses may be drawn about the framework mechanism concerning the direction and mobility of cognitive dissonance effects within and across attitude structures. Within an extended intra-attitudinal structure, a change in attitude towards an attitude object may occur due to dissonance-based alterations in (a) the tri-componential bases of the attitude (bottom-up) or (b) the value from which the attitude derives (top-down). The overall change in the intra-attitudinal structure of that attitude could likely then cause inter-attitudinal cognitive dissonance to emerge in terms of its external attitudinal link with another (related) attitude object (assuming consistency between the attitudinal structures of both attitude objects prior to the former's intra-attitudinal structure change). If these are strong enough, corresponding cognitive dissonance effects will bear on the intra-attitudinal structure of the second related attitude object to ultimately change it and bring it in line with the altered intra-attitudinal structure of the first attitude object, *ceteris paribus*. The hypothesis that a change in attitude towards an attitude object would correspondingly influence a change in attitude towards another related attitude object has been (1) supported by research on inter-attitudinal structure and attitude change, which showed the spreading activation effect to apply across various attitude object level pairings (i.e., superordinate-superordinate, superordinate-subordinate, subordinate-superordinate, subordinate-subordinate), regardless of the initial attitude object level from which the attitude change began (Dinauer & Fink, 2005), and (2) suggested by specific food research examining associations between food-related attitudes such as Bergmann et al.'s (2010) study, which advocated influencing meat consumption via leveraging on consumers' ethical concerns about the impact of factory farming on the environment,

including animal welfare. However, the hypothesized cognitive dissonance mechanism underlying such attitude alterations amongst linked attitude objects, as postulated in the FCD framework, are yet to be empirically tested. Additionally, whilst the basis of the on-going discussion is predicated on intra- and inter-attitudinal cognitive dissonance occurring sequentially in that order, it is theoretically possible for the sequence to occur in reverse order, or for the interaction to occur simultaneously. The actual effects of these latter two theoretical possibilities would likewise require empirical testing. It is, however, suspected that the effects might be lesser if the sequence is reversed but strongest when both types of attitudinal cognitive dissonance are activated simultaneously (particularly if both of these complement each other and work in unison to drive linked attitudes in the same direction).

3.3.1 Immediate research going forward – Testing the proposed FCD conceptual framework

The proposed FCD conceptual framework presented in this chapter represents an initial basic step towards facilitating a systematic approach to the study of cognitive dissonance in food and nutrition, particularly in terms of how food-related cognitive dissonance might impact on food-related attitudes and/or behaviours. In this regard, the framework provides an alternative, unique and novel perspective in studying the effects of food-related cognitive dissonance on food-related attitudes via the latter's structural pathways and/or properties (i.e., intra- and inter-attitudinal dimensions of cognitive dissonance). An initial, and immediate, research work to be conducted in this area therefore involves testing, and fine-tuning, some of these basic assumptions and features of the proposed framework, as discussed here.

Chapter 4. Preliminary Study

4.1 Attitudinal Dimensions of Food-related Cognitive Dissonance – Pre-test Considerations

As described in the previous chapter, a crucial, salient feature of the FCD framework is the proposed novel constructs relating to the intra- and inter-attitudinal dimensions of food-related cognitive dissonance – notions borne out of the integration of basic principles of cognitive dissonance theory (Festinger, 1957) and the tri-partite model of attitude (Breckler, 1984), and based on literature review of food-related research that informed their existence. One of the significant tasks to accomplish as part of an empirical test of the FCD framework's conceptions entails verifying the viability of the novel, attitudinal dimensions of food-related cognitive dissonance proposed. This requires explicit cognitive dissonance assessment, which has been largely limited in mainstream social cognition studies and even more so, in food and nutrition research (Freijy & Kothe, 2013).

In the context of such limited explicit assessment, nonetheless, cognitive dissonance measurement is typified by the self-report method (e.g., Festinger, 1957; Elliot & Devine, 1994; Sweeney et al., 2000; Rothgerber, 2014; Onwezen & van der Weele, 2016). Given the conceptual novelty of the proposed attitudinal dimensions of food-related cognitive dissonance, the self-report presents a feasible, initial mode of construct measurement as it simplifies the construct operationalization process. The newness of the proposed constructs dictates that content for items in a self-report measure be subjected to prior exploration and ascertained before proceeding with formal instrumentation development.

Thus, building on the existing literature, a preliminary study was conducted to qualitatively explore cognitive dissonance applied in food choice and behaviour, with an aim to identify information relevant for developing self-report assessment items to be used in the main quantitative study (chapter 5), in particular the intra- and inter-attitudinal dimensions of food-related cognitive dissonance. Chapter 4 reports this qualitative research, which included subsequent, initial follow-up efforts to explore possible working measurement scale(s), with corresponding experimental manipulation(s) of cognitive dissonance arousal.

4.2 Method

4.2.1 Participants and design

A primarily qualitative method – the focus group discussion – was used for the initial part of the preliminary study. Given that dietary habits evolve during childhood but are usually established by late adolescence/young adulthood (Black & Hurley, 2013), in addition to helping children *cultivate* good dietary habits, the challenge is to help individuals from late adolescence onwards to *change* bad dietary attitudes and/or behaviours. This then defines the target age group for any proposed dissonance-based attitude/behaviour change strategy, which, in turn, determines the age sampling frame to be used in all studies of the present thesis. Correspondingly, through the use of purposive sampling, a total of 18 English-speaking, tertiary-educated staff and students (14 Chinese, 2 Malay, 1 Indian and 1 Eurasian/Other of Singaporean citizenship) from the School of Health Sciences, Nanyang Polytechnic (Singapore) from 18 to 65 years old[9] were selected to participate in the preliminary study. The participants were classified into four focus groups based on age – 18-24 (n=5; 3 males, 2 females), 25-34 (n=5; 3 males, 2 females), 35-49 (n=4; 1 male, 3 females) and 50-65 (n=4; 1 male, 3 females); (mean age=36.52, SD=13.97). Individuals with specific dietary restrictions that grossly constrained consumption of one or more of the five basic food groups[10] (e.g., veganism, vegetarianism, etc.) were excluded from the study. Research participation was completely voluntary, with informed consent obtained from each respondent prior to the study – in attaining consent, participants were informed that the focus groups would be audio recorded and transcribed, with confidentiality and anonymity preserved through ensuring that study participants would be identifiable only by a code number during data analysis[11]. Participants were also informed of the need for them to be included in a follow-up study subsequent to the focus group discussion where they would be asked to complete a questionnaire. Each respondent was given a SG$5 supermarket voucher as token of

[9] In Singapore, the retirement age is 62, after which workers may be re-employed by their companies (if they meet certain eligibility criteria) on a contractual basis that is renewable annually (Ministry of Manpower, Singapore, 2017). The current re-employment age, effective 1 July 2017, is 67. However, the PhD candidature began in Jan 2013, with research conceptualization and all subsequent data collection completed by mid-2016 when the re-employment age was 65. To minimize economic/financial concerns being a potential confounding factor in influencing food choice decisions in late adulthood, the decision to cap participation age limit to 65 was taken.

[10] This would also automatically exclude individuals with disordered eating as well. The exclusion criteria was uniformly applied to sampling conducted across all (i.e., preliminary, pilot and main) studies.

[11] The ethical requirements of voluntary participation, informed consent (obtained prior to research participation) and, participant confidentiality and anonymity were consistently applied across all (i.e., preliminary, pilot and main) studies.

appreciation for their research participation. Both protocols were approved by the relevant research ethics committee within Newcastle University prior to study commencement.

4.2.2 Materials, procedure and analyses

All four group discussions conducted were guided by a set of questions that revolved around, and sought to elicit responses to, the following three main queries[12]: (1) What are the food considerations used to make food choices? (2) Are there conflicts between the food considerations? (3) How is/are such conflict(s) dealt with? (see Appendix A-1 for detailed questions). Prior to the focus group discussions, which were all conducted by the author, participants were asked to fill up a short survey that required them to select and rank considerations important to them when making food choices. These considerations were adapted from Hauser et al.'s (2011), as well as, Connors et al.'s (2001) work on food values, and provided the context for the starting point of each focus group discussion. The food values included in the survey were (1) *authenticity/naturalness* (prepared with love and attention; setting aside a lot of time for cooking; natural and authentic taste; sustainable, organic farming; traditional down-to-earth farming methods), (2) *convenience* (time and effort), (3) *conviviality* (relating to, occupied with, or fond of feasting, drinking, and good/merry company) (4) *cost* (monetary considerations), (5) *health and nutrition* (disease avoidance/control, weight control and bodily well-being), (6) *indulgence* (eating familiar, traditional dishes; rewarding oneself with food), (7) *managing relationships* (interpersonal interactions – maintaining harmony in their households by anticipating, addressing and accommodating conflicts over issues of food choice), (8) *quality* (standard of excellence; safe, reliable products; aesthetically appealing presentation), (9) *sensory characteristics* (taste, texture, odour, appearance) and (10) *others* (please specify). Subsequent to the focus group discussions, the frequency and average ranking for selected food values were calculated using IBM SPSS Statistics (version 21). Respondents' answers to the qualitative questions were anonymously transcribed by a professional transcribing company[13] before being subjected to (a) primary, specific content analysis in terms of the *a priori* queries raised regarding the intra- and inter-attitudinal dimensions of cognitive dissonance, and (b) secondary, thematic analysis conducted to examine general emerging themes in the data.

[12] The question set served merely as a semi-structured guide for the moderator of the focus group discussions who need not ask all questions listed and was free to vary the questions, as along as the three main queries were adequately responded to.
[13] This was accounted for in the research protocol that was approved by the relevant ethics committee.

Both analyses were manually undertaken by the author. All analyses collectively provided the basis – in addition to the relevant existing literature – for conceptual, as well as methodological, input related to the experimental arousal of intra- and inter-attitudinal cognitive dissonance and their assessments. These were then transformed into initial draft self-report measures as such, and tested, in the questionnaire-based follow-up study.

4.3 Results

4.3.1 Focus group discussion – Food values ranking

The frequency and average ranking for selected food values are presented in Table 4.1.

Group / Food Value	18-24	25-34	35-49	50-65	Overall
Authenticity / Naturalness	Freq (n) = 3 Mean ranking = 4.67 (SD=2.52)	Freq (n) = 1 Mean ranking = 8.00 (SD=N.A.)	Freq (n) = 3 Mean ranking = 4.33 (SD=1.53)	Freq (n) = 4 Mean ranking = 5.75 (SD=1.26)	Freq (n) = 11 Mean ranking = 5.27 (SD=1.85)
Convenience	Freq (n) = 4 Mean ranking = 3.50 (SD=3.11)	Freq (n) = 5 Mean ranking = 3.40 (SD=1.52)	Freq (n) = 4 Mean ranking = 5.00 (SD=1.41)	Freq (n) = 4 Mean ranking = 3.75 (SD=1.50)	Freq (n) = 17 Mean ranking = 3.88 (SD=1.90)
Conviviality	Freq (n) = 4 Mean ranking = 5.50 (SD=1.29)	Freq (n) = 2 Mean ranking = 4.50 (SD=0.71)	Freq (n) = 2 Mean ranking = 8.50 (SD=1.85)	Freq (n) = 3 Mean ranking = 8.67 (SD=0.58)	Freq (n) = 11 Mean ranking = 6.73 (SD=2.00)
Cost	Freq (n) = 5 Mean ranking = 4.20 (SD=1.30)	Freq (n) = 4 Mean ranking = 3.75 (SD=1.71)	Freq (n) = 3 Mean ranking = 3.67 (SD=2.08)	Freq (n) = 4 Mean ranking = 4.75 (SD=1.71)	Freq (n) = 16 Mean ranking = 4.13 (SD=1.54)
Health and nutrition	Freq (n) = 5 Mean ranking = 4.20 (SD=3.11)	Freq (n) = 5 Mean ranking = 3.20 (SD=1.64)	Freq (n) = 4 Mean ranking = 1.25 (SD=0.50)	Freq (n) = 4 Mean ranking = 2.00 (SD=1.41)	Freq (n) = 18 Mean ranking = 2.78 (SD=2.16)
Indulgence	Freq (n) = 4 Mean ranking = 5.00 (SD=1.41)	Freq (n) = 3 Mean ranking = 6.00 (SD=1.00)	Freq (n) = 1 Mean ranking = 3.00 (SD=N.A.)	Freq (n) = 3 Mean ranking = 7.00 (SD=2.65)	Freq (n) = 11 Mean ranking = 5.64 (SD=1.91)
Managing relationships	Freq (n) = 2 Mean ranking = 7.00 (SD=2.83)	Freq (n) = 1 Mean ranking = 9.00 (SD=N.A.)	Freq (n) = 2 Mean ranking = 6.50 (SD=2.12)	Freq (n) = 4 Mean ranking = 6.75 (SD=0.96)	Freq (n) = 9 Mean ranking = 7.00 (SD=1.58)
Quality	Freq (n) = 4	Freq (n) = 4	Freq (n) = 4	Freq (n) = 4	Freq (n) = 16

	Mean ranking = 4.00 (SD=2.83)	Mean ranking = 2.75 (SD=0.96)	Mean ranking = 3.50 (SD=2.38)	Mean ranking = 2.75 (SD=1.71)	Mean ranking = 3.25 (SD=1.95)
Sensory characteristics	Freq (n) = 5 Mean ranking = 2.20 (SD=1.64)	Freq (n) = 5 Mean ranking = 2.60 (SD=2.19)	Freq (n) = 3 Mean ranking = 3.33 (SD=2.08)	Freq (n) = 4 Mean ranking = 3.25 (SD=2.63)	Freq (n) = 17 Mean ranking = 2.76 (SD=1.99)
Others	Freq (n) = 0 Mean ranking = N.A. (SD=N.A.)	Freq (n) = 1 Mean ranking = 1.00 (SD=N.A.)	Freq (n) = 0 Mean ranking = N.A. (SD=N.A.)	Freq (n) = 0 Mean ranking = N.A. (SD=N.A.)	Freq (n) = 1 Mean ranking = 1.00 (SD=N.A.)

Table 4.1 Food considerations/values – frequency and average ranking (overall and by age group)

In terms of frequency, it may be seen from Table 4.1 that on the whole, eight out of ten of the food values had double-digit endorsements. In descending order, these were health and nutrition (18), sensory characteristics (17), convenience (17), cost (16), quality (16), authenticity/naturalness (11), indulgence (11) and conviviality (11). Amongst these, in terms of overall average ranking, the top five food values were, in descending order, sensory characteristics (2.76), health and nutrition (2.78), quality (3.25), convenience (3.88) and cost (4.13). This pattern of results suggests that for an initial investigation into inter-attitudinal cognitive dissonance, it might be instructive to look at the conflict between the food values/considerations of health and nutrition *vs*. sensory characteristics in making food choices.

4.3.2 Focus group discussion – Primary, specific content analyses

- Conflict in making food choices

Participants' qualitative responses to the set of questions were next content analysed (see Appendix A-3 for transcription) and organized according to whether the conflict represented intra- or inter-attitudinal cognitive dissonance by age group. This is presented in Table 4.2.

Cognitive dissonance type / **Group**	**Intra-attitudinal cognitive dissonance**	**Inter-attitudinal cognitive dissonance**
18-24 (Affect experienced: cautious; guilt; dissatisfaction; uncertainty)	• Fruits and/or Fruit juices – Good but too much might be bad,	• Cost *vs.* convenience • Cost *vs.* sensory characteristics

	particularly processed ones (because of high sugar content) • Tea – Good but too much might be bad, particularly processed ones (because of high sugar content) • Vegetables – Good but its preparation (i.e., how it's cooked or prepared) might be questionable • Fish-paste-stuffed-tofu (local food) – Healthy but salt content might be high • Artificial sweetener – Touted to be better than sugar but safety for consumption questionable	• Health *vs.* convenience • Health *vs.* cost • Health *vs.* sensory characteristics • Quality *vs.* convenience • Sensory characteristics *vs.* convenience
25-34 (Affect experienced: anger; disgust; disappointment; insecurity; sulkiness; upset)	• Vitamin C – Touted to be good but too much stated to be bad • Omega 3 – Fish oil good but fish origin might be questionable (e.g., polluted waters) • Dried seaweed – Healthy snack but salt content might be high • Vegetables – Good but vegetable origin might be questionable (e.g., tainted agriculture)	• Cost *vs.* convenience • Health *vs.* sensory characteristics • Quality *vs.* convenience • Quality *vs.* conviviality • Sensory characteristics *vs.* conviviality
35-49 (Affect experienced: confusion; discomfort; dissatisfaction; frustration; hesitation; tension)	• Eggs – Consensus not unanimous on how much is good *vs.* bad • Yogurt – Good but too much might be bad, particularly processed ones (because of high sugar content)	• Authenticity *vs.* convenience • Cost *vs.* health • Health *vs.* convenience • Quality *vs.* convenience
50-65 (Affect experienced: conflicted; discomfort; guilt; fear; uneasiness)	• Blueberries – Touted to be good but benefits might be doubtful • Milk – Touted to be good but benefits might be questionable • Luncheon meat – Its origin might make its consumption worse than what had been prior assumed • High-fibre bread – Touted to be good but benefits might be questionable, particularly the processed ones	• Health *vs.* sensory characteristics • Health *vs.* quality

Table 4.2 Conflict in making food choices – cognitive dissonance within (intra) and between (inter) attitudinal structures of objects (i.e., attitude objects) by age group (with described affect due to conflict in parentheses)

From Table 4.2, it may be seen that both intra- and inter-attitudinal cognitive dissonance exist in the food and nutrition domain. Across the various age groups, health and nutrition seemed to be the one food value that was consistently in conflict with another food value. In terms of conflict within an attitudinal structure, there was a diverse spread of attitude objects about which respondents indicated they had experienced cognitive conflict. In addition, the affect reported by the respondents ranged from clear basic emotions of anger, disgust, fear, upset to definitionally less conventional feelings of caution, confliction, confusion, disappointment, discomfort, dissatisfaction, frustration, guilt, hesitance, insecurity, sulkiness, uncertainty, uneasiness, and tension. Some, if not most, of these affect have been reported in cognitive dissonance related research (whether food or non-food linked) previously (e.g., Elliot & Devine, 1994; Rothgerber, 2014). The crucial task here is to distinguish the various reported affect and identify the one(s) that most closely and directly fit Festinger's (1957) conceptualization of cognitive dissonance, which according to Elliot and Devine (1994) should rightly revolve around the idea of "psychological discomfort" (p. 384), and exclude emotions that are not directly related, such as guilt (p. 386). This notion is substantiated by the response of a female focus group discussion participant in the 50-65 age group who explicitly stated, "I'm not guilty" but "I do feel that discomfort" when making a less than healthy food choice. This has an important implication for the derivation of a precise food-related cognitive dissonance measure in terms cautioning against the indiscriminate, synonymous use of non-directly related affect as indices of cognitive dissonance, a point raised in chapters 2 and 3.

- Conflict resolution in making food choices

Following the questions on the conflicts participants encountered in food choice situations, responses to how they resolved the experienced conflicts were content analysed, and the results presented in Table 4.3.

Cognitive dissonance type / **Group**	**Intra-attitudinal cognitive dissonance**	**Inter-attitudinal cognitive dissonance**
18-24	• Change attitude (e.g.,	• Change situation (e.g.,

	convince oneself that food consumed is not that healthy/unhealthy) – *N/B: attitude change may not be sufficiently drastic to effect an overall change • Change behaviour (e.g., stop consuming the unhealthy food; reduce consumption of unhealthy food) – *N/B: for reducing, behaviour is just decreased and not necessarily stopped or reversed	prepare/cook awful tasting healthy food in ways that make it more palatable) • Moderating behaviour (e.g., indulge in unhealthy food occasionally) • Give excuses /Rationalizing (e.g., exercise later) • Balancing /Compensatory behaviour (e.g., eating unhealthy food and then working it off through exercise – maintaining a 50-50 ratio) • Change attitude (e.g., convince oneself that the having tasty, not healthy, food is more important) – *N/B: attitude change may be permanent or may be just be momentary to reduce guilt
25-34	• Change attitude (e.g., convince oneself that food consumed is not that healthy/unhealthy) – *N/B: attitude change may or may not be sufficiently drastic to effect an overall change • Change behaviour (e.g., stop consuming the unhealthy food; reduce consumption of unhealthy food) – *N/B: (1) for stopping, abstinence may be both temporary or permanent; if short-term, consumption will subsequently revert to previous level; (2) for reducing, behaviour is just decreased and not necessarily stopped or reversed	• Change situation (e.g., avoid the restaurant that served awful quality food in future group gatherings) • Rationalizing (e.g., exercise more later) • Compensatory behaviour (e.g., eating unhealthy food and then working it off through exercise)
35-49	• Change behaviour (e.g., reduce consumption of unhealthy food) – *N/B: behaviour is just reduced and not necessarily stopped or reversed	• Change situation (e.g., buy less sinful versions of unhealthy snacks) • Moderating behaviour (e.g., indulge in unhealthy food occasionally or spread out indulgence over time) • Balancing /Compensatory behaviour (e.g., eating unhealthy food after having exercised or vice-versa)

50-65	• Change behaviour (e.g., stop consuming the unhealthy food)	• Rationalizing (e.g., life is short; exercise more later; cut down on unhealthy food later) • Moderating behaviour (e.g., eating unhealthy food in moderation) • Balancing /Compensatory behaviour (e.g., exercising or taking cholesterol medicine after eating unhealthy food)

Table 4.3 Resolving conflict in making food choices – strategies by age group and cognitive dissonance type

As seen in Table 4.3., the cognitive dissonance resolution strategies ranged from changing attitudes and/or behaviours, to changing the situation, rationalizing, moderating behaviours and, balancing or engaging in compensatory behaviours. Most, if not all, of these are strategies that had been had been reported in past food as well as non-food research (e.g., Brijball, 2001; Šedová et al., 2016). A note of interest is an emerging pattern that suggests structural-specific modes of cognitive dissonance resolution such that attitudinal and/or behavioural change(s) is/are engaged as response(s) to intra-attitudinal cognitive dissonance whilst rationalization, behavioural moderation, balancing and/or compensation, and situational and/or attitudinal change(s) is/are engaged as response(s) to inter-attitudinal cognitive dissonance. In addition, whilst attitude change was presented as a plausible cognitive dissonance resolution strategy, respondent sentiment indicated that the overall attitude might not necessarily change drastically such that if the overall attitude was positive, it could become less positive but still remaining positive on the whole – e.g., a respondent in the 25-34 age group articulated that he might reduce consumption of a seaweed snack because of the sodium levels and as such, his attitude towards it might become "less positive" but on the whole, the attitude towards the seaweed snack "is still an overall positive attitude" because "I'll still be consuming it". This appeared to also apply to a reverse situation in which a "correct" attitude had been compromised – e.g., a respondent in the 18-24 age group said that if he consumed fried chicken even though he believed the food was unhealthy, he'd focus on the benefits of consuming the fried chicken to alter his position on its healthiness only momentarily "just to reduce the guilt" but this change would not be long-term. Similarly, although changes in behaviour could take place as another cognitive dissonance resolution strategy, these might only be temporary in order to allay dissonant affect in the short-term but revert to

status quo in the long-term – e.g., a respondent in the 25-34 age group said that knowing salmon might potentially came from polluted waters would only lead to her abstaining from it in the short-term but subsequently she would go back to consuming it in "the same amount". Any relatively permanent change in behaviour would likely occur "if there is…a major life event happening" according to another respondent in the 18-24 age group who cited the example of diabetes onset and sugar intake reduction (cf. Devine, Connors, Bisogni & Sobal, 1998) but interestingly acknowledged that there would not be "a huge shift in attitude", which independently verified the aforementioned take on the dried seaweed snack by the respondent from the 25-34 age group.

4.3.3 Focus group discussion – Secondary thematic analyses

- Cognitive dissonance arousal and resolution

Examining the data in terms of food-related cognitive dissonance from a secondary, and more general, thematic analysis approach, the emerging themes may be classified as either cognitive dissonance arousal or cognitive dissonance resolution. In the first instance, food-related cognitive dissonance appears to be aroused not just after a food choice decision has been made but specifically only after there is a follow through behaviour of actual consumption (i.e., ***post-consumption arousal***). In the context of food and eating, post-consumption broadly refers to post-ingestion and/or post purchase of the food(s). As implied by a 24-35 participant (male), for example: "So for me, because I place quite a high emphasis on quality. So let's say I buy something, and it does not meet my quality, of course I pay more for it then I feel disappointed. Yeah. I'm not getting my money's worth." Another 24-35 participant (male) more explicitly indicated: "For me, it's the last time I ate... *char kuay teow* (a type of local fried Chinese rice noodles). After that my friend told me, this ah, it's very high content in fat. Since then, I stopped eating *char kuay teow*..." Further support for post-consumption arousal came from a 50-65 participant (male) who said: "Although there is a conflict, like I said, ...but it's nice or fatty meat you know... *Bak kua* (local Chinese barbequed meat)... So, in the end number 2 (taste) wins la. But there is a conflict after that." Actual consumption fulfils the requirement of irrevocable commitment in the enactment of counter-attitudinal behaviour that arouses cognitive dissonance (Taylor, Peplau & Sears, 2006).

An important related theme, and indeed an immediate precursor to post-consumption arousal, is that of ***conflict awareness***. Before food-related cognitive dissonance arousal can occur following consumption of a food, there must be an

awareness that the consumption constitutes a conflict in terms of one's food value(s). This was implied by the statement of an 18-24 participant (male): "After you eat like a.... big unhealthy meal... You go buffet… you go binging or something... initially you feel very good lah, after that you will go like, oh what did I just do?" Similarly reflected by a 50-65 participant (female) stated: "But I think maybe it's some product, like China made product… Like those luncheon meat... you don't think it was awful. But then after that, you find... you hear some news about some... inferior quality or suspicion you know. Then I have the conflicting feeling, like oh my god, I've taken how many cans already."

In terms of cognitive dissonance resolution, it appears that cognitive inconsistency may be reduced via ***situation-focused modification*** that encompasses actual behavioural enactment(s) to alter the experienced conflict(s) or ***cognition-focused modification*** that includes only belief and/or perceptual alterations of the experienced conflict(s). In terms of situation-focused modification, an 18-24 participant (male) talked about dealing with the conflict between health and taste (sensory characteristic) thus: "It's very healthy but it tastes yucky. So I'll... find ways to make it nice. Like for example…you spice alternatively to make the food taste slightly less yucky", further adding: "…if let's say you eat chicken. Instead of frying it, which is very nice, you steam or grill it with other spices." If the food consumed was unhealthy, he stated: "But after (eating) you do something about it--- Like you go work out. You know tomorrow I work out, so today you can eat more." Similar behavioural responses to unhealthy eating came from the following – an 18-24 participant (female): "Like as in, today... if I really eat up a lot of like unhealthy (food), then tomorrow like... for the next few days I will try to like.... make it balanced."; a 25-34 participant (male): "I cut down, I cut down on it (an unhealthy food)."; a 25-34 participant (female): "I stopped eating brownies, after I made brownies from scratch, and realize how much oil went in it."; a 35-49 participant (female): "So commercial yogurt has a lot of sugar… Oh then I make my own yogurt lah... I side step the whole thing."; another 35-49 participant (female): "I'd say balancing. So, say if I take a plate more sinful stuff and I know that I've sinned a bit more just work it out loh."

In terms of cognition-focused modification, most, if not all, of the evidence points to participants rationalizing their counter-attitudinal behaviours. For example, in choosing taste (sensory characteristic) over health concerns in food, an 18-24 participant (female) stated: "I just give excuses…Like exercise later…", which was similar to how another 18-24 participant (male) would react in such an instance: "I think I might give something

similar to a reason…and yet not exercise.". A somewhat different rationalization was provided by a 50-65 participant (female) who said: "So I will eat because I tell myself life is short, you have to eat and I will eat whatever I can find that satisfies my hunger because sometimes by evening time, I'm really hungry through the day, it's work, work, work until your stomach is really empty, so you need something to sustain you." While situation-focused modification appears to lead to some real tangible changes to reduce inconsistency, cognition-focused modification appears somewhat more as a means to ameliorate negative emotions that emerge due to experienced inconsistency, as an 18-24 participant (male) indicated about making unhealthy good choices: "So you kind... of bluff yourself into saying that you just need carbs…your body needs it… It's just to reduce the guilt."

- Life course perspective in food choice

Moving beyond cognitive dissonance-centric analyses to the more general area of food choice, a discernible pattern to emerge from the data relates to how food values used in food choice decisions appear to follow certain themes underlying the life course perspective in food choice (Devine, 2005), the cross-sectional nature of the focus group discussions notwithstanding. The notion of food choice ***trajectories***, with a single trajectory being referred to as an individual's "persistent thoughts, feelings, strategies, and actions" with food and eating formed "over the lifespan", within a socio-historical context (Devine 2005, citing Devine et al., 1998, p. 361), is one such specific theme. According to Devine (2005), food choice trajectories have persistence-defining direction and momentum, which is reflected in the relatively stable use of certain food values – namely, health and nutrition, sensory characteristics, quality and, to a slightly lesser degree, cost and convenience – by study participants across the different age groups in making food choices (see Tables 4.1 & 4.2).

Another theme consistent with the life course perspective to emerge from the data would be that of ***transitions***, which essentially refer to changes experienced by individuals in their lives that take place across the lifespan (Devine, 2005; Wethington, 2005). Small adjustments are typically made by individuals to their food choice trajectories in order to adapt to new food choice settings arising from normal life transitions. In the context of the current study, the adjustments made were in terms of the relative importance of food values in making food choice decisions. For example, cost was a relatively less important food consideration in food choice for the youngest

participants (18-24) but became more important as the participants increased in age right up to the middle-agers (25-34 and 35-49), before becoming comparatively less important again for the most senior participants (50-65). The shifts in the relative importance of cost consideration in food choice decisions across the ages might be explained thus: in late adolescence/early adulthood, as individuals are likely to be single, money spent on food would largely be for themselves only, making cost a lesser concern; food expenditures are presumably increased for individuals in their mid-twenties to late forties as they are likely to be married, typically with children, and for these individuals, trying to keep food expenditures down would be important as they also have other expenses to deal with, like children's education, home mortgages, etc.; when individuals reach late-middle adulthood to late adulthood, they go back to being alone again, with their children all grown up and having left home to start their own families (empty nest), at which point, food expenditures necessarily decrease and cost becomes relatively less of a concern once more. This is an exemplar of a transition-based explanation of how food values might change over time but still within relatively stable food choice trajectories, and may be seen to apply to the food values of health and nutrition (i.e., becomes generally more important with age) in the data obtained (see also Table 4.1) – "I think younger... you don't think about health but now at our age we have to think about our health" (a 50-65 participant, male) – and sensory characteristics (i.e., becomes generally less important with age) – "... I think as we age.... uh I think maybe like what you said, ... health might go. For now, (what is important to me is) definitely taste" (an 18-24 participant, male). It is notable that transitions frequently represent changes that are not considered major enough to alter trajectories but are merely accommodated into existing trajectories (typically in a gradual manner).

Major life changes are referred to as ***turning points*** (a separate theme), which can alter trajectories (typically in an abrupt manner), but are comparatively less frequently encountered in a life course, particularly with respect to food values and food choice decisions (Devine, 2005). In the current data, potential turning points which emerged appeared to relate to the occurrence of food scandals or an individual's encounter with chronic illnesses, whether personally experienced or vicariously experienced through affected family members. For example, a 25-34 participant (male) reported: "…let's say really major case of you know, like example, like...food scandal, the way they paint oyster red or something like that --- the chemicals, you know, just to make it nice ah.

Then it's really reported. Maybe we have known of relatives who have got sick or something like that…, I think that would definitely...stop anybody." With specific reference to food scandals, a 25-34 participant (female) said: "Actually, the past 5 to 8 years I saw some news stating that...agriculture, farming industry in China, the food that they produce is like questionable. So it's like...I'm very cautious about that…generally, in Singapore, most of our goods are actually imported. And likewise food. So, actually the majority of our vegetables for instance, are imported. So I tried to psycho my mom, saying that okay, why don't I sponsor you to buy other imports vegetables…I feel very insecure seriously --- Seeing the images, yeah so this is an example where total... um... abstinence from this particular range of food." With reference to familial chronic illness, another 25-34 participant (male) more specifically stated: "I ---- actually based on experience, because I know my uncle. He loves his salted fish. He loves his salted fish. Uh.... unfortunately, he was actually down with the cancer, throat cancer. So there's a high likelihood that because of this high salted and preserved fish, he actually developed this. So actually gives me a wakeup call that these particular food... is actually not --- very unhealthy to the point that it can cause you to be that sick. So for these kind of food I would avoid it..." Similar sentiments were similarly shared by an 18-24 participant (male): "For me personally in the past, I would go for... nice food and cheap food. So I would not really care about health part, so just, eat and drink soft drinks... McDonalds, everything. But then I would hit a certain part of time, like I don't know what I'm eating, then my parents also had some uh... cardiovascular, high blood pressure and diabetes. Suddenly it struck me upon me that uh.... it's time for me to eat less, and eat something that is more bland. So like... for my dinner time, I eat lesser rice, now not so much", adding "I think it only change if there is... a major life event is happening. Or a few major. Because for me, is because you see the past due to diabetes or something like that, then... it struck before you that it's runs in your family so you need to be more careful."

However, the same 18-24 participant (male) conceded: "I wouldn't say there would a huge shift in attitude, but I would be more cautious in eating. So for instance..., you just reduce the sugar intake. So just small steps not to take, not I do not take this food at all." Similarly countering familial chronic illness as a potential turning point, a 25-34 participant (female) stated: "…my aunt recently lost lot of weight, because she has a diabetes scare, then she like reverted to eating basmati rice. Yeah. So even though I saw that she lost a lot of weight, and I also would like to lose a lot of weight, like but it's

inconvenient. Hence, I haven't made the switch."; and a 50-65 participant (female) added: "I will eat...but I will do something about it to stop whatever the effect of that particular food. For example, if it's cholesterol, I go back and take one tablet of Simvastatin." Countering food scandals as a potential turning point, a 35-49 participant (female) said: "I think my experience is more of...the salmon fish. Salmon fish is like, we all know that the value of it is like omega 3. Yeah. So, but there is also news that's reported saying... oh you know, it's like salmon that's in the ---is it Pacific, or Atlantic? --- I can't remember... yeah, and the ocean water is affected by pollution…okay, yeah so I know this news ya, so it's like I stay away for a while before I resume again, my diet of salmon. Still consume subsequently. It's only --- it's only a short term... abstinence, yeah."

The mixed data pattern supports Devine's (2005) stipulation that turning points occur relatively infrequently to alter food choice trajectories. If they do occur, it appears that they might affect choice of specific foods only, with no major alterations in the underlying food values that determine food choice decisions, which are, in turn, more likely to be subjected to transitional effects (cf. Devine, 2005) instead. The mixed data pattern also suggests that events constituting turning points might be subjectively defined, differing from individuals to individuals.

Consistent as a theme in the life course perspective, there is also some data evidence for ***cultural and contextual influences***, which include socio-cultural locations, socio-demographic characteristics, etc. (within or without a historical/temporal context), in individuals' food values and food choices across the lifespan (Devine, 2005; Wethington, 2005). This is dually reflected in (1) how familial dietary practices in childhood influenced current food practice in late adolescence/young adulthood, with a 18-24 participant (male) reflecting on his present healthier food choice decisions thus: "…my parents cook more often than they *tapau* (local lingo for take-away). So, when they cook they always make sure there's a lot of fish…so last time they cook a lot of fish, and then they force me to eat. Like, when I am young I don't mind ah, but after that I'm okay."; and (2) how early religious upbringing helped define the importance of certain food values in adulthood as a 24-35 participant (male) indicated: "One is I have... to eat halal food. Basically that one is definitely a must first lah."

Finally, the theme of ***adaptive strategies***, which might be seen as "conscious decisions that people make to improve their health or well-being" (Wethington, 2005, p. 116) as they move along their life course, is also reflected in the current data. Specifically,

as a means of dealing with eating unhealthily, although participants across the different age groups commonly cited the use of rationalization (or giving excuses) that they would, for instance, exercise thereafter or eat more healthily the next time round, the younger participants reported actually exercising (25-34, male) and/or relying on their body's (better) metabolism (18-24 male) as actual compensatory measures while the older participants more often reported using medication to counter the effects of unhealthy eating (50-65, female and male) in reality. This pattern appears to support the life course notion that individuals will adapt their behaviours accordingly to maintain health, depending on which part of the life stage that they are in.

4.3.4 Follow-up study

The follow-up study entailed deriving and testing an initial set of questionnaires, consisting of an (1) experimental manipulation of food-related cognitive dissonance arousal and (2) assessment of food-related cognitive dissonance. Based on both the results of the focus group discussions and the food and nutrition literature reviewed for the development of the FCD conceptual framework, it was decided that both (1) and (2) would be based on the conflict between health and nutrition concerns with sensory characteristics – namely taste. As nutrition and taste often emerge in opposition to each with respect to specific foods, the idea was to assess individuals' attitude towards health and taste in food (Roininen & Tuorila, 1999), in the specific context of vegetable consumption where the conflict has been well documented (e.g., Cox, Anderson, Lean & Mela, 1998; Glanz, Basil, Maibach, Goldberg & Snyder, 1998), and examine how these might be related to the experience of intra- and inter-attitudinal food-related cognitive dissonance after exposing them to some negative, contradictory information about the health benefits of vegetable consumption. This was based on the notion of possible consumer backlash against dietary health messages espousing different nutritional information or knowledge at different points in time due to advances in scientific research in food and nutrition (Patterson et al., 2001) – for example, individuals reacted with confusion, scepticism and anger on being informed of the negative effects of trans fat in margarine after years of being told to consume margarine instead of butter (Goldberg, 1992).

Accordingly, a measure of inter-attitudinal cognitive dissonance between attitude towards health and taste in food and a measure of intra-attitudinal cognitive dissonance in terms of attitude towards health in food were constructed (see Appendix A-2). Each

measure had unique cognitive discrepancy items but common dissonance items – e.g., "The tastiness of the food is at odds with its healthiness for me" (inter-attitudinal cognitive discrepancy); "The healthiness of the food is discrepant from what I know" (intra-attitudinal cognitive discrepancy); and "I feel bothered about the food" (intra- and inter-attitudinal dissonance). Based on work done respectively by Menasco and Hawkins (1978), as well as, Cialdini, Trost and Newsom (1995), the constructs of state anxiety (measured via selected items from the state anxiety subscale, *A-State*, of the State-Trait Anxiety Inventory for adults, *STAI*, by Spielberger, Gorsuch and Lushene, 1970) and preference for consistency (measured via the Preference for Consistency-Brief scale, *PFC-B*, by Cialdini et al., 1995) were included for convergent validation of the novel food-related cognitive dissonance constructs. In addition, based on the recommendation of Freijy and Kothe (2013), the Marlowe-Crowne Social Desirability Scale (MCSDS, Crowne & Marlowe, 1960) was also included as a measure of potential social desirability in responses, providing divergent validation for the derived food-related cognitive dissonance measures. Additional scales contained in the questionnaire set included the *General Health Interest* (interest in eating healthily) and *Pleasure* (importance of obtaining pleasure from food) subscales of Roininen, Lähteenmaki and Tuorila's (1999) *Health and Taste Attitude Scale (HTAS)*, used as measures of attitudes toward health and taste in food respectively. To emphasize the difference between health and taste of vegetables, a short write-up of the importance of vegetable consumption for health was given before questions that enquired about respondents' rating of the taste of vegetables and their attitude towards it were presented. In manipulating the negative, contradictory information about the benefits of vegetable consumption, a reading passage was put together based on articles detailing the harmful properties of vegetables taken from various sources, the references of which were also shown to respondents. This method of cognitive dissonance arousal was based on the *belief disconfirmation* paradigm.

The questionnaire set was compiled and disseminated (in-person) to the same 18 respondents two weeks after their focus group discussion participation and retrieved immediately on completion. Upon an attempt to analyse the data collected, it was discovered that the data could not be subjected to logical analysis which would make them interpretable in terms of the proposed intra- and inter-attitudinal dimensions of food-related cognitive dissonance. This was retrospectively traced to conceptualization

issues in the set-up of the follow-up study, including, in particular, methodological missteps. No quantitative analyses proceeded as such.

4.4 Discussion

The main purpose of the preliminary study was to qualitatively identify the existence of the intra- and inter-attitudinal dimensions of food-related cognitive dissonance, which would then provide the basis for scale measurements construction. This objective was centrally achieved with the primary, specific content analyses of the focus group discussion data that demonstrated and substantiated the existence of the intra- and inter-attitudinal dimensions of food-related cognitive dissonance, specifying some of the underlying circumstances, as well as, dissonance resolution strategies, associated with each dimension. The results of the food values ranking, which showed health/nutrition and sensory characteristics (namely, taste) to be the two most significant food values to influence food choice across the different age groups, additionally helped to specify the food values that could be potentially studied in food-related cognitive dissonance research, particularly at its initial stages. This appeared logical, particularly so since health/nutrition considerations have often been shown to be at odds with sensory characteristics, especially, taste, in food choices (Connors et al., 2001). These results, together with the secondary thematic analysis that related the post-consumption arousal to conflict awareness, informed the drafting of initial measurements, and experimental arousal, of food-related cognitive dissonance. The viability of these initial measures and arousal manipulation were explored and tested in a follow-up study.

Despite producing data that was retrospectively adjudged to be unamenable to conceptually cogent analysis, the follow-up study is nevertheless valuable as it has both conceptual and methodological implications for the design of the main study, particularly with respect to the experimental arousal and measurement of the attitudinal dimensions of food-related cognitive dissonance. These insights/lessons, including the identified flaws, will now be discussed.

4.4.1 Attitude object-centred research conceptualization

Whilst it is acknowledged that research should be conceptually driven and/or derived from the need to find solutions to applied issues, in the context of the attitudinal dimensions of food-related cognitive dissonance, it is important to be particularly mindful of the specific attitude object(s), including the number of these, that a study is examining.

The failure to do this was a major flaw in the follow-up study that led to subsequent errors in the experimental arousal and measurement of food-related cognitive dissonance. Specifically, while the conceived study was on the conflict between health and taste considerations in food, with a target focus on vegetable consumption, which meant that there were three attitude objects, only intra-attitudinal cognitive dissonance related to health attitude towards food and inter-attitudinal cognitive dissonance related to health and taste attitudes toward food were assessed. Factoring vegetable consumption in the way that it was done in the study complicated the situation by entangling a third attitude object with two existing attitude objects (i.e., health and taste attitudes toward food), for which the assessments of attitudinal dimensions of food-related cognitive dissonance were already incomplete (i.e., intra-attitudinal cognitive dissonance related to taste attitude towards food missing). For clarity, especially for an initial empirical test of the FCD framework, it is thus proposed that the number of attitude objects examined be capped at two. The two attitude objects selected should be conceptually driven such that a logical, theoretical relationship may be established between the two for an inter-attitudinal dimension of cognitive dissonance to be conceivably and soundly derived.

4.4.2 Measurement of attitudinal dimensions of food-related cognitive dissonance

A general principle derived regarding measurement of the attitudinal dimensions of food-related cognitive dissonance is that it should be carried on a *per attitude object* basis. To elaborate and illustrate, in the context of two attitude objects *A* and *B*, there should be assessments of intra-attitudinal cognitive dissonance related to *A* and *B* separately and an assessment of inter-attitudinal cognitive dissonance related to the external attitudinal link between them. Furthermore, within each assessment, there should be measurements of cognitive discrepancy and dissonance – i.e., intra-attitudinal cognitive discrepancy and dissonance related to attitude object *A*, intra-attitudinal cognitive discrepancy and dissonance related to attitude object *B*, and inter-attitudinal cognitive discrepancy and dissonance related to attitude objects *A* and *B*. Thus, for two attitude objects, there would be a total of six assessments in terms of the attitudinal dimensions of food-related cognitive dissonance. In comparison, in the follow-up study, only three assessments (i.e., two separate intra- and inter-attitudinal cognitive discrepancy and one common dissonance measures) were accounted for, albeit ambiguously, across three attitude objects, which represented a gross under-estimation.

4.4.3 Experimental manipulation of cognitive dissonance arousal

There should only be one manipulation to trigger food-related cognitive dissonance arousal across the attitudinal dimensions. In retrospect, the entanglement amongst three attitude objects notwithstanding, two different manipulations were used in the follow-up study – aforementioned, the *belief disconfirmation* paradigm was used to arouse cognitive dissonance within the internal structure of the health attitude towards food (in the context of vegetable consumption); the other manipulation was supposed to highlight the conflict between health and taste attitudes toward food (in the context of vegetable consumption), bearing closest semblance to (but not quite exactly the same as) the *hypocrisy* paradigm. Apart from committing the error of being non-descript when it comes to the use of established cognitive dissonance paradigms in the arousal of food-related cognitive dissonance, the use of two different arousal manipulations is a major flaw as it renders any comparison of the differential effects of attitudinal dimensions of cognitive dissonance to be inequitable and untenable since the sources of arousal are different.

4.4.4 Cognitive dissonance and food choice trajectories

The secondary thematic analysis results that are relevant to the outcome of food-related cognitive dissonance research in general relate to the life course perspective of food choice. In this instance, the qualitative data suggests that the two food values of health/nutrition and sensory characteristics (amongst some others) are subject to transitional changes but remain relatively stable in their influence on food choice across time – that is, food values vary in terms of their relative importance *within food choice trajectories*, depending on which part of an individual's lifespan they are being considered. For a food choice trajectory to change direction altogether, turning points need to occur instead of transitions. It would be of interest to see if food-related cognitive dissonance effects would or could be strong enough to alter food choice trajectories and be classified as turning points or would they just cause minor adjustments that are not strong enough to change the trajectories and be classified as transitions. This is an empirical question that, hopefully, the main study could shed some initial light on.

4.4.5 Other limitations

Apart from flaws in the follow-up portion of the preliminary study, which became a strength of the study as a result of the conceptual and methodological insights they

provided, a limitation of the focus group discussion portion of the preliminary study relates to the fact that there was ethnic imbalance in terms of the 35-49 and 50-65 focus groups, which were lacking in Malay representation. Additionally, whilst obtaining responses from individuals from a diverse age range (18-65) was a strength of the study, the age cap of 65 might be seen to be a limitation as it excludes food choice exploration of those beyond re-employment age in Singapore.

4.5 Summary Conclusion

In summary, lessons learnt from the preliminary study include: (a) apart from designing a food-related cognitive dissonance study from a conceptual perspective, it is important for the researcher to be cognizant of the numbers of attitude object that would be subjected to cognitive dissonance analysis; (b) for each attitude object, there should be assessments of intra-attitudinal cognitive discrepancy and dissonance; (c) the choice of examined attitude objects should entail a logical link between/amongst them so as to facilitate the assessment of inter-attitudinal cognitive dissonance (between the relevant attitude objects). Taken together, the suggested wisdom would be to focus on two attitude objects for an initial examination of food-related cognitive dissonance, the arousal of which should derive from a single source (rather than multiple sources) of experimental manipulation, going into the main study.

Chapter 5. Main Study

5.1 Increasing Vegetable Consumption via Cognitive Dissonance

5.1.1 Parameters of main study

The main study aims to understand the role of cognitive dissonance in influencing food-related attitudes and/or behaviours through examining the FCD conceptual framework in terms of its efficacy in specifying the mechanics underlying cognitive dissonance effects in altering food-related attitudes and/or behaviours. This entails empirically testing the framework's basic conceptions that cover its structural viability in terms of (1) the proposed intra- and inter-attitudinal dimensions of cognitive dissonance, including the cognitive discrepancy and dissonance make-up of the cognitive dissonance construct itself, and (2) the pathways through which cognitive dissonance affects attitude and behaviour. Practically, this involves identifying and selecting appropriate food-related attitude object(s) upon which targeted cognitive dissonance arousal(s) might be evoked via relevant cognitive dissonance paradigm(s), measured, and assessed in terms of their effects on relevant attitudinal/behavioural outcome(s).

Based on insights gained from the preliminary study, particularly its associated follow-up, it is clear that crucial to the legitimacy and integrity of the efficacy test would be the choice of attitude object(s) and the cognitive dissonance paradigm(s) used, which are now discussed.

- Choice of attitude object(s)

Apart from capping the limit at two, the choice of attitude objects for an initial efficacy test should be based on identified public health concerns related to food and nutrition in order to optimize research applied value. Given the increasingly important role of dietary behaviour in the aetiology of various chronic illnesses (e.g., diabetes, heart disease, etc.), public health efforts have been focused on encouraging individuals to adopt healthy eating practices (e.g., Reinwand et al., 2016) as primary prevention means. One focus has been on reducing, or at least balancing, meat consumption with increased fibre intake (Talukder, 2015). Fruits and vegetables are widely recognized as natural sources of fibre, and in view of the evidenced inverse relationship between non-communicable diseases, such as cardiovascular disease and cancer, and fruit-vegetable intake (Oyebode, Gordon-Dseagu, Walker & Mindell, 2014), one of the challenges faced by public health

agencies globally is to increase individuals' consumption of fruits and vegetables to meet the daily requirements for a healthy diet (Hall, Moore, Harper & Lynch, 2009). Frequently, actual fruit and vegetable consumption fall short of public health recommendations – for instance, between 2007-2010, 76% and 87% of the adult population in the United States did not meet fruit and vegetable intake recommendations respectively, with the numbers rising to 87% and 91% correspondingly in 2013 (Moore & Thompson, 2015). The distinct fruit and vegetable intake rates suggest that fruit and vegetable consumption should be studied separately rather than collectively as a whole, as is common practice in the food-nutrition and public health spheres (e.g., Tomasone, Meikle & Bray, 2015). Further support for keeping fruit consumption separate from vegetable consumption comes from the finding that fruits and vegetables have somewhat different effects on health, with the latter having a stronger association with mortality reduction than the former (Oyebode et al., 2014). The evidence thus not only calls for the consumption of each to be studied separately but indeed, proposes that vegetable consumption be promoted ahead of fruit consumption.

The public health challenge of promoting healthy eating, particularly in increasing vegetable consumption, thus provides a suitable, realistic context and opportunity for an initial efficacy test of the FCD conceptual framework in relation to different-level attitude objects. Specifically, the current study will explore whether it is more efficacious to increase vegetable consumption via influencing (1) attitude towards healthy eating (superordinate-level attitude object) or (2) attitude towards vegetable consumption (subordinate-level attitude object), leveraging on the provisions made within the framework for such a delineation. To the author's knowledge, there is no published research to date that has reported such an empirical exploration, particularly from a cognitive dissonance perspective.

- Choice of cognitive dissonance paradigm(s)

The major flaw of the follow-up to the preliminary study in terms of experimental manipulation of food-related cognitive dissonance serves as a real, stark reminder of how cognitive dissonance-centric, food-related studies had largely neglected the rigorous, and theoretically underpinned, application of cognitive dissonance paradigms in attempts to elicit cognitive dissonance arousal. The main study seeks to redress this issue to ensure conceptual and methodological integrity.

Of the five major cognitive dissonance paradigms (refer Table 2.2), *hypocrisy* and *induced compliance* (see Harmon-Jones, 2002; Harmon-Jones & Harmon-Jones, 2007) are the two paradigms that have been most frequently adopted in the context of effecting health-related changes (Freijy & Kothe, 2013). Between these two paradigms, although *induced compliance* – which assumes that dissonance is aroused when an individual does or says something that contradicts a prior held belief or attitude – has been successfully applied to the prevention of disordered eating (e.g., Stice, Marti & Cheng, 2014), *hypocrisy* – which assumes that dissonance is aroused whenever individuals are induced to publicly make statements consistent with some normative standards and thereafter, reminded of times when they did not act in accordance with these standards – "appears most effective in inciting change across a range of non-clinical health behaviour" (Freijy & Kothe, 2013, p. 311). Indeed, with respect to *non-clinical* health behaviour, "studies based on the induced compliance paradigm produced mixed findings at best" whilst the *hypocrisy* paradigm "appears to most reliably lead to changes in attitude, intention or behaviour" (Freijy & Kothe, 2013, p. 330). This could be attributed to the fact that the latter involves a relatively standardized protocol governing the arousal of cognitive dissonance (Aronson, Fried & Stone, 1991) whereas studies adopting the former "reported a variety of dissonance-arousing techniques" (Freijy & Kothe, 2013, p. 326). In addition, according to Stone and Fernandez (2008), the *hypocrisy* paradigm works best in a situation where individuals agree with, and are knowledgeable about, the prescribed standards and benefits of a behaviour but are not practising the behaviour, mirroring the current public health challenge faced globally in which individuals are not eating healthily and/or consuming enough vegetables despite a general acknowledgement of their importance and benefits (Ball et al., 2016). All these indicate the *hypocrisy* paradigm to be a good fit for the main study, given its precise focus on increasing vegetable consumption, and suggest that it'd be instructive to use it as the paradigm of choice in the current initial efficacy test.

In sum, as an initial efficacy test of the FCD conceptual framework, the current research will examine how the targeted arousal of cognitive dissonance, via the *hypocrisy* paradigm, on superordinate-level attitude towards healthy eating on one hand, and subordinate-level attitude towards vegetable consumption on another, might lead to changes in vegetable consumption behaviour through impacting attitudinal pathways.

5.1.2 Hypotheses of main study

The research question for the main study primarily relates to how food-related attitude/behaviour might be positively changed through appropriate arousal of cognitive dissonance. The research hypotheses may be divided into two categories – (1) those relating to the measurement of the novel food-related cognitive dissonance constructs within the FCD framework and (2) those relating to the pathways of influence between the food-related cognitive dissonance constructs and food-related attitudinal/behavioural outcomes.

- Measurement model hypotheses

Based on the FCD framework's theorization of the intra- and inter-attitudinal aspects of cognitive dissonance, given the two attitude objects of healthy eating and vegetable consumption, it is anticipated that there would be six (correlated) food-related cognitive dissonance constructs in the (CFA) measurement model. These are: (1) intra-attitudinal (a) cognitive discrepancy and (b) dissonance related to attitude towards healthy eating (i.e., *Intra-FCDp_H* and *Intra-FD_H* respectively); (2) intra-attitudinal (a) cognitive discrepancy and (b) dissonance related to attitude towards vegetable consumption (i.e., *Intra-FCDp_VC* and *Intra-FD_VC* respectively); and (3) inter-attitudinal (a) cognitive discrepancy and (b) dissonance related to attitudes toward healthy eating and vegetable consumption (i.e., *Inter-FCDp_HVC* and *Inter-FD_HVC* respectively).

In addition, to augment construct validation, "individual differences in the desire to be consistent, to be perceived as consistent, and for others to be consistent" (Guadagno & Cialdini, 2010, p. 152) [14], as well as, individual propensity towards giving socially desirable responses (Freijy & Kothe, 2013) will be assessed and included in the study to establish convergent and discriminant validity respectively. In terms of convergent validity, individuals with high preference for consistency are expected to experience greater dissonance given greater cognitive discrepancy (Cialdini et al., 1995), both intra- and inter-attitudinally, than individuals with low preference for consistency. In terms of discriminant validity, all six food-related cognitive dissonance constructs are not expected to correlate with social desirability.

[14] With the replacement of a common dissonance measure with separate dissonance measures *per attitudinal dimension*, preference for consistency was assessed to be more generically appropriate to be retained as a construct for convergent validation than state anxiety for both the cognitive discrepancy and dissonance aspects of food-related cognitive dissonance.

- Path model hypotheses

As the study seeks to examine how food-related cognitive dissonance might affect vegetable consumption behaviour via its targeted effects on attitude towards healthy eating versus its targeted effects on attitude towards vegetable consumption, there are essentially two path model hypotheses to be tested – one which relates to food-related cognitive dissonance aroused at the superordinate-level attitude towards healthy eating and the other that relates to food-related cognitive dissonance aroused at the subordinate-level attitude towards vegetable consumption. Based on the plausible pathways of influence as stipulated in chapter 3, within each path model, two possible path mechanics – sequential versus simultaneous effects of food-related cognitive dissonance – will be examined.

In terms of food-related cognitive dissonance arousal targeted at attitude towards healthy eating, a sequential effects hypothesis postulates that high intra-attitudinal cognitive discrepancy generated within the attitude (i.e., *Intra-FCDp_H*) will lead to high intra-attitudinal dissonance (i.e., *Intra-FD_H*). The latter would lead to a more positive healthy eating attitude, which would increase vegetable consumption directly and indirectly through positively influencing attitude towards vegetable consumption. The vegetable consumption attitude is additionally, positively influenced by inter-attitudinal dissonance related to the healthy eating and vegetable consumption (i.e., *Inter-FD_HVC*) and intra-attitudinal dissonance related to the vegetable consumption (i.e., *Intra-FD_VC*). Each of these dissonances are caused by their corresponding cognitive discrepancies (i.e., *Inter-FCDp_HVC* and *Intra-FCDp_VC* respectively) that spring from reverberations within the intra-attitudinal structure of the attitude towards healthy eating caused by *Intra-FCDp_H*. The conceptual logic underlying this (sequenced) path pattern is hypothesized to similarly apply when food-related cognitive dissonance arousal is targeted at attitude towards vegetable consumption, with intra-attitudinal cognitive discrepancy related to vegetable consumption (i.e., *Intra-FCDp_VC*) as the root source of attitudinal structural changes in this instance (see Figure 5.1a). Such hypothesized path patterns are partially based on the qualitative findings obtained in the preliminary study linking attitude change to the intra-and inter-attitudinal dimensions of cognitive dissonance and the spatial-linkage model regarding inter-attitudinal influence dynamics (Dinauer & Fink, 2005).

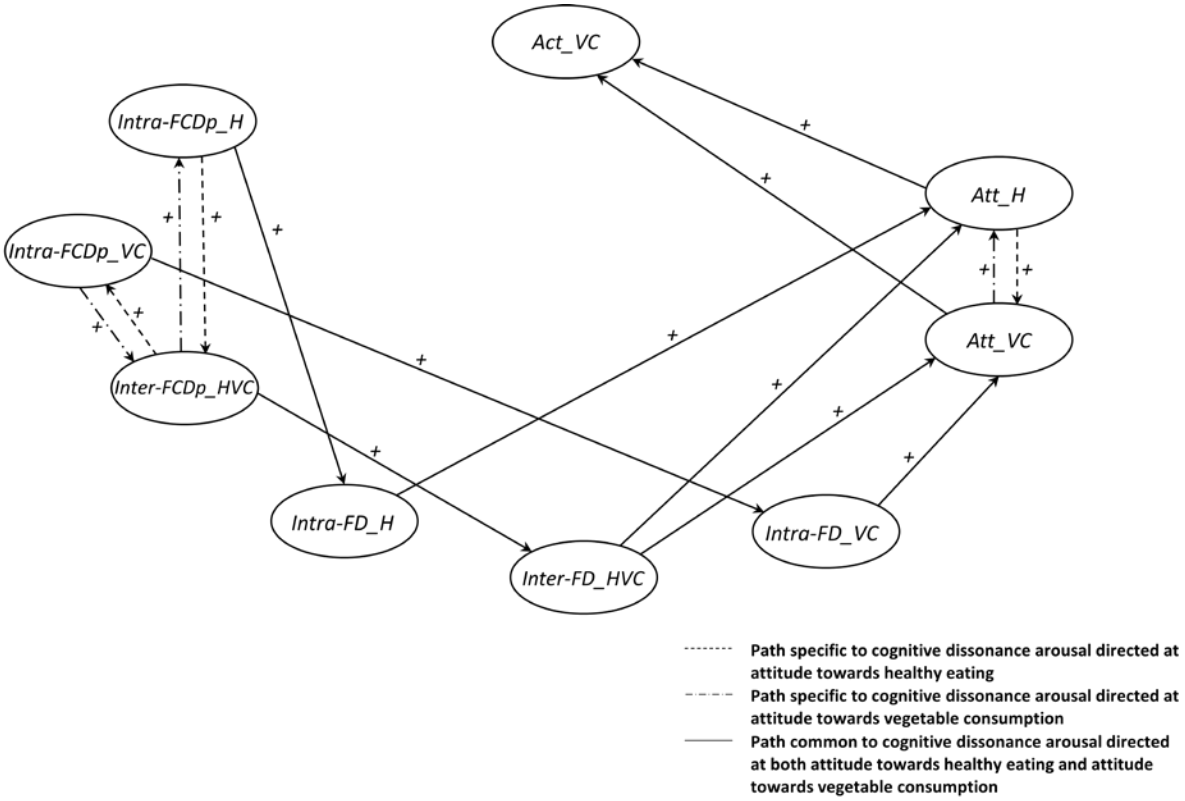


Figure 5.1a: Hypothesized sequential effect path model(s)

In the alternative simultaneous effects model, all paths are the same as depicted in Figure 5.1a except that instead of unidirectional paths, the three food-related cognitive discrepancies (i.e., *Intra-FCDp_H*, *Intra-FCDp_VC* and *Inter-FCDp_HVC*) are now linked to each other via covariance paths to reflect their concurrent elicitation (see Figure 5.1b).

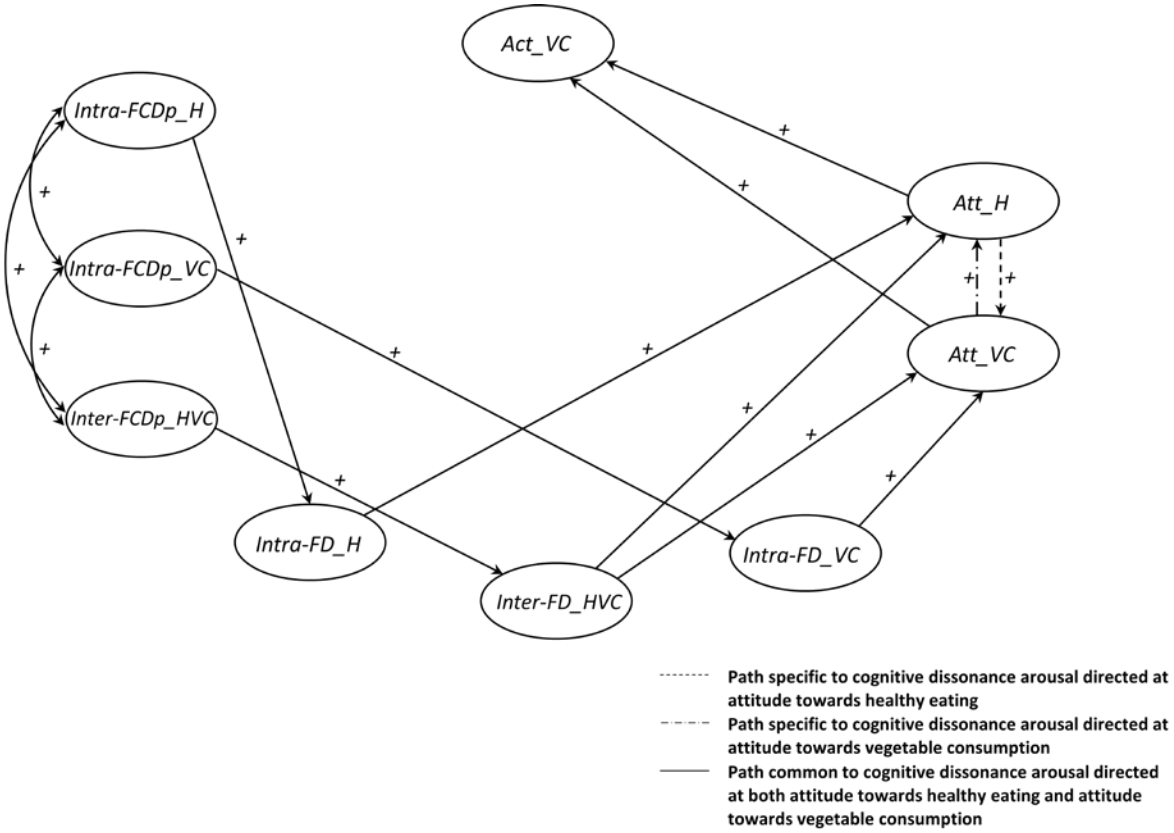


Figure 5.1b: Hypothesized simultaneous effect path model(s)

5.2 Method

5.2.1 Notes on pilot study

Discarding the erroneous approach taken in the follow-up to the preliminary study, and based on lessons learnt from it, a fresh questionnaire (see Appendix B) containing the experimental manipulation of food-related cognitive dissonance arousal, as well as, measures of cognitive discrepancy and dissonance within and across attitudes toward healthy eating and vegetable consumption were constructed and piloted to assess appropriateness of the (1) experimental/treatment stimuli used to elicit cognitive dissonance, (2) questionnaire items created to measure the novel intra- and inter-attitudinal food-related cognitive dissonance constructs and (3) overall length of these two components taken together, prior to actual use in the main study.

In the case of (1), following the established protocol for the *hypocrisy* paradigm, participants were asked to write a short essay on the importance of either (a) healthy eating or (b) vegetable consumption, where they were specifically asked to (i) give five reasons for why either was important (depending on the experimental condition to which

they were assigned) and (ii) list five statements of advice to promote these. Participants were then asked how many of the listed statements they personally followed. To increase personal engagement and public commitment (see Festinger, 1957; Fointiat, 2008), participants were told that as eating habits had been shown to be established at a young age, the ideas expressed in their essay would be specifically effected on 10-year-old children, and be subsequently forwarded to a public health agency responsible for promoting positive dietary behaviour amongst young children, for consideration and/or inclusion in its promotional efforts.

In the case of (2), following the theorization of food-related cognitive dissonance given in the FCD conceptual framework, cognitive discrepancy and dissonance were separately measured, at the intra- and inter-attitudinal levels, for both the superordinate attitude towards healthy eating and the subordinate attitude towards vegetable consumption. A total of six food-related cognitive dissonance constructs were assessed – intra-attitudinal cognitive discrepancy associated with healthy eating; intra-attitudinal dissonance associated with healthy eating; intra-attitudinal cognitive discrepancy associated with vegetable consumption; intra-attitudinal dissonance associated with vegetable consumption; inter-attitudinal cognitive discrepancy associated with healthy eating and vegetable consumption; and inter-attitudinal dissonance associated with healthy eating and vegetable consumption – each with four items. Responses to the items were made along a 7-point Likert rating scale, ranging from "Strongly Disagree" (point 1) to "Strongly Agree" (point 7), with higher scores indicating higher levels of cognitive discrepancy and dissonance.

Once again employing the use of purposive sampling, a separate group of 15 tertiary-educated individuals (11 Chinese, 2 Malay, 1 Indian and 1 Eurasian/Other of Singaporean citizenship) from Nanyang Polytechnic, covering the same age groups of 18-24 (n=3; 2 males, 1 female), 25-34 (n=3; 1 male, 2 females), 35-49 (n=4; 2 males, 2 females) and 50-65 (n=5; 3 males, 2 females) were selected to take part in the pilot study (mean age=39.20, SD=15.00). They were randomly assigned to either the healthy eating (n=5) or vegetable consumption (n=5) treatment conditions, or the control condition (n=5), first and foremost by age group, and secondarily, by gender, to ensure equal condition allocation by these categories as far as possible. The questionnaire was distributed in-person and collected on-the-spot immediately after completion. Descriptive analyses of the data collected showed the experimental manipulations to be generally

effective, with the dissonance and (to a lesser extent) cognitive discrepancy scores being correspondingly higher in the relevant treatment conditions than either the control or irrelevant treatment conditions (see Table 5.1).

Condition / **Cognitive dissonance type**	***Healthy Eating*** *(n=5)*	***Vegetable Consumption*** *(n=5)*	***Control*** *(n=5)*
Intra-attitudinal cognitive discrepancy related to healthy eating	19.2 (3.11)	19 (8.69)	20.2 (5.26)
Intra-attitudinal dissonance related to healthy eating	18 (2.83)	16.2 (7.29)	17.4 (6.54)
Intra-attitudinal cognitive discrepancy related to vegetable consumption	12.2 (5.97)	18.2 (8.44)	11.4 (8.11)
Intra-attitudinal dissonance related to vegetable consumption	10.8 (3.11)	15.8 (7.16)	7.8 (2.28)
Inter-attitudinal cognitive discrepancy related to healthy eating and vegetable consumption	12.8 (5.84)	17.6 (7.73)	12.2 (8.38)
Inter-attitudinal dissonance related to healthy eating and vegetable consumption	9 (2.83)	16.4 (6.99)	9.2 (1.64)
	Mean survey completion time (in minutes): 32.4 (SD=32.35)	Mean survey completion time (in minutes): 26.5 (SD=8.94)	Mean survey completion time (in minutes): 7.22 (SD=2.43)

Table 5.1 Mean intra- and inter-attitudinal cognitive discrepancy and dissonance scores (with standard deviation in parentheses) by study condition

Though unsolicited, any, and all, of the respondents' verbal feedback on possible improvements to the questionnaire were noted. These, taken together with the mean time recorded to complete the survey per condition, led to some adjustments made to both the experimental manipulation of cognitive dissonance arousal as well as the measurement of the attitudinal dimensions of food-related cognitive dissonance, and also partially informed the survey administration procedure for the main study. All these are reflected in the methodology description of the main study in the following sections.

5.2.2 Participants and design

A survey-based, panel study with experimental manipulation was conducted for the main study, in which participants had to complete questionnaires across three time points (with a minimal 7-day gap between Time 1 and Time 2, and, between Time 2 and Time 3), after being randomly assigned to one of three study conditions. Using the *hypocrisy* paradigm, the first treatment condition related to the arousal of cognitive

dissonance directed at attitude towards healthy eating (*Trt1_H*) whilst the second treatment condition related to the arousal of cognitive dissonance directed at attitude towards vegetable consumption (*Trt2_VC*). No active arousal of cognitive dissonance was applied in the control condition (*Ctrl*). Attitudinal and behavioural baselines were established with questionnaires at Time 1 and beginning of Time 2 respectively, with experimental manipulation taking place in the latter half of Time 2, before the same attitudinal and behavioural outcomes were re-measured at Time 3 (see Figure 5.3).

A stratified sampling approach was taken to achieve sub-sample demographic characteristics representativeness and equality within and across study conditions as much as possible (see Table 5.2 for details)[15], with baseline attitudes toward healthy eating and vegetable consumption matched across study conditions. To maintain methodological rigor and uphold data integrity, only respondents who had provided complete data at all three time points were included in the final analyses; those who had provided incomplete data and/or dropped out at any time during the course of the study were excluded. From 878 participants who had completed the survey at Time 1, a final total of 615 English-speaking, tertiary-educated Singaporeans (344 males, 271 females), spread equally across the three study conditions (i.e., n=205), with age ranging from 19 to 65 years (M=37.01, SD=11.702), contributed data (no missing values) that was used in the final analyses of the study[16].

Participant recruitment, including the overall survey administration, was conducted online by a research agency (from its existing pool of panelists), and respondents were given a token incentive for their participation in the study[17].

[15] The main strata used were ethnicity (Chinese-75.5%, Malay-12.7%, Indian-8.7%, Other-3.1%), followed by gender x age (Male: 18-24-9.6%, 25-34-11.4%, 35-49-15.7%, 50-65-12.8%; Female: 18-24-9.8%, 25-34-11.6%, 35-49-16.4%, 50-65-12.7%), constrained by the requirement of a diploma or higher educational status. Strata proportion estimates were based on Singapore population trends 2016 (Department of Statistics Singapore, 2016).

[16] The 878 survey completions at Time 1 was from an initial pool of 988 eligible participants who attempted the survey at Time 1 (110 incompletes ≈ 11.1%). Out of the 878 respondents, 754 (85.9%) completed the survey at Time 2, registering a respondent attrition rate of 14.1%. The final sample size of 615 at Time 3 was 81.6% of the 754 completions at Time 2, registering a respondent attrition rate of 18.4%. Overall, the drop from 878 at Time 1 to 615 at Time 3 was 29.9%. Sample demographic characteristics in terms of gender, age and ethnic proportions remained almost identical between the initial sample of 878 participants and the final sample of 615 participants.

[17] The hiring of the research agency, was supported by the Capability Development Platform Project (CDPP) grant (project no. R11233) from Nanyang Polytechnic, after ethics approval/clearance was additionally obtained from the polytechnic's institutional review board (in addition to that which had been prior obtained from Newcastle University's ethics committee).

Demographic characteristics	Study condition*		
	Trt1_H (n=205)	***Trt2_VC (n=205)***	***Ctrl (n=205)***
Gender	111 Males; 94 Females	121 Males; 84 Females	112 Males; 93 Females
Age	19-65; M=37.83, SD=12.1	20-65; M=35.86, SD=11.448	19-65; M=37.34, SD=11.513
Ethnicity	187 Chinese (91.2%); 10 Malay (4.9%); 4 Indian (2%); 4 Other (2%)	179 Chinese (87.3%); 14 Malay (6.8%); 9 Indian (4.4%); 3 Other (1.5%)	184 Chinese (89.8%); 10 Malay (4.9%); 9 Indian (4.4%); 2 Other (1%)
Education	82 Diploma (40%); 98 Bachelor's Degree (47.8%); 20 Post-graduate Degree (9.8%); 5 Professional Higher Education (2.4%)	83 Diploma (40.5%); 97 Bachelor's Degree (47.3%); 16 Post-graduate Degree (7.8%); 9 Professional Higher Education (4.4%)	66 Diploma (32.2%); 103 Bachelor's Degree (50.2%); 27 Post-graduate Degree (13.2%); 9 Professional Higher Education (4.4%)

*Chi-square test of independence analyses showed that there were no significant associations between study condition and the four demographic characteristics.

Table 5.2: Sub-sample demographic characteristics across study conditions

5.2.3 Materials and procedure

Apart from demographic information, measures related to (1) food-related cognitive dissonance, (2) attitude towards healthy eating, (3) attitude towards vegetable consumption, (4) actual vegetable consumption, (5) preference for consistency and (6) social desirability were included in the questionnaire sets. Whilst measures (4) and (6) had their own unique rating bar, for measures (1) – (3) and (5), respondents responded to statements using a standard 7-point Likert rating scale ranging from "Strongly Disagree" (point 1) on one end to "Strongly Agree" (point 7) on the other end. Relevant details of all measures are described in the following sub-sections.

- Food-related cognitive dissonance

As was the case in the pilot study, food-related cognitive dissonance was aroused following the established protocol for the *hypocrisy* paradigm, and measured. Participants in the treatment conditions were asked to write a short essay on the importance of either (1) healthy eating (*Trt1_H*) or (2) vegetable consumption (*Trt2_VC*), where they were specifically asked to (a) give five reasons for why either was important (depending on the experimental condition to which they were assigned) and (b) list five statements of advice to promote these. Participants were then asked how many of the listed statements they personally followed. As before, to increase personal engagement and public commitment, participants were told that as eating habits had been shown to be established at a young age, the ideas expressed in their essay would be specifically effected on 12-year-old

children[18], and be subsequently forwarded to a public health agency responsible for promoting positive dietary behaviour amongst young children, for consideration and/or inclusion in its promotional efforts. Following experimental manipulation, participants were then presented with items measuring cognitive dissonance with respect to healthy eating (superordinate-level attitude object) and vegetable consumption (subordinate-level attitude object). As in the pilot study, cognitive discrepancy and dissonance were separately measured, at the intra- and inter-attitudinal levels, for both the superordinate- and subordinate-level attitude objects, resulting in the six food-related cognitive dissonance constructs of intra-attitudinal cognitive discrepancy associated with healthy eating (*Intra-FCDp_H*); intra-attitudinal dissonance associated with healthy eating (*Intra-FD_H*); intra-attitudinal cognitive discrepancy associated with vegetable consumption (*Intra-FCDp_VC*); intra-attitudinal dissonance associated with vegetable consumption (*Intra-FD_VC*); inter-attitudinal cognitive discrepancy associated with healthy eating and vegetable consumption (*Inter-FCDp_HVC*); and inter-attitudinal dissonance associated with healthy eating and vegetable consumption (*Inter-FD_HVC*). Based on the pilot study's respondents' feedback to reduce survey fatigue, each component now had three (instead of four)[19] items for a total of 18 items, which participants had to likewise indicate the extent of their agreement/disagreement along the aforementioned 7-point Likert rating scale – a higher score indicated a higher level of cognitive discrepancy and dissonance, both intra- and inter-attitudinally.

- Attitude towards healthy eating

As before, the *General health interest* subscale of Roininen et al.'s (1999) *Health and Taste Attitude Scale (HTAS)*, which "deals with an interest in eating healthily" (p. 358), was used as a measure of attitude towards healthy eating in the main study. It contained eight items that participants had to respond to using the aforementioned 7-point Likert rating scale. With the overall assessment based on a summation of the scores in a positive direction, a higher score indicated a more positive attitude towards healthy eating and vice-versa. The *HTAS* has been used within as well as across cultures with relatively stable psychometric properties (e.g., Chen, 2013; Roininen et al., 2001).

[18] The change in children's age was done following feedback on the pilot study to specifically allow participants greater freedom in grammatical expressions when writing the list of five statements in the essay.

[19] The items dropped were those that were adjudged to be the least compatible with the other items in each respective attitudinal dimension.

- Attitude towards vegetable consumption

With no formal instrumentation in existence, an ad hoc attitude towards vegetable consumption scale was put together based on reported research that related to attitude towards vegetable and/or vegetable consumption. Specifically, content reflected in relevant attitudinal measures used in three studies (Dibsdall, Lambert, Bobbin & Frewer, 2003; Vereecken, van Damm & Maes, 2005; Produce for Better Health Foundation, 2014) that closely paralleled the conceptualization of attitude adopted within the FCD conceptual framework provided the basis for the current ad hoc measure. Five statements that related to the affective, behavioural, cognitive and evaluative aspects of attitude towards vegetable consumption were thus derived, to which respondents had to indicate the extent of their agreement/disagreement along the aforementioned 7-point Likert rating scale. A higher summated score indicated a more positive attitude towards vegetable consumption.

- Actual vegetable consumption

In the self-report measure of actual vegetable consumption, participants were presented with a panel of printed visual images that illustrated, and hence served as a point of reference for, what constituted the recommended daily intake of vegetables (see Figure 5.2).

Illustration: 1 cup (250ml) of broccoli = Approx. 8 pieces of standard-sized broccoli florets

Figure 5.2: Illustration of daily recommended amount (2½ cups) of vegetable consumption used in main study survey

Using 2½ cups of vegetables as the benchmark daily recommended intake (Schlenker & Gilbert, 2014), participants had to indicate how much vegetables they consumed daily by

making a mark on a visual analogue rating scale measuring 10cm, with 0ml and 625ml indicated on either extremes, and where every 1cm (starting from 0ml) represented 10% of the total recommended daily amount. The actual vegetable consumed by each individual was thus estimated by measuring the length between 0ml and the point along the analogue scale that the individual marked, such that, for instance, if an individual placed a mark 6cm from the 0ml point, this would indicate that the actual vegetable consumed to be 375ml (60% of 625ml).

- Preference for consistency

Individual difference in consistency preference was measured using the 9-item Preference for Consistency-Brief (PFC-B) scale (Cialdini et al., 1995). Respondents registered the extent to which they agreed/disagreed with nine statements that assessed consistency desire and perception along the aforementioned 7-point Likert rating scale. A higher score, from the summation of responses across the nine items, indicated a greater preference for consistency and vice-versa. According to Cialdini et al. (1995), the PFC-B "had scale characteristics nearly identical" (p. 320) to the full 18-item Preference for Consistency (PFC) Scale that had been found to be valid and reliable across diverse contexts (e.g., Brown, Asher & Cialdini, 2005; Greenhalgh & Watt, 2015; Sénémeaud, Mange, Fointiat & Somat, 2014), with this general tendency towards consistency appearing across individualistic and collectivistic cultures (Petrova, Cialdini & Sills, 2007).

- Social desirability

Individual tendency towards self-presentational responses was assessed using the 33-item Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960), in which participants responded to statements measuring such response bias using a "True/False" format. A higher score on the scale represented an increased tendency towards social desirability, and vice-versa. The MCSDS has been widely used to check self-report data across a variety of contexts, as well as, across cultures with relatively robust psychometric properties (Johnson & van de Vijver, 2002).

The scales were compiled into distinct questionnaire sets to be distributed at the three different time points and given to the research agency, which created an online platform for survey-taking and data collection[20]. Measures (2) and (3) were distributed at

[20] The data collected was provided in IBM SPSS Statistics (version 21) data file format.

Time 1 to establish attitudinal baselines for healthy eating and vegetable consumption, together with measures (5) and (6). Measure (4) was given at the start of Time 2 to establish the baseline for actual vegetable consumed in order to avoid any unintentional arousal of food-related cognitive dissonance that could potentially occur if it was given at Time 1 together with the healthy eating and vegetable consumption attitude measures. The experimental manipulation was then applied, in which participants in the *Trt1_H* condition were given the essay task focusing on healthy eating and those in the *Trt2_VC* condition given the essay task focusing on vegetable consumption. Control condition participants were given the measures of food-related cognitive dissonance without the essay task. At Time 3, measures (2), (3) and (4) were given to assess final, post-treatment attitudinal and behavioural outcomes. The study design is graphically presented in Figure 5.3 as summary of the survey administration procedure.

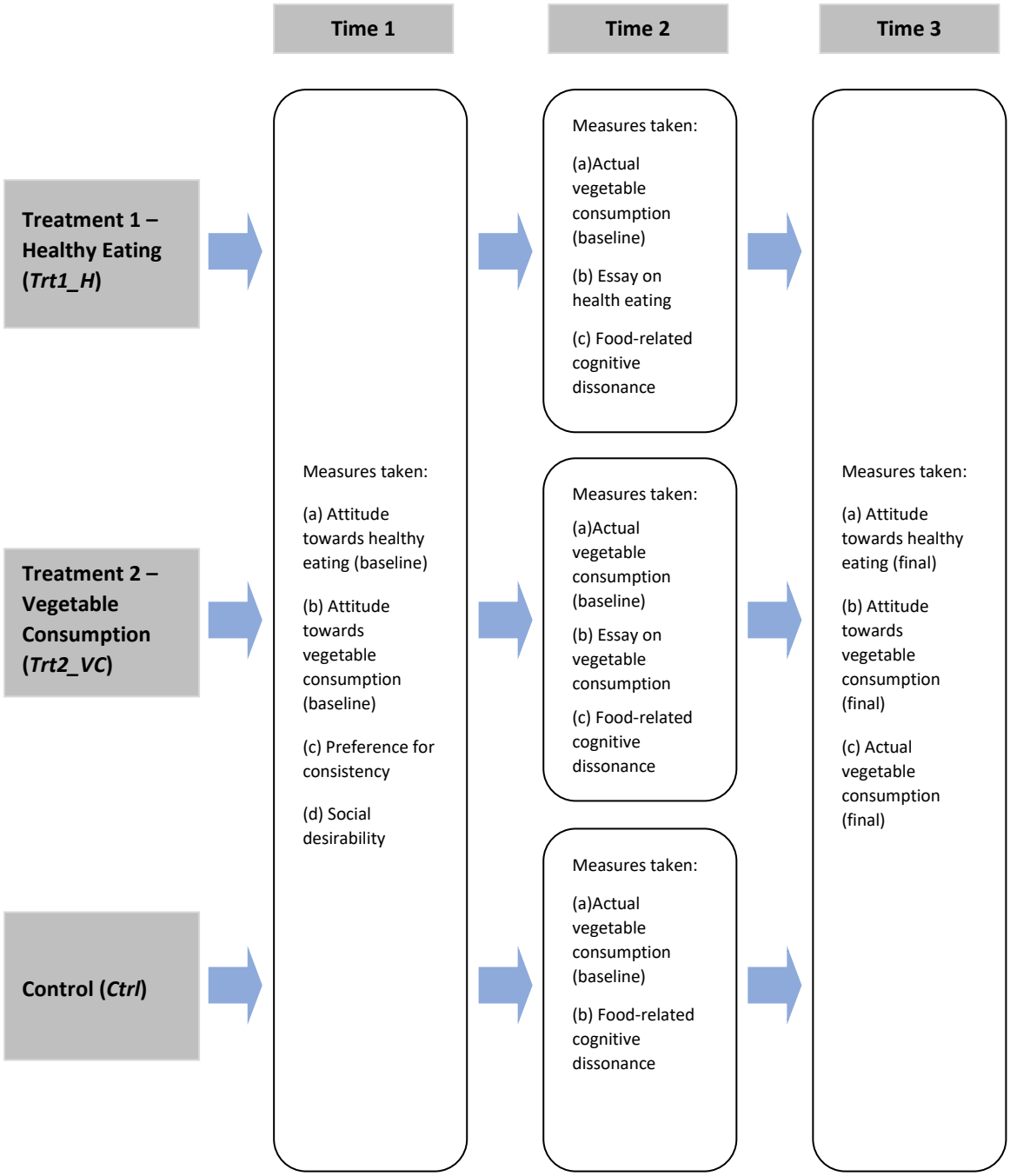


Figure 5.3: Study design/Survey administration procedure used in the main study

5.2.4 Analyses

Covariance-based structural equation modelling (SEM), which encompassed assessments of both measurement and path models (McDonald & Ho, 2002), was the primary analysis carried out in the main study, with relevant descriptive, reliability, correlational and analysis of variance (ANOVA) analyses conducted in addition. All analyses were conducted using IBM SPSS Statistics/AMOS (version 21). In terms of

measurement model(s), given the three sub-groups of participants in *Trt1_H*, *Trt2_VC* and *Ctrl* conditions, a multiple-groups confirmatory factor analysis (CFA) was used to ascertain, and cross-validate, the measurement structure(s) of the food-related cognitive dissonance constructs, and to ensure these were equivalent across groups (Byrne, Shavelson & Muthén, 1989; Little & Slegers, 2005). This procedure examined the assumptions of measurement equivalence in a series of increasingly restrictive hypothesis tests – (1) the first model to be fitted was one in which the factor loadings and error variances of the indicators (i.e., items) as well as the factor variance-covariances were all freely estimated in each group (*configural invariance*); (2) this model was then compared to a model in which the factor loadings were fixed as equal across groups (*metric invariance*); (3) this model was then compared to a model in which the factor loadings and item intercepts were fixed as equal across groups (*scalar invariance*); and finally, (4) this model was compared to a model in which the factor loadings, item intercepts, error variances and factor variance-covariances were fixed as equal across groups (*strict factorial invariance*). A significant reduction of fit (as indicated by the χ^2 difference test) in successive (nested) models (i.e., from less constrained to more constrained) would indicate that the particular parameters fixed at equality in the more constrained model were not equal across groups. In other words, measurement equivalence would be evidenced when there was no significant reduction of fit in successive models. This series of hierarchical comparisons of increasingly constrained (nested) models was similarly adopted to ascertain longitudinal measurement invariance (Meredith, 1993; Vandenberg & Lance, 2000) of the attitude constructs (i.e., attitudes toward healthy eating and vegetable consumption), given that pre- and post-experimental attitudinal assessments occurred over time. In this instance, instead of "stacked" covariance matrices (as was the case in multiple-groups analysis), a single-sample covariance matrix was derived, based on both pre- and post-treatment data sets, for the test of the equality of the parameters of the measurement model across time. In the specification of the longitudinal model, error covariances between same items over time were inserted, as were factor covariance(s) between the same latent variable(s) over time. In either case, it is widely accepted that measurement invariance is established when the factor loading matrix is invariant across groups (Alwin & Jackson, 1981; Meade, 2005; Sörbom, 1974; Vandenberg & Lance, 2000) although a more stringent criterion for measurement invariance is for item intercepts, factor variance-covariance and error variances to be invariant across groups as

well. In terms of path model(s), SEM was conducted per study condition to examine the pathways of influence between latent variables and to verify if food-related cognitive dissonance effects (if any) were sequential or simultaneous (as hypothesized) through the specific use of the Chi-square difference test (Bollen, 1989; Kline, 1998).

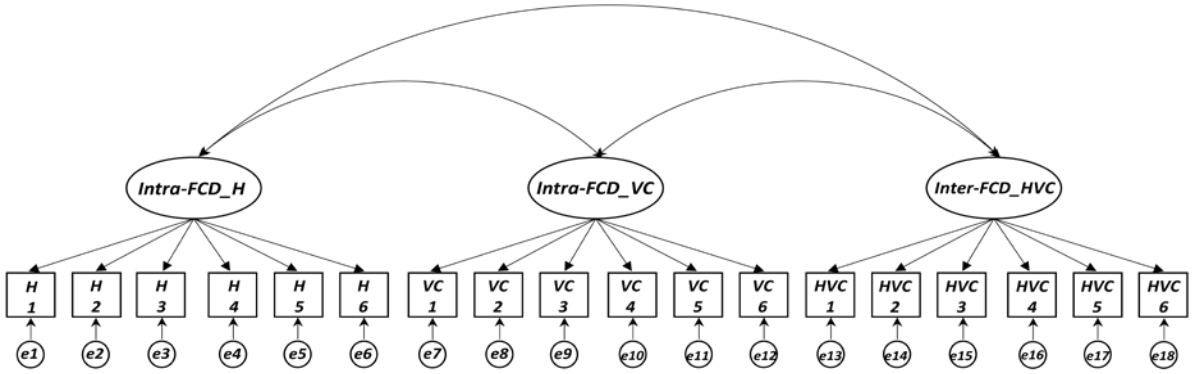
5.3 Results

5.3.1 Measurement model(s)

- Food-related cognitive dissonance

Two measurement models – 3-factor (M1) and 6-factor (M2) – of food-related cognitive dissonance (see Figure 5.4) were initially tested across the three study sub-groups to eliminate an alternative competing factor structure in establishing the viability of the hypothesized measurement model.

3-Factor Model



6-Factor Model

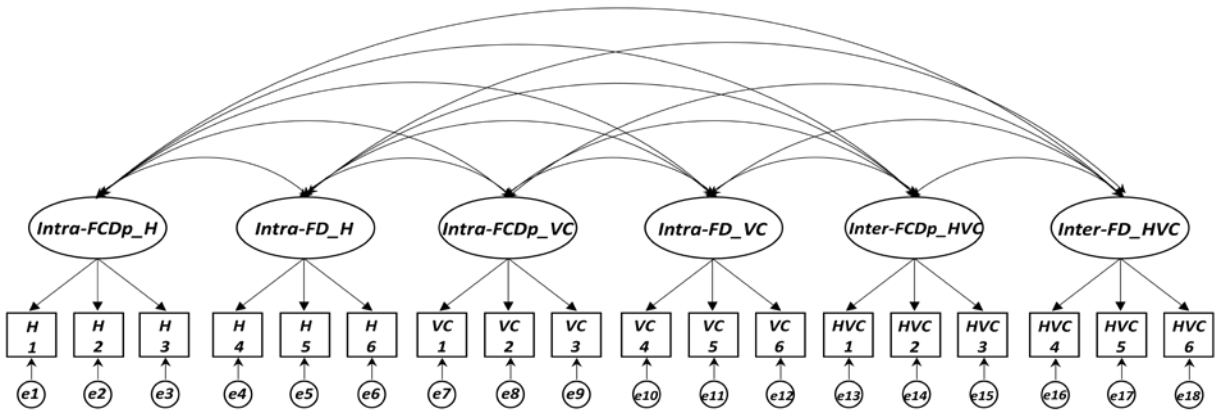


Figure 5.4: Hypothesized measurement model(s) of food-related cognitive dissonance

A comparison of the model fit indices, as well as Chi-square difference test results, between the two models confirmed that a 6-factor measurement model was optimal and more viable (see Table 5.3 – M1 *vs.* M2). The multiple-groups CFA was then conducted based on this 6-factor measurement model, with the fitting of successively more constrained (nested) models to observed covariance matrices (derived off food-related cognitive dissonance items) in ascertaining measurement invariance across the three study conditions. In this instance, results showed that the minimally required metric invariance was obtained (see Table 5.3 – M2 *vs.* M3).

Model specification across groups	*df*	χ^2	Model comparison	Δdf	$\Delta\chi^2$	CFI	NNFI	IFI	RMSEA	SRMR
M1	396	5521.288	-	-	-	0.635	0.577	0.637	0.145	0.179
M2	360	991.141	M1 *vs.* M2	36	4530.147*	0.955	0.943	0.955	0.054	0.032
M3	384	1020.014	M2 *vs.* M3	24	28.873	0.955	0.946	0.955	0.052	0.036
M4	420	1075.840	M3 *vs.* M4	36	55.826*	0.926	0.949	0.953	0.051	0.036
M5	462	1307.179	M4 *vs.* M5	42	231.339*	0.910	0.940	0.940	0.055	0.102
M6	498	1567.449	M5 *vs.* M6	36	260.27*	0.892	0.930	0.924	0.059	0.108

M1: 3 correlated factors – Free factor loading, free item intercept, free factor variance-covariance, free error variance.
M2: 6 correlated factors – Free factor loading, free item intercept, free factor variance-covariance, free error variance.
M3: 6 correlated factors – Equal factor loading, free item intercept, free factor variance-covariance, free error variance.
M4: 6 correlated factors – Equal factor loading, equal item intercept, free factor variance-covariance, free error variance.
M5: 6 correlated factors – Equal factor loading, equal item intercept, equal factor variance-covariance, free error variance.
M6: 6 correlated factors – Equal factor loading, equal item intercept, equal factor variance-covariance, equal error variance.

*p<.05

Average factor loadings (6-factor) across study conditions

Intra-FCDp_H			***Intra-FD_H***			***Intra-FCDp_VC***			***Intra-FD_VC***			***Inter-FCDp_HVC***			***Inter-FD_HVC***		
H1	H2	H3	H4	H5	H6	VC1	VC2	VC3	VC4	VC5	VC6	HVC1	HVC2	HVC3	HVC4	HVC5	HVC6
.86	.88	.77	.90	.95	.90	.96	.94	.81	.92	.95	.94	.95	.94	.89	.96	.96	.95

Table 5.3: Multiple-groups confirmatory factor analysis across study conditions (measurement invariance test) – food-related cognitive dissonance

Construct validation was further augmented by evidence of convergent validity with the finding of a statistically significant group difference in dissonance scores – *Intra-FD_H* (t(576.99)=-2.144, p=.032), *Intra-FD_VC* (t(576.35)=-2.316, p=.021) and *Inter-FD_HVC* (t(576.18)=-2.169, p=.030) – in terms of preference for consistency, such that individuals high in preference for consistency generally registered higher dissonance scores compared to individuals low in preference for consistency (see Table 5.4). Such a statistically significant group difference was, however, not found for cognitive discrepancy scores – *Intra-FCDp_H* (t(577)=-.870, p=.385), *Intra-FCDp_VC* (t(574.79)=-1.838, p=.067) and *Inter-FCDp_HVC* (t(576.88)=-1.451, p=.147) although

higher means were obtained for individuals high in preference for consistency than those low in preference for consistency (see Table 5.4). In terms of discriminant validity, dissonance scores were not significantly correlated with social desirability but cognitive discrepancy scores were significantly correlated (albeit with low coefficients) with social desirability in a negative direction (see Table 5.4).

	Preference for Consistency		
Food-related Cognitive Dissonance	***Low (n=272)***	***High (n=307)***	Correlation with ***social desirability*** *(N=615)*
Intra-FCDp_H	12.67 (3.97)	12.96 (4.18)	-.26 (*p*=.000)
Intra-FCDp_VC	12.04 (4.56)	12.76 (4.84)	-.20 (*p*=.000)
Inter-FCDp_HVC	12.32 (4.23)	12.86 (4.84)	-.16 (*p*=000)
Intra-FD_H	12.62 (3.74)	13.33 (4.24)	.01 (*p*=.722)
Intra-FD_VC	12.29 (4.08)	13.11 (4.45)	.03 (*p*=.402)
Inter-FD_HVC	12.32 (4.15)	13.10 (4.51)	-.02 (*p*=.590)

Table 5.4: Food-related cognitive dissonance constructs – means (standard deviations) by preference for consistency and correlation (Pearson's *r*) with social desirability

Internal consistency tests showed all of the 6 sub-scales to be reliable, with each possessing good Cronbach's α levels – *Intra-FCDp_H* (.876), *Intra-FD_H* (.942), *Intra-FCDp_VC* (.927), *Intra-FD_VC* (.954), *Inter-FCDp_HVC* (.948) and *Inter-FD_HVC* (.968).

- Attitude towards healthy eating and attitude towards vegetable consumption

Longitudinal measurement invariance, via the aforesaid hierarchical comparisons of nested models, was tested separately for attitude towards healthy eating and attitude towards vegetable consumption based on single-sample, observed covariance matrices of the respective attitude items in Time 1 and Time 3. With some prior adjustments made to covary error variances of scale items within each attitude construct across the respective Time 1 and Time 3 scores (to improve fit), evidence for longitudinal measurement invariance at the beta change and scalar levels were found for attitude towards healthy eating and attitude towards vegetable consumption respectively (see Table 5.5).

Attitude towards Healthy Eating

Model specification across groups	*df*	χ^2	Model comparison	Δdf	$\Delta\chi^2$	CFI	NNFI	IFI	RMSEA	SRMR
M1	79	359.534	-	-	-	0.936	0.903	0.937	0.074	0.090
M2	86	371.128	M1 *vs.* M2	7	11.594	0.935	0.910	0.936	0.073	0.090
M3	94	384.222	M2 vs. M3	8	13.094	0.934	0.916	0.934	0.071	0.090
M4	102	391.707	M3 *vs.* M4	8	7.485	0.934	0.923	0.934	0.068	0.089
M5	103	393.193	M4 *vs.* M5	1	1.486	0.934	0.923	0.934	0.068	0.090

M1: 2 correlated factors – Free factor loading, free item intercept, free factor variance-covariance, free error variance.
M2: 2 correlated factors – Equal factor loading, free item intercept, free factor variance-covariance, free error variance.
M3: 2 correlated factors – Equal factor loading, equal item intercept, free factor variance-covariance, free error variance.
M4: 2 correlated factors – Equal factor loading, equal item intercept, equal factor variance-covariance, free error variance.
M5: 2 correlated factors – Equal factor loading, equal item intercept, equal factor variance-covariance, equal error variance.

Attitude towards Vegetable Consumption

Model specification across groups	*df*	χ^2	Model comparison	Δdf	$\Delta\chi^2$	CFI	NNFI	IFI	RMSEA	SRMR
M1	21	201.599	-	-	-	0.970	0.937	0.971	0.118	0.035
M2	25	210.635	M1 *vs.* M2	4	9.036	0.970	0.945	0.970	0.054	0.035
M3	30	220.809	M2 *vs.* M3	5	10.174	0.969	0.953	0.969	0.052	0.035
M4	35	240.312	M3 *vs.* M4	5	19.503*	0.969	0.957	0.966	0.051	0.036
M5	36	240.381	M4 *vs.* M5	1	0.069	0.967	0.958	0.967	0.059	0.036

M1: 2 correlated factors – Free factor loading, free item intercept, free factor variance-covariance, free error variance.
M2: 2 correlated factors – Equal factor loading, free item intercept, free factor variance-covariance, free error variance.
M3: 2 correlated factors – Equal factor loading, equal item intercept, free factor variance-covariance, free error variance.
M4: 2 correlated factors – Equal factor loading, equal item intercept, equal factor variance-covariance, free error variance.
M5: 2 correlated factors – Equal factor loading, equal item intercept, equal factor variance-covariance, equal error variance.

*$p<.05$

Table 5.5: Longitudinal measurement invariance test – attitude towards healthy eating & attitude towards vegetable consumption

Cronbach's α reliability tests for the attitude towards healthy eating measurement showed it to be reliable at Time 1 (.832) and Time 3 (.802); the attitude towards vegetable consumption measure was likewise found to be reliable at Time 1 (.917) and Time 3 (.930).

5.3.2 Path model(s)

- Pre-SEM analyses

Prior to SEM analysis, preliminary analyses were undertaken to assess (1) if there were significant differences in food-related cognitive dissonance between the study conditions and (2) if post-treatment attitudinal and behavioural outcomes differed significantly from pre-treatment baselines overall as well as per study condition. In the first instance, one-way analysis of variance (ANOVA), with study condition as the independent variable and the respectively summed cognitive discrepancy and dissonance

measures as the dependent variables, revealed significant differences for the dissonance constructs but not for the cognitive discrepancy constructs (see Table 5.6).

Condition / Cognitive dissonance type	***Trt1_H – Healthy Eating*** *(n=205)*	***Trt2_VC – Vegetable Consumption*** *(n=205)*	***Ctrl – Control*** *(n=205)*	**One-way ANOVA**
Intra-attitudinal cognitive discrepancy related to healthy eating (Intra-FCDp_H)	12.72 (3.83)	12.52 (4.34)	13.31 (3.92)	$F(2, 612)=2.133$, $p=.119$
Intra-attitudinal dissonance related to healthy eating (Intra-FD_H)	13.39 (3.79)	12.32 (4.46)	13.27 (3.63)	$F(2, 612)=4.432$, $p=.012$
Intra-attitudinal cognitive discrepancy related to vegetable consumption (Intra-FCDp_VC)	12.29 (4.68)	11.93 (4.93)	12.92 (4.53)	$F(2, 612)=2.276$, $p=.104$
Intra-attitudinal dissonance related to vegetable consumption (Intra-FD_VC)	12.48 (4.30)	12.28 (4.39)	13.32 (4.10)	$F(2, 612)=3.424$, $p=033$
Inter-attitudinal cognitive discrepancy related to healthy eating and vegetable consumption (Intra-FCDp_HVC)	12.48 (4.51)	12.25 (4.74)	12.99 (4.36)	$F(2, 612)=1.450$, $p=.235$
Inter-attitudinal dissonance related to healthy eating and vegetable consumption (Intra-FD_HVC)	12.53 (4.31)	12.24 (4.61)	13.39 (4.04)	$F(2, 612)=3.888$, $p=.021$

Table 5.6: Mean intra- and inter-attitudinal cognitive discrepancy and dissonance scores (with standard deviation in parentheses) by study condition with one-way ANOVA results

Post hoc comparisons showed that *Intra-FD_H* was significantly higher in *Trt1_H* ($p=.018$) and *Ctrl* ($p=.043$) compared to *Trt2_VC*; *Intra-FD_VC* was significantly higher in *Ctrl* than in *Trt2_VC* ($p=.037$); and *Inter-FD_HVC* was significantly higher in *Ctrl* than in *Trt2_VC* ($p=.020$). Whilst the pattern of results here provided further evidence that demonstrated the distinctiveness of the cognitive discrepancy and dissonance constructs, it showed the experimental manipulations of cognitive dissonance arousal to be slightly mixed in terms of effectiveness, with that in *Trt1_H* but not *Trt2_VC*, occurring as expected. Moreover, in the *Ctrl* condition, three dissonance scores were unexpectedly, significantly higher than their counterparts in the *Trt2_VC* condition. It is important to note, however, that whilst the various dissonance scores did not differ as expected in relative terms, given that an aggregate dissonance score could range in value from 3 to 21, the mean aggregate dissonance score range of 12 to 14 achieved within study conditions indicated that the various dissonances were fairly experienced in absolute terms.

A 3 (study condition) x 2 (pre-, post-treatment) mixed ANOVA conducted in the second instance, showed that there was no significant main effect of study condition on the pre- and post-treatment scores for all the attitudinal and behavioural dependent variables (see Table 5.7).

Outcome / **Condition**	***Attitude towards Healthy Eating (Att_H)***		***Attitude towards Vegetable Consumption (Att_VC)***		***Estimated Actual Vegetable Consumption (Act_VC)***	
	Pre-treatment: Time 1 (Att_H1)	***Post-treatment: Time 3 (Att_H3)***	***Pre-treatment: Time 1 (Att_VC1)***	***Pre-treatment: Time 3 (Att_VC3)***	***Pre-treatment: Time 2 (Act_VC2)***	***Pre-treatment: Time 3 (Act_VC3)***
Treatment 1 (Trt1_H) - summed mean	34.27 (7.254)	34.81 (6.642)	26.54 (5.846)	26.47 (5.610)	379.69 (154.546)	385.07 (155.500)
- item mean	4.28 (.907)	4.35 (.83)	5.31 (1.169)	5.29 (1.122)		
Treatment 2 (Trt2_VC) - summed mean	33.53 (7.388)	33.78 (7.217)	26.57 (5.710)	26.17 (5.586)	372.79 (151.415)	401.65 (148.384)
- item mean	4.19 (.924)	4.22 (.902)	5.31 (1.142)	5.23 (1.197)		
Control (Ctrl) - summed mean	33.85 (7.478)	34.52 (6.675)	26.61 (5.828)	26.13 (5.885)	371.08 (168.642)	383.64 (159.463)
- item mean	4.23 (.935)	4.32 (.834)	5.32 (1.166)	5.23 (1.177)		
Overall - summed mean	33.88 (7.368)	34.37 (6.852)	26.58 (5.786)	26.26 (5.822)	374.52 (158.164)	390.12 (154.482)
- item mean	4.23 (.921)	4.30 (.857)	5.32 (1.157)	5.25 (1.164)		
3 (Study Condition) x 2 (Pre-, Post-Treatment) Mixed ANOVA	Main effect ▪ Study Condition: $F(2, 612)=.918$, $p=.40$ ▪ Pre-, Post-treatment: $F(1, 612)=6.277$, $p=.012$ Interaction effect ▪ Study Condition x Pre-, Post-treatment: $F(2, 612)=.402$, $p=.669$		Main effect ▪ Study Condition: $F(2, 612)=.042$, $p=.959$ ▪ Pre-, Post-treatment: $F(1, 612)=4.312$, $p=.038$ Interaction effect ▪ Study Condition x Pre-, Post-treatment: $F(2, 612)=.687$, $p=.503$		Main effect ▪ Study Condition: $F(2, 612)=.235$, $p=.790$ ▪ Pre-, Post-treatment: $F(1, 612)=11.295$, $p=.001$ Interaction effect ▪ Study Condition x Pre-, Post-treatment: $F(2, 612)=2.24$, $p=.107$	

Table 5.7: Mean attitude towards healthy eating, attitude towards vegetable consumption and estimated actual vegetable consumption scores (with standard deviation in parentheses) overall, and by study condition, and pre-, post-treatment with 3 x 2 mixed ANOVA results

However, there was a significant main pre-, post-treatment effect such that statistically significant differences were found between pre- and post-treatment scores for all the attitudinal and behavioural dependent variables (see Table 5.7). Specifically, on average, (i) attitude towards healthy eating scores were significantly higher in post-treatment than pre-treatment (Cohen's *d*=-.07), (ii) attitude towards vegetable consumption scores were significantly lower in post-treatment than pre-treatment (Cohen's *d*=.06), and (iii) estimated actual vegetable consumption scores were significantly higher in post-treatment than pre-treatment (Cohen's *d*=-.10). In view of this, even though no overall significant interaction effects between study condition and pre, post-treatment were found for all dependent variables, simple main effect analyses were conducted to examine the difference between pre- and post-treatment dependent variable scores per study condition. In this instance, statistically significant differences were found between (iv) estimated actual vegetable consumption scores at Time 2 (M=372.79, SD=151.42) and Time 3 (M=401.65, SD=148.38) in the *Trt2_VC* condition, $F(1, 612)=12.886$, $p=.000$, and between (v) attitude towards healthy eating scores at Time 1 (M=33.85, SD=7.48) and Time 3 (M=34.52, SD=6.68) in the *Ctrl* condition, $F(1, 612)=3.958$, $p=.047$. In summary, increases in actual vegetable consumption (Cohen's *d*=-.19) and attitude towards healthy eating (Cohen's *d*=-.09) were found for the *Trt2_VC* and *Ctrl* conditions respectively.

- SEM analyses

Given the statistically significant difference in pre- and post-treatment, estimated actual vegetable consumption scores for *Trt2_VC*, SEM analysis[21] was first and foremost conducted for the data points involving the food-related cognitive dissonance constructs and the post-treatment attitudinal and behavioural outcome variables in this study condition. In this instance, the hypothesized sequential effect path model ($\chi^2=1320.312$, $df=443$) was first tested and found to have fair fit – .870 (CFI), .854 (NNFI), .871 (IFI), .099 (RMSEA) and .193 (SRMR). The hypothesized simultaneous effect path model ($\chi^2=1320.166$, $df=442$) was next tested and found to have identically fair fit – .870 (CFI), .854 (NNFI), .871 (IFI), .099 (RMSEA) and .193 (SRMR). A Chi-square difference test between the two models showed that the less constrained simultaneous effect model was not a better model than the more constrained sequential effect model,

[21] As the path model(s) included a single-indicator latent variable (i.e., actual vegetable consumption), model identification was facilitated by fixing the latter's indicator factor loading to 1 and the error variance to a value based on the indicator's variance and its (assumed) reliability (Brown, 2006, p. 139; Hayduk, 1987).

$\Delta\chi^2$=.146, *p*=.702 (Δdf=1). The sequential effect model was thus used as the base model and adjustments were then made to it based on (1) statistical significance of parameter estimates and (2) modification indices to improve model fit. The final, resultant modified model showed improved fit indices – .945 (CFI), .938 (NNFI), .945 (IFI), .064 (RMSEA) and .0892 (SRMR) – and was accepted as adequate after additionally assessing it for conceptual soundness. This model is illustrated in Figure 5.5 with all the statistically significant path estimates indicated, and the crucial structural paths linking relevant latent variables to actual vegetable consumption highlighted in bold.

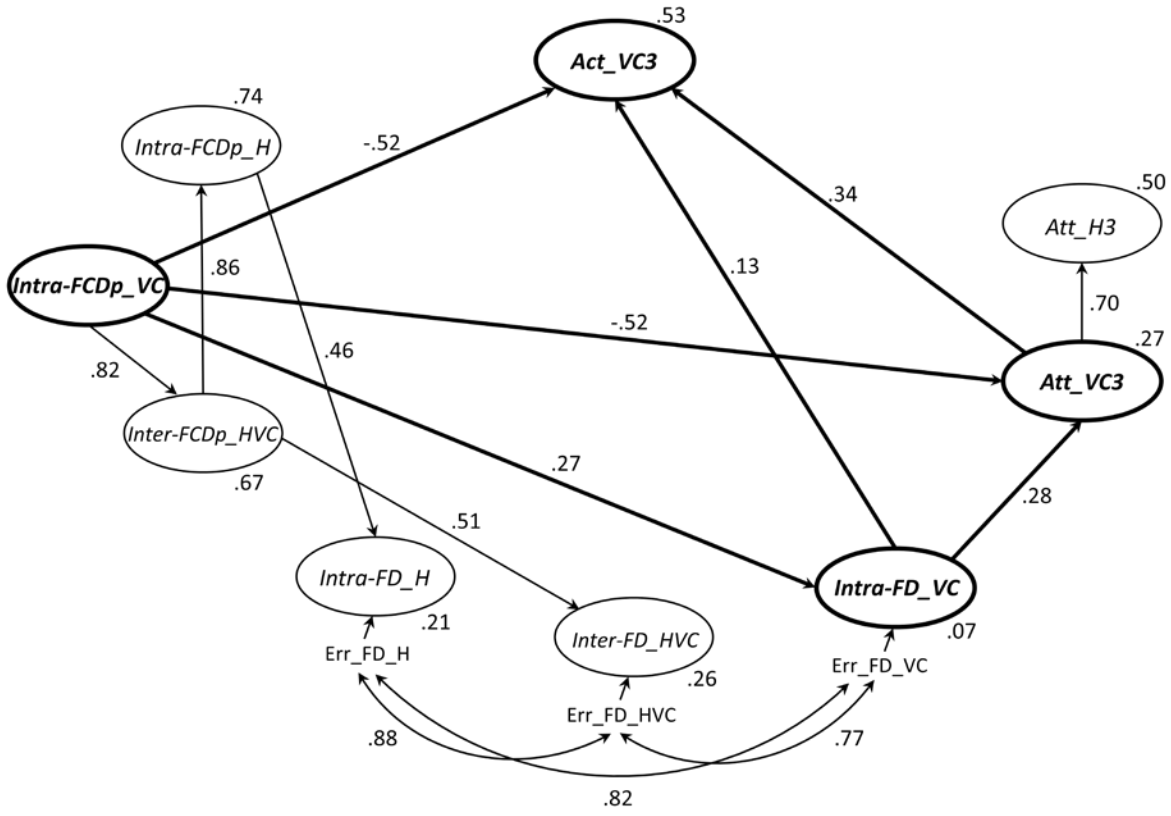


Figure 5.5: SEM analysis for treatment 2 (vegetable consumption) condition

As might be seen, *Act_VC3* was directly impacted by *Intra-FCDp_VC*, *Intra-FD_VC* and *Att_VC3*, with the former two variables additionally influencing it through indirect pathways. Given the various possible indirect effects in this instance, the SEM was re-run based on the final accepted model with bootstrapping (1000 samples), which additionally afforded the advantage of analysis taking into account sample size inadequacy and data non-normality (Cheung & Lau, 2008), if any. The results are presented in Table 5.8.

	Standardized Direct Effects			Standardized Indirect Effects			Standardized Total Effects		
	Intra-FCDp_VC	***Intra-FD_VC***	***Att_VC3***	***Intra-FCDp_VC***	***Intra-FD_VC***	***Att_VC3***	***Intra-FCDp_VC***	***Intra-FD_VC***	***Att_VC3***
Att_VC3	-.52 (*p*=.002); 95% *CI*: -.65~-.40	.28 (*p*=.002); 95% *CI*: .14~.43	-	.08 (*p*=.001); 95%*CI*: .03~.16	-	-	-.44 (*p*=.002); 95% *CI*: -.56~-.30	.28 (*p*=.002); 95% *CI*: .14~.43	-
Act_VC3	-.52 (*p*=.002); 95% *CI*: -.66~-.39	.13 (*p*=.034); 95% *CI*: .01~.27	.34 (*p*=.002); 95% *CI*: .18~.49	-.11 (*p*=.038); 95% *CI*: -.22~-.01	.10 (*p*=.001); 95%*CI*: .04~.18	-	-.63 (*p*=.002); 95% *CI*: -.73~-.52	.23 (*p*=.002); 95% *CI*: .10~.35	.34 (*p*=.002); 95% *CI*: .18~.49

Table 5.8: Standardized direct, indirect and total effects in SEM analysis (with bootstrapping) for treatment 2 (vegetable consumption) condition

In sum, (1) positive attitude towards vegetable consumption predicted higher actual vegetable consumption at post-treatment; (2) greater intra-attitudinal dissonance related to vegetable consumption predicted (a) more positive attitude towards vegetable consumption and (b) higher actual vegetable consumption at post-treatment; (3) greater intra-attitudinal cognitive discrepancy related to vegetable consumption predicted (a) greater intra-attitudinal dissonance related to vegetable consumption, (b) less positive attitude towards vegetable consumption, and (c) lower actual vegetable consumption at post-treatment. Findings 3(b) and 3(c) appeared logically incongruous as greater cognitive discrepancy was expected to predict more positive attitudinal/behavioural outcomes since it led to greater dissonance that had, in turn, predicted the same outcomes positively. However, an examination of the correlations between *Intra-FCDp_VC* and pre-/post-treatment vegetable consumption attitudinal/behavioural outcomes (i.e., *Att_VC1*, *Att_VC3*, *Act_VC2* and *Act_VC3*) showed that less positive baseline (i.e., Time 1) attitude and behaviour were associated with higher cognitive discrepancy at Time 2, and this association remained when the Time 2 cognitive discrepancy score was assessed against post-treatment attitudinal and behavioural outcome scores taken in Time 3 (see Table 5.9)[22].

[22] The corresponding attitudinal dimension of dissonance was included in the correlational analysis for comparative reference. This practice holds for subsequent similar correlational analyses conducted for the other study conditions.

	Pre-treatment attitude towards vegetable consumption – Time 1 (Att_VC1)	Post-treatment attitude towards vegetable consumption – Time 3 (Att_VC3)	Pre-treatment estimated actual vegetable consumption – Time 2 (Act_VC2)	Post-treatment estimated actual vegetable consumption – Time 3 (Act_VC3)
Intra-attitudinal cognitive discrepancy related to vegetable consumption (Intra-FCDp_VC)	r=-.460, p=.000	r=-.420, p=.000	r=-.606, p=.000	r=-.533, p=.000
Intra-attitudinal dissonance related to vegetable consumption (Intra-FD_VC)	r=.094, p=.181	r=.123, p=.078	r=-.116, p=.096	r=.036, p=.610

Table 5.9: Correlations between intra-attitudinal cognitive discrepancy/dissonance related to vegetable consumption, pre- and post-treatment attitude towards vegetable consumption and pre- and post-treatment estimate actual vegetable consumption

Interpretatively, these results indicated that individuals with less positive attitude and/or behaviour towards vegetable consumption were likely to experience higher cognitive discrepancy related to vegetable consumption on going through the experimental arousal of cognitive dissonance, and this negative association appeared to be sustained over time. Apart from further reinforcing the fact that cognitive discrepancy and dissonance are separate constructs, such results imply two likely realities: (1) The experimental manipulation of cognitive dissonance arousal does not so much create cognitive discrepancies as it does merely heightening the awareness of *pre-existing* cognitive discrepancies; and (2) Any change(s) in post-treatment attitude/behaviour might more likely be in response to dissonance arousal rather than cognitive discrepancy arousal, which means any attitude/behaviour change in the form of cognitive discrepancy reduction (Harmon-Jones, 2002) would be limited. In spite of this, nonetheless, the negative link between intra-attitudinal cognitive discrepancy and actual vegetable consumption at Time 3 appeared to have been sufficiently offset by the positive, partial mediating effects of intra-attitudinal dissonance related to vegetable consumption, directly and indirectly via attitude towards vegetable consumption at Time 3, to result in a significant difference between the Time 3 consumption behaviour and its baseline in a positive direction.

SEM analysis was next undertaken for the *Ctrl* condition, given the significant, albeit unanticipated, change in pre- and post-treatment attitude towards healthy eating scores. For consistency, the initial model tested here was of the sequential-effect type,

with hypothesized path patterns following the conceptual logic used to derive the initial models of such type for the *Trt1_H* and *Trt2_VC* treatment conditions. As participants in the *Ctrl* condition directly answered cognitive dissonance questions relating to both types of attitudes without one being made more salient than the other, the root source of attitudinal structural changes within the model was hypothesized to be *Inter-FCDp_HVC* in this instance (see Figure 5.6) [23].

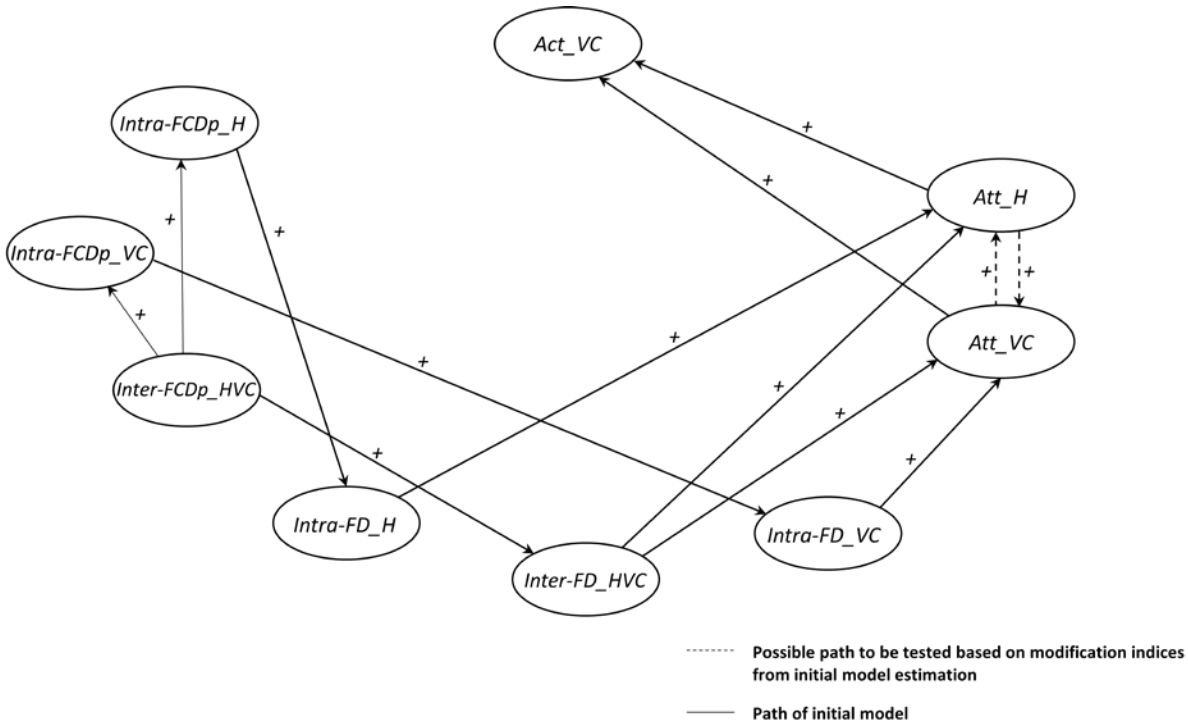


Figure 5.6: Hypothesized sequential effect path model for control condition

This initial sequential effect model (χ^2=1393.715, *df*=446) yielded fair fit indices – .855 (CFI), .838 (NNFI), .856 (IFI), .102 (RMSEA) and .211 (SRMR). A corresponding initial simultaneous effect model (χ^2=1373.961, *df*=445), in which the unidirectional paths between the cognitive discrepancy constructs were now replaced with covariance paths, was next tested. This model yielded slightly better, but still overall similar, fair fit indices – .858 (CFI), .841 (NNFI), .859 (IFI), .101 (RMSEA) and .211 (SRMR). A Chi-square difference test between the two models showed the less constrained simultaneous effect model to be a better model than the more constrained sequential effect model, $\Delta\chi^2$=19.754, *p*=.000 (Δdf=1). The simultaneous effect model was thus used as the base model and

[23] Whilst a path is expected between Att_H3 and Att_VC3, its direction may not be pre-determined and is thus left out in the initial model. Its inclusion will be based on the modification indices generated after the first run of the SEM analysis.

subjected to adjustments made based on the same considerations as before (i.e., significance of parameter estimates, modification indices and conceptual soundness). The final accepted model after adjustments had good fit – .940 (CFI), .933 (NNFI), .941 (IFI), .066 (RMSEA) and .0701 (SRMR) – and is illustrated in Figure 5.7 with all the statistically significant path estimates indicated.

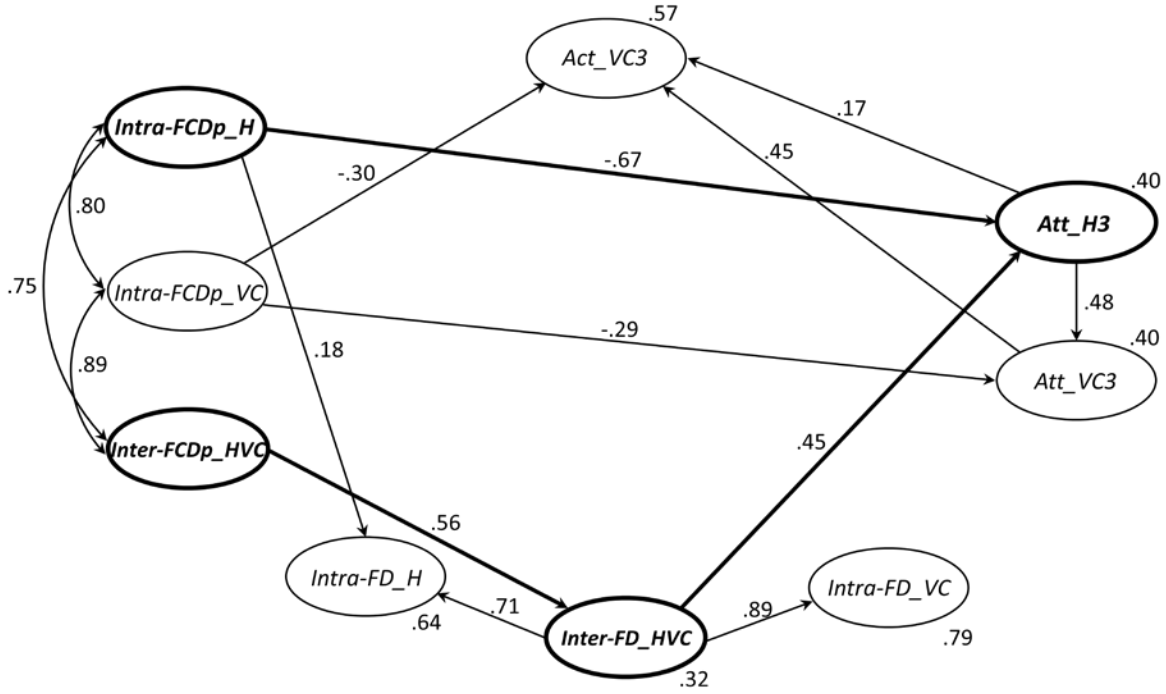


Figure 5.7: SEM analysis for control condition

Of specific relevance would be the influences on *Att_H3* (highlighted in bold in Figure 5.7), which encompassed the direct impacts of *Intra-FCDp_H* and *Inter-FD_HVC*, with the latter mediating the link between *Inter-FCDp_HVC* and *Att_H3*. A bootstrapped SEM was conducted based on the final accepted model (1000 samples), the results of which are presented in Table 5.10.

	Standardized Direct Effects			Standardized Indirect Effects			Standardized Total Effects		
	Intra-FCDp_H	***Inter-FCDp_HVC***	***Inter-FD_HVC***	***Intra-FCDp_H***	***Inter-FCDp_HVC***	***Inter-FD_HVC***	***Intra-FCDp_H***	***Inter-FCDp_HVC***	***Inter-FD_HVC***
Inter-FD_HVC	-	.56 (*p*=.001); 95% *CI*: .39~.73	-	-	-	-	-	.56 (*p*=.001); 95% *CI*: .39~.73	-
Att_H3	-.68 (*p*=.001); 95% CI: -.84~-.51	-	.45 (*p*=.001); 95%CI: .30~.63	-	.25 (*p*=.001); 95%*CI*: .15~.40	-	-.68 (*p*=.002); 95% CI: -.84~-.51	.25 (*p*=.002); 95% CI: .15~.40	.45 (*p*=.002); 95% CI: .30~.63

Table 5.10: Standardized direct, indirect and total effects in SEM analysis (with bootstrapping) for control condition

To summarise, post-treatment attitude towards healthy eating was predicted (1) negatively by its intra-attitudinal cognitive discrepancy and (2) positively by inter-attitudinal dissonance related to healthy eating and vegetable consumption, which derived from, and fully mediated the effects of[24], the corresponding inter-attitudinal cognitive discrepancy. Correlational analyses (see Table 5.11) examining the links between the cognitive discrepancy measures (i.e., *Intra-FCDp_H* and *Inter-FCDp_HVC*) and pre- and post-treatment healthy eating attitudinal outcomes (i.e., *Att_H1* and *Att_H3*) showed the former two measures to be negatively associated with the latter two measures with similar magnitudes, again suggesting limited attitudinal change(s).

	Pre-treatment attitude towards healthy eating – Time 1 (Att_H1)	**Post-treatment attitude towards healthy eating – Time 3 (Att_H3)**
Intra-attitudinal cognitive discrepancy related to healthy eating (Intra-FCDp_H)	r=-.397, p=.000	r=-.409, p=.000
Intra-attitudinal dissonance related to healthy eating (Intra-FD_H)	r=.120, p=.088	r=.123, p=.079
Inter-attitudinal cognitive discrepancy related to healthy eating & vegetable consumption (Inter-FCDp_HVC)	r=-.143, p=.040	r=-.176, p=.012
Inter-attitudinal dissonance related to healthy eating & vegetable consumption (Inter-FD_HVC)	r=.099, p=.156	r=.158, p=.024

Table 5.11: Correlations between intra-attitudinal cognitive discrepancy/dissonance related to healthy eating, inter-attitudinal cognitive discrepancy/dissonance related to healthy eating and vegetable consumption, and pre- and post-treatment attitude towards healthy eating

[24] The initial path estimate from *Inter-FCDp_HVC* to *Att_H3*, without paths from *Inter-FCDp_HVC* to *Inter-FD_HVC*, and from *Inter-FD-HVC* to *Att_H3*, was .267, *p*=.001. After including the latter two paths, the path estimate from *Inter-FCDp_HVC* to *Att_H3* became .065, *p*=.410.

However, the positive, full mediation exacted by inter-attitudinal dissonance related to healthy eating and vegetable consumption on the negative relationship between its corresponding inter-attitudinal cognitive discrepancy and attitude towards healthy eating at Time 3 sufficiently offset this limitation to improve the latter attitude significantly on the whole.

While no statistically significant changes in pre- and post-treatment scores were found for the attitudinal and behavioural measures in the *Trt1_H* condition, SEM analysis proceeded as planned to obtain an idea of the path patterns involving these outcome measures and the various food-related cognitive dissonance constructs in this condition. The initial hypothesized sequential effect model (χ^2=1230.278, *df*=444) had a fair fit – .878 (CFI), .864 (NNFI), .879 (IFI), .093 (RMSEA) and .1379 (SRMR). The corresponding simultaneous effect model (χ^2=1218.459, *df*=443) that was tested next, showed slightly better, albeit overall still similar, fair fit indices – .880 (CFI), .866 (NNFI), .881 (IFI), .093 (RMSEA) and .1381 (SRMR). A Chi-square difference test between the two models showed the less constrained simultaneous effect model to be a better model than the more constrained sequential effect model, $\Delta\chi^2$=11.819, *p*=.06 (Δ*df*=1). The simultaneous effect model was thus used as the base model upon which procedurally-consistent (as before) adjustments were made, resulting in a model with improved fit – .934 (CFI), .926 (NNFI), .935 (IFI), .069 (RMSEA) and .0661 (SRMR). This adjusted model was taken as final, and is illustrated in Figure 5.8 with all the statistically significant path estimates indicated.

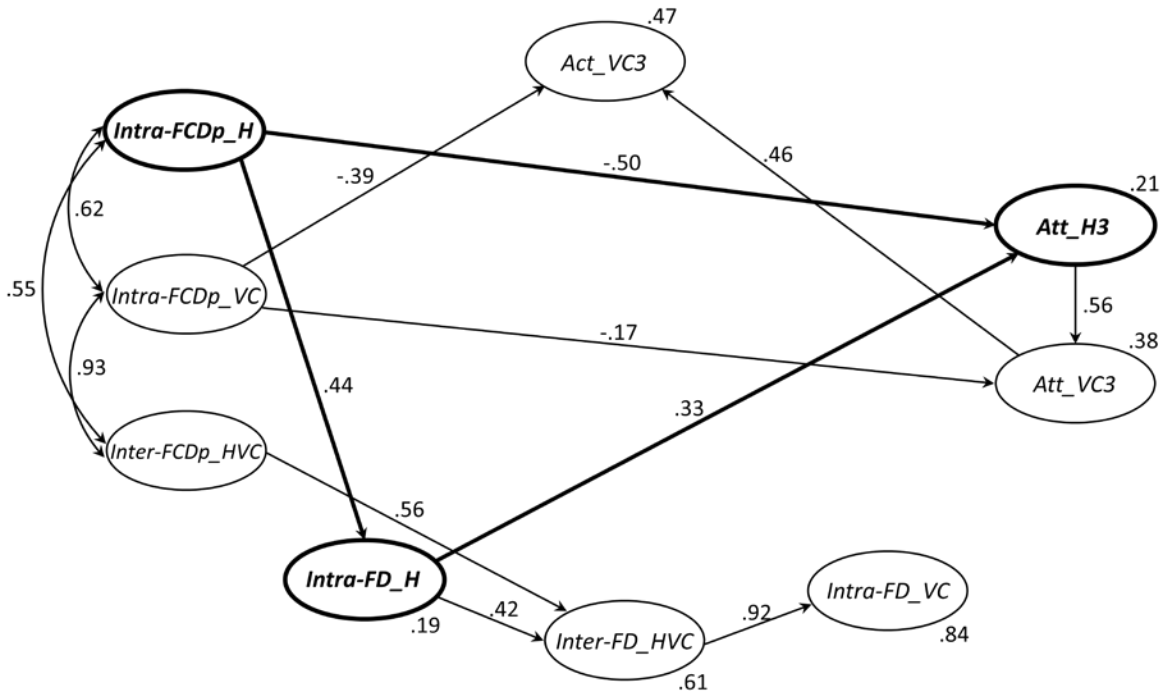


Figure 5.8: SEM analysis for treatment 1 (healthy eating) condition

Focusing on dissonance effect(s), it might be seen that *Intra-FD_H* not only directly impacted *Att_H3* but it also mediated the link between *Intra-FCDp_H* and *Att_H3* (highlighted in bold in Figure 5.7). A bootstrapped SEM was run based on the final accepted model (1000 samples), and the results are presented in Table 5.12.

	Standardized Direct Effects		**Standardized Indirect Effects**		**Standardized Total Effects**	
	Intra-FCDp_H	***Intra-FD_H***	***Intra-FCDp_H***	***Intra-FD_H***	***Intra-FCDp_H***	***Intra-FD_H***
Intra-FD_H	.44 (*p*=.002); 95% *CI*: .23~.61	-	-	-	.44 (*p*=.002); 95% *CI*: .23~.61	-
Att_H3	-.49 (*p*=.002); 95% CI: -.66~-.31	.33 (*p*=.002); 95% *CI*: .15~.49	.14 (*p*=.001); 95%*CI*: .07~.30	-	-.35 (*p*=.003); 95% CI: -.52~-.18	.33 (*p*=.002); 95% CI: .15~.49

Table 5.12: Standardized direct, indirect and total effects in SEM analysis (with bootstrapping) for treatment 1 (healthy eating) condition

In summary, post-treatment attitude towards healthy eating was directly predicted by (1) intra-attitudinal cognitive discrepancy negatively and (2) intra-attitudinal dissonance related to healthy eating positively, which also partially mediated the effects of the former. The negative correlations between the cognitive discrepancy (i.e., *Intra-FCDp_H*), and the pre- and post-treatment attitudinal outcome measures (i.e., *Att_H1* and *Att_H3*) again indicated limited attitudinal change at Time 3 (see Table 5.13).

	Pre-treatment attitude towards healthy eating – Time 1 (Att_H1)	Post-treatment attitude towards healthy eating – Time 3 (Att_H3)
Intra-attitudinal cognitive discrepancy related to healthy eating (Intra-FCDp_H)	r=-.233, p=.001	r=-.234, p=.001
Intra-attitudinal dissonance related to healthy eating (Intra-FD_H)	r=.163, p=.019	r=.154, p=.028

Table 5.13: Correlations between intra-attitudinal cognitive discrepancy/dissonance related to healthy eating, and pre- and post-treatment attitude towards healthy eating

In this instance, the positive partial mediation of the negative relationship between intra-attitudinal cognitive discrepancy related to healthy eating and attitude towards healthy eating at Time 3 by its corresponding intra-attitudinal dissonance appeared to be inadequate to offset the negativity to result in any significant attitude change from its baseline.

5.4 Discussion

The main study represents the first systematic investigation into the utility of cognitive dissonance in influencing food-related attitudes (specifically, attitude towards healthy eating and attitude towards vegetable consumption) and behaviour (namely, actual vegetable consumption) via the use of the FCD conceptual framework. By and large, utility has been demonstrated through findings that not only verified the viability of the attitudinal dimensions of food-related cognitive dissonance, but also showed differential pathways through which these variously impact upon relevant attitudinal and/or behavioural outcomes. Conceptual and applied insights into cognitive dissonance research, both in general as well as in food and nutrition, may be drawn from the main study's obtained results. These will now be discussed.

5.4.1 Distinguishing cognitive discrepancy from dissonance

The current study shows that cognitive discrepancy and dissonance are distinct but related constructs, and should be precisely referred to as the cognitive and affective aspects of the *cognitive dissonance arousal process* rather than cognitive dissonance *per se* (cf. Sweeney et al., 2000; Harmon-Jones, 2002) respectively. The obtained CFA results, as well as, results showing differential links between each construct and attitudinal/behavioural outcomes support this contention. Specifically, individuals with less positive pre-treatment attitudes and behaviour tended to experience higher cognitive

discrepancy immediately post-treatment, which in turn, predicted less positive attitudes and behaviour one week later; dissonance immediately post-treatment was not associated with baseline attitudes and behaviour but mediated the direct negative effect of cognitive discrepancy on attitudes and behaviour one week after post-treatment in a positive direction. Thus, a minor modification of the graphical representation of the FCD framework is warranted and this is presented in Figure 5.8. Going forward, it would be crucial for researchers to be mindful about using the term "cognitive dissonance arousal" instead of just "cognitive dissonance", and in the event that the latter term is used, it should be explicitly specified that it is merely a short-hand for the former term. Correspondingly, in the FCD framework, the notations, *Intra-FCD* and *Inter-FCD*, which were used to reflect intra- and inter-attitudinal food-related cognitive dissonance respectively, will no longer be utilized as such. Instead, these will henceforth be used to denote intra- and inter-attitudinal cognitive discrepancy respectively, accordingly replacing the previously used notations of *Intra-FCDp* and *Inter-FCDp* for simplification.

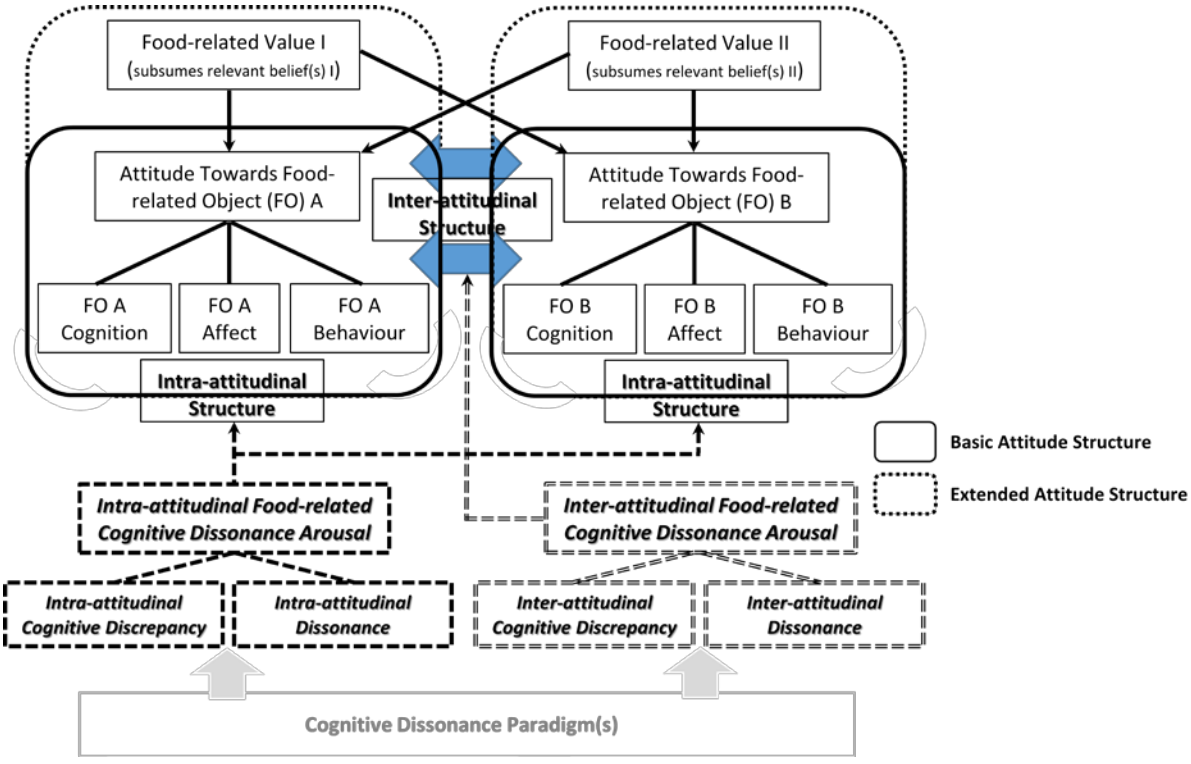


Figure 5.9: Revised food cognition dissonance (FCD) conceptual framework

The distinction between cognitive discrepancy and dissonance is important as it has several implications:

- Cognitive dissonance paradigm(s) and cognitive dissonance arousal

Given the finding that dissonance but not cognitive discrepancy scores differed between study conditions, more than merely dictating the conditions under which cognitive inconsistency would lead to cognitive dissonance, in the context of survey-based, field experiments dealing with actual food-related attitudes and/or behaviours at least, cognitive dissonance paradigms might be more precisely seen to involve the elicitation of dissonance(s) through making salient, and bringing into conscious awareness, *(pre-)existing* cognitive discrepancies, under specific circumstances. This explains why, particularly in the control condition, by simply, and directly, asking individuals to assess how different their current behaviours are from their thoughts can lead them to experience discomfort. Such a phenomenon is akin to the *mere-measurement* or *question-behaviour effect*, which demonstrates how measurement increases attitude accessibility, thereby influencing behaviour (Morwitz & Fitzsimons, 2004; Wood, Conner, Sandberg, Godin & Sheeran, 2014). Self-reflection is congruent with the cognitive consistency perspective of the FCD framework, and in the context of self-report, the tendency for a discrepancy assessment to be negatively associated with social desirability appears low, whilst report of dissonance experienced is almost totally independent of social desirability. Based on the results of the current study, such direct self-reflection not only serves the dual purpose of being an explicit measurement of cognitive discrepancy but also appears as, if not more, effective than the *hypocrisy* paradigm in arousing dissonance. Contrary to the stipulation that the *hypocrisy* paradigm works only when one has a positive attitude towards a specific attitude object (Stone & Fernandez, 2008), the results presented here suggest that discrepancy and dissonance are more likely to occur when one espouses certain standards to follow but is then made aware of one's own actual attitude (towards the relevant attitude object) falling short of these standards. This is reflected by the findings of (1) negative correlations amongst the discrepancy, dissonance and attitude/behaviour measures and (2) comparatively more/less positive vegetable consumption/healthy eating attitudes. This potentially explains the lack of dissonance arousal related to vegetable consumption in the *Trt2_VC* condition, and the significant dissonance arousal related to healthy eating in the *Trt1_H* condition.

Overall, this study thus provides a protocol blueprint that describes and supports the simultaneous manipulation and measurement of both cognitive discrepancy and dissonance for future cognitive dissonance research in food and nutrition, constituting what might be considered a (new) cognitive dissonance paradigm termed the *mere-measurement* or *question-behaviour paradigm*.

- Reducing cognitive discrepancy *vs.* reducing dissonance

Harmon-Jones (2002) had referred to dissonance as the affective motivational state resulting from cognitive inconsistency, which is cognitive discrepancy, and the cognitive and behavioural changes that result from the affective motivational state of dissonance as cognitive discrepancy reduction. Current results showing that attitudinal and/or behavioural changes occurred due to dissonance mediating the link between cognitive discrepancy and the concerned attitudes and/or behaviours support the link between dissonance and cognitive/behavioural changes. However, looking at the similarly sized, negative correlations between the cognitive discrepancy and pre-/post-treatment attitudinal/behavioural outcome scores, and in particular, the latter's mean differences and their associated effect sizes, it appears that cognitive discrepancy might not have necessarily been drastically reduced despite statistical significance indications.

As the affective aspect of cognitive dissonance arousal, beyond merely being a motivational state, dissonance is an aversive state of psychological discomfort in and of itself (e.g., Gawronski, 2012). Thus, the pattern of results here suggests the possibility that changes in attitudinal/behavioural responses, at least in the shorter term, might reflect efforts *aimed at reducing psychological discomfort rather than cognitive inconsistency per se* – individuals modify their cognitions and/or behaviours just amply to reduce dissonance but not necessarily enough to reduce cognitive discrepancy appreciatively (for substantive attitude change); to achieve the latter, in this instance, perhaps a sustained period of such affective-based change might be necessary for a cumulative cognitive-based change in the longer term (cf. Keller & Block, 1999) – this could explain why it is oftentimes not easy to change individual attitudes, particularly those that have been well established, overnight (e.g., Eagly & Chaiken, 1993; Shepherd, 2002). If so, this implies that individuals might be able to live with cognitive discrepancies as long as they are not reminded or made aware of their existence.

At the same time, it should be noted that the dissonance(s) elicited must be sufficiently large to cause statistically significant changes in attitudinal/behavioural outcomes. The findings indicate that this is more likely to occur when (i) there are more numbers of positive paths leading from the dissonance construct(s) to a given attitudinal/behavioural outcome, and/or (ii) the negative path(s) from the cognitive discrepancy construct(s) to a given attitudinal/behavioural outcome is *fully* mediated by the dissonance construct(s). Thus, if conditions (i) and (ii) were to be combined in a way that results in sizeable arousal of dissonance(s) being brought to bear upon a given attitudinal/behavioural outcome, then substantive attitude change could theoretically occur in the shorter term as more of the negative effect(s) of cognitive discrepancy on the attitudinal/behavioural outcome would be (fully) negated, corresponding potentially to greater cognitive discrepancy reduction – this could explain how and why a health scare related self-reflection could lead to relatively swift and substantial changes in lifestyle, including diet and exercise, (e.g., Bennet, Gruszczynska & Marke, 2016).

Regardless, given the cognitive discrepancy-dissonance distinction, the crucial point of note here is that cognitive dissonance resolution might not only entail cognitive discrepancy reduction (longer term aim) but also dissonance reduction (shorter term aim), and as such, should be reflected in the cognitive dissonance process as part of the cognitive dissonance resolution sub-process (see Figure 5.9).

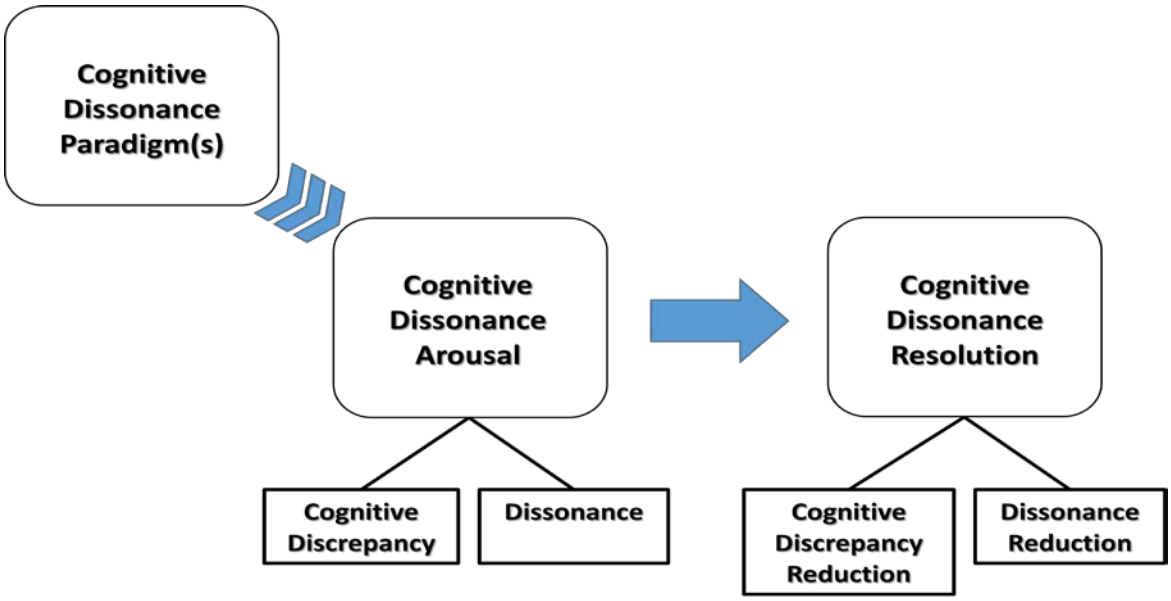


Figure 5.10: Revised cognitive dissonance process

Such a delineation might present a plausible compatibility fix to the ego-defence (e.g., Stone & Focella, 2011) *vs.* cognitive consistency (e.g., Gawronski, 2012) perspectives of cognitive dissonance effects, with the former potentially explaining dissonance reduction and the latter potentially explaining cognitive discrepancy reduction. At the same time, in the context of the life course perspective as derived from the secondary thematic analyses of the preliminary study, it might also be logically suggested that cognitive discrepancy reduction could potentially act as turning point(s) to change food choice trajectories whereas dissonance reduction potentially only serve to hasten transitions within food choice trajectories. To verify all aforesaid possibilities, nonetheless, it'd be necessary for researchers to continue making the distinction between cognitive discrepancy and dissonance going forward, and to measure these constructs, together with appropriate attitudinal/behavioural outcomes, at two (or more) time points post-treatment to more precisely gauge the underlying cognitive dissonance resolution mechanics.

5.4.2 Targeting superordinate- vs. subordinate-level attitude objects in dissonance arousal

Taken against the backdrop of two distinct but related attitude objects, the obtained results show that whilst cognitive discrepancy would *usually* lead to dissonance, this might not *always* be the case, and the dissonance aroused, if any, might not always impact on attitudinal/behavioural outcomes. The eventuality seems dependent on the source of cognitive inconsistency, in terms of the specific attitude object from which the cognitive discrepancy originates, as this largely determines the specific dissonance(s) aroused – only dissonance(s) relevant to the attitudinal/behavioural outcomes in question would exact an influence.

In the current study, when cognitive discrepancy within the internal structure of the subordinate-level attitude towards vegetable consumption (i.e., *Intra-FCD_VC*) was evoked, it sequentially triggered cognitive discrepancy within the internal structure of the superordinate-level attitude towards healthy eating (i.e., *Intra-FCD_H*) via the cognitive discrepancy created in the external structure of the two said attitude objects (i.e., *Inter-FCD_HVC*). These led to corresponding dissonances, but only dissonance aroused within the internal structure of the vegetable consumption attitude (i.e., *Intra-FD_VC*) led to relatively substantive changes in actual vegetable consumption, both directly and indirectly through its respective attitude. On the other hand, when cognitive discrepancy within the internal structure of the superordinate-level attitude towards healthy eating (i.e.,

Intra-FCD_H) was elicited, cognitive discrepancies within the internal structure of the subordinate-level vegetable consumption attitude (i.e., *Intra-FCD_VC*) and external structure linking the two said attitude objects (i.e., *Inter-FCD_HVC*), triggered simultaneously. In this instance, however, only dissonances aroused within the internal structure of the healthy eating attitude (i.e., *Intra-FD_H*) and external structure linking the healthy eating and vegetable consumption attitudes (i.e., *Inter-FD_HVC*) correspondingly followed, with the former impacting on healthy eating attitude. A similar simultaneous effect pattern was obtained when neither attitude objects were targeted for cognitive discrepancy arousal, implying that in a "neutral" instance like this, the subordinate-level attitude object (i.e., vegetable consumption) would be superseded by the superordinate-level attitude object (i.e., healthy eating). In this instance, however, it was dissonance aroused in the external attitudinal structure related to healthy eating and vegetable consumption (i.e., *Inter-FD_HVC*) that had a substantive effect on healthy eating attitude. In explaining this, it might been seen, as suggested by the covariance estimates amongst the various cognitive discrepancies, that compared to when healthy eating was specifically targeted for cognitive dissonance arousal, thoughts about the subordinate-level attitude object of vegetable consumption seemed to have meshed more in unison with thoughts about the superordinate-level attitude object of healthy eating, thereby facilitating the latter's augmentation, when no specific attitude object was targeted in arousal.

Looking at the estimates of the unidirectional paths between the three cognitive discrepancy constructs in the final sequential effect model of *Trt2_VC*, it might be tentatively surmised that in order for dissonance(s) aroused to have a substantive impact on attitudinal/behavioural outcomes (in the context of positively influencing these outcomes), the relevant cognitive discrepancies must strongly relate to each other in a congruent manner, regardless of whether these trigger simultaneously or sequentially. However, this additionally implies the necessity for a corresponding cognitive discrepancy-based arousal of dissonance as dissonance aroused without a corresponding cognitive discrepancy is likely to have little to no impact on attitudes and/or behaviours. Cognitive discrepancy-based dissonance arousal appears to be facilitated by the sequential rather than simultaneous effect model, as observed from the simultaneous effect models in the *Trt1_H* and *Ctrl* conditions, where intra-attitudinal dissonance related to vegetable consumption (i.e., *Inter-FD_VC*) arose only directly from the onset of one of

the other two types of dissonance and was inconsequential to the measured attitudinal/behavioural outcomes.

Given a related superordinate-subordinate attitude object pair, the current results thus show that (1) sequential/simultaneous trigger of cognitive discrepancies is more/less likely to result in corresponding dissonances, and occurs bottom-up/top-down, (2) only the dissonance(s) relevant to the attitudinal/behavioural outcomes would have effect(s) on the latter, and (3) although a positive link might exist between the superordinate-level attitude towards healthy eating and the subordinate-level attitude towards vegetable consumption in terms of pre- and post-treatment scores, significant dissonance-based changes in one do not necessarily correspond to similar changes in the other, showing a limit to the spreading activation effect (Dinauer & Fink, 2005). Point (3) is likely to be especially true if/when the subordinate-level attitude object does not constitute a primary core of the superordinate-level attitude object – in the current situation, for instance, healthy eating involves more than just vegetable consumption and may include other things like reducing meat consumption, lowering sugar intake, etc. (e.g., Bisogni, Jastran, Seligson & Thompson, 2012).

5.4.3 Other – Cognitive dissonance resolution strategy

A note of interest would be the finding that whilst attitude towards healthy eating and actual vegetable consumption scores increased from pre- to post-treatment, attitude towards vegetable consumption decreased over that same timeline. Effect sizes notwithstanding, in terms of vegetable consumption, a strategy in cognitive dissonance resolution thus appears to be increasing one's actual vegetable consumption (behaviour) whilst simultaneously decreasing one's attitude towards it (cognition) in bridging intra-attitudinal cognitive discrepancy related to vegetable consumption (i.e., *Intra-FCD_VC*). Over time, this could likely place a ceiling on how much vegetable consumption might be raised ultimately, given the attitude-behaviour link. If this is true, the challenge then, in this instance, would be to examine how cognitive dissonance arousal might be manipulated to still preserve its overall positive impact on increasing vegetable consumption behaviour but lead to an improvement in vegetable consumption attitude at the same time. Future work could look into the use of the induced compliance paradigm in cognitive dissonance arousal to investigate if this might present a potential solution (Freijy & Kothe, 2013).

5.4.4 Applied implications

Based on the theoretical conclusions, in using food-related cognitive dissonance to change food-related attitudes and/or behaviours, the suggested applied principles would be:

- **Target attitude object should be focused upon with sufficient specificity** to maximise dissonance effects by ensuring that cognitive dissonance arousal at the intra-attitudinal level closely matches the specified attitudinal/behavioural characteristics, particularly for superordinate attitude objects that encompass wide sets of characteristics, therein potentially subsuming other subordinate attitude objects.
- **Other related and/or relevant attitude objects should be brought in** to bolster the focus and importance of the target attitude object but not to replace it as focus, particularly if the former is a superordinate attitude object that subsumes other subordinate attitude objects besides the latter. This is to avoid creating intra-attitudinal cognitive dissonance in terms of the other attitude objects but at the same time, evoking cognitive discrepancy, and subsequently dissonance, in terms of the inter-attitudinal structure(s) between these other attitude objects with the target attitude object. The more such other related attitude objects are brought to bear, the better.
- **Cognitive paradigms used to arouse cognitive dissonance should be chosen with care**. To draw individuals into linking the target attitude object with other related attitude objects and yet still be able to have them keep the focus on the former, the self-reflection protocol used in the current study presents a potentially useful means of highlighting the appropriate cognitive discrepancies to arouse the corresponding dissonances required for attitudinal/behavioural change(s), over and beyond the use of the *hypocrisy* paradigm to target a specific attitude object (bearing in mind that the application of the *hypocrisy* paradigm is recommended when the actual target attitude falls short of acknowledged standards).

5.4.5 Limitations

Whilst the current initial efficacy test of the utility of cognitive dissonance in influencing food-related attitudes/behaviours has provided specific conceptual and applied insights, it has, nonetheless, several limitations that need to be noted and discussed.

1. Experimental manipulation of cognitive dissonance arousal

Although the unexpected patterns of cognitive dissonance arousal amongst the study conditions were accounted for via appealing to (a) the distinction between the cognitive discrepancy and dissonance constructs, and (b) the differential effects of different cognitive dissonance paradigms, there is no denying that the experimental manipulation of cognitive dissonance arousal appeared to be comparatively more effective in discriminating the different study conditions in the pilot study than in the main study. In this instance, potential factors that could account for the difference in discriminative power include methodology-related changes to the following:

- Essay instructions targeting 12-year-old youths

With younger children normally seen to be more vulnerable to environmental health risks (WHO, 2017), increasing the age of the target group for advice receipt in the essay from 10-year-olds to 12-year-olds might have lessen perceptions of vulnerability, leading to participants having less personal investment, and thus, conviction, in the essay write-up, thereby affecting the degree of cognitive dissonance experience. Future research might see fit to take this into consideration when using the *hypocrisy* paradigm to arouse cognitive dissonance. Alternatively, future research might focus on the essay methodology to induce hypocrisy to arouse cognitive dissonance *sans* a specific audience. This is the standard approach used in cognitive dissonance studies utilizing the paradigm (e.g., Stellefson et al., 2006).

- Phrasing of the cognitive dissonance assessment items

The cognitive dissonance measurement items, particularly the dissonance items, were phrased more tentatively in the pilot study but more definitively in the main study. Participants might have been more ready to commit themselves on the more tentative statements than on the more definitive ones. Future work in cognitive dissonance research might consider reviewing dissonance measurement and ascertaining better ways of phrasing the measurement items in order to increase their effectiveness.

- Number of measurement items per cognitive dissonance dimension

Whilst the reduction in the number of measurement items per cognitive dissonance dimension from four (pilot study) to three (main study) in order were deemed necessary to reduce subject fatigue in survey-taking, it, nevertheless, might

have led to range restriction in measurement that affected their discriminative capacities. Future research could look into increasing the number of measurement items per cognitive dissonance dimension to circumvent this problem.

- Mode of survey administration from paper-and-pencil to online completion

The paper-and-pencil mode of survey administration used in the pilot study was done face-to-face, which translated to mean immediacy in survey completion, with fewer distractions. Aside from affording comparatively less immediacy, online survey-taking also entails less experimental control, which might mean the presence of extraneous variable(s) that could have resulted in the unanticipated differentials. Future research needs to balance these considerations with practical, logistical concerns in survey administration to arrive at an optimal mode of data collection.

- Control condition parameters

In the main study, control condition participants were given the cognitive dissonance measures to complete without the need to perform any other activity, a procedure that is common practice in cognitive dissonance studies using the *hypocrisy* paradigm (e.g., Petersen, Haynes & Olson, 2008; Stone & Fernandez, 2008). Nonetheless, it is also commonplace for studies to employ a control condition in which participants engage in a similar (but neutral) activity to that in the experimental condition. For example, in their experimental conditions, Stellefson et al. (2006) had their participants write an essay on why healthy diet and physical activity were important either to maintaining one's health (dissonance-health condition), or to maintain an attractive physical appearance (dissonance-appearance condition) but in the control condition, participants were asked to write an essay about their favourite movie. Future research might consider using such a method of experimental control, over and beyond the type which was used in the current main study to examine if there would be any difference(s) in result in different outcomes.

Despite the above, it must be reiterated that fair levels of dissonance were experienced in the study conditions in absolute terms, and as such, the SEM analyses reported were not invalid. Nonetheless, had the experimental arousal of dissonance been more effective to correspondingly result in higher levels of experienced dissonance, then perhaps greater effect sizes might have been obtained with regards to attitudinal and/or behavioural outcome changes than the current marginal to small effect sizes achieved. An

ascertainment of actual effect size(s) is important as it could determine if a dissonance-based strategy is sufficient on its own (large effect size) as a change strategy or should it be used as a supplement (small effect size) to some other main attitude/behaviour change strategy.

2. Measurement of actual vegetable consumption

The use of a visual analogue rating scale in the estimation of actual vegetable consumption was another potential limitation in the main study. Whilst efforts were taken to increase estimation accuracy through the provision of a pictorial presentation of what constituted the daily recommended intake of 2½ cups of vegetables serving as a reference point[25], validity of the estimation could be increased via triangulating the responses on the visual analogue rating scale with responses on other modes of measurement such as keeping a food diary, recording observations, etc.

3. Intra- and inter-cultural differences

Although a stratified sampling approach was taken to achieve sub-sample demographic characteristics representativeness and equality as much as possible within and across study conditions based on the strata of ethnicity, and gender by age, the constraint placed by the requirement of a diploma or higher education qualification resulted in a sample of participants, in which there were more Chinese than other ethnic groups and more males than females within study conditions. The difficulty in obtaining the planned strata within study conditions might be attributed to ethnic and gender inequalities in educational qualifications, with more Chinese/males possessing diploma or higher educational qualifications compared to the other ethnic groups/females (Department of Statistics, Singapore, 2016). Despite achieving strata proportions that remained relatively consistent across study conditions, future research might consider removing the educational status constraint to attain a more comprehensive representation of the local population[26].

[25] The current study used broccoli in the pictorial presentation as this vegetable is familiar to Singaporeans. Other studies that attempt the same, or similar, mode of actual vegetable consumption assessment might consider the use of other vegetable types that are more familiar to their target sample/population.

[26] Due to the novelty of the intra- and inter-attitudinal dimensions of food-related cognitive dissonance and their English-based, self-report modes of assessment, the requirement of a diploma or higher educational qualification was used in the research to facilitate participant responses, and hence, measurement of the constructs. It is relevant to note that Whitton, Ma, Bastian, Chan and Chew (2014) did not find this educational class of individuals to be less given to unhealthy eating compared to individuals of lower educational status (secondary school and below), but instead found the former to form a higher proportion of regular consumers of fast food (≈59%) compared to the latter (≈21%).

Whilst Singapore is a developed, cosmopolitan city state with a fair bit of Western influence in individual lifestyles including, but not limited to, culinary cuisine and dietary behaviour, with consumption patterns in fruits and vegetables mirroring global patterns in terms of a comparatively lower consumption of these foods compared to meat consumption (Singapore Health Promotion Board, 2004), it is nevertheless an Asian country with eastern influences as well. As such, to augment the external validity of the results obtained in the current initial efficacy test of the FCD framework with regards to vegetable consumption, it is recommended that the parameters of the study be replicated in a developed Western country for comparison.

5.5 Summary Conclusion

Overall, the main study has provided evidence which suggests that cognitive dissonance arousal lead to positive alterations in food-related attitude/behaviour, via the FCD conceptual framework. The insights gained, in terms of conceptual and methodological contributions to cognitive dissonance scholarship both generally as well as in the context of food and nutrition, represent a valuable first step towards developing and/or discovering the potential of cognitive dissonance as a tool to modify the dietary aspect of lifestyle, in pursuit of primary prevention goals in health and illness.

Chapter 6. General Discussion

6.1 Consolidation of Current Work on Food-related Cognitive Dissonance

The thesis began with a review of cognitive dissonance scholarship in food and nutrition. The review indicated that research in this specific domain was inadequate and limited, particularly with respect to the use of cognitive dissonance to positively influence non-clinical dietary behaviour. Inconsistent and fragmented research findings were potentially traced to imprecise conceptualization of the cognitive dissonance construct, including a lack of direct measurement of the construct as well as weaknesses in the experimental manipulation of cognitive dissonance arousal. In response to this, with the ultimate aim of utilizing cognitive dissonance to effect positive changes to food-related attitudes and behaviours in the direction of health in mind, the FCD conceptual framework was proposed to guide cognitive dissonance research in food and nutrition. Integrating cognitive dissonance theory and tripartite theory of attitude within the context of food values, the FCD framework focused on the mechanics of the cognitive dissonance arousal process in order to understand the cognitive dissonance resolution process that followed, which included attitudinal and/or behavioural change(s).

Two studies were conducted and reported in this thesis to identify the viability of the proposed FCD framework. The first was a preliminary qualitative study that primarily aimed to verify the attitudinal dimensions of food-related cognitive dissonance through the use of focus group discussions, which then provided content for the development of cognitive dissonance measurement scale items to be used in subsequent hypothesis-testing. At a secondary level, the analyses of food values ranking and focus group discussion transcripts also informed the potential type of food-related conflict that might be used in the experimental manipulation of food-related cognitive dissonance arousal. By and large, both objectives were achieved, and a quick follow-up was conducted with the focus group discussion participants that tested initial ideas about cognitive dissonance measurement and experimental arousal. In the latter instance, the preliminary results suggested examining the opposing food values of health/nutrition *vs*. taste in the context of vegetable consumption, with food-related cognitive dissonance arousal experimentally triggered by (i) having participants write a short essay on the health benefits of vegetable consumption before asking them for their rating on the taste of vegetables and their

attitude towards it, and (ii) exposing participants to negative, contradictory information about the health benefits of eating vegetables. The data returned was ultimately found to be unamenable to logical analysis or interpretation due to construct operationalization flaws related to the attitudinal dimensions of food-related cognitive dissonance – not only were the measurements of intra- and inter-attitudinal cognitive discrepancies and dissonances incongruent given that three, instead of the planned two, attitude objects were examined, but the experimental arousal of cognitive dissonance also incorrectly derived from disparate sources rather than a common one. The insights gained from the mistakes made in the preliminary study, particularly the follow-up portion, helped fine-tune measurement and arousal manipulation of food-related cognitive dissonance going in the second (main) hypotheses-testing study.

The second, main hypotheses-testing study represented the first formal investigation into the utility of cognitive dissonance in influencing food-related attitude and/or behaviour, which was equivalent to an initial efficacy test of the FCD conceptual framework in this regard. Based on lessons learnt in the preliminary study, the main study restricted the number of attitude objects to two, and examined the differential effects, if any, of cognitive dissonance arousal directed at attitude towards healthy eating or attitude towards vegetable consumption on actual vegetable consumption behaviour. Using a survey-based experimental design across three different time points, baseline measures of attitudes toward healthy eating and vegetable consumption, as well as actual vegetable consumption were taken prior to experimental arousal of cognitive dissonance, after which the same food-related attitudinal and behavioural variables were re-measured. Along with measured intra- and inter-attitudinal cognitive discrepancies and dissonances, results showed that actual vegetable consumption increased from baseline in the event that cognitive dissonance was aroused with respect to attitude towards vegetable consumption. The increase in behaviour was achieved directly via created intra-attitudinal cognitive dissonance related to vegetable consumption and indirectly via the same cognitive dissonance leading to an improvement in attitude towards vegetable consumption. Inter-attitudinal cognitive dissonance related to attitudes toward healthy eating and vegetable consumption was aroused when neither attitudes were made the focal point, and resulted in an improvement in the superordinate attitude towards healthy eating but not the subordinate attitude towards vegetable consumption. Whilst acknowledging that certain limitations existed, on the whole, the main quantitative study

provided evidence to support the potential utility of cognitive dissonance in influencing food-related attitudes and behaviours, via the FCD framework. This contributes to both conceptual and methodological innovations in cognitive dissonance scholarship generally as well as in the context of food and nutrition.

Having discussed these contributions, and limitations, in Chapter 5 of the thesis, the current chapter will explore future directions in the use of the FCD conceptual framework in studying food-related attitudes and/or behaviours, particularly in the context of utilizing cognitive dissonance to effect positive attitudinal and/or behavioural changes in the direction of health.

6.2 Future Directions – Use of the FCD Framework for Food and Nutrition Research

The proposed FCD conceptual framework developed in the current thesis has shown promise in providing an alternative, unique and novel perspective of the effects of food-related cognitive dissonance arousal on food-related attitudes and/or behaviours via attitudinal pathways. Considerations in the future use of the framework are discussed and/or reiterated.

6.2.1 Cognitive dissonance arousal – Triggering it and measuring it

Aforementioned, the cognitive dissonance process entails cognitive dissonance arousal and cognitive dissonance resolution. For food-related research that are interested in examining cognitive dissonance as a focal construct, with regards to cognitive dissonance arousal, it is important to pay careful attention to (1) referencing established protocols in the arousal of cognitive dissonance (i.e., cognitive paradigms), and (2) ensuring that the actual cognitive dissonance aroused thereafter is formally and explicitly assessed. Whilst mainstream cognitive dissonance research has generally been adept at the former, with some research having attempted the latter, *cognitive dissonance research in the food-related domain has been relatively inadequate in both*, and as such, could be improved upon.

In focusing and elaborating on the arousal portion of the cognitive dissonance process, the proposed FCD framework not only serves to distinguish the use of cognitive dissonance paradigms to arouse cognitive dissonance (i.e., cognitive paradigms) from the explicit measurement of actual cognitive dissonance aroused itself, but it also particularly provides a blueprint for the latter in terms of what should be assessed. Indeed, assessing

the arousal of both intra- and inter-attitudinal cognitive dissonance in terms of the sub-components of cognitive discrepancy and dissonance within each arousal process, allow for potential interaction effects between the two to be explored and discovered. For example, reminding an individual that he/she has not been eating healthily despite his/her belief in doing so (*Intra-FCD*) and highlighting that he/she has compromised health for something less consequential such as convenience (*Inter-FCD*; e.g., Connors et al., 2001; Dave, An, Jeffery, & Ahluwalia, 2009; Sijtsema, Jesionkowska, Symoneaux, Konopacka & Snoek, 2012). The potential of cumulative benefits would be tested in this instance. Intra- and inter-attitudinal cognitive discrepancies can also realistically occur in opposite directions simultaneously as illustrated in the main study of the current thesis. As another example in the opposite direction, this may occur when individuals eat plenty of a specific food because they believe that they should (*Intra-FCD*), only to be told subsequently that the food is not as healthy as they had been led to believe (*Inter-FCD*; e.g., Goldberg & Sliwa, 2011; Patterson, Satia, Kristal, Neuhouser & Drewnowski, 2001). In this latter example, determining which attitude is least resistant to change under such circumstances, and hence, the net result(s) of opposing structural food-related cognitive dissonance, have important implications, particularly for the design and implementation of effective dietary attitude change interventions (e.g., food and/or food-related health/nutrition communication).

Additionally, it should be noted that the differential application of distinct cognitive dissonance paradigms (see Table 2.2) could have different consequences, *ceteris paribus*. Whilst the main study has provided an initial glimpse into the utility of the *hypocrisy* paradigm to effect attitudinal and/or behavioural changes in a non-clinical, food and nutrition context, the jury is still out on the effects of the other paradigms in this domain. Looking at the reviewed food-related studies (conceptual/methodological flaws notwithstanding), and finding some semblance of specific cognitive dissonance paradigms used (almost all of them did not explicitly cite any) in their manipulation of cognitive dissonance arousal, for at least some of the studies, it might be seen that, in food-related consumer behaviour research, cognitive dissonance appeared to be almost always aroused *via* the *belief disconfirmation* paradigm, particularly in expectancy-disconfirmation studies (e.g., Behrens et al., 2007; Schifferstein et al., 1999) where individuals had been generally shown to react to discrepant food or food-related (characteristics) information by assimilating these into prior knowledge as a means of

dissonance resolution. In addition, Albarracín et al. (2003) seemed to have used the *induced compliance* paradigm in nutrition communication to a somewhat similar effect. Specifically, participants in the study who were exposed to an abstinence message regarding an alcohol-like beverage, expressed higher intentions to use the product after consuming the drink compared to those who were exposed to a moderate-use message. In these studies, the arousal of cognitive dissonance occurred intra-attitudinally. Of the food-related studies reviewed in the current thesis, inter-attitudinal cognitive dissonance arousal was clearly evident primarily in a meat consumption study by Rothgerber (2014) who found a tendency amongst meat eaters to sustain their meat consumption behaviour through selective cognitive modification after being exposed to vignettes depicting various types of vegetarians. The method of cognitive dissonance arousal was, however, indiscernible within the parameters of any of the established cognitive dissonance paradigms, coming marginally close only to an atypical version of *belief disconfirmation* at best.

Thus, it would be instructive to systematically explore the application of the various cognitive dissonance paradigms in terms of their precise effects on the arousal of food-related cognitive dissonance, particularly in relation to the latter's distinct structural dimensions as proposed in the FCD framework. A systematic study in this vein, along with noting the precise circumstances under which food-related cognitive dissonance emerge, might possibly facilitate efforts to appropriately match paradigms to intra- and/or inter-attitudinal dimensions of food-related cognitive dissonance to attain optimal food-related attitude change outcomes. For example, even though Albarracín et al.'s (2003) study implies that the *induced compliance* paradigm would lead to the maintenance of an existing negative dietary behaviour, the same paradigm has been used as the premise of a clinical, dissonance-based intervention to help individuals with body-image concerns keep potential dysfunctional eating at bay (e.g., Stice et al., 2000; 2012). This example serves to reiterate the fact that careful thought must be given to how cognitive dissonance is created or aroused, as this might influence the mode of dissonance resolution undertaken subsequently.

6.2.2 Choice of attitude object(s) – Attitude strength

Aside from being cognizant of the number of attitude object(s) chosen in an analysis, in part of ensuring that the choice(s) is/are guided by applied significance, it is important to identify and select attitudes that are powerful drivers of behaviours and

cognition rather than those that are “minimally consequential” (Bizer & Krosnick, 2001, p. 566). The former are, however, often strong attitudes that are hard to change, while the latter are often weak attitudes that are relatively easy to change. This is what has come to be known as *attitude strength* which, in its multi-dimensional form, is determined by the dimensions of extremity, intensity, certainty, importance, knowledge, accessibility, direct experience, latitudes of rejection and non-commitment, and evaluative-cognitive consistency (Krosnick & Smith, 1994); in its simpler, (higher order) bi-dimensional form, it is determined by the dimensions of centrality and commitment (Holland, 2003; Pomerantz, Chaiken & Tordesillas, 1995).

Attitude accessibility, one of the dimensions underlying attitude strength, is an intra-attitudinal structure property that denotes the strength of association between attitude object and its attitudinal evaluation (Fabrigar et al. 2005). Highly accessible attitudes are usually those that have been used or activated frequently, such that “repeated expressions strengthen the associations between objects and evaluations, thereby increasing the ease of retrieval of the evaluation from memory” (Fabrigar et al., 2005, p. 81, citing Fazio, Chen, McDonel & Sherman, 1982, and Powell & Fazio, 1984). Highly accessible attitudes typically, therefore, engender fast responses to situations that appropriately elicit them, and have been found to be relatively stable over time, and good predictors of behaviour (Schwarz & Bohner, 2001, citing Fazio, 1995). Such fast computational responses occur particularly when all information that comes to mind is evaluatively consistent (Schwarz & Bohner 2001). Given thus, assuming that an individual has a positive and highly accessible attitude towards consuming fried chicken nuggets, then hypothetically, an appropriately created and channelled intra-attitudinal cognitive discrepancy could be used to disrupt attitude accessibility through the generation of evaluative inconsistency, which in turn, would slow the computational responses (Schwarz & Bohner, 2001) for a more deliberated evaluation (Fabrigar et al., 2005). The subsequent intra-attitudinal dissonance aroused may impact on the latter in terms of driving it in a healthier direction. Such a hypothesis about the underlying cognitive dissonance mechanism may be derived from the FCD framework for empirical testing.

Given that attitude represents an overall evaluative summary of information deriving from affective, behavioural and cognitive bases, attitudes have also been postulated to be acutely accessible when based on information considered as highly

diagnostic (i.e., credible evaluative information) by an individual. These commonly include classes of information from across the three bases, such as sensory information about the object, emotional reactions engendered by the object, past behaviour towards the object, and direct experience with the object (Fabrigar et al., 2005; Fazio, 1995). According to researchers (e.g., Fabrigar et al., 2005), some attitudes may be primarily affective-based (i.e., attitude formed mainly from emotional experiences with, or responses to, an attitude object), some primarily behavioural-based (i.e., attitude formed mainly from behavioural experiences with, or responses to, an attitude object) and some primarily cognitive-based (i.e., attitude formed mainly from cognitive experiences with, or responses to, an attitude object). When intra-attitudinal cognitive discrepancy occurs due to cognitive inconsistency between at least two componential bases (e.g., affective-cognitive – liking junk food despite knowing its unhealthy properties), in which one is the primary basis for the attitude (e.g., affect), cognitive discrepancy reduction in response to intra-attitudinal dissonance might possibly occur through changing one or both of the other two secondary bases (e.g., cognition and/or behaviour) to be in line with the primary base, owing to the cognitive dissonance resolution principle of effecting change via the route of least resistance. The challenge then is to see how cognitive dissonance may be manoeuvred using the FCD framework to target and change the more resistant, negative (and affective-based in the on-going example) food-related attitudes.

Whilst attitude accessibility is an intra-attitudinal structure property, recent research has begun to examine the impact of attitude accessibility across attitude structures (i.e., inter-attitudinal effects of attitude accessibility on two different (but related) attitude objects). It has generally been found that increasing the accessibility of one attitude leads to greater strength and resistance of the related attitude to counter-attitudinal responses in a consistent direction, *ceteris paribus* (Blankenship, Wegener & Murray, 2015). This makes the introduction of the FCD framework timely as it allows for analysis of how intra- and inter-attitudinal cognitive dissonance might be utilized to overcome strong, negative food-related attitudes linked to one another.

Finally, it is important to note that attitude strength generally follows the life stages hypothesis, such that susceptibility to change is highest in the early and late part of an individual's life, which Visser and Krosnick (1998) attributed to factors such as role transitions, changes over time in the meaning linked to particular attitude objects, etc. Thus, an additional challenge for a dissonance-based strategy of attitude change is to

effect alteration of unhealthy food attitudes held by individuals in the middle stage of their lives (i.e., young to middle adulthood) when attitude strength is strongest.

6.2.3 Explicit vs. implicit attitude

Amongst the many typologies of attitude that researchers have considered in the study of the concept, one that has gained increased, though, comparatively limited, traction in food-related research pertains to the explicit-implicit classification (e.g., Czyzewska, Graham & Ceballos, 2011; Panzone, Hilton, Sale & Cohen, 2016). Typically, explicit attitudes have been referred to as evaluations that may be consciously expressed, controlled and thus, directly measureable, and implicit attitudes as evaluations "for which people may not initially have conscious access and for which activation cannot be controlled" (Rydell, McConnell & Mackie, 2008, p. 1526), and thus, only indirectly measurable. With the use of consciousness as distinguishing criterion being in contention (Gawronski, Hofmann & Wilbur 2006), an alternative take on the explicit-implicit distinction, which focuses on underlying principles of information processing, has been suggested. In this instance, explicit attitudes may be seen as declarative, propositional evaluations, which entail deliberate, evaluative judgements on assertions about evaluative properties of specific attitude objects, particularly in terms of truth values (i.e., as being true or false). Implicit attitudes, on the other hand, may be seen as associative evaluations, which entail spontaneous (with little cognitive resources expended), affective reactions to specific attitude objects, independent of the assignment of truth values (Gawronski & Strack, 2004; Gawronski et al., 2006).

Hence, as the cognitive dissonance arousal and resolution processes are inherently propositional, only explicit, but not implicit, attitudes would be subjected to cognitive dissonance effects, including dissonance-based attitude changes, if any (Gawronski & Strack, 2004). Correspondingly, the current proposed FCD framework applies only to explicit attitudinal judgements (i.e., explicit attitudes), but not for implicit evaluative associations (i.e., implicit attitudes). Nonetheless, researchers have studied the idea of *implicit ambivalence*, which is described as the discrepancy between implicit and explicit evaluations of the same object (Gawronski & Strack, 2012), and found dissonance to result from such a discrepancy. The resultant dissonance induced greater cognitive processing of attitude object relevant information (Rydell et al., 2008) apparently as an explicit discrepancy reduction strategy. How this phenomenon works its way into the current proposed FCD framework remains a work-in-progress, particularly since there is

ambiguity surrounding the notion of ambivalence. Typically, attitudinal ambivalence is said to have occurred "when there is evaluative tension associated with one's attitude because the summary includes both positive and negative evaluations" (Fabrigar et al., 2005, p. 84, citing Kaplan, 1972, Scott, 1969, and Thompson et al., 1995). Explicit attitude forms the base of such a typical definition of attitudinal ambivalence, which has also been referred to as explicit ambivalence (Gawronski & Strack, 2012), and noted to be an intra-attitudinal phenomenon (Fabrigar et al., 2005). The involvement of implicit and explicit attitudes in implicit ambivalence, however, seem to suggest that this latter ambivalence is inter-attitudinal in nature, as akin to the notion of dual attitude structures (Wilson, Lindsey & Schooler, 2000).

6.3 Conclusion

The proposed FCD conceptual framework presented in this paper represents an initial basic step towards facilitating a systematic approach to the study of cognitive dissonance in food and nutrition, particularly in terms of how food-related cognitive dissonance might impact on food-related attitudes and/or behaviours. It specifically focuses on understanding the dissonance arousal process, which has hitherto been inadequately studied, in order to facilitate an understanding of the subsequent dissonance resolution process that includes attitude change. Through integrating insights from the literature on cognitive dissonance and attitude, in the context of food and nutrition, the FCD framework presents a novel, structural perspective of food-related cognitive dissonance that would, hopefully, contribute to, and enhance, both of these understandings. Whilst it was used primarily to examine the utility of cognitive dissonance in influencing positive food-related attitudes/behaviours in the current thesis, the framework may be used in other food-related contexts such as food risk/safety, health/nutrition communication, etc., as long as the main research objective revolves or centres around examining cognitive dissonance effects on food-related outcomes.

With a view to eventually utilize the proposed FCD conceptual framework to guide the development of dissonance-based strategies to influence positive dietary attitudes (and thus behaviours), nonetheless, future research work in this area should focus on testing, and fine-tuning, some of the basic assumptions and features of the proposed framework, as discussed here. As the FCD framework focuses on the arousal portion of the cognitive dissonance process, deriving the resolution portion of the process based on the basics of the framework could be part of such efforts to complete and close

the loop. Ultimately, the establishment of a systematic explanation of cognitive dissonance effects in food-related attitudes would, in turn, improve the construct's application precision in changing dietary patterns towards health and aid in the development of effective nutrition programmes in public health promotion.

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APPENDICES

APPENDIX A: PRELIMINARY STUDY MATERIALS & DATA

Appendix A-1: Focus group discussion materials

Making food choices

We would like to know how you make decision in choosing your food – specifically what is/are important considerations for you when making food choices?

1. There are many factors that could influence our decisions in our choice of food. What are those factors to consider? Can you describe them?

Tick if applicable	Food Considerations	Rank
	sensory characteristics (taste, texture, odour, appearance)	
	cost (monetary considerations)	
	convenience (time and effort)	
	health and nutrition (disease avoidance/control, weight control & bodily well-being)	
	managing relationships (interpersonal interactions – maintaining harmony in their households by anticipating, addressing and accommodating conflicts over issues of food choice)	
	quality (standard of excellence; safe, reliable products; aesthetically appealing presentation)	
	indulgence (eating familiar, traditional dishes; rewarding oneself with food)	
	authenticity/naturalness (prepared with love and attention; setting aside a lot of time for cooking; natural and authentic taste; sustainable, organic farming; traditional down-to-earth farming methods)	
	conviviality (from the word "Convivial" which means relating to, occupied with, or fond of feasting, drinking, and good/merry company e.g., communal eating; taking time to savour meals; eating what one likes without guilt; eating as relaxation)	
	others – please specify	

2. What is the most important factor to you when choosing food? From what you have chosen/selected from the list above in (1), rank the consideration(s) from most important to least importance.

Conflict in making food choices

We would like to know how you make decision(s) in choosing your food when you face a situation where your food considerations contradict each other.

3. Based on the consideration(s) that had been selected, have you ever found these to conflict with each other when you were making food choices?

- Yes/No.

4. If yes, could you list which consideration(s) conflicted with each other (in pairs)? List the pairs in terms of their importance to you (TOP THREE).[27]

- E.g., _____

5. When the consideration(s) conflicted with each other, how did you feel?

- E.g., _____

6. What are the situations that arise that will cause you to be aware of the conflict amongst your food considerations? Can you describe those situations?

- E.g., _____

7. Do you pay attention to health messages and/or nutrition messages regarding food?

- Yes/No.

8. If yes, to what extent do you believe in the health/nutrition messages?

- 100%
- 75%
- 50%
- 25%
- 0%

9. Do you come across health/nutrition messages that seemingly contradict each other about one particular type of food?

- Yes/No.

10. If yes, can you provide an example?

- E.g., _____

11. How do you feel about such conflicting messages?

- E.g., _____

[27] Q4a. Are there any other situations where conflict might arise that involve a food value/consideration and some other non-food value/consideration (e.g., sensory *vs.* animal welfare, religious beliefs, etc.)

12. Do you pay attention to food labels?

- Yes/No.

13. If yes, to what extent do you understand them? Elaborate.

- E.g., _____

14. Have you ever come across food labels that contradict what you know about a particular food?

- Yes/No.

15. If yes, can you provide an example?

- E.g., _____

16. How do you feel about such contradictions?

- E.g., _____

Conflict resolution in food choices

We are interested to find out how you deal with situation(s) where your food considerations are in conflict with each other.

17. Sometimes, we may face a situation in which health benefit is conflicted with other factors such as convenience, cost, etc. in deciding the food we eat. Based on the emotions/thoughts that you had indicated to result because of such conflicts, how did you resolve the feelings you experienced?

- E.g., _____

18. Based on the feelings/thoughts you had indicated that you experienced due to conflict in health messages about food, how did you resolve such feelings experienced?

- E.g., _____

19. What determines the resolution method of such feelings?

- E.g., _____

20. What are some of the barriers you face in changing your food behaviour for the better?

- E.g., _____

Appendix A-2: Focus group discussion qualitative data transcripts

(18-24 age group)

Timecode	Person	Transcription	Remarks
0:00:00	Facilitator	Okay I'm going to begin the recording right now. If you take a look at that handout, okay --- the handout basically gives you a list of possible things that you consider, when you are looking at food, okay? And the things include sensory characteristics, the cost, convenience, health and nutrition, okay --- and managing relationships. So what I would like you to do is take a look and basically tick whatever that applies to you when you are making food choices. Okay. Do you base your choice on sensory characteristics, taste, texture --- whatever? Okay. You make your food choice based on cost, whether it's cheap or not cheap, whatever. Okay. So you go through the food considerations, you tick everything that applies to you, and then at the same time, you rank it, what's the most important 1, then 2 and 3. Okay?	
0:00:58	Participant 1 (Chinese, M)	1, 2?	
0:00:59	Facilitator	Depending on how many you uh, you actually choose, exactly.	
0:01:01	Participant 1 (Chinese, M)	What' the range? 1, 2...	
0:01:03	Participant 3 (Indian, F)	But the food consideration is during your school like uhhhh... free time, or---	
0:01:10	Facilitator	Yeah, generally speaking, when you want to eat, whenever you want to make food choices.	
0:01:16	Participant 1 (Chinese, M)	1 to 10, 1 to 3?	
0:01:18	Facilitator	No. It's basically you only have 1, 2, 3, 4, 5, 6, 7, 8, 9. You have 9 and there's an---another category that 10 others. So if there's any anything that you actively base your food choice on that's not here, you can put others, but you specify what it is la. [pause] Okay? You all can	

		go ahead and do it, maybe we take about 2 minutes okay. So a lot of times, uhhh... you think, but most importantly is your reactions. Okay, if there's anything you do not umm... if you require further explanations on any of the things you can ask me I will let you know. Otherwise, I'll try to put in as much as description as possible in each of those terms there.	
0:02:05	-	[pause]	
0:03:58	Facilitator	Okay, is everybody alright, already? Okay, alright now. Based on what you have selected, based on the food choices or food considerations that you have selected, looking at what you have --- has there been a time where you actually find that your food considerations actually conflict with each other?	
0:04:23	Participant 1 (Chinese, M)	Yes.	
0:04:25	Facilitator	Yes. Okay. Yes, can you elaborate?	
0:04:26	Participant 1 (Chinese, M)	Like something nice versus something healthy.	
0:04:31	Facilitator	So. Something nice versus something that's healthy.	
0:04:33	Participant 1 (Chinese, M)	For example, like... we all like food that is nice. But the problem is that if eat too much you get fat.	
0:04:41	Facilitator	Okay. So in your list, right, which was the number 1 thing that you consider?	
0:04:46	Participant 1 (Chinese, M)	Uh.... Health.	
0:04:47	Facilitator	That's health. What's the second one?	
0:04:50	Participant 1 (Chinese, M)	Uh.... Convenient.	

0:04:51	Facilitator	Convenience. OK, but so last time when you said nice-	
0:04:54	Participant 1 (Chinese, M)	So, okay. For example, let's say I am short of time. So I need to choose something healthy. So instead of going to McDonalds, I will go to Subway. It's healthy. It's relatively more healthier.	
0:05:05	Facilitator	Okay. But then when it conflicts, the just now --- the very first thing that came to your mind, the conflict was between health and taste.	
0:05:14	Participant 1 (Chinese, M)	Yeah, yeah.	
0:05:16	Facilitator	Okay, then how about, is it important health and convenience that you're talking about? Does it come --- So if I ask you to rank a conflict, which one comes first?	
0:05:25	Participant 1 (Chinese, M)	Health or convenience.	
0:05:27	Facilitator	Health versus --- like between health versus. taste or health and convenience. Which one... which of the conflict comes first?	
0:05:37		[all participants laugh]	
0:05:40	Participant 1 (Chinese, M)	I.... I'll still pick convenience lah.	
0:05:41	Facilitator	Okay you think about that. How about the rest of you? Are there any conflicts for you all?	
0:05:48	Participant 2 (Chinese, F)	My... my conflict is actually between one of my first and one of my last. Like, uh... taste and cost.	
0:05:56	Facilitator	Taste and cost.	

0:05:58	Participant 2 (Chinese, F)	But... because the rest of it, I.... to me it's still important to enjoy your food. But in my mind, subconsciously, aaaa.... it's so expensive but I will eat anyway.	
0:06:08	Facilitator	Ahh.. Okay, so taste is important to you. So taste you actually put number 1.	
0:06:14	Participant 2 (Chinese, F)	Yeah.	
0:06:16	Facilitator	Aahh, okay. How about the rest of you?	
0:06:18	Participant 3 (Indian, F)	I guess for me it's like the first 4... [laughs] Like conflict is between this first 4.	
0:06:24	Facilitator	The first 4. So it's sensory characteristics... then cost--	
0:06:28	Participant 3 (Indian, F)	Then cost, convenience, and health and nutrition. Maybe convenience can be like --- if not convenience sometimes for the food I really don't mind travelling.	
0:06:38	Facilitator	Oh, okay. So for the food then --- are you staying there for the taste again?	
0:06:43	Participant 3 (Indian, F)	Yeah, the taste.	
0:06:44	Facilitator	So we are all like Singaporeans here, right?	
0:06:45	Participant 3 (Indian, F)	[laughs]	
0:06:47	Facilitator	So how about Participant 5 and Participant 4?	
0:06:50	Participant 4 (Chinese, M)	I think my greatest conflict whenever I want to buy food is really convenience.	

0:06:55	Facilitator	Convenience ---	
0:06:56	Participant 4 (Chinese, M)	Convenience versus health and nutrition, then the cost.	
0:07:01	Facilitator	Ooh, okay.	
0:07:01	Participant 4 (Chinese, M)	This one --- the first one I rank is convenience, the second one I rank is health nutrition. Third is cost. So here's it's convenience versus cost and convenience versus health and nutrition.	
0:07:09	Facilitator	OK… So why convenience for you? Why is convenience is ranked very high up for you?	
0:07:13	Participant 4 (Chinese, M)	Because sometimes I think eating is a waste of time.	
0:07:16	Facilitator	Oh, so you think eating is a waste of time.	
0:07:17	All	[laugh]	
0:07:19	Participant 4 (Chinese, M)	---sit there and slowly eat. You can do all other things.	
0:07:22	Facilitator	So that means taste is not something that is important to you?	
0:07:26	Participant 4 (Chinese, M)	Um, no.	
0:07:28	Facilitator	Aaah.... That's interesting. Ok, Participant 5?	
0:07:30	Participant 5 (Malay, M)	Um.... actually uh.... my conflict is I also don't mind the taste so much, but because here right appearance, odor, uh, the texture. So I rate that first because what brings you to choose a food is how it looks, at first. So it must be like physically attracting you la. So that's why I put	

		the 2nd one is also aesthetically appealing which is quality, like how they present their food. But then uh.... besides that, if the queue for the food stall is let's say, so long for just which you want, like it's really troublesome, you just tell yourself, ah, forget it. Let's choose another food choice which is a shorter line, eatable, like edible one. Yeah...	
0:08:21	Facilitator	So for you, what is the conflict? Because we have heard from the rest---	
0:08:26	Participant 5 (Malay, M)	The conflict is um, I think between uh.... convenience and.... taste.	
0:08:34	Facilitator	Convenience and taste.	
0:08:35	Participant 5 (Malay, M)	Taste and cost. These three. Convenience, taste and cost.	
0:08:38	Facilitator	So it seems that it's pretty common. I think the one that goes around most frequently looks like taste except for Participant 4. And then after that there'll be cost and convenience, and of course the other one would be health. OK. Alright. so… Did you have an answer to what I'm asking just now?	
0:08:53	Participant 1 (Chinese, M)	It's still health and nutrition vs convenience... and health & nutrition versus cost. So, it's still like the three... three choice.	
0:09:01	Facilitator	So at this point in time you have no---	
0:09:03	Participant 1 (Chinese, M)	No definite one. In fact, let's say if I have slightly more time, I would go for the.... less convenient food.	
0:09:10	Facilitator	Okay, whenever your experience conflict, alright? Say for example, if you want something healthy, but you find that you know... um the healthy thing is just really awful tasting, okay? Uh.... How do you feel? You have to eat something that is really yucky but it's good for you, but at the same time you eat something good but it's bad for you.	

0:09:38	Participant 2 (Chinese, F)	I'll choose the really good but it's bad for you.	
0:09:40	Facilitator	Do you feel like --- I mean, I mean --- when you made that choice, do you feel sort of guilty?	
0:09:47	Participant 2 (Chinese, F)	It depends on how bad is bad actually. As in... I just give excuses lah. Like exercise later... [laughs]	
0:09:53	Facilitator	Oh, okay.	
0:09:54	Participant 2 (Chinese, F)	To me, to me... food is like, I have to enjoy my food. That it's no point if I don't enjoy it.	
0:10:04	Facilitator	That's because taste ranks number 1 for you lah. OK. [Participant 2: Yeah]. How about the rest of you all?	
0:10:07	Participant 5 (Malay, M)	I think, I don't mind both because definitely taste matters so even if it's unhealthy I think I might give something similar to a reason... and yet not exercise. After that, because I depend on my metabolism one. Then the next one... So that's how I balance how I see healthy food, just swallow it up because it's healthy so I don't mind the taste, but I don't... I try to avoid it if I can.	
0:10:40	Facilitator	OK, OK… Anything else? How about the rest of you?	
0:10:45	Participant 1 (Chinese, M)	The you say --- the taste wise right? It's very healthy but it tastes yucky. So I'll... find ways to make it nice. Like for example, for example... if you cook something right, it's very bland, so usually they will put a less of spices, you spice alternatively to make the food taste slightly less yucky.	
0:11:02	Facilitator	Like how?	
0:11:04	Participant 1 (Chinese, M)	Like okay for example, if let's say you eat chicken. Instead of frying it, which is very nice, you steam or grill it with other spices.	

0:11:18	Facilitator	Okay, so. Okay. Before I proceed here, how about the two of you all?	
0:11:22	Participant 4 (Chinese, M)	Still go for the yucky food. Sorry, I'll go for the nicer and unhealthier food. [laughs]	
0:11:28	Facilitator	Because?	
0:11:30	Participant 4 (Chinese, M)	I think to me, I'll still go because --- it's the feel good factor. You eat it you feel better, rather than you eat something that is not so nice. And then you don't feel satisfied with it.	
0:11:43	Facilitator	Okay, fair enough? Participant 3?	
0:11:45	Participant 3 (Indian, F)	I think I'll try to maintain 50-50.	
0:11:51	Facilitator	Try to maintain 50-50, as in?	
0:11:51	Participant 3 (Indian, F)	Like as in, today... have like... if I really eat up a lot of like unhealthy, then tomorrow like... for the next few days I will try to like.... make it balanced.	
0:12:01	Facilitator	Okay, make it balanced. Okay, from whatever you all are saying, it sounds to me that --- uh for example, uh... you all actually go for your preferred food uh... by thinking about reasons, by rationalizing... is that correct? Rationalizing your choice with something, whatever that thing might be. Is that correct?	
0:12:23	Participant 3 (Indian, F)	Yep.	
0:12:25	Participant 4 (Chinese, M)	Most of the time.	
0:12:27	Facilitator	Most of the time?	

0:12:28	Participant 1 (Chinese, M)	It's like I don't eat like very healthy all of the time, but I do have like... sometimes I'll go. If there's something I like, I don't do it very often. I do it maybe once a month or... like two months once.	
0:12:38	Facilitator	That one, you are talking about things that are healthy?	
0:12:43	Participant 1 (Chinese, M)	Things that are unhealthy but very nice, that I like personally.	
0:12:46	Facilitator	Okay. But that one, so you do that occasionally. So most of the time... you eat healthily?	
0:12:50	Participant 1 (Chinese, M)	I will choose the healthier one.	
0:12:52	Facilitator	Oh is it? Okay, okay. Alright, now, during this time, you know, whenever you all like run into conflicts like this. Say for example, you want to eat healthy, but because you don't have time, so you choose something that's convenient uh... or whatever the conflicts are there. Do you feel certain things, do you feel like okay --- if I choose this, then you know, I don't feel right choosing this, uh.... and it doesn't seem right but you do it anyway. Do you have that kind of feeling?	
0:13:22	Participant 1 (Chinese, M)	Sometimes after we eat, yeah.	
0:13:26	Facilitator	So, um.... so, can you describe that feeling? Is that guilt, discomfort, umm..... anxiety? If you can put an adjective when you choose something when you are in conflict?	
0:13:47	Participant 4 (Chinese, M)	I will feel dissatisfied.	
0:13:52	Facilitator	Okay, so you are dissatisfied with what you have chosen, right?	
0:13:54	Participant 4 (Chinese, M)	Ya. You feel like eating something else after you eat. You eat it.	

0:13:58	Facilitator	Okay. How about the rest of you all?	
0:14:00	Participant 2 (Chinese, F)	Mine is probably... uncertainty and the need of someone to assure me that it's correct... in any way.	
0:14:09	Facilitator	Okay, uncertainty, yep. What are you all saying?	
0:14:13	Participant 4 (Chinese, M)	He says the same.	
0:14:14	Facilitator	Same ah? As in what?	
0:14:16	Participant 5 (Malay, M)	Like the same thing over and over again because the limited choice of food. So I don't know what's good.	
0:14:23	Facilitator	So you feel bored with your choice? You feel very-	
0:14:30	Participant 5 (Malay, M)	Like…uh.... Lame, bland kind of feeling.	
0:14:31	Facilitator	Lame, bland kind of feeling. So there's a certain degree of dissatisfaction I guess. Okay, so that's similar.	
0:14:39	Participant 3 (Indian, F)	I guess, guilt.	
0:14:40	Facilitator	Guilt? [laughs] Guilt as well.	
0:14:44	Participant 1 (Chinese, M)	After you eat like a.... big unhealthy meal... You go buffet you go binging or something. Then you go like --- as in.... initially you feel very good lah, after that you will go like, oh what did I just do?	
0:15:00	Facilitator	Okay. Okay. When you all feel all these things, how do you get over it? Is it through rationalizing?	

0:15:08	Participant 2 (Chinese, F)	Yeah	
0:15:10	Participant 1 (Chinese, M)	But after you do something about it---	
0:15:12	Facilitator	What? Like---	
0:15:13	Participant 1 (Chinese, M)	Like you go work out. You know tomorrow I work out, so today you can eat more.	
0:15:21	Facilitator	Does it happen that uh... this feeling that you get after you choose certain food, uh... that is actually conflicting something that you are thinking about, does it ever happen that you would then change the way you behave, change your attitude towards the food, change your behavior in the future? Like say for example. We all know fried chicken is no good. It's really nice but we know it's not really healthy right? But if let's say I'm the one for taste. So I buy the chicken, I eat it, I feel really good, right, but then I go, aiyah, actually it's not healthy. After that, I convince myself actually fried chicken is not that bad. It's not so unhealthy, if you fry it the right way, no oil, it's still healthy. That one possible way you can do. So long term wise, I would then change my attitude towards fried chicken. So I wouldn't think fried chicken is going to be unhealthy anymore. I would think that hey you know what? If I fry it the right way it's good. Does it lead to that kind of thing or no? You still think it's unhealthy. And then you just try to get by... just doing different things.	
0:16:34	Participant 1 (Chinese, M)	Partially yeah. The way you say it, yes lah. Because, like, if you break it down to uh... the science part, you just put in carbs in. Fats. So in any meat there's also those kind of uh... components. So you kind... of bluff yourself into saying that you just need carbs. You need, your body needs it. But deep down you know it's... it's not correct lah. I mean like it's a lot of fat compared to other stuff you eat.	
0:17:07	Facilitator	But would that then in the long term wise actually convince you to have the new thinking that this is actually good for this or not?	

0:17:15	All	[inaudible]	
0:17:18	Participant 1 (Chinese, M)	Long term... no. It's just to reduce the guilt.	
0:17:20	Facilitator	At this point in time?	
0:17:21	Participant 1 (Chinese, M)	Yeah, at the moment.	
0:17:25	Facilitator	Okay would it in any way change, for example... um, your ranking of the food considerations. Like, say for example--- If, for example, you say that health is important for you, alright, and say taste, for example. And after you eat something that is really nice, but it's unhealthy, would you then, for example change, like actually health is not important. Taste is more important?	
0:17:51	Participant 2 (Chinese, F)	Yeah, yeah…	
0:17:53	Participant 1 (Chinese, M)	Very unlikely? Unless the food is really really--	
0:18:00	Facilitator	OK… Say for example, you put health as No. 1, and taste as No. 2. Okay? If let's say, you make a choice to eat something really unhealthy but really good, OK, now because the conflict right, you don't feel so good, will you then change and say, actually health is not important, and then after that over time, taste becomes more important than health?	
0:18:22	Participant 2 (Chinese, F)	It does for me. 2/3.	
0:18:23	Facilitator	It does to you?	
0:18:25	Participant 3 (Indian, F)	Yeah, I feel that, yeah, taste is—[laughs]	
0:18:29	Facilitator	Participant 4, how about--	
0:18:30	Participant 4 (Chinese, M)	For me personally in the past, I would go for... nice food and cheap food. So I would not really care about health part, so just, eat and drink soft drinks... McDonalds, everything. But then I would hit a certain part of time,	

		like I don’t know what I’m eating, then my parents also had some uh... cardiovascular, high blood pressure and diabetes. Suddenly it struck me upon me that uh.... it's time for me to eat less, and eat something that is more bland. So like... for my dinner time, I eat lesser rice, now not so much.	
0:19:07	Facilitator	So that brings about an interesting point. Nutrition messages. You all pay attention to those?	
0:19:11	Participant 2 (Chinese, F)	Yes	
0:19:13	Facilitator	You all? No?	
0:19:15	Participant 5 (Malay, M)	Cannot be bothered.	
0:19:18	Facilitator	You've not been bothered by nutrition messages? That means they tell you what are the nutritional properties of food... and say that this food is good, that food is not that good.	
0:19:26	Participant 5 (Malay, M)	Sometimes…	
0:19:27	Participant 1 (Chinese, M)	I feel very cautious. After you know, you eat everything, like chips. Usually, you eat the whole packet by yourself. Then you look behind and see, oh shit, 300 over calories. Then... oh okay, I think I'll eat half, or 1/4. And then I will eat it on the rest of the day.	
0:19:41	Facilitator	So you actually read the labels? [Participant 1 (M): Yeah] Do you all read the nutrition labels?	
0:19:42	Participant 1 (Chinese, M)	Yes.	
0:19:42	Participant 5 (Malay, M)	No.	
0:19:43	Facilitator	You do?	
0:19:46	Participant 1 (Chinese, M)	Yeah, I do.	

0:19:49	Participant 3 (Indian, F)	Once in a blue moon.	
0:19:48	Facilitator	Once in a blue moon? Okay, so---	
0:19:50	Participant 5 (Malay, M)	I only check for pork, gelatin [laughs]	
0:19:54	Facilitator	So... okay. So, it seems that some of you read the nutrition label, some of you don't. So those of you all who pay attention to nutrition messages, can I safely say that? [Participant 3 and Participant 1: Um] And those of you who do not read, you all don't bother about nutrition messages? [Participant 5: Kind of... yeah] Why? Why are you all not bothered by nutritional messages?	
0:20:14	Participant 5 (Malay, M)	For my side, I think taste really matters ah. Uh....Maybe because I am still young so I'm complacent and make full use of my body function, metabolism wise. So... But then, I think as we age.... uh I think maybe like what you said, health.... health might go. For now, definitely taste.	
0:20:37	Facilitator	Okay so for now, it's still taste lah. So you all don't bother. How about the rest of you... why? Because you are all similar in age. So, how come you all pay attention and then they are alright with not... bothering?	
0:20:49	Participant 1 (Chinese, M)	It's in like. [inaudible] It's in like... people say you are what you eat, so you want to look good indirectly, better eat something better [laughs]	
0:21:00	Facilitator	So.... since young ah, you're saying?	
0:21:06	Participant 1 (Chinese, M)	My parents cook… Uh, what you call that? When they cook, right, because my parents cook more often than they tapau. So, when they cook they always make sure there's a lot of fish. So.... so last time they cook a lot of fish, and then they force me to eat. Like, when I am young I don't mind ah, but after that I'm okay.	
0:21:26	Facilitator	Okay, I understand. Then, okay I understand... how about Participant 3? You pay attention to nutrition	

		messages? You are saying yes right?	
0:21:33	Participant 3 (Indian, F)	Yeah, like… Especially during function times.	
0:21:37	Facilitator	Oh okay. Can you elaborate on that?	
0:21:40	Participant 3 (Indian, F)	I mean, like, if I got a function, like... my sister's wedding or something in two months' time, then that... that uh kind of time, I'm like really okay... I must like cut down cut down. After that, like.... after the function, I'll be like since I have... too much control, I need to.... enjoy more food. Yeah.	
0:21:56	Facilitator	Have you ever come across any nutritional message that actually contradicts what you actually currently believe about a certain food? Give you one example. A long time ago, people say that butter is no good. Margarine is a... safer and more nutritious choice, correct or not? Recently what do they say? Recently, they tell you butter is better than margarine. Okay? So, things like that. You have been led to believe that something is-	
0:22:33	Participant 1 (Chinese, M)	Fruit juice	
0:22:35	Facilitator	Fruit juice, what about that?	
0:22:37	Participant 1 (Chinese, M)	The sugar content in the fruits. As in like.. prior like in in the past, people say drinking fruit juice is is good, coz there's a lot of vitamin C and all the antioxidants and the... you could see a lot like on those labels, people got say, vitamin C, A whatever... vitamins. Yeah... So.... Now I think... a lot of companies are trying to get their consumer like better tasting juices. So they-- I think they started adding additives or sugar into it to make it tastes nicer than the original juices. So now, like, when you buy fruit juice, you have to really look at the label. Like for example, some fruit juice are freshly squeezed, but some are made from concentrates, so it's like processed.	
0:23:30	Facilitator	So it's something you have always thought fruit juices was alright. But then now, there are certain types that are---	

0:23:40	Participant 1 (Chinese, M)	Not as beneficial as you think it is.	
0:23:39	Facilitator	Okay. Anything else?	
0:23:41	Participant 5 (Malay, M)	Vegetables.	
0:23:42	Facilitator	What about vegetables?	
0:23:47	Participant 5 (Malay, M)	Uh, I don't know. Because they say vegetables is very healthy, right? But what if you fry you put on ingredient to make it taste nice. Because you want that nice vegetable. So... I think it conflict. Because you are telling yourself you are eating a healthy food, but maybe the ingredients you put maybe like Ajinomoto, MSG... like all those just to make it nice. All those flavorings.	
0:24:07	Facilitator	Okay. Alright, anything else?	
0:24:10	Participant 4 (Chinese, M)	People would choose eating Taufoo to eat... because yong tau foo is maybe... [inaudible]. It's a healthy option because you can mix with everything. A lot of.... That time when I was eating, this guy from one of the directors of SH, the chemical director said, Yong Tau Foo is high of—very full of—it's very high in sodium. Which is very bad for you, it's high salt content. So yeah... it kind of, sort of switch my [inaudible] initially, but maybe there's a healthier choice. I think with even fruits also. You say fruits are healthy... but after a while, we say you cannot eat so much of this certain fruit and everything. Because sometimes they have certain properties which if you eat too much then you will be [inaudible]	
0:24:57	Facilitator	Like what? What kind of fruit?	
0:24:57	Participant 4 (Chinese, M)	Durian	
0:24:58	Participant 3 (Indian, F)	Even, watermelon.	

0:25:01	Facilitator	What about watermelon?	
0:25:06	Participant 3 (Indian, F)	Because very sweet. And... actually I came across a patient that who really loves watermelon, but she-- that's when she had diabetes like... because she consume every day. [Facilitator: Because of the watermelon?] I mean… One of the causing factor.	
0:25:22	Facilitator	Okay. Okay. Alright. So you know, based on all these things, would you all buy into these nutritional messages. And then, if...you know since there are many, if you will, contradictions, right, so you have been led to believe a certain food is good for you only to find in the future actually not so.... How would you then based on this, react to messages about nutrition? Avoid of--- As in, I was to give you a message about the nutritional properties of food A, how many percent would you believe about this nutritionals message?	
0:26:04	Participant 4 (Chinese, M)	I think you, like, read the whole thing right, for instance... the tea bottle. Take for example. So for instance when I start drinking, I would look at it. So if then I look at it I wouldn't know what it actually means. Except for maybe for the energy, and maybe that sugar content. And...if you say that it looks-- like I think likes there's a healthier choice flavor... I don't know what it means a healthier choice before, so it's 25% sugar, is it... even verified? Is it even healthy in the first place even though it's at 25% sugar? Because it's like... this is the amount of sugar, this is healthy, 25% doesn't make any difference.	
0:26:40	Facilitator	Those are the-- So, I understand what you are saying. So... The nutritional labels so sometimes... you have issues understanding it lah?	
0:26:46	Participant 2 (Chinese, F)	So I don't bother to read it. I can't understand…[laughs]	
0:26:51	Participant 1 (Chinese, M)	Then another thing is...artificial sweetener. It's a-- They say it's healthier, yes, in terms of calories, but... the thing is you are consuming, but would that make --- as in so far in America the food authority says it's safe	

		for.... consumption, but there are some articles that say it may not be as safe as they say it is stated. like if you consume it very long term wise.	
0:27:27	Facilitator	Okay I get, I get that.	
0:27:30	Participant 1 (Chinese, M)	Like Coke Zero for example.	
0:27:37	Facilitator	Yeah, that's another one, right? Yeah the Diet Coke thing. Yeah, they actually said that it would be a healthier alternative. but then I think they-- recently because of the artificial sweetener thing... yeah, same thing then the other things like, long time ago they say alcohol is no good, so now they say a little bit is alright. Chocolate same thing.	
0:27:53	Participant 1 (Chinese, M)	I think it's the high fructose corn syrup. It's made by Japs.... uh Japanese company--- they manufacture the sugar because it's very very sweet. So if... you don't have to use so much real sugar, you just add in a little bit of it. So it kind of cut down the cost of manufacturing for like... high volume profit.	
0:28:19	Facilitator	Understand okay. So is there anything else you want to add, in terms of whatever we have discussed? Food considerations. Okay, so, to just summarize, what we have discussed today is really right from the beginning, I've asked you all to think about, when it comes to making food choice, what are some of the thing that you all consider? Following that, I actually then asked you has there ever been occasions where your food considerations actually conflicted with each other. And then you said, ya --- and then after that I proceed to ask basically, when it happen, how do you feel and then how do you respond. Right? So, most of the time, you know... you all would still go ahead with it, but somehow you all would compensate ---	
0:29:05		Compromise.	
0:29:06	Facilitator	Compromise. Okay, so you rationalize, compromise, compensate in some form. But in the end, your attitude	

		doesn't change, right? Does it already, change at the end?	
0:29:20	Participant 1 (Chinese, M)	Not drastically.	
0:29:23	Participant 4 (Chinese, M)	I think it only change if there is... a major life event is happening. Or a few major. Because for me, is because you see the past due to diabetes or something like that, then... it struck before you that it's runs in your family so you need to be more careful.	
0:29:37	Facilitator	Okay, when those things happen... do you see it through? Because I know some people at that point in time, okay this is something. But then over time, sometimes habits are hard to change. And then, yeah--	
0:29:48	Participant 4 (Chinese, M)	I wouldn't say there would a huge shift in attitude, but I would be more cautious in eating. So for instance... kopi, teh, you just reduce the sugar intake. So just small steps not to take, not I do not take this food at all.	
0:30:06	Facilitator	Oh OK… So you would --- so that means, at the end of the day, am I right to say that for all of you, you would not give up a particular food? [Participant: Um...Yep] You would still continue to eat, but you eat lesser of it?	
0:30:21	Participant 3 (Indian, F)	I mean, yeah.	
0:30:22	Facilitator	Or you continue to eat, and then somehow you tell yourself I'm going to compensate or compromise in some other way?	
0:30:27	Participant 4 (Chinese, M)	Possible that I will rationalize until I don't like it	
0:30:30	Facilitator	Does that happen?	
0:30:32	Participant 4 (Chinese, M)	You know fried chicken, after you eat --- You suddenly feel like all the oil is in your mouth, you feel very	

		disgusted.	
0:30:42	Facilitator	Did... did that happen to you?	
0:30:40	Participant 4 (Chinese, M)	Yeah. So I used to like to eat KFC. So… But now after a while, I can't take it anymore. So I stay away from KFC.	
0:30:50	Facilitator	Oh... Ah okay, it happened…	
0:30:51	Participant 1 (Chinese, M)	I love to KFC. I loved KFC so much. Now I'd be [inaudible]	
0:31:00	Facilitator	And what was the thing that caused you to stop eating it?	
0:31:04	Participant 1 (Chinese, M)	Actually I just stopped eating --- but the thing is I like Coke. I still... like you know, but the thing is the control, where Coke is the fuel. [Facilitator: Yeah, yeah] I won't compromise that. [laughs]	
0:31:19	Facilitator	Okay. Alright. Anything you all want to add?	
0:31:23	Participant 2 (Chinese, F)	Actually for the food.... food messages, I don't think it applies to me at all. Because it's about the lifestyle that I have. I don't eat a certain thing, a lot. I arrange so that I.... nothing really affects me a lot, you know. If there's one very bad thing that I eat, but I don't eat a lot. So it's like...tt doesn't really appear to me as a threat.	
0:31:49	Facilitator	Ok, so you eat what you like to eat. But you eat then in moderation. [Participant 2: Yeah yeah yeah]. So, okay. Alright. Anything else to add? If not I will close, and you all stay for a while for me to debrief you all.	

(25-34 age group)

Timecode	Person	Transcription	Remarks
0:00:06	Facilitator	Okay you guys are alright already? Okay. So we are going to begin the discussion. Right… So what's going to happen is hopefully everybody will get into this. Now the very first thing I'd like you all to help me to do, I think I've given you, a slip of paper ---- just one page. Ok, uh... whenever we make food choices, we decide on what to eat and everything, okay our food choices might be guided by certain considerations. Normally what we call food values. So food values like, whether you would choose based on health considerations, whether you choose it based on taste. So right in front of you, you have 9 considerations, 9 food values. Beginning with sensory characteristics. Sensory characteristics would be like texture, odor, taste, and so on and so forth. So what I would like you to do is look through the food values, and then you put a check or tick on the left hand side, what is relevant to you… Then based on what you have chosen, rank them, which is most important. Maybe you all can take 2-3 minutes to do this.	
0:01:18	Participant 1 (Chinese, M)	So meaning, must tick how many?	
0:01:20	Facilitator	It doesn't matter. Whatever that's relevant to you. [Participant 1: Okay] Whatever you have used before ---- it sort of influence your food behavior, your food choices, then you just go ahead and ---	
0:01:30	-	[pause]	
0:03:04	Facilitator	Okay, if you have happened to... check others, maybe you could just write for me what would be most important there to you?	
0:03:12	-	[pause]	
0:04:54	Facilitator	So is everybody done? Okay, alright… So basically what you have just done is you have chosen what are some of the consideration that you would take into account when you make your food choices, right. Like,	

		if you take a look at the list, could you then tell me has there been a time when you make a food choice, when you decide what to eat --- you actually find that your food values actually conflict with each other. For instance, when you... come to a certain food, and you say, this is really nice, really tasty, but then it's really unhealthy. So that represents a situation where.... your food considerations of health conflicts with your food consideration of taste, for example. So, what we are going to discuss is are there any situations, uh... that you actually experienced such conflicts, and if you did, what were some of the values that conflicted with each other? Right, so could you all tell me?	
0:06:00	Participant 3 (Malay, M)	Definitely health.	
0:06:01	Facilitator	Health? Okay, health and what?	
0:06:03	Participant 3 (Malay, M)	Health and... of course, actually a lot lah. Among my number 2... to number fifth...	
0:06:11	Facilitator	Okay… So what was your number 1 consideration?	
0:06:12	Participant 3 (Malay, M)	One is I have... to eat halal food. Basically that one is definitely a must first lah.	
0:06:16	Facilitator	Okay for you, so it has to be halal. Alright. What was your number 2 then?	
0:06:22	Participant 3 (Malay, M)	2, cost. By convenience, health and sensory.	
0:06:28	Facilitator	Okay… So for you, the conflict was between eating halal food and...	
0:06:35	Participant 3 (Malay, M)	Uh... Halal usually... that one is no conflict lah.	
0:06:41	Facilitator	So what is the most prominent--?	

0:06:43	Participant 3 (Malay, M)	Most prominent... Maybe cost and convenience.	
0:06:45	Facilitator	Cost and convenience. What do you mean, can you elaborate on that?	
0:06:48	Participant 3 (Malay, M)	It's maybe easy to get food here, but uh... a bit expensive.	
0:06:53	Facilitator	So for you it is cost, convenience. How about the rest of you all?	
0:06:56	Participant 1 (Chinese, M)	My one is uh... health and nutrition, sensory characteristic.	
0:07:03	Facilitator	Okay. Specifically, which aspect of sensory characteristic?	
0:07:06	Participant 1 (Chinese, M)	Ummm… I think it's... taste and appearance.	
0:07:11	Facilitator	Taste and appearance. So maybe you could describe a particular food?	
0:07:16	Participant 1 (Chinese, M)	Like oily food right. Sometimes, like chicken colored or maybe some oily stuff. You want to go and buy, after that I think... wah, it's very unhealthy that. So I will stop buying that. If I have the craving but I will stop myself from buying the food...	
0:07:31	Facilitator	So for example, out of 5 times... how successful you are in stopping yourself?	
0:07:35	Participant 1 (Chinese, M)	I think 4 out 5.	
0:07:37	Facilitator	Oh, really? So maybe 1 out of 5 time you would give in.	

		[Participant 1: Ya, ya] Okay, Joselin?	
0:07:42	Participant 4 (Chinese, F)	My conflict is actually an area of quality. For example, in school, some stall actually, you see them handling the food, then they handle together... collection of cash. But somehow, I see it for myself it doesn't deter me from purchasing it. Yeah, because uh... previous factor because I'm rushing for time, so that's my last resort. I mean I don't have other options, so I still go ahead with itt.	
0:08:08	Facilitator	So it sounds to me like you're saying it's really the example you gave is uh... time, which is convenience versus quality. [Participant 4: Convenience, quality… Yes] That means you actually... place a premium on handling. That means it matters to you the quality, but because you don't have time, so then you go with that food. But then this is when the conflicts happens lah. Alright, Participant 2?	
0:08:35	Participant 2 (Chinese, F)	Mine is like.... what is that...conviviality? Like maybe eating with friends. Sometimes friends want to eat certain things, but you know like, the quality is not good and the taste not fantastic. But because, like, you want to spend time with your friends - my friends- I want to spend time with my friends so I'll like just go ahead. That means even though... I don't like it. Yeah...	
0:08:54	Facilitator	And then you still eat it anyway?	
0:08:56	Participant 2 (Chinese, F)	Yeah...	
0:08:56	Facilitator	That's interesting---	
0:08:59	Participant 5 (Indian-Eurasian, M)	For me it would be convenience and cost ah. Because I don't mind paying something more, if it's convenient to me. It's nearer to my place. Yeah.	
0:09:09	Facilitator	Okay. Okay. Alright, now, when you all come across situations like this, where you actually experience a conflict in terms of your values. Uh... Do you feel	

		anything? Do you feel a certain emotions or... what do you feel --- like say for example, Participant 4. You were saying that, I don't have the time, but then I also don't like the fact that, you know, you're not really handling the food properly. But then, you know, you do you feel a kind of --- What do you feel, do you feel any discomfort or whatever?	
0:09:41	Participant 4 (Chinese, F)	For that few seconds where I saw... the action of using their hands to touch the food and money. But when I'm consuming it, it's like okay, that's it, I need to rush, I need to go already. It's just the 2 seconds... of seeing that actual scene happening. The disgustion is like ughh, yuck.	
0:10:00	Facilitator	So what you felt was, disgust?	
0:10:01	Participant 4 (Chinese, F)	Uhuh.	
0:10:03	Facilitator	Any other emotions?	
0:10:06	Participant 4 (Chinese, F)	Yeah, tell myself I won't come back again, but I have no choice. [laughs] That's the shortest queue most of the time... during the peak hours. Yeah	
0:10:15	Facilitator	So then when you actually eat the food itself, do you feel that, still?	
0:10:18	Participant 4 (Chinese, F)	Uhh... no.	
0:10:21	Facilitator	Okay… How do you get over that?	
0:10:25	Participant 4 (Chinese, F)	How do I get over that... uh... actually I didn't do anything to get over that. Yeah... [Facilitator: You didn't do anything to get over that, but then--?] But this way, it kind of stopped, maybe if I had more options in the future I would not go for that stall. Yeah.	

0:10:38	Facilitator	Then in the future, do you find yourself going back to that stall?	
0:10:40	Participant 4 (Chinese, F)	Um... no. Try not to. Subsequent behavior... yeah.	
0:10:48	Facilitator	Ok, alright. Then for Participant 1, the 1 out of 5 times when you actually go and buy the oily food, right? Do you feel something, do you feel --- I shouldn't buy this food?	
0:11:01	Participant 1 (Chinese, M)	I would think that if I eat, maybe I need to exercise more.	
0:11:07	Facilitator	Ok, so um… Do you feel any emotions after eating? Do you feel like guilty or--?	
0:11:12	Participant 1 (Chinese, M)	Uh.... Not really lah. But I would convince myself I need to go more... go do more exercise lah.	
0:11:23	Facilitator	But do you actually do exercise?	
0:11:23	Participant 1 (Chinese, M)	Yeah	
0:11:24	Facilitator	Yeah, you do? Alright. How about the rest of you all? Do you all feel certain emotions whenever you choose something and then there's some kind of conflict? What do you all feel, can you all describe maybe just one emotion that you-- or an adjective to describe that emotion.	
0:11:41	Participant 3 (Malay, M)	I... I feel emotion when --- but it's not like I choose the food --- you know, for example if my wife or my mum bought something... expensive and it tastes not so good but expensive, but they already buy, so you just have to go through that, mean that emotion I'm of course upset lah... you know. They waste money on too much food or not nice food, something like that. But cannot, have to... because they already bought.	

0:12:08	Facilitator	Okay. So you just went ahead with it. Do you, like, do you have to tell yourself or convince yourself to just eat the food, or...?	
0:12:15	Participant 3 (Malay, M)	Because it's already there [laughs]	
0:12:18	Facilitator	Ok, alright…	
0:12:19	Participant 5 (Indian-Eurasian, M)	So for me, because I place quite a high emphasis on quality. So let's say I buy something, and it does not meet my quality, of course I pay more for it then I feel disappointed. Yeah. I'm not getting my money's worth.	
0:12:32	Facilitator	Okay, then after that um... do you find --- okay, so what do you do with that disappointment?	
0:12:39	Participant 5 (Indian-Eurasian, M)	Um... I would --- I know this place isn't good, I will avoid this place, I would just avoid it totally. [Facilitator: Avoid it totally? Okay…]	
0:12:48	Participant 2 (Chinese, F)	I'll be sulky in the beginning. If the company is good, then that goes away, because it was worthwhile because of that good time spent together. But if the company was terrible, then… Yeah, I'll be like... even angrier with myself.	
0:13:04	Facilitator	Alright, okay… Do you all, everyone here, did you all choose health & nutrition as one of the important consideration?	
0:13:13	All	Yes.	

0:13:16	Facilitator	Ok. You all did. Now um... If that is the case, do you all pay attention to nutrition messages about food? Do you all pay attention to nutrition messages about food? Do you all?	
0:13:26	Participant 1 (Chinese, M)	Not always	
0:13:27	Facilitator	Not always? Okay, so how --- so who here does, diligently? Participant 1?	
0:13:35	Participant 2 (Chinese, F)	What is diligently? [inaudible chatter]	
0:13:47	Facilitator	Every time. For example, you know, whenever there's news about certain food that is healthy or not healthy, you read about it and then you say fine, I think I'm going to fold this. Or whenever you go to supermarket before you buy something you look at the nutrition label --- okay fine, you know. Then that would be something I would consider to be someone who is very mindful and diligent. But if let's say you are the kind who--- the messages come in and aaah you go, aahh I'm not going to bother. You know. So, the rest of you all, Thomas does that, right? [Participant 1: Yeah] you read nutrition labels also? And you can understand everything what's really there?	
0:14:10	Participant 1 (Chinese, M)	Not really lah. I see the fat contents, like what's the proteins, how many percentage of proteins… like that	
0:14:21	Facilitator	Okay, so the rest of you all you all don't look at the nutrition labels?	
0:14:25	Participant 4 (Chinese, F)	Sometimes it might not be accurate either. It's just presenting facts. [laughs] So it's like, there's a bit of doubt also, I say, "ah heck, whatever".	
0:14:34	Facilitator	Actually, that's true. Then how about nutrition messages? What do you all think about them?	

0:14:40	Participant 4 (Chinese, F)	It's all marketing schemes. [Faciltator: It's all marketing schemes?!] It's like combination to promote the product. Yeah, so…	
0:14:45	Participant 2 (Chinese, F)	It depends on who it originates from. Like if it's from HPB then you know they really have your health, your welfare... uh as their concern. But if it's like from say... one of the companies, like they say this bread is better, whatever, then you think it's just some ploy to get you buy more of their product.	
0:15:06	Facilitator	Ok. Has there ever been a time where you read a certain nutrition message, and after you read it, you sort of realize that whatever it's saying, actually contradicts what you actually believe about that particular food? Has there been a time like that? To give you an example, a long time ago, they used to say margarine is better than butter. [laughter in background] Not too long ago, now they changed their tag, and now what, margarine is actually not good. Butter is better. So… Let's say I'm the one who long time ago, I heard that message about margarine being the better option, so I do margarine, but then now they tell me, you know what, butter is better. Have you all come across situations like that, where you have been taking something, a food, that you thought was good for you and suddenly a report comes and actually it's not good?	
0:16:06	Participant 2 (Chinese, F)	I think like vitamin C, people used to say that like take vitamin C and stuff like that. And then in the end, other reports come and say you shouldn't be taking too much vitamin C because because it gets excreted at the end of the day anyway. Yeah so like, now instead of taking like... 1000mg of vitamin C, I'd probably choose to take the sustained release type of vitamin C pills, rather than take the kind... that does not do sustained release. Yeah...	
0:16:33	Facilitator	In terms of vitamin C lah. [Participant 2: Hmm] Okay. How about the rest of you all? No? So, everything, no, you have not come across something like that?	
0:16:45	Participant 4 (Chinese, F)	I think my experience is more of the... the salmon fish. Salmon fish is like, we all know that the value of it is like omega 3. Yeah. So, but there is also news that's	

		reported saying... oh you know, it's like salmon that's in the ---is it Pacific, or Atlantic? --- I can't remember... yeah, and the ocean water is affected by pollution bla bla bla. Yeah, so it's like...okay, yeah so I know this news ya, so it's like I stay away for a while before I resume again, my diet of salmon.	
0:17:12	Facilitator	So that's interesting. So you are saying that, when you read reports like that, you don't change your behavior... you still consume salmon?	
0:17:22	Participant 4 (Chinese, F)	Still consume subsequently. It's only --- it's only a short term... abstinence, yeah.	
0:17:28	Facilitator	So when the report first come out, you stopped. Then after that, you go back consuming it?	
0:17:34	Participant 4 (Chinese, F)	Yes.	
0:17:35	Facilitator	Is it back to the same amount?	
0:17:36	Participant 4 (Chinese, F)	Yes.	
0:17:3	Facilitator	Same amount?	
0:17:37	Participant 4 (Chinese, F)	Yeah.	
0:17:41	Facilitator	[laughs]That's interesting. How about Participant 3? Participant 5?	
0:17:44	Participant 3 (Malay, M)	Trying to think of something [laughs]	
0:17:41	Facilitator	Participant 5 you come across something like that?	
0:17:49	Participant 5 (Indian-Eurasian, M)	Okay, I think like those instant seaweed, those instant snacks. Because I always think that seaweeds it's really healthy. [laughs] Yeah, but I was quite surprised that sometimes the content --- there's a heavily --- there's a very quite high salt content in the seaweed itself. Because seaweeds ideally I thought it should be good	

		for you, healthy, natural.	
0:18:10	Facilitator	Right, okay. So then, when you realized that you know, it's not that healthy because of the sodium content right, what do you do?	
0:18:18	Participant 5 (Indian-Eurasian, M)	I cut down, I cut down on it	
0:18:20	Facilitator	You cut down, but you don't stop completely?	
0:18:21	Participant 5 (Indian-Eurasian, M)	On no, I don't stop completely. [laughs]	
0:18:27	Facilitator	Now why do you all think, that, I mean the examples given by Participant 4 and Participant 5 of course, and I think to a certain extent Participant 2 as well. That when you come across things like that, you don't stop. Why don't you stop? I mean you may cut down or you know... temporarily or after that. What is stopping you from giving it up completely?	
0:18:51	Participant 3 (Malay, M)	Used to it.	
0:18:53	Facilitator	Used to it? Does your attitude change though? Do you like --- do you change your evaluation of say for example, salmon from a particular place. Do you change your perception of seaweed? Does your attitude change?	
0:19:06	Participant 3 (Malay, M)	Um... If you reduce it, that's the change. If you reduce lah.	
0:19:12	Facilitator	So then, your attitude does change. It does change --- does change [Participant 2: There's someone at the door] --- does it become more negative, or less positive?	

0:19:31	Participant 5 (Indian-Eurasian, M)	Less positive	
0:19:33	Participant 4 (Chinese, F)	Less positive.	
0:19:36	Facilitator	So you become less positive.... not negative right? So generally it is still an overall a positive attitude? Good. Am I right to say it or not?	
0:19:46	Participant 5 (Indian-Eurasian, M)	Yes, because... I'll still be consuming it.	
0:19:50	Facilitator	Exactly right? Because if it's totally negative, then ya, then it becomes like... uh... you would probably not eat it at all. Okay um... what are some of the situations that can actually trigger, okay... that can actually trigger your awareness that the food that you're consuming actually is --- has your food values all conflicting with each other? Let's say for example right--- let's say I don't think about anything, and I take KFC. Okay. I enjoy it, it's really good. All right? Then after that, someone comes in and say, 'eh you know what, you know how much oil is there?' Then suddenly then I become more aware. Okay, so are there any situations like that where when you are eating something, you know, you are not thinking about anything at all, but something happens that triggers you to think about 'Hey you know what? What I'm doing is actually conflicting with something else that I believe in?' If there are situations are like that, can you think about it and tell me what those situations are?	
0:21:07	Participant 2 (Chinese, F)	Okay I can go first. I stopped eating brownies, after I made brownies from scratch, and realize how much oil went in it. [laughs].Ya.	
0:21:15	Facilitator	Okay, aaah... So, okay, basically.... okay if I get you correctly --- you love brownies, right? [Participant 2: Yeah] So you just like it, but when you actually then make it, you actually know the ingredients that goes into it? That was when you realize. Oh okay, that's interesting. Okay, alright. The rest of you all?	

0:21:34	Participant 1 (Chinese, M)	For me, it's the last time I ate... char kuay teow. After that my friend told me, this ah, it's very high content in fat. Since then, I stopped eating char kuay teow...	
0:21:45	Facilitator	So for you, it's when people tell you. Okay. So that was your friend?	
0:21:55	Participant 1 (Chinese, M)	No my friend.	
0:21:56	Facilitator	Would it, would it matter let's say if it was someone else, if a stranger told you?	
0:21:57	Participant 1 (Chinese, M)	I would go and check loh. I would go and check.	
0:22:00	Facilitator	You would go and check. When your friend told you, did you check?	
0:22:02	Participant 1 (Chinese, M)	That time no.	
0:22:02	Facilitator	You didn't check. Okay, so you believe a friend, but if a stranger tells you really---	
0:22:08	Participant 1 (Chinese, M)	Um... I haven't come across yet. I think I would take precautions, yeah.	
0:22:11	Facilitator	You would take precautions still. Okay.	
0:22:16	Participant 5 (Indian-Eurasian, M)	I used to --- when I was younger, I used to like a lot of fast food. Yeah. Then when I get older, then how come all uh... the crowds in fast food restaurants seems to be all bigger size, yeah bigger build? [laughter in background] So... then from there lah, I begin to realize fast food is not good for me. Although I do enjoy it when I was younger. Yeah...	

0:22:32	Facilitator	Okay. So, that basically, when you became older, um... you look at the people, the customers at the... Okay, that's very interesting. Participant 4, Participant 3?	
0:22:50	Participant 4 (Chinese, F)	Um... Actually, the past 5 to 8 years I saw some news stating that oooh... agriculture, farming industry in China, the food that they produce is like questionable. So it's like... I kind of like, okay I actually I'm very cautious about that. So it's like... uh generally, in Singapore, most of our goods are actually imported. And likewise food. So, actually the majority of our vegetables for instance, are imported. So I tried to psycho my mom, saying that okay, why don't I sponsor you to buy other imports vegetables. Cause like, I feel very insecure seriously --- Seeing the images, yeah so this is an example where total... um... abstinence from this particular range of food. Yeah.	
0:23:33	Facilitator	So the trigger for you is when you read reports?	
0:23:37	Participant 4 (Chinese, F)	Reports and I saw images of how they process the food. Yeah...	
0:23:40	Facilitator	The images was --- where do you see the images?	
0:23:42	Participant 4 (Chinese, F)	Video clips...	
0:23:42	Facilitator	Video clips on the internet? [Participant 4: Yeah] Okay. Participant 3?	
0:23:48	Participant 3 (Malay, M)	Um.... So far, not really happened. But, I guess if there's really reports on news... then I would definitely take.... precaution	
0:24:00	Facilitator	So for you the trigger is news also. [Participant 3: News yeah] So if I'm hearing you all correctly, uh.... the triggers range from news --- okay, the news reports that you see, maybe online content ---- uh... to friends, coming to tell you, to personal, when you get down to cooking it, cooking something, you realize something and from your observation. Okay. All right. Um... what	

		do you think... would actually be effective? Okay, if let's say, because from whatever you all have been saying, it seems that even though you are aware of the food for example, a food, you have been consuming is not really that healthy or the quality there's a problem. All right. Because, after that you consume it anyway, but it will be a reduced amount right? What do you think... can be done to actually stop you, or stop people from completely taking something which is --- say for example --- unhealthy, but the person has always been consuming it. So what do you think something can be done effectively to actually stop?	
0:25:25	Participant 2 (Chinese, F)	Stop completely? [laughs]	
0:25:28	Facilitator	You think that's not going to happen?	
0:25:30	Participant 2 (Chinese, F)	Super tough.	
0:25:31	Facilitator	I mean --- Yeah, you all can actually tell still and it's not gonna --- Why do you say it's tough?	
0:25:35	Participant 2 (Chinese, F)	Okay like for instance, my aunt recently lost a lot weight, because she has a diabetes scare, then she like reverted to eating basmati rice. Yeah. So even though I saw that she lost a lot of weight, and I also would like to lose a lot of weight, like but it's inconvenient. Hence, I haven't made the switch. Same for another friend who took like only oats, then lost a lot of weight, but... I mean, it's like I was tempted for a while to follow, but... like the convenience and the time you need to spend and the taste like... a lot of other things which are important to me are being compromised if I take the switch. Yeah...	
0:26:10	Facilitator	Okay. So, what you are saying is that you feel it is not possible to stop completely because if you stop completely, there's a lot of major sacrifices and changes. [Participant 2: Hmmm] Do you all feel the same way? Or do you all think there's definitely something we can do to actually---	

0:26:31	Participant 3 (Malay, M)	Even if it's just the case of unhealthy maybe but might not stop, but let's say really major case of you know, like example, like... food scandal, the way they paint oyster red or something like that --- the chemicals, you know, just to make it nice ah. Then it's really reported, maybe we have known of relatives who have got sick or something like that lah, I think that would definitely... stop anybody. I think.	
0:26:55	Facilitator	Okay that's interesting. Thank you for that. Thomas, you want to say something?	
0:27:00	Participant 1 (Chinese, M)	I think it's based on individual food values, how they think about um... the food. Last time I also don't really care about health and nutrition. I just eat anything that I like, but after this awareness right, I would be very... caution to choose my food wisely.	
0:27:17	Facilitator	So that means, in your case, what happens is your food values actually change.	
0:27:21	Participant 1 (Chinese, M)	Change, and my ---- food consuming behavior also changed.	
0:27:28	Facilitator	Okay. What do you think --- if you reflect on the experience? What actually help you to change your food values?	
0:27:35	Participant 1 (Chinese, M)	I think it's about -- I was concerned about my self image. If I really take a lot of unhealthy food, maybe I will become very... fat. That's what would stop me from taking unhealthy food.	
0:27:46	Facilitator	Self-image. Okay. Alright, Participant 5 you want to--	
0:27:50	Participant 5 (Indian-Eurasian, M)	I ---- actually based on experience, because I know my uncle. He loves his salted fish. He loves his salted fish. Uh.... unfortunately, he was actually down with the cancer, throat cancer. So there's a high likelihood that because of this high salted and preserved fish, he actually developed this. So actually gives me a wakeup	

		call that these particular food... is actually not --- very unhealthy to the point that it can cause you to be that sick. So for these kind of food I would avoid it lah.	
0:28:24	Facilitator	So, okay. If I'm hearing you all correctly, nutritional messages on their own is not enough to help people to change? Is that correct?	
0:28:36	Participant 5 (Indian-Eurasian, M)	Yes	
0:28:39	Facilitator	You need... some kind of um... personal experience, whether it's direct or indirect. Okay. Means HP is basically useless here.	
0:28:51	Participant 4 (Chinese, F)	[laughs] I think there's a certain percentage that would be affected, whatever that is being presented by the campaigns or by health promotion boards, it shows the worst case scenario of things. Yeah. But it will not speak to everyone. Some percentages will only... really awakening moment when it actually strikes them.	
0:29:09	Facilitator	That's an interesting point. If I were to ask you to give a number, out of 100%, how many percent do you think respond to just the nutrition message?	
0:29:21	Participant 2 (Chinese, F)	10%?	
0:29:22	Facilitator	10%?	
0:29:27	Participant 4 (Chinese, F)	Very low, very low. Maybe they know it, but they don't do any action, yeah... most of the time it's like that.	
0:29:33	Facilitator	So there are --- the majority would then would have to wait until there is a personal experience, again direct or indirect, for the message to... to ring through lah. Okay, interesting. Okay, I'm going to stop the discussion here, do you all have anything to add? No? Okay. I'm going to stop.	

(35-49 age group)

Timecode	Person	Transcription	Remarks
0:00:00	Facilitator	What you have on uh... the one that have one-piece thing. Ok the one-piece thing basically what is down there, OK, all of us when it comes to food, we make food choices right? When we make food choices there are certain considerations, what we call food values. So listed there are 9 food considerations or food values that research has shown that people look at when they are making food choices. So could you all take a look at that list, mark those that is relevant to you. That means those food considerations as important to you. And after you have marked those as important to you, rank them, so you don't have to choose everything, but whatever is relevant to you. So maybe you could take... about 3 minutes for you all to do that.	
0:00:55	Participant 1 (Chinese, M)	Rank them? So one being... So being one as the most important?	
0:01:16	Facilitator	Yes, one is most important..	
0:01:19	Participant 2 (Chinese, F)	Are you talking about making food choices as in like when you cook food or we buying raw ingredients...	
0:01:28	Facilitator	Like when you are, when you want to eat for example. Choosing whether we are talking about cooking or cooked food...	
0:01:34	Participant 2 (Chinese, F)	So we can be either or.... [inaudible]	
0:01:39	Facilitator	Yes, exactly. Like see for example... say let's see one of the important consideration is health and nutrition. When you go hawker center you choose healthier versions or is there extreme importance when you cook yourself, you would choose the ingredients that also match that.	
0:02:00	-	[pause]	
0:04:16	Facilitator	OK so we all done?	
0:04:17	Participant 2 (Chinese, F)	Uhuh done	
0:04:18	Facilitator	OK, so looking at the food values that you have chosen to be relevant. Um... If I were to ask you has there ever been an occasion where you actually found your food consideration like your food values to conflict with each other? That means for example if you sort of value health and nutrition, for example. But on a Sunday maybe because of schedule, maybe work or school	

		schedule, you find that you have to have a very quick bite because you don't have time. And so then, if convenience is another food value, than if that conflicts with health and nutrition. So has there ever been any occasion where you experience those conflicts before? OK, so what are those occasions, can you tell me which are the conflict pairs? Maybe we begin with Participant 3.	
0:05:13	Participant 3 (Chinese, F)	Convenience is always, like you said. For example like you say... like today I decided that I'm going to eat cereal for lunch even though it's more understood as a breakfast food because I didn't want to battle the crowd in the canteen.	
0:05:26	Participant 4 (Chinese, F)	But it's healthy, right? Is it healthy?	
0:05:29	Participant 3 (Chinese, F)	It depends la...	
0:05:30	Facilitator	Ok, so you are saying that there are a conflict between, say for example.. your health, nutrition in the example.	
0:05:37	Participant 3 (Chinese, F)	Yes.	
0:05:38	Facilitator	Convenience la.	
0:05:40	Participant 3 (Chinese, F)	Quite classically cost is always an issue. You know certain things are better for you to eat, that you should eat them but sometimes they cost quite a lot. So you play with a bit of compromise and you decide 'Okay I'll for the slightly less expensive but borderline healthy options.' So you compromise one for another.	
0:05:57	Facilitator	Okay. Is there one specific example of that one particular food where... that happens?	
0:06:02	Participant 3 (Chinese, F)	Let's just take meat... I mean, uou buy meat, like seriously good, lean beef. It will cost... a lot. And so you... compromise at some point of time... And you will, you will compromise unless you have limitless resources, you will compromise it.	
0:06:19	Facilitator	Okay... so for you is health, nutrition and convenience. Health, nutrition and cost.	
0:06:26	Participant 3 (Chinese, F)	Yeah	
0:06:27	Facilitator	OK, how about the rest of you, Participant 4?	
0:06:29	Participant 4 (Chinese, F)	OK, uh, two examples. One example is conflict between authenticity, naturalness versus convenience. So for	

		example we eat out and for the sake of convenience we go for McDonald's, but McDonald's is bad food. It's not authentic, it's not natural but we do it because it's easier for everybody. It's easier for the kid... Rather than you go to the food court and you cannot find place to sit. You have to think about what to order and they may not eat, and stuff like that. It's occasional, for that situation... Limited time that you have.	
0:07:14	Facilitator	Alright, is there anything else?	
0:07:16	Participant 4 (Chinese, F)	The other example is like what Participant 3 says. Uh... thinking like, okay if you want to --- I used to look at the price tag of uh... frozen... cod fish versus cod fish. It's a big deal of difference, so it's like. So therefore it again a conflict between cost versus... health and nutrition.	
0:07:35	Facilitator	Health and nutrition, okay. Participant 2?	
0:07:37	Participant 2 (Chinese, F)	Uh... I would say that it is also more towards... uh cost and nutrition la.... Sometimes we like to buy organic food which we know is probably much better and good for your health. But because of the cost, organic food becomes a little bit more... expensive. So ya, I would like to balance that lah. Yeah and convenience.... and quality.... yeah. Coz you may want quality food and nice food but on the other hand you don't have the time so... yeah, you just pick and go.	
0:08:16	Facilitator	Ok, alright. Participant 1?	
0:08:17	Participant 1 (Chinese, M)	For me, uh... the conflict is when I'm preparing the food. So uh... it's between uh... how easy it is to prepare and versus the amount of ingredients needed to buy so that also conflicts with the cost. So if I want to have a quick meal, then I'll buy simple ingredients and cook the meal and that is a conflict with nutrition and... yeah.	
0:08:39	Facilitator	Ok, so for lot of you I think is similar. Does none of you not ever experience the conflict between health and taste? Like you know, normally what they usually say is that something that tastes really bad is normally good for you. And you know, something that is good for you normally doesn't taste as good. Do you all ever experience that kind of conflict or... is that not uh...	
0:09:04	Participant 3 (Chinese, F)	Only for Chinese medicine! [laughter] I will tolerate a really.... unpleasant taste... um.... in... for its so called benefits. If I understand it as such is that it is good for me and I can't really have a choice.... yeah. If it is a medicinal value.... then I will, then I will bend.	

0:09:30	Facilitator	Then how about snacks, for example. Do you all snack?	
0:09:36	Participant 2 (Chinese, F)	Yes... I'm snacking now. [laughter]	
0:09:40	Facilitator	Oh you all cut down? But you all do. So when we talk about snacking for example, what has been some of the snacks that you have taken? [Participant 2: Chocolates] Chocolates? [Participant 1: Nuts] Nuts? [Participant 3: Chips] Chips? So, say for example when you consume chocolate, when you consume... chips... uh... Do you think, 'Oh no, this is not going to be healthy' but you eat it anyway.	
0:10:03	Participant 3 (Chinese, F)	Oh yes!	
0:10:05	Participant 2 (Chinese, F)	Yes, but I would choose the chocolate that is probably.... uh slightly better grades than the one that is in the mass market. Yeah...	
0:10:14	Facilitator	So better grade would that therefore mean also more nutritional?	
0:10:20	Participant 2 (Chinese, F)	Probably less sinful... [laughs with Participant 3] Sugar level lesser. [laughs]	
0:10:32	Facilitator	Do you really take note of the labels when you buy?	
0:10:33	Participant 2 (Chinese, F)	Yeah...	
0:10:34	Facilitator	Oh you do ah?	
0:10:36	Participant 2 (Chinese, F)	I normally check the ingredients and the amount of cooking... The cocoa level. Yeah..	
0:10:42	Facilitator	Is it like coffee, if you drink coffee you have to drink high grade coffee... rather than you know--	
0:10:47	Participant 1 (Chinese, M)	Unnecessary for me, I mean, I'm very happy with 70 cents coffee... compared to Starbucks coffee whatever... I mean, I still enjoy the simple coffee shop...	
0:10:57	Participant 2 (Chinese, F)	I think it also depends on the mood and setting. Whether you have the time... you have a bit of bandwidth, you can actually enjoy... your coffee and tea right. I don't mind to splurge a little bit more to enjoy to buy my... mocha latte... and sit down there for the day to enjoy, but if I'm in a rush I will probably go for the quick and takeaway go lah.	
0:11:21	Facilitator	Ok, so coming back... Okay, basically when you talk about chocolate snacking, so you try to look for something which is healthy. What about chips? Is there	

		such thing as healthier chips?	
0:11:33	Participant 3 (Chinese, F)	No.	
0:11:34	Facilitator	No? So you don't look at it?	
0:11:35	Participant 3 (Chinese, F)	No. By the time you're committed to buying the darned thing, right, you're committed to the calories and the oil and the whatever, and it's just 'OK I'm going to be nice to myself today.... and ack the consequences for that... under 20 minutes whatsoever. And then just do it. Of course it's about frequency. You know you're not going to do that every other day.. You don't even do it every other week. I'll only do it maybe once a month.	
0:11:57	Facilitator	OK, so that's interesting. So, if let's say, at a point in time you have decided, okay normally you would buy something that's healthy, nutritional, but just at that point of time you decide to get that chips for example... Do you feel kind of guilt? No, No guilt?	
0:12:14	Participant 4 (Chinese, F)	[laughs] No... No.	
0:12:18	Facilitator	You feel guilty when you're buying some--	
0:12:19	Participant 2 (Chinese, F)	In a way that like this way I know if I've been consuming too much of chocolate, I said "Uh... I think I have enough for a week... uh... Postpone to next week."	
0:12:27	Participant 1 (Chinese, M)	Keep some for the next session... spread it out...	
0:12:28	Participant 2 (Chinese, F)	Yeah, you just spread it out rather than indulge everything in that week.	
0:12:34	Facilitator	Oh, ok. So to that extent... uh there's this compensation that is happening. [Participant 2: Hmm] If you get something which is not healthy now you sort of tell yourself I'll work it out, [Participant 2: Yes], I'm going to take something that is more healthy or less of it next week.	
0:12:51	Participant 4 (Chinese, F)	I see the other way. The majority of the time I'm eating fairly healthy. It's not going to kill me to do this.... you know. So I guilt-free enjoy the thing coz maybe 90% of the time I'm eating well. So I don't guilt-- Just saying I'm... it's the opposite.	
0:13:10	Facilitator	So it depends on where you're starting out from? Ahh ok. That's another interesting thing.	
0:13:15	Participant 4 (Chinese, F)	Correct. It's the perspective lah.	

0:13:17	Participant 2 (Chinese, F)	And probably when there have a workout for the day now Ah.... I know I have burn enough calories so maybe I will go back have a bit of more chocolates.	
0:13:28	Participant 3 (Chinese, F)	So kind of earn it right?	
0:13:29	Participant 2 (Chinese, F)	Yeah, earn my chocolate.	
0:13:34	Facilitator	So, coming back to all these things, um... so if she's saying that she reads all the labels... Do you all read the labels of things that you buy?	
0:13:43	Participant 3 (Chinese, F)	Obsessively. Yes.	
0:13:46	Facilitator	Oh you don’t? Then how would you tell what is health-- Is health and nutrition important for you?	
0:13:53	Participant 1 (Chinese, M)	Uh... Generally, yes lah... Go by categories. I won't go to the details about calories, stuff like that.... yeah.	
0:14:00	Facilitator	Ok, when you say go by general categories what do you mean?	
0:14:02	Participant 1 (Chinese, M)	Go for, like nuts, I mean when you're talking about snacks rather than sweet stuff. Yeah, so...	
0:14:11	Facilitator	So that means right from the start it is the food itself that you choose rather than go for something-- How about Shin?	
0:14:19	Participant 4 (Chinese, F)	Similar. Choosing the foods.	
0:14:21	Facilitator	Ok. So you all... so the both of you all, do place attention on nutrition not so much as your product. For you....	
0:14:32	Participant 4 (Chinese, F)	Or category...	
0:14:34	Facilitator	Or category, so you don't really read the nutrition labels.	
0:14:37	Participant 4 (Chinese, F)	Not with every product that I buy.	
0:14:39	Facilitator	Not with everything?	
0:14:40	Participant 4 (Chinese, F)	So let's say now after classes I'm hungry, I would think that eating a biscuit would be healthier than eating chips although I do have a packet of chips in the office so I could give it to you... [laughs] I mean, you know, it's just a general perception that, biscuits...	

0:15:00	Facilitator	Yeah, so it's more of the product.	
0:15:03	Participant 4 (Chinese, F)	---- Ya, it's healthier but I do not know what's in the ingredient of the biscuit. I didn't actually read the label or check it. Not to the minute details, but just a matter of choices, I would choose the biscuit over chips.	
0:15:16	Facilitator	Okay. Has there ever been an occasion where you actually had believed that a product or a particular food is healthy? Uh... and you consume it because it's important for you be healthy, to eat healthy and everything and after that later on discover that actually it's not that healthy. Has there ever been an occasion like that?	
0:15:42	Participant 4 (Chinese, F)	Think so you know.	
0:15:44	Facilitator	If there is such an occasion can you think about that occasion and tell me what was that food that you actually thought initially was healthy. And then so therefore you consume it but later on realize that it is not healthy...	
0:15:58	Participant 1 (Chinese, M)	A moment I can think of is uh... the eggs, egg yolk, you know. Maybe there are some conceptions. There are some people who say.... that it's fine... All the vitamins, all the essential stuff... are all in the egg yolk. But then, you know... it stop, I avoid it because of cholesterol so... yeah... sometimes I want to consume it I'll just... should I or should I not?	
0:16:24	Facilitator	Ok so that's interesting. Eggs. How about the rest of you all, is there like for example...? For example, um.... a long time ago, uh... I think we're all about the same generation. A long time ago they used to say that butter is not as good as margarine, that margarine is the better alternative, right? [Everyone: Hmm] And then not too long ago now, they are actually saying margarine is not that good and butter is better. So for example, you know, I for one, had bought into the message long ago that margarine is better and so I actually substituted butter with margarine, only to be told now that actually margarine is not good. [Participant 3: You were conned]. And there are many, many other examples. I'm just wondering whether there are do you all have that kind of experience?	
0:17:21	Participant 3 (Chinese, F)	To some extent yeah the whole butter/margarine happened in my house as well but I was thinking of another scenario where yogurt was... pushed very much as a healthy thing, right? But the more I looked into it... and the more you look at how commercial yogurt is	

		produced... then I realized that that is not necessarily... good for you because of the amount of sugar that they actually put inside. Yeah... So commercial yogurt has a lot of sugar, such that you start to... question whether the benefits of the... pro bacteria and all that, and then the calcium and all that... versus the sugar added to it... Is that worth eating that tub la because you get a bit of good but quite a lot of bad as well.	
0:18:10	Facilitator	Ok, so in the end do you, your come to conclusion whether--	
0:18:12	Participant 3 (Chinese, F)	Oh then I make my own yogurt lah... I Side step the whole thing. Forget it I'm not buying you, I make my own yogurt. That's one way of... Then that way I have no issue. When I eat it I am guilt-free, I know what I'm eating, I have no issue with it. There is no guilt because I know exactly what's inside. So like that loh.	
0:18:31	Facilitator	Ok, that's interesting.... Ok if you... come to that situation where you are sort of, you come to this particular food where you have all these conflicting thoughts... Okay. How does that make you feel? If you could use just an adjective, just one adjective, describe the way you feel when you come to those... When you come across the food that you have conflicted thoughts about, what would be that one adjective to describe the way you feel in that situation. Can each of you give 1 adjective?	
0:19:17	Participant 1 (Chinese, M)	Actually just confused lah sometimes. [Facilitator: Confused? The way--] The way the nutritional--- You know, like I used to think that this was healthy but then should I or should I not... but in the end I just eat it.	
0:19:33	Participant 3 (Chinese, F)	Very frustrated. [Facilitator: Frustrated] Because again, like I said, I don't know whether to go proceed or change or-- Then you spend a lot of time... I think I spend a lot of time trying to decide and find out more. And then it's more research and I think can't I just eat it forget about it but cannot... you know you got to find out. That kind of thing. It's very frustrating.	
0:19:54	Facilitator	Ok so there's frustration, there's also confusion. [Participant 3: Yeah...]	
0:19:59	Participant 2 (Chinese, F)	I'd say balancing. So, say if I take a plate more sinful stuff and I know that I've sinned a bit more just work it out loh. Yeah... At least I know I feel better psychologically. [laughs]	
0:20:15	Facilitator	If there was one adjective--	

0:20:18	Participant 2 (Chinese, F)	I think hesitant, like I not so decisive, so... I'm not sure whether I really want to eat it. Even if I eat it, whether I will eat it in the long run. I mean,.. for the long term. Hesitant la... not decisive.	
0:20:37	Facilitator	OK, there's a certain degree of hesitation. If I were to use the word tension... discomfort... maybe dissatisfaction... would those words be words that you would use to describe what you feel when you are conflicted about something? Or anxiety.	
0:21:00	Participant 1 (Chinese, M)	Tension ok ah, but not... dis.... dissatisfaction.	
0:21:12	Facilitator	Not dissatisfaction? Tension, discomfort. [Participant 1: Yeah.,.] Okay.	
0:21:12	Participant 2 (Chinese, F)	That's possible. A bit of it. Discomfort, a bit. [Facilitator: That's possible? A bit of it? Okay... Okay].	
0:21:21	Participant 4 (Chinese, F)	Maybe dissatisfaction.	
0:21:22	Facilitator	Maybe, this one for you lah... [Participant 4: Hmmm]	
0:21:25	Participant 3 (Chinese, F)	I think dissatisfaction comes from if I were... it's more like I feel like been like... you said... cheated or conned. They didn't communicate to me about this food early... Like you tell me one thing, then you tell me something else. I'm not happy with the information you have given to me. Because information helps me decide, right, you tell me one thing, then 3 years later you tell me something else. Like 10 years down the road there's a different story then as a consumer I think that you are just marketing for the sake of marketing, not really telling... me honestly about the food.	
0:21:59	Facilitator	Right, so the dissatisfaction is more with the people?	
0:22:03	Participant 3 (Chinese, F)	With the people, the publicity--	
0:22:04	Facilitator	But not with yourself for choosing or believing in it?	
0:22:07	Participant 3 (Chinese, F)	Oh. We're victims to it!	
0:22:13	Facilitator	Ok, so I think more or less I am done. You all have anything to add? No? So now I will debrief and then end the entire session.	

(50-65 age group)

Timecode	Person	Transcription	Remarks
0:00:02	Facilitator	Ok so... thank you all of you... for helping me with this discussion. What I would like for you all to do there is another one-page uh... questionnaire you can call it. Basically this uh... sheet talks about whenever we make food choices, decide the kind of food we want to eat we actually base it on uh... certain values, what they call food values. So what you see in front of you are some possible food values or food considerations that research has shown that people would use when they are choosing. Things like for example, uh... sensory properties, like taste, the look of, the texture of the food. Things like health considerations and so forth. So could you all take a look at that and go through the list, check those considerations that you would use when you are making your food choice and after you have chosen those considerations can you rank those that you have chosen from the most important to the least. Most important being 1 ah... [Participant 1: Now?] Now yes.	
0:01:39	Participant 1 (Chinese, M)	Can be all, right?	
0:01:40	Facilitator	Can be all, yes. You can check everything there or you can select, see which one...	
0:02:16	Participant 2 (Chinese, F)	1 the most important thing because it goes down to...?	
0:02:20	Facilitator	Altogether there are.... uh I think there are nine.	
0:02:28	Participant 2 (Chinese, F)	... okay. So 1 to 9?	
0:02:28	Facilitator	Depending on the how many you check off lah.	
0:04:32	-	[inaudible]	
0:04:34	Facilitator	No, this one would have been... You have ranked them already...	

0:04:45	Participant 1 (Chinese, M)	Okay.	
0:04:46	Facilitator	Okay, we shall wait for everybody to be.... done. Okay so, you all have recheck those considerations that's important to you, and you have also ranked them. So if you take a look at that uh... what you all have, okay. Could I just ask... has there ever been a time where you had difficulty to making a food choice because the food values or your food considerations actually conflicted with each other? See for example, very frequently people who, to them health and nutrition is important, but at the same time also they enjoy their food in terms of the taste. So very frequently they have this conflict, 'should I eat this because this is nice to eat, I love this, but then you know, it's not healthy'. So have you ever experienced any conflict like this before? [inaudible background speech] If there were such situations, what were the conflict between? Was it between like if you take a look at your list, what is the most important conflict that you have to deal with between which 2 values.	
0:06:05	Participant 2 (Chinese, F)	I find for me it's the.... the health and the taste.	
0:06:10	Facilitator	Health and taste. Are they also the top 2 ranked?	
0:06:12	Participant 2 (Chinese, F)	Yes.... Top.... Top 3.	
0:06:16	Facilitator	So which one was the first one?	
0:06:17	Participant 2 (Chinese, F)	First, I always look at health first. And then my... third was uh... in terms of 3. I mean... the sensory. The...	
0:06:28	Facilitator	Oh, sensory lah. Then what was your 2nd one?	
0:06:31	Participant 2 (Chinese, F)	Second I look at the quality. You know... Is it fresh? Like you know... If I'm going to have uh... a food that is in the evening, I always look if it is cold food I'm not going to take because I worry you know, it may not be	

		fresh.	
0:06:51	Facilitator	Ok, between the top 3, the conflict that you experienced more is between 1 & 3 and 1 & 2 lah.	
0:06:58	Participant 2 (Chinese, F)	More common is 1 & 3 lah...	
0:07:00	Facilitator	1 & 3 lah. Can you give me one example?	
0:07:02	Participant 2 (Chinese, F)	Like, uou know, recently I went to Penang and I love char kuay teow... and with the eggs and the big prawns, I love it. But I was like stop shall I eat or shall I choose something like you know... what is that... a meatball, kuay teow sup or something like that...	
0:07:22	Facilitator	So eventually did you eat?	
0:07:24	Participant 2 (Chinese, F)	I had to. [laughs] My brother was saying you are not going to be down here-- It's just once in a long time... but if it is everyday thing I would not have that. Here in Singapore, I would love it but I will not eat it.	
0:07:40	Facilitator	Ok but only there lah...? Okay, so if you go down the line, Participant 3 what was your--	
0:07:45	Participant 3 (Chinese, F)	For me, of course my main concern is... best choice are health and nutrition. My conflict will be my third choice which I'm looking at the quality of the.... the food whereby it is very appealing. I look at it I really want to I eat it but then again, I look at it, is it nutritious? It may be appealing but it may not be that nutritious so this gives me that.... that tussle, do I want to eat it or do I just want to go for presentation?	
0:08:14	Facilitator	So you're saying the quality, is that correct?	
0:08:17	Participant 3 (Chinese, F)	For me, my third choice is quality of the... Like I say it's aesthetically appealing, it looks so... inviting. But I want to eat, but I tell myself...	

0:08:28	Facilitator	So is there any specific example like for... just now was the... Penang kuay teow. So, for you?	
0:08:34	Participant 3 (Chinese, F)	Mine would be like I look at some.... when I go to the restaurant, I see somebody eating and I think 'Wahh that looks like a wonderful looking steak!'. But I told myself, 'cannot be eating so much red meat every time right', so I have to think of nutritional value of it. Whether I can take that steak, and some more they cook the steak in wine and whatever, red wine white wine, so I said it's so... yummy yummy but health nutrition I've been told to stay off red meat so I still got to consider. But if it is... outside when I'm dining, I got no choice if the menu has been set, so I just partake lah but I cannot eat too much of it.	
0:09:14	Facilitator	So in that situation at the restaurant did you eventually eat the steak?	
0:09:18	Participant 3 (Chinese, F)	I do, but in a smaller portion, but at home I don't cook it, I don't cook it at all. I don't have beef at home. It's not because of religious but it's more for health. All more into white meat.	
0:09:30	Facilitator	Now lah. For health reasons la...	
0:09:31	Participant 3 (Chinese, F)	Yes, the whole family.	
0:09:33	Facilitator	Great, Participant 4 how about you?	
0:09:35	Participant 4 (Chinese, F)	Mmkay, mine is a tussle between something that looks-- Actually I'm a very simple diner. I always eat back the same thing. But when I look at something quite tempting, I --- my consideration because I'm diabetic so uh... I have to.... *jaga* my sugar level. So very simple. Have to consider the health and nutrition part... That's my main consideration. I cannot have too much sugar, I cannot let it spike because when I drive I feel very, very drowsy when I drive.... so.... I will... I will just minimize. Like for example I went out for dinner last night with my family. We went to PS Cafe, Paragon, very beautiful food. But I had to cut not only the	

		quantity to look at what they are eating. So there was a lot more vegetables, and then the drink you know, the beverage... I always have to leave out the beverage because the beverage is sweet. So in the end I always take warm water. So these are my considerations.	
0:10:39	Facilitator	So basically for you is again the taste and you have to balance that with the health considerations la.	
0:10:48	Participant 4 (Chinese, F)	Yeah yeah, managing the sugar level.	
0:10:53	Facilitator	Sugar level, Ok. Participant 1? Yes?	
0:10:56	Participant 1 (Chinese, M)	Uh, conflict is it? Conflict. Again probably health and nutrition which I rank fourth. Alright. My first is actually quality ah.... that means to me... quality must be safe and reliable. That means.... I don't eat food China things like that... [Facilitator: Speak a little bit louder]. So that's number one, quality. But uh... sensory would be number two. The conflict is mainly between number 2 and 4 which is the my --- health thing. I think at our age, health is probably the number one concern --- the one that creates the conflict la. I think younger... you don't think about health but now at our age we have to think about our health.	
0:11:45	Facilitator	But then for you if I might see from your --- health is actually number 4... But then your number 1 is actually quality, and then the sensory ---	
0:11:55	Participant 1 (Chinese, M)	And then the sensory --- but then I still eat la [laughs]. Although there is a conflict, like I said, I say eggs shouldn't eat, but it's nice or fatty meat you know... Things like that. *Bak kua*... So, in the end number 2 wins la. But there is a conflict after that --- [laughs]	
0:12:13	Participant 3 (Chinese, F)	Basically greedy.	
0:12:15	Participant 1 (Chinese, M)	[laughs] My number 1 is still the most important.	
0:12:18	Facilitator	Number 1 quality lah	

0:12:19	Participant 1 (Chinese, M)	Yeah correct. If the *bak kua* comes from China, then I won't eat it already.	
0:12:24	Facilitator	So basically if I'm hearing all of you correctly, health seems to be the anchor, is that correct?	
0:12:31	Participant 1 (Chinese, M)	Correct. Or rather I won't say anchor but for me, is... the conflicts mainly eat or should not eat because it's not healthy, but something else makes you want to eat it. Let's say in Penang, if I go Penang I also... [Participant 3 laughs]. You're not there every day what.	
0:12:49	Facilitator	So basically, it seems like... there's a lot of food considerations, but it seems that you know, maybe when you take a look at the others you always take as a reference point, that's what you mean. So I guess that's the health thing, and then that we... compare against others. Is that right?	
0:13:06	Participant 1 (Chinese, M)	And whether you decide to eat or not, how you rank it lah I suppose.	
0:13:10	Facilitator	Okay. Whenever you all come across conflict like that, uh... do you all feel uneasy? Do you all feel uneasy?	
0:13:19	Participant 2 (Chinese, F)	Yes. I feel very uneasy, but um... because lately I was prescribed some Simvastatin, and I told myself... [laughs] I will eat it and then [laughs] go take my tablet simvastatin. So I imagine juggling with... you know, the strategy to... trying to lower the cholesterol from the food.	
0:13:42	Facilitator	So you all actually feel a certain uneasiness, is that correct? [Participant 2: Yes, Yes.] When you all have to make, there is a conflict. Do you all feel that? [Participant 2: I feel, I feel].	
0:13:50	Participant 1 (Chinese, M)	No. I say I don't eat this everyday so I can get rid of the guilt consciousness. That means like said, also... cholesterol there are many ways to... you know, you want to take fatty food take a Xenical lah... or	

		something. [laughs] Or I think the main thing is, you tell yourself, I tell myself... I don't eat this every day.	
0:14:14	Facilitator	So you do feel --- do you feel guilt?	
0:14:15	Participant 1 (Chinese, M)	I don't feel guilt. I mean at that one I said you should not eat, but what the heck. [laughs] I don't eat this everyday so I eat lah. But I don't feel guilty after that because if you feel guilty after that, then... you're going to have a very miserable life. Every time you're going to eat and then feel guilty,... eat feel guilty, so myself eat don't feel guilty. Eat, don't feel guilty. That's how I look at it la.	
0:14:42	Facilitator	Ok, but when you are aware of the conflict between your food considerations, you don't feel anything?	
0:14:47	Participant 1 (Chinese, M)	I don't, I mean... you have to accept what you have done la I suppose. No point regretting it right.	
0:14:58	Facilitator	No, but before la-- Like we are deciding right, but then you have not yet make your decision.	
0:15:01	Participant 1 (Chinese, M)	Before ah... Come from me ah, because I said but the rest may not right... for me it's... I weigh the consequences. If.... if I decide that I enjoy it more, this food gives me more enjoyment than guilt, then I eat lah. If I feel that this food doesn't give me that much enjoyment, then that's why at the end, health is still not ranked not top. [Facilitator: Okay] Because I want to ultimately my decision is based on the enjoyment, it's the sensory part.	
0:15:35	Facilitator	Participant 3, you feel anything when you eat?	
0:15:36	Participant 3 (Chinese, F)	For me, I think I stand in between Participant 2 and Participant 1 because I won't say I feel that guilty but I'll say yes I'm on my cholesterol medication, at this age. [laughs] So I will eat because I tell myself life is short, you have to eat and I will eat whatever I can find that satisfies my hunger because sometimes by evening	

		time, I'm really hungry through the day, it's work work work until your stomach is really empty, so you need something to sustain you. And so the choice of the food is really it is made, but I tell myself that I need the essential vitamins and minerals that this particular food can give me. Sometimes it's really zero but I cannot help it but because that's what's being offered, so I will just eat what I can find. So... as I said, I will eat but then I have to go back and take my medication and I will eat. I'm not guilty, because I said I have no choice. So I eat for sustenance.	
0:16:39	Facilitator	Before you actually eat, do you also like Participant 2 feel a sense of discomfort thinking about this food and then it sorts of...	
0:16:46	Participant 3 (Chinese, F)	Yes, I do. I do feel that discomfort because I say 'Oh.... okay. By then after I finish this I go home I still have to take my high cholesterol medication I got no choice, but then I got no choice; but to also eat here, because they don't get anything else healthier so I just have to just pick something simple. But like Participant 1 says, eat because you have to eat it. You don't want to feel guilty after that but you know that you can fall back on your medication.	
0:17:15	Facilitator	Ok, ok... Participant 4?	
0:17:16	Participant 4 (Chinese, F)	For me um.... I think I used to be conflicted thinking about uh.... whether to eat or not. But since I had diabetes, my main motivation is I do not want to have to do injection. So um... I always very concerned. I don't know whether I'm driven by fear or what but I'm driven by that motivation that I don't want to degenerate into that state. So... I would try to scale back or...Somehow actually now, when I reflect back actually I pretty disciplined you know. I would sort of reflect back, um... how much I have eaten. I've never done this before. It's not my style, but now I recollect in the past 1 year or 2 I've been like this. So I will moderate what I enough already cannot anymore... So my body will tell me I've had enough, too much of something. So by then I will feel a lot of discomfort. I would not want to feel that way, it's very uncomfortable. So those drives me towards consideration. How much I eat and what I eat.	

		What I eat is number 1. How much I eat is another.	
0:18:34	Facilitator	Ok, so hearing from what you all have said, so you all do ---- whenever you are looking at a particular food is presented to you. And you know, the food being what it is, does cause certain conflicted thoughts, maybe because food is nice but at the same time it may not necessarily be healthy and so on and so forth, so it does cause a certain degree of... I mean, conflict at least in terms cognitively, and some of you said there's a certain sense of discomfort. So from what I'm hearing also, then... beyond that, you all eventually just eat the food anyway, okay. And the way at least for Participant 1... and I think you, Participant 3... to get by this is to then, can I use the word rationalize? Rationalize because then you know why, life is short. I'm not going to be in Penang all the time anyway so on and so forth. Ok? So then, after that, so when you do that... does it relieve you of the discomfort that you feel? Remember initially there's a discomfort because of conflict right? After you eat, you may feel guilty but then after that you convince yourself actually it's not that bad, I didn't take too much of it, uh... I'm not going to be here or I don't always take it, after saying that, does it make you feel better? Does it get rid of the... guilt? Does it get rid of the discomfort?	
0:20:00	Participant 1 (Chinese, M)	I have no discomfort. [laughs]	
0:20:02	Facilitator	Because you would have objectively, yeah, okay, rationalized it. Participant 2?	
0:20:08	Participant 1 (Chinese, M)	I think let's say tomorrow's lunch. All the food is there. Are you going to limit yourself? You say, ooooh let's say some rich curry, or deep fried whatever? I think that, I think in your case you would right because...	
0:20:30	Participant 4 (Chinese, F)	I will still eat. I will still eat but I would know the quantity is very important. How much I eat it. Yeah...	
0:20:39	Participant 1 (Chinese, M)	I think when you have a condition, let's say a heart attack, it will be very different already. You know you *cannot* eat anymore, even though no matter how much you love it.	

0:20:48	Participant 4 (Chinese, F)	You will suffer lah. It's very ---	
0:20:52	Participant 1 (Chinese, M)	In a way I say discipline. In a way it's habit also. If you have a guilt conscious after that, but after 10 times ah... it will just disappear.	
0:21:06	All	[Laugh]	
0:21:07	Participant 1 (Chinese, M)	You won't feel guilty anymore. So that --- I think discipline --- I used to control my diet a lot... you know... 10 years ago. But nowadays I don't. You also, like you said, rationalize it --- exercise more lah in the afternoon whatever... Or cut down on fatty food tomorrow. But no point feeling guilty, after that you already eaten it, it's gone into your stomach, it's absorbed already.	
0:21:34	Facilitator	Okay.	
0:21:36	Participant 2 (Chinese, F)	I think more after that, is at that point, is like, shall I eat, shall I not eat? That is the part I find, you know, I will decide after that. I will eat... but I will do something about it to stop whatever the effect of that particular food. For example, if it's cholesterol, I go back and take one table of Simvastatin [laughs]	
0:22:01	Facilitator	Okay. So, when you think about it that way, does it make you feel less tense---	
0:22:07	Participant 2 (Chinese, F)	Then I would take lah. [laughs]	
0:22:08	Facilitator	Then okay lah. Participant 3, do you have anything you want to ---	
0:22:14	Participant 3 (Chinese, F)	For me, I would think that the point I got told... I have high cholesterol and I have to medicate. The doctor just said, uh.... cut down on oily food. I said, 'I don't take much oily food. I'm more on a soup noodles, you know. Then 'Do you take a lot of fried food?' I said, 'No, I	

		don't even go for fast food. 'Then how come you got such a high cholesterol?' I said 'I don't know... you're a doctor you tell me lah. If you say I have to medicate, I medicate lah'. So what I do is I eat, I eat what I feel I can manage and then I don't want to feel guilty about eating it. I have a friend in Malacca who used to say, 'Parrticipant 3, just eat anything lah! After that just look for the antidote'. So I maybe have followed what he has preached. You take and eat what you like, after that... look for the antidote. So, my antidote is my tea and my medication.	
0:23:09	Facilitator	Okay. Okay. All the responses I think is very very interesting. I'd like to move forward and ask this question. Do you all listen to nutritional messages about food? Uh.... do you all pay attention to what is written about certain foods, the nutritional qualities of food? Do you all pay attention to those messages about food? If yes, do you all buy into those messages?	
0:23:34	Participant 1 (Chinese, M)	Like, like... what do you mean? You mean like TV or...?	
0:23:38	Facilitator	Ok, I mean can be through TV it can be online content, anything. And I think the follow up question is if you buy into nutrition messages, has there been a time you actually believe it, you act upon it? And then after that, only for you to realize later on that actually this is not true. Like for example, for example, I think I remember a long time ago, they used to say that margarine is the... good substitute for butter. But now, recently, they are saying that butter is better than margarine. So, if let's say you are someone who has bought into the nutrition message, and you heard that originally. So you would say, okay I'm not going to eat butter. I'm going to eat margarine. So you eat, and then you think it's good. Then later on you discover they have come out with another thing, actually margarine is not good. It's actually butter that's better. Have you ever found yourself in that situation, if you are someone who follows nutritional messages before? Maybe you should ---	
0:24:44	Participant 1 (Chinese,	Um.... Okay. Normally, there are nutritional ---- usually I would search for... that means I need hard facts. That means I don't just... you know? It must be based on true	

	M)	scientific fact that this... whatever vitamins is really... if it's just TV advert of course I won't believe it. And you're using the example of the margarine and butter it's based on current... investigations. At that time, margarine was supposed to be better. But again, as time passes, certain things change, so can't be helped. You know.	
0:25:28	Facilitator	So, you know about the butter margarine thing before. Did that actually cause you to use margarine more than butter?	
0:25:34	Participant 1 (Chinese, M)	Yeah. No, I don't use either, so it did not really affect me. I didn't like butter in the first place, and I don't eat margarine.	
0:25:41	Facilitator	Okay, was there any... food that you actually bought into the so-called nutritional messages?	
0:25:47	Participant 1 (Chinese, M)	I suppose... things like blueberries and all that, you know. Those... pigmented fruits. But to me, it is, if it's true, good for me. If it's not true, I would get extra source of fiber, vitamin C. So, as long as it doesn't cause any harm....	
0:26:08	Facilitator	But has there been a time when you consume something you believe something is good for you, but then after that it turns out not to be good for you?	
0:26:14	Participant 1 (Chinese, M)	Good for me and not good.... Can't think of any.	
0:26:19	Facilitator	Can't think of any. And Participant 4?	
0:26:23	Participant 4 (Chinese, F)	Um, I'm not a big time milk drink. But I don't drink a lot of milk. But one time, I thought milk was good. Then subsequently, I was told that actually milk is not good. It's not really needed by... human. That it's --- I mean, it may not be actually uh.... appropriate. But by then I would have not drink it already, but I sort of grew out of it. But then, I'm thinking, if *I* would still be	

		continue drinking, then I would stop.	
0:27:00	Facilitator	Then would you make you feel a certain way, like if you have always been thinking something is good, you thought it was good, then suddenly somebody else tell you it's not good.	
0:27:05	Participant 4 (Chinese, F)	I would stop.	
0:27:07	Facilitator	You would stop? If you feel something, what would be two emotions that you would feel?	
0:27:16	Participant 4 (Chinese, F)	Uh... I would feel relieved that I knew about it, okay. And then I would uh... but the thing mainly is relief. Relief and determined to stop.	
0:27:27	Facilitator	Determined to stop. Would you feel any negative emotions because you say, I've took this already, and then it's actually already---?	
0:27:34	Participant 4 (Chinese, F)	I think for milk it's not like... like some artificial supplement. If it's some artificial supplement I would feel that, oh my goodness, I have poisoned myself. But milk is very neutral. But I wouldn't continue.	
0:27:52	Facilitator	You wouldn't continue, okay. Thank you.	
0:27:56	Participant 3 (Chinese, F)	For me I would think that I am not swayed easily by all these products that they put on the tabloids and the newspaper advert, and the TV and all that. Basically if the food that's advertised is something I think is from natural source, I look at it, and I say, I'm going to try. But if it doesn't have any beneficial --- benefit me at all, I would just totally stop. And then you were saying about butter and margarine. I'm old school, I still prefer butter. I've never ever taken margarine at all. Even though my mother bought, and she tried to make us eat. I say no, I'm not a butter person also, but I would take some of it. So... even things like jam, it's only when I'm sick then I would be taking jam. Otherwise I wouldn't be touching all of that. Up to the present day itself, if	

		I'm looking at products itself. Uh... like Participant 1 shared about the bilberries, all the blueberries, as I said. If it's a natural fruit, and not synthetized, I would take it. Then fiber source... vitamin source... the polyphenols... then great. It's not like I have to eat it every day. I see it's nice I want to have a taste of it, I'll go to the supermarket I buy it. But again I'm not persuaded by all the claims, saying oh, you must eat it, you must eat that. Basically not.	
0:29:16	Facilitator	So you don't buy into that lah. Participant 2?	
0:29:18	Participant 2 (Chinese, F)	Well in a certain way, I do actually, you know... when I hear of any nutritional messages, I will like --- Participant 1 said. I will do my little search, then enough evidence, I would actually yeah uh.... subscribe to it and uh... avoid the whatever the evidence has shown in that point of time. Uh... Yeah. Like margarine and butter, at that time I did switch to margarine, although I'm not really a type that goes for margarine and butter. But when I did purchase, I... did go for margarine. But we consume very little margarine or butter.	
0:30:05	Facilitator	Okay, but then, if that's the case, then when you saw the more recent report, actually that butter is better than margarine. Then how did that make you feel?	
0:30:17	Participant 2 (Chinese, F)	Well, I've come to a conclusion is that the... research is ongoing all the time, it's seems to change. So I have to be in moderation in whatever you know... new discoveries are.	
0:30:28	Participant 1 (Chinese, M)	Unless they falsify --- but I think it's based on what they know at that time, this was their best conclusion.	
0:30:38	Participant 3 (Chinese, F)	And then, like for example, another one was cooking oil. At one point, I was in dilemma, what oil is best for cooking? So I went to even check with the dietician. What oil is good for? One minute that you claim canola oil is good, next minute came out a research that canola oil is no good. And my question is, what then the type of oil is the best?	

0:31:03	Participant 4 (Chinese, F)	But I think maybe it's some product, like China made product. Yeah I mean, it's something to consider. Like those luncheon meat... you don't think it was awful. But then after that, you find... you hear some news about some... inferior quality or suspicion you know. Then I have the conflicting feeling, like oh my god, I've taken how many cans already. [everyone laughs]	
0:31:34	Participant 1 (Chinese, M)	Do you know you can make your own luncheon meat? It's very easy.	
0:31:36	Participant 4 (Chinese, F)	Okay that's beside the point. That I would felt like I have poisoned myself. Straight away I throw away whatever I have. But then, there's a little fear inside I have, oh no... what have I done?	
0:31:52	Facilitator	Does it make you feel a little bit skeptical about nutritional messages?	
0:31:58	Participant 2 (Chinese, F)	Yes.	
0:32:00	Facilitator	It does?	
0:32:01	Participant 2 (Chinese, F)	You have to be in moderation	
0:32:03	Facilitator	So that means that then you--- if you had experienced this situation before, it will probably make you take subsequent nutrition messages with a pinch of salt. You don't buy into everything loh, basically. Okay	
0:32:17	Participant 4 (Chinese, F)	But it also, when you hear about this kind of incidence, where there's a reverse in the reporting, it does cast a shadow over other products. Which may not have negative feedback or evidence, but it does make me feel, when I pick up pamphlets right, they always highlight about the good stuff, then they talk a little bit about the side effect. But then now, I would have a little skepticism about the presentation of all these messages, and whether how it is all really efficacious, all these	

		kind of supplements. I mean if you consider supplements as part of food... like vitamins, fiber, some product. Because sometimes I buy them, but then now I find... yeah, a bit skeptical about it.	
0:33:17	Facilitator	Okay. Um, do you all read nutrition labels? You all do?	
0:33:15	Participant 2 (Chinese, F)	I do. I compare.	
0:33:19	Facilitator	You compare. Are you all able to make sense of what's on the nutrition label?	
0:33:25	Participant 2 (Chinese, F)	I think in health care you know suppose... I am able to make sense of the basic ones lah. You know like, if I buy, I usually will compare which product has less sodium, glucose, you know, chemicals, preservatives...	
0:33:40	Facilitator	So your decision will be partly based on the nutrition figures?	
0:33:42	Participant 3 (Chinese, F)	Yeah, I read the labels and I see, 'huh, sodium. Oh cannot cannot cannot'. So I would think that if I am choosing a product I will look at it, can I have this in moderation and whatever we eat whether it's the oil or whatever, basically I don't cook much oil at home. My oil is one bottle can lasts me nearly 6 months to 1 year. I hardly use, and I buy olive oil. So whatever I use, olive oil, you cannot over fry. Because you will lose its nutritional value. So you got to slowly get it up but not too hot. So all this again from what I read about all these products. So anything I choose I also have to understand, what is in there? Nutritionally does it help me? And I understand olive oil you can even consume it straight --- for some kind of liver detoxing of your system and all that. Which I've not tried lah but it's more for my cooking. So... moderation. I read labels and I see, if sodium too high no. If too much of a certain benzoate, that's a preservative... no more. Don't want, too much of it. Nitrates, too high, can cause cancer. Out! So you see, you need to know a bit of this as well. What are the implication of taking too much of all this stuff. So I need to read labels, I do.	

0:35:04	Facilitator	Do you all read labels?	
0:35:08	Participant 1 (Chinese, M)	Not really, depending la... if you want to compare 2 products yes. But you know... if... not really... I mean ---- what are the processed foods we come buying, things like bread. So we look at low fat... high fiber, things like that. I just look at --- I don't really look in detail what's inside... all the additives inside, unless you wanna make your own bread. Then it's--- [laughs]	
0:35:40	Facilitator	So you don't really look at the labels?	
0:35:43	Participant 1 (Chinese, M)	Not the detailed ones. But I look at the, like I said high fiber... and.... low salt or whatever ---	
0:35:48	Facilitator	The overall packaging. Okay. Izu, is it the same as well for you also?	
0:35:53	Participant 4 (Chinese, F)	Um, I don't really buy packaged stuff. Except for bread. The only thing I go for is sugar and bread. The rest of it, somehow I don't know how to make sense of it.	
0:36:04	Facilitator	Okay. I'm going to ask a last question. Basically, just now I ask you all, when you all come across a certain food, then you know, uh... you might --- it might cause a certain health consideration versus taste and everything. Does it come automatically, that when you come to a certain food, that this thought suddenly come automatically to you, or would there be some kind of trigger that makes you become aware of that kind of conflict? I think one of the things, if if.... correct me if I'm wrong. Maybe for Participant 4's case, because of the condition. Then that condition it triggers, whenever you come across certain food automatically, then you think about. Bu the rest of you, do you have any triggers that when you see a certain food, immediately that trigger will cause you to think this food has this but this --- Are there any environmental triggers, and so what are the triggers?	

0:37:07	Participant 3 (Chinese, F)	For me if it is a food that I like... I would immediately look at it in terms of is it... is it okay to take, any all? And is it... fresh? Yeah... It comes quite automatic.	
0:37:23	Facilitator	So automatic lah. Okay.	
0:37:24	Participant 2 (Chinese, F)	For me also, yeah. I have to consider is it way too oily, the oil are dripping out, then paper is soaking it up... then no okay, I'm not eating that.	
0:37:33	Facilitator	So also, quite automatic. Participant 1?	
0:37:39	Participant 1 (Chinese, M)	Um.... I suppose, it depends on the food. Yeah? Like if I see a fatty food... then like... lamb... foie grass... oysters... But oysters I eat. So, it depends, let's say if it's expensive food, you would eat it, I would eat it. But if it's cheap food, [laughs] then I won't eat it lah. Like egg yolk, I won't eat egg yolk. Yeah...	
0:38:13	Facilitator	Is there anything you want to add, Participant 4? Was I right to say, that because of the condition, it makes you ---	
0:38:21	Participant 4 (Chinese, F)	Yeah... More careful. Especially quantity lah.	
0:38:27	Facilitator	So, quantity. Can. So I'm going to close the discussion. Thank you very much. I think it was very informative, I think more informative than the other groups that I had. The other groups that I had, was actually so called the younger age groups. But I think, what was very clear about this group discussion is actually, the experience, the richness of experience, which I think was sort of missing in the other groups. Thank you very much for the discussion.	

Appendix A-3: Follow-up survey materials

SECTION (A): INSTRUCTIONS

Please respond to the following items by circling a number next to each item that best describes your level of agreement with it.

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I am very particular about the healthiness of food.	1	2	3	4	5	6	7
2.	The appearance of food makes no difference to me.	1	2	3	4	5	6	7
3.	I always follow a healthy and balanced diet.	1	2	3	4	5	6	7
4.	When I eat, I concentrate on enjoying the taste of food.	1	2	3	4	5	6	7
5.	It is important for me that my diet is low in fat.	1	2	3	4	5	6	7
6.	I do not believe that food should always be source of pleasure.	1	2	3	4	5	6	7
7.	It is important for me that my daily diet contains a lot of vitamins and minerals.	1	2	3	4	5	6	7
8.	It is important for me to eat delicious food on weekdays as well as weekends.	1	2	3	4	5	6	7
9.	I eat what I like and I do not worry about healthiness of food.	1	2	3	4	5	6	7
10.	An essential part of my weekend is eating delicious food.	1	2	3	4	5	6	7
11.	The healthiness of food has little impact on my food choices.	1	2	3	4	5	6	7
12.	I finish my meal even when I do not like the taste of a food.	1	2	3	4	5	6	7
13.	The healthiness of snacks makes no difference to me.	1	2	3	4	5	6	7
14.	I do not avoid any foods, even if they may raise my cholesterol.	1	2	3	4	5	6	7

SECTION (B): INSTRUCTIONS

Please read the brief write-up on vegetable consumption and give your responses to the questions and/or items that follow.

Brief write-up on vegetable consumption

A diet high in vegetables has always been considered a key component to good health and staying slim. One of the best ways to improve your health is to eat plenty of high quality vegetables, with the recommended vegetable intake to be at least two servings per day (which works out to be at least fourteen servings per week).

According to Singapore Health Promotion Board, two servings would include ¾ of a 250ml mug of cooked/non-leafy vegetables, ¼ of a 10-inch round plate of cooked vegetables, 150g of raw leafy vegetables and 100g of raw non-leafy vegetables.

Despite the purported healthiness of the food, vegetables have a component of bitterness to them that make the food distasteful to many people.

1. In general, what is your attitude towards vegetables?

I don't like vegetables at all.	I don't like vegetables very much.	I don't like vegetables slightly.	I neither like nor dislike vegetables.	I like vegetables slightly.	I like vegetables very much.	I like vegetables totally.
1	2	3	4	5	6	7

2. In general, how would you rate the taste of vegetables?

Vegetables taste totally awful.	Vegetables taste quite awful.	Vegetables taste slightly awful.	Vegetables taste neither awful nor awesome.	Vegetables taste slightly awesome.	Vegetables taste quite awesome.	Vegetables taste totally awesome.
1	2	3	4	5	6	7

3. To what extent do you agree that vegetables are good for you?

Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

4. To what extent do you agree with the recommendation of two servings of vegetables per day?

Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

5. Do you meet the recommended intake of vegetables per day? Yes/No

If 'No', provide an estimate of the number of servings of vegetables that you consume on a per-week basis: _____ servings per week (Bear in mind that the recommended servings of vegetables work out to be fourteen servings per week).

6. To what extent do you think that your vegetable intake is sufficient?

My vegetable intake is totally insufficient.	My vegetable intake is quite insufficient.	My vegetable intake is slightly insufficient.	My vegetable intake is neither insufficient nor sufficient.	My vegetable intake is slightly sufficient.	My vegetable intake is quite sufficient.	My vegetable intake is totally sufficient.
1	2	3	4	5	6	7

With reference to **vegetables**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

		Totally Disagree (0% agreement)	Disagree (25% agreement)	Neutral (50% agreement)	Agree (75% agreement)	Totally Agree (100% agreement)
1.	I am torn between health and taste considerations when it comes to the food.	1	2	3	4	5
1.	I feel bothered about the food.	1	2	3	4	5
2.	The tastiness of the food is at odds with its healthiness for me.	1	2	3	4	5
2.	I feel bothered over my consumption of the food.	1	2	3	4	5
3.	I have difficulty reconciling the healthiness *vs.* tastiness of the food.	1	2	3	4	5
3.	I feel uncomfortable about the food.	1	2	3	4	5
4.	What I think about the healthiness of the food is in conflict with what I think about its tastiness.	1	2	3	4	5
4.	I feel uncomfortable over my consumption of the food.	1	2	3	4	5
5.	I have difficulty reconciling my consumption of the food based on health *vs.* taste considerations.	1	2	3	4	5
5.	I feel uneasy about the food.	1	2	3	4	5
6.	My thoughts on the healthiness of the food are at odds with my thoughts on its tastiness.	1	2	3	4	5
6.	I feel uneasy over my consumption of the food.	1	2	3	4	5
7.	My consumption of the food is largely based on taste instead of being equally based on health as well.	1	2	3	4	5

7.	I feel perturbed about the food.	1	2	3	4	5
8.	I have difficulty reconciling my thoughts on the healthiness of the food with my thoughts on its tastiness.	1	2	3	4	5
8.	I feel perturbed over my consumption of the food.	1	2	3	4	5
9.	I am conflicted in my thoughts on the healthiness *vs.* the tastiness of the food.	1	2	3	4	5
9.	I feel tensed about the food.	1	2	3	4	5
10.	My consumption of the food is largely based on taste when health is important to me too.	1	2	3	4	5
10.	I feel tensed over my consumption of the food.	1	2	3	4	5
11.	I feel disconcerted about the food.	1	2	3	4	5
12.	I feel disconcerted about my consumption of the food.	1	2	3	4	5
13.	I feel unsettled about the food.	1	2	3	4	5
14.	I feel unsettled about my consumption of the food.	1	2	3	4	5

SECTION (C): INSTRUCTIONS

The following are words and phrases that describe different feelings and emotions. Read each item and then circle the appropriate number next to the word to indicate the extent you feel this way about **your consumption of vegetables right now (i.e., at this moment)**.

		Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1.	Guilty	1	2	3	4	5
2.	Ashamed	1	2	3	4	5
3.	Blameworthy	1	2	3	4	5
4.	Angry at self	1	2	3	4	5
5.	Disgusted with self	1	2	3	4	5
6.	Dissatisfied with self	1	2	3	4	5

SECTION (D): INSTRUCTIONS

Read the following write-up on vegetables and give your responses to the questions and/or items that follow.

Why vegetables may be bad for you

Despite the notion that a diet high in vegetables is key to good health and staying slim, and that one of the best ways to improve your health is to eat plenty of high quality vegetables, what many people are not aware of is that the US Environmental Protection Agency (EPA) considers 60 percent of herbicides, 90 percent of fungicides and 30 percent of insecticides used in vegetable farming to be carcinogenic (i.e., cancer-causing). Most pesticides can damage your nervous system and are associated with numerous health problems such as neurotoxicity, endocrine dysfunction, immunosuppression, impaired reproductive function, miscarriage, and even Parkinson's disease.

Thus, the health authorities have recommended that vegetables consumed should be ideally raw, locally grown and organic. However, aside from sounding like a tall order – it takes time to get a bounty of fresh vegetables together and eat them every day (the recommended quantity to be consumed being two servings per meal) – recent research evidence has shown that eating such fresh and raw vegetables (and fruits) may not be as good for us as we have been led to believe. The study by the U.S. Centre for Disease Control and Prevention revealed that fruit and vegetables are responsible for 46 percent of food poisoning cases, with leafy vegetables, namely lettuce and spinach, being the worst offenders. This is in stark contrast to meat and poultry that were found to be responsible for only 22 percent of food poisoning cases. The reason for this is that these products tend to be eaten raw. In contrast, the bugs in meat and poultry that many people would expect to be the cause of most cases of food poisoning are usually killed during cooking.

Dr Michael Doyle, director of the University of Georgia's Centre for Food Safety explained that some vegetables like lettuce are particularly dangerous as harmful bacteria can form within the plant tissues. This means, for example, that when the lettuce is washed, the bacteria will not be washed away. He added that leafy greens can cause E.Coli, salmonella, and listeria. These bugs tend to come from animals which carry them in their intestines. If the animals' manure gets into soil or water, it can contaminate vegetables. Salmonella is especially likely to be transmitted in this way as manure can be blown around by the wind when it dries out, and salmonella is known to be tolerant to drying. In extreme cases, contaminated bagged salad can cause fatal kidney failure, according to Dr Doyle.

The solution to the problem appears then to lie in cooking the vegetables before consumption. However, this brings about another conundrum – nutritionists are becoming increasingly aware that the quantity consumed and the preparation technique can negate or even reverse any positive effects of eating vegetables. An international team of researchers led by Zumin Shi at Jiangsu Provincial Center for Disease Control and Prevention in Nanjing, China, and the University of Newcastle in Australia has found that although Chinese people eat a lot of vegetables, the amount of oil used in cooking vegetables is increasing the risk of becoming obese.

Furthermore, scientists have discovered that going veggie could be bad for your brain – with those on a meat-free diet six times more likely to suffer brain shrinkage. Vegans and vegetarians are the most likely to be deficient because the best sources of the vitamin are meat, particularly liver, milk and fish. Vitamin B12 deficiency can also cause anaemia and inflammation of the

nervous system. Yeast extracts are one of the few vegetarian foods which provide good levels of the vitamin. The link was discovered by Oxford University scientists who used memory tests, physical checks and brain scans to examine 107 people between the ages of 61 and 87. When the volunteers were retested five years later the medics found those with the lowest levels of vitamin B12 were also the most likely to have brain shrinkage. It confirms earlier research showing a link between brain atrophy and low levels of B12.

Thus, research evidence is strongly suggesting that you review the wisdom behind the echoes from your childhood memories of meals gone-by, in which your mother's utterance of the phrase "eat your vegetables" might not be the best advice given.

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With reference to above information provided about **vegetables**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

		Totally Disagree (0% agreement)	Disagree (25% agreement)	Neutral (50% agreement)	Agree (75% agreement)	Totally Agree (100% agreement)
1.	The healthiness of the food is discrepant from what I know.	1	2	3	4	5
2.	I feel bothered about the food.	1	2	3	4	5
3.	I have conflicted thoughts on the nutritional and health properties of the food.	1	2	3	4	5
4.	I feel bothered over my consumption of the food.	1	2	3	4	5
5.	The healthiness of the food is not what I had expected.	1	2	3	4	5
6.	I feel uncomfortable about the food.	1	2	3	4	5

7.	The healthiness information given about the food contradicts what I had thought and known about it.	1	2	3	4	5
8.	I feel uncomfortable over my consumption of the food.	1	2	3	4	5
9.	The nutrition information given about the food contradicts my thoughts about the healthiness of the food.	1	2	3	4	5
10.	I feel uneasy about the food.	1	2	3	4	5
11.	I am confused over the healthiness of the food.	1	2	3	4	5
12.	I feel uneasy over my consumption of the food.	1	2	3	4	5
13.	I am conflicted over the healthiness of the food.	1	2	3	4	5
14.	I feel perturbed about the food.	1	2	3	4	5
15.	The nutrition information given about the food contradicts my current understanding of its healthy properties.	1	2	3	4	5
16.	I feel perturbed over my consumption of the food.	1	2	3	4	5
17.	What I now know and feel about the healthiness of the food are at odds with my existing behaviour towards it/my consumption of it.	1	2	3	4	5
18.	I feel tensed about the food.	1	2	3	4	5
19.	My consumption of the food is at odds with what I currently know and feel about its healthiness.	1	2	3	4	5
20.	I feel tensed over my consumption of the food.	1	2	3	4	5
21.	I have contradictory thoughts about the healthiness of the food.	1	2	3	4	5
22.	I feel disconcerted about the food.	1	2	3	4	5
23.	I feel disconcerted about my consumption of the food.	1	2	3	4	5
24.	I feel unsettled about the food.	1	2	3	4	5
25.	I feel unsettled about my consumption of the food.	1	2	3	4	5

SECTION (E): INSTRUCTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel about your consumption of vegetables / vegetable consumption habits right now (i.e., at this moment). There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

		Not at all	Somewhat	Moderately	Very much
1.	I feel calm	1	2	3	4
2.	I am tense	1	2	3	4
3.	I feel upset	1	2	3	4
4.	I am relaxed	1	2	3	4
5.	I feel content	1	2	3	4
6.	I am worried	1	2	3	4

In light of the above information about vegetables, to what extent do you think you will change your consumption of vegetables?

SECTION (F): INSTRUCTIONS

Please respond to the following items by placing a number next to each item that best describes your level of agreement with it:

		Strongly Disagree	Disagree	Somewhat Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Somewhat Agree	Agree	Strongly Agree
1.	It is important to me that those who know me can predict what I will do.	1	2	3	4	5	6	7	8	9
2.	I want to be described by others as a stable, predictable person.	1	2	3	4	5	6	7	8	9
3.	The appearance of consistency is an important part of the image I present to the world.	1	2	3	4	5	6	7	8	9
4.	An important requirement for any friend of mine is personal consistency.	1	2	3	4	5	6	7	8	9
5.	I typically prefer to do things the same way.	1	2	3	4	5	6	7	8	9
6.	I want my close friends to be predictable.	1	2	3	4	5	6	7	8	9
7.	It is important to me that others view me as a stable person.	1	2	3	4	5	6	7	8	9
8.	I make an effort to appear consistent to others.	1	2	3	4	5	6	7	8	9
9.	It doesn't bother me much if my actions are inconsistent.	1	2	3	4	5	6	7	8	9

SECTION (G): INSTRUCTIONS

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is **(T)rue** or **(F)alse** as it pertains to you. Please **circle** your answers.

1.	Before voting I thoroughly investigate the qualifications of all the candidates.	T	F
2.	I never hesitate to go out of my way to help someone in trouble.	T	F
3.	It is sometimes hard for me to go on with my work if I am not encouraged.	T	F
4.	I have never intensely disliked anyone.	T	F
5.	On occasion I have had doubts about my ability to succeed in life.	T	F
6.	I sometimes feel resentful when I don't get my way.	T	F
7.	I am always careful about my manner of dress.	T	F
8.	My table manners at home are as good as when I eat out in a restaurant.	T	F
9.	If I could get into a movie without paying and be sure I was not seen, I would probably do it.	T	F
10.	On a few occasions, I have given up doing something because I thought too little of my ability.	T	F
11.	I like to gossip at times.	T	F
12.	There have been times when I felt like rebelling against people in authority even though I knew they were right.	T	F
13.	No matter whom I'm talking to, I'm always a good listener.	T	F
14.	I can remember pretending to be sick to get out of something.	T	F
15.	There have been occasions when I took advantage of someone.	T	F
16.	I'm always willing to admit it when I make a mistake.	T	F
17.	I always try to practise what I preach.	T	F
18.	I don't find it particularly difficult to get along with loud-mouthed, obnoxious people.	T	F
19.	I sometimes try to get even, rather than forgive and forget.	T	F
20.	When I don't know something, I don't mind admitting it.	T	F
21.	I am always courteous, even to people who are disagreeable.	T	F
22.	At times I have really insisted on having things my own way.	T	F
23.	There have been occasions when I felt like smashing things.	T	F
24.	I would never think of letting someone else be punished for my wrongdoings.	T	F
25.	I never resent being asked to return a favour.	T	F
26.	I have never been annoyed when people expressed ideas very different from my own.	T	F
27.	I never make a long trip without checking the safety of my car.	T	F
28.	There have been times when I was quite jealous of the good fortune of others.	T	F
29.	I have almost never felt the urge to scold someone.	T	F
30.	I am sometimes irritated by people who ask favours of me.	T	F
31.	I have never felt that I was punished without cause.	T	F
32.	I sometimes think when people have a misfortune, they only got what they deserved.	T	F
33.	I have never deliberately said something that hurt someone's feelings.	T	F

APPENDIX B: PILOT STUDY MATERIALS

Appendix B-1: Healthy eating condition

SECTION (A): Experimental Manipulation – Cognitive Dissonance Arousal (Hypocrisy) in Terms of Healthy Eating

Instructions

Research has shown that eating habits are established early in life. You are tasked to relate to a group of 10-year-old primary school children the importance of eating a healthy diet. Write a short essay stating **FIVE (5)** reasons why eating healthily is important. Then list **FIVE (5)** statements of advice that you think would be crucial to convey the message of healthy eating to the young audience. Your ideas will be incorporated into a proposal to be submitted to a public agency responsible for the promotion of healthy eating for youths. Answer the questions that follow (overleaf) after you have completed your write-up.

Essay:

Statements:

(1)

(2)

(3)

(4)

(5)

1. In the past 3 months, to what extent did you follow at least three or more of the statements you have listed?

Completely do not follow	Rarely follow	Follow a few times	Follow half the time	Moderately follow	Frequently follow	Completely follow
1	2	3	4	5	6	7

2. In general, to what extent do you follow at least three or more of the statements you have listed?

Completely do not follow	Rarely follow	Follow a few times	Follow half the time	Moderately follow	Frequently follow	Completely follow
1	2	3	4	5	6	7

3. Based on Q1 and Q2, how healthy would you rate your current dietary habits?

Completely unhealthy	Fairly unhealthy	Slightly unhealthy	Neither healthy nor unhealthy	Slightly healthy	Fairly healthy	Completely healthy
1	2	3	4	5	6	7

SECTION (B1): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Healthy Eating

With reference to **healthy eating**, indicate the extent of your agreement/disagreement with each statement along the following scale:

Cognitive Discrepancy

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I am not eating as healthily as I should be doing.	1	2	3	4	5	6	7
2.	My current dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	I have difficulty reconciling the inconsistency between my unhealthy food choices with beliefs about a healthy diet.	1	2	3	4	5	6	7
4.	My diet is not as healthy as I feel it should be.	1	2	3	4	5	6	7

Dissonance

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I feel some psychological discomfort knowing that my current dietary behaviour is not as healthy as it should be.	1	2	3	4	5	6	7
2.	I feel rather perturbed that I'm not following standards of healthy eating.	1	2	3	4	5	6	7
3.	I feel some degree of uneasiness over making unhealthy, rather than healthy, food choices in my diet.	1	2	3	4	5	6	7
4.	I feel somewhat bothered that my diet is not as healthy as it should be.	1	2	3	4	5	6	7

SECTION (B2): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Vegetable Consumption

With reference to **your vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

Cognitive Discrepancy

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I am not eating enough vegetables as I should be doing.	1	2	3	4	5	6	7
2.	My current vegetable consumption level falls short of the daily serving standards required for sufficient vegetable consumption.	1	2	3	4	5	6	7
3.	I have difficulty reconciling the inconsistency between my lack of vegetable consumption with beliefs about proper vegetable dietary behaviour.	1	2	3	4	5	6	7
4.	My current diet is lacking in vegetable level.	1	2	3	4	5	6	7

Dissonance

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
3.	I feel somewhat bothered that I'm not eating enough vegetables as I should be.	1	2	3	4	5	6	7
1.	I feel some psychological discomfort in knowing that my current level of vegetable consumption is inadequate.	1	2	3	4	5	6	7
4.	I feel rather perturbed that I'm not following standards of proper adequate vegetable dietary behaviour.	1	2	3	4	5	6	7
2.	I feel some degree of uneasiness over not including sufficient servings of vegetables in my diet.	1	2	3	4	5	6	7

SECTION (B3): Assessment of Inter-attitudinal Cognitive Discrepancy & Dissonance Related to Attitudes toward Healthy Eating & Vegetable Consumption

With reference to **healthy eating AND your vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

Cognitive Discrepancy

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I am not eating enough vegetables as I should be doing to maintain a healthy diet.	1	2	3	4	5	6	7
2.	My current vegetable dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	I have difficulty reconciling the inconsistency between my lack of vegetable consumption with beliefs about a healthy diet.	1	2	3	4	5	6	7
4.	My vegetable consumption is not as healthy as I feel it should be.	1	2	3	4	5	6	7

Dissonance

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I feel some psychological discomfort knowing that my current vegetable consumption behaviour is not as healthy as it should be.	1	2	3	4	5	6	7
2.	I feel rather perturbed that I'm not following standards of healthy vegetable consumption.	1	2	3	4	5	6	7
3.	I feel some degree of uneasiness over not eating enough vegetables to maintain a healthy diet as I should be doing.	1	2	3	4	5	6	7
4.	I feel somewhat bothered that I am not making healthy vegetable choices.	1	2	3	4	5	6	7

Appendix B-2: Vegetable consumption condition

SECTION (A): Experimental Manipulation – Cognitive Dissonance Arousal (Hypocrisy) in Terms of Vegetable Consumption

Instructions

Research has shown that eating habits are established early in life. You are tasked to relate to a group of 10-year-old primary school children the importance of eating a healthy diet. Write a short essay stating **FIVE (5)** reasons why eating vegetables is important. Then list **FIVE (5)** statements of advice that you think would be crucial to convey the message of healthy eating to the young audience. Your ideas will be incorporated into a proposal to be submitted to a public agency responsible for the promotion of healthy eating for youths. Answer the questions that follow (overleaf) after you have completed your write-up.

Essay:

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Statements:

(1) _____

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(2) _____

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(3) _____

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(4) _____

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(5) _____

_____

_____

1. In the past 3 months, to what extent did you follow at least three or more of the statements you have listed?

Completely do not follow	Rarely follow	Follow a few times	Follow half the time	Moderately follow	Frequently follow	Completely follow
1	2	3	4	5	6	7

2. In general, to what extent do you follow at least three or more of the statements you have listed?

Completely do not follow	Rarely follow	Follow a few times	Follow half the time	Moderately follow	Frequently follow	Completely follow
1	2	3	4	5	6	7

3. Based on Q1 and Q2, how healthy would you rate your current dietary habits?

Completely unhealthy	Fairly unhealthy	Slightly unhealthy	Neither healthy nor unhealthy	Slightly healthy	Fairly healthy	Completely healthy
1	2	3	4	5	6	7

SECTION (B1): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Healthy Eating

With reference to **healthy eating**, indicate the extent of your agreement/disagreement with each statement along the following scale:

Cognitive Discrepancy

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I am not eating as healthily as I should be doing.	1	2	3	4	5	6	7
2.	My current dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	I have difficulty reconciling the inconsistency between my unhealthy food choices with beliefs about a healthy diet.	1	2	3	4	5	6	7
4.	My diet is not as healthy as I feel it should be.	1	2	3	4	5	6	7

Dissonance

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I feel some psychological discomfort knowing that my current dietary behaviour is not as healthy as it should be.	1	2	3	4	5	6	7
2.	I feel rather perturbed that I'm not following standards of healthy eating.	1	2	3	4	5	6	7
3.	I feel some degree of uneasiness over making unhealthy, rather than healthy, food choices in my diet.	1	2	3	4	5	6	7
4.	I feel somewhat bothered that my diet is not as healthy as it should be.	1	2	3	4	5	6	7

SECTION (B2): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Vegetable Consumption

With reference to **your vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

Cognitive Discrepancy

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I am not eating enough vegetables as I should be doing.	1	2	3	4	5	6	7
2.	My current vegetable consumption level falls short of the daily serving standards required for sufficient vegetable consumption.	1	2	3	4	5	6	7
3.	I have difficulty reconciling the inconsistency between my lack of vegetable consumption with beliefs about proper vegetable dietary behaviour.	1	2	3	4	5	6	7
4.	My current diet is lacking in vegetable level.	1	2	3	4	5	6	7

Dissonance

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
3.	I feel somewhat bothered that I'm not eating enough vegetables as I should be.	1	2	3	4	5	6	7
1.	I feel some psychological discomfort in knowing that my current level of vegetable consumption is inadequate.	1	2	3	4	5	6	7
4.	I feel rather perturbed that I'm not following standards of proper adequate vegetable dietary behaviour.	1	2	3	4	5	6	7
2.	I feel some degree of uneasiness over not including sufficient servings of vegetables in my diet.	1	2	3	4	5	6	7

SECTION (B3): Assessment of Inter-attitudinal Cognitive Discrepancy & Dissonance Related to Attitudes toward Healthy Eating & Vegetable Consumption

With reference to **healthy eating AND your vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

Cognitive Discrepancy

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I am not eating enough vegetables as I should be doing to maintain a healthy diet.	1	2	3	4	5	6	7
2.	My current vegetable dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	I have difficulty reconciling the inconsistency between my lack of vegetable consumption with beliefs about a healthy diet.	1	2	3	4	5	6	7
4.	My vegetable consumption is not as healthy as I feel it should be.	1	2	3	4	5	6	7

Dissonance

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I feel some psychological discomfort knowing that my current vegetable consumption behaviour is not as healthy as it should be.	1	2	3	4	5	6	7
2.	I feel rather perturbed that I'm not following standards of healthy vegetable consumption.	1	2	3	4	5	6	7
3.	I feel some degree of uneasiness over not eating enough vegetables to maintain a healthy diet as I should be doing.	1	2	3	4	5	6	7
4.	I feel somewhat bothered that I am not making healthy vegetable choices.	1	2	3	4	5	6	7

APPENDIX C: MAIN STUDY MATERIALS

Appendix C-1: Time 1 questionnaire

SECTION (A1): Health & Taste Attitudes Scale (HTAS) – General Health Interest subscale (Initial Assessment)

We are interested in learning about your food attitudes. Please respond to the following items by circling a number next to each item that best describes your level of agreement with it.

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I am very particular about the healthiness of food.	1	2	3	4	5	6	7
2.	I always follow a healthy and balanced diet.	1	2	3	4	5	6	7
3.	It is important for me that my diet is low in fat.	1	2	3	4	5	6	7
4.	It is important for me that my daily diet contains a lot of vitamins and minerals.	1	2	3	4	5	6	7
5.	I eat what I like and I do not worry about healthiness of food.	1	2	3	4	5	6	7
6.	The healthiness of food has little impact on my food choices.	1	2	3	4	5	6	7
7.	The healthiness of snacks makes no difference to me.	1	2	3	4	5	6	7
8.	I do not avoid any foods, even if they may raise my cholesterol.	1	2	3	4	5	6	7

SECTION (A2): Attitude toward Vegetables (Initial Assessment)

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I enjoy eating vegetables.	1	2	3	4	5	6	7
2.	It is important to me that I include vegetables in my meals.	1	2	3	4	5	6	7
3.	I feel good when I eat vegetables.	1	2	3	4	5	6	7
4.	It is important for me to meet the daily requirements of adequate vegetable consumption.	1	2	3	4	5	6	7
5.	Eating vegetables comes effortlessly for me.	1	2	3	4	5	6	7

SECTION (B): Preference for Consistency Scale-Brief Form (PFC-B)

Instructions

The following are statements concerning personal attitudes. Please respond to the following items by circling a number next to each item that best describes your level of agreement with it.

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	It is important to me that those who know me can predict what I will do.	1	2	3	4	5	6	7
2.	I want to be described by others as a stable, predictable person.	1	2	3	4	5	6	7
3.	The appearance of consistency is an important part of the image I present to the world.	1	2	3	4	5	6	7
4.	An important requirement for any friend of mine is personal consistency.	1	2	3	4	5	6	7
5.	I typically prefer to do things the same way.	1	2	3	4	5	6	7
6.	I want my close friends to be predictable.	1	2	3	4	5	6	7
7.	It is important to me that others view me as a stable person.	1	2	3	4	5	6	7
8.	I make an effort to appear consistent to others.	1	2	3	4	5	6	7
9.	It doesn't bother me much if my actions are inconsistent.	1	2	3	4	5	6	7

SECTION (C): Marlowe-Crowne Social Desirability (MCSD) Scale

Instructions

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is **(T)rue** or **(F)alse** as it pertains to you. Please **circle** your answers.

1.	Before voting I thoroughly investigate the qualifications of all the candidates.	T	F
2.	I never hesitate to go out of my way to help someone in trouble.	T	F
3.	It is sometimes hard for me to go on with my work if I am not encouraged.	T	F
4.	I have never intensely disliked anyone.	T	F
5.	On occasion I have had doubts about my ability to succeed in life.	T	F
6.	I sometimes feel resentful when I don't get my way.	T	F
7.	I am always careful about my manner of dress.	T	F
8.	My table manners at home are as good as when I eat out in a restaurant.	T	F
9.	If I could get into a movie without paying and be sure I was not seen, I would probably do it.	T	F
10.	On a few occasions, I have given up doing something because I thought too little of my ability.	T	F
11.	I like to gossip at times.	T	F
12.	There have been times when I felt like rebelling against people in authority even though I knew they were right.	T	F
13.	No matter whom I'm talking to, I'm always a good listener.	T	F
14.	I can remember pretending to be sick to get out of something.	T	F
15.	There have been occasions when I took advantage of someone.	T	F
16.	I'm always willing to admit it when I make a mistake.	T	F
17.	I always try to practise what I preach.	T	F
18.	I don't find it particularly difficult to get along with loud-mouthed, obnoxious people.	T	F
19.	I sometimes try to get even, rather than forgive and forget.	T	F
20.	When I don't know something, I don't mind admitting it.	T	F
21.	I am always courteous, even to people who are disagreeable.	T	F
22.	At times I have really insisted on having things my own way.	T	F
23.	There have been occasions when I felt like smashing things.	T	F
24.	I would never think of letting someone else be punished for my wrongdoings.	T	F
25.	I never resent being asked to return a favour.	T	F
26.	I have never been annoyed when people expressed ideas very different from my own.	T	F
27.	I never make a long trip without checking the safety of my car.	T	F
28.	There have been times when I was quite jealous of the good fortune of others.	T	F
29.	I have almost never felt the urge to scold someone.	T	F
30.	I am sometimes irritated by people who ask favours of me.	T	F
31.	I have never felt that I was punished without cause.	T	F
32.	I sometimes think when people have a misfortune, they only got what they deserved.	T	F
33.	I have never deliberately said something that hurt someone's feelings.	T	F

Appendix C-2-1: Time 2 questionnaire – Healthy eating condition

SECTION (A): Estimated Actual Vegetable Consumption (Initial Assessment)

It is recommended that individuals consume 2 servings of fruits and 2 servings of vegetables daily. 2 servings of vegetables is equivalent to 2½ cups of vegetables (1 cup = standard 250ml measuring cup – see figure). Estimate how much vegetable you consume daily by making a mark on the following line*:

|----------|

0g (0% of recommendation)

625ml (100% of recommendation)

*Your estimate would be in terms of the percentage of total daily recommended amount of vegetables (i.e., 625ml) consumed. The line is exactly 10cm long – each 1mm represents 1% of the daily recommended amount of vegetables consumed.

Illustration: 1 cup (250ml) of broccoli = Approx. 8 pieces of standard-sized broccoli florets

SECTION (B): Experimental Manipulation – Intra-attitudinal Cognitive Discrepancy (Hypocrisy)

Instructions

Research has shown that eating habits are established early in life. You are tasked to relate to a group of 12-year-old youths the importance of eating a healthy diet. Write a short essay stating **FIVE (5)** reasons why eating healthily is important. Then, based on what you have written, list **FIVE (5)** statements of advice and/or recommendations that you think would be crucial to promote/convey the message of healthy eating to the young audience. Your ideas will be incorporated into a proposal to be submitted to a public agency responsible for the promotion of healthy eating for youths. Answer the questions that follow (overleaf) after you have completed your write-up.

Essay:

Statements:

(1) _____

(2) _____

(3) _____

(4) _____

(5) _____

_____

_____

1. With respect to the FIVE statements you gave, in the past 3 months, to what extent did you follow:

Statement 1						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

Statement 2						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

Statement 3						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

Statement 4						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

Statement 5						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

2. Based on the above, how healthy would you rate your current dietary behaviour?

Completely unhealthy	Fairly unhealthy	Slightly unhealthy	Neither healthy nor unhealthy	Slightly healthy	Fairly healthy	Completely healthy
1	2	3	4	5	6	7

SECTION (C1): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Healthy Eating

With reference to **healthy eating**, indicate the extent of your agreement/disagreement with each statement along the following scale:

	Cognitive Discrepancy	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I am not eating as healthily as I should be doing.	1	2	3	4	5	6	7
2.	My dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	My unhealthy food choices are inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7
	Dissonance	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I feel bothered knowing that I am not eating as healthily as I should be doing.	1	2	3	4	5	6	7
2.	I feel uneasy knowing that my dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	I feel uncomfortable knowing that my unhealthy food choices are inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7

SECTION (C2): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Vegetable Consumption

With reference to **vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

	Cognitive Discrepancy	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I am not eating enough vegetables as I should be doing.	1	2	3	4	5	6	7
2.	My vegetable intake falls short of the daily serving standards required for adequate vegetable consumption.	1	2	3	4	5	6	7
3.	My lack of vegetable consumption is inconsistent with my beliefs about proper vegetable dietary behaviour.	1	2	3	4	5	6	7
	Dissonance	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I feel bothered knowing that I'm not eating enough vegetables as I should be doing.	1	2	3	4	5	6	7
2.	I feel uneasy knowing that my vegetable intake falls short of the daily serving standards required for sufficient vegetable consumption.	1	2	3	4	5	6	7
3.	I feel uncomfortable knowing that my lack of vegetable consumption is inconsistent with my beliefs about proper vegetable dietary behaviour.	1	2	3	4	5	6	7

SECTION (C3): Assessment of Inter-attitudinal Cognitive Discrepancy & Dissonance Related to Attitudes toward Healthy Eating & Vegetable Consumption

With reference to **healthy eating AND vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

	Cognitive Discrepancy	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I am not eating enough vegetables as I should be doing to maintain a healthy diet.	1	2	3	4	5	6	7
2.	My vegetable dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	My lack of vegetable consumption is inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7
	Dissonance	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I feel bothered knowing that I am not eating enough vegetables as I should be doing to maintain a healthy diet.	1	2	3	4	5	6	7
2.	I feel uneasy knowing that my vegetable dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	I feel uncomfortable knowing that my lack of vegetable consumption is inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7

Appendix C-2-2: Time 2 Questionnaire – Vegetable Consumption Condition

SECTION (A): Estimated Actual Vegetable Consumption (Initial Assessment)

It is recommended that individuals consume 2 servings of fruits and 2 servings of vegetables daily. 2 servings of vegetables is equivalent to 2½ cups of vegetables (1 cup = standard 250ml measuring cup – see figure). Estimate how much vegetable you consume daily by making a mark on the following line*:

I----------I

0ml (0% of recommendation)

625ml (100% of recommendation)

*Your estimate would be in terms of the percentage of total daily recommended amount of vegetables (i.e., 625ml) consumed. The line is exactly 10cm long – each 1mm represents 1% of the daily recommended amount of vegetables consumed.

Illustration: 1 cup (250ml) of broccoli = Approx. 8 pieces of standard-sized broccoli florets

SECTION (B): Experimental Manipulation – Intra-attitudinal Cognitive Discrepancy (Hypocrisy)

Instructions

Research has shown that eating habits are established early in life. You are tasked to relate to a group of 12-year-old youths the importance of eating vegetables. Write a short essay stating **FIVE (5)** reasons why eating vegetables is important. Then, based on what you have written, list **FIVE (5)** statements of advice and/or recommendations that you think would be crucial to promote/convey the message of vegetable consumption to the young audience. Your ideas will be incorporated into a proposal to be submitted to a public agency responsible for the promotion of vegetable consumption for youths. Answer the questions that follow (overleaf) after you have completed your write-up.

Essay:

Statements:

(1)

(2)

(3)

(4)

(5) _____

_____

_____

1. With respect to the FIVE statements you gave, <u>in the past 3 months</u>, to what extent did you follow:

Statement 1						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

Statement 2						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

Statement 3						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

Statement 4						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

Statement 5						
Did not follow at all	Rarely followed	Followed a few times	Followed half the time	Moderately followed	Frequently followed	Followed all the time
1	2	3	4	5	6	7

2. Based on the above, how sufficient would you rate your current vegetable consumption behaviour?

Completely insufficient	Fairly insufficient	Slightly insufficient	Neither sufficient nor insufficient	Slightly sufficient	Fairly sufficient	Completely sufficient
1	2	3	4	5	6	7

SECTION (C1): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Vegetable Consumption

With reference to **vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

	Cognitive Discrepancy	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I am not eating enough vegetables as I should be doing.	1	2	3	4	5	6	7
2.	My vegetable intake falls short of the daily serving standards required for adequate vegetable consumption.	1	2	3	4	5	6	7
3.	My lack of vegetable consumption is inconsistent with my beliefs about proper vegetable dietary behaviour.	1	2	3	4	5	6	7
	Dissonance	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
4.	I feel bothered knowing that I'm not eating enough vegetables as I should be doing.	1	2	3	4	5	6	7
5.	I feel uneasy knowing that my vegetable intake falls short of the daily serving standards required for sufficient vegetable consumption.	1	2	3	4	5	6	7
6.	I feel uncomfortable knowing that my lack of vegetable consumption is inconsistent with my beliefs about proper vegetable dietary behaviour.	1	2	3	4	5	6	7

SECTION (C2): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Healthy Eating

With reference to **healthy eating**, indicate the extent of your agreement/disagreement with each statement along the following scale:

	Cognitive Discrepancy	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I am not eating as healthily as I should be doing.	1	2	3	4	5	6	7
2.	My dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	My unhealthy food choices are inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7
	Dissonance	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
4.	I feel bothered knowing that I am not eating as healthily as I should be doing.	1	2	3	4	5	6	7
5.	I feel uneasy knowing that my dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
6.	I feel uncomfortable knowing that my unhealthy food choices are inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7

SECTION (C3): Assessment of Inter-attitudinal Cognitive Discrepancy & Dissonance Related to Attitudes toward Healthy Eating & Vegetable Consumption

With reference to **healthy eating AND vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

	Cognitive Discrepancy	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I am not eating enough vegetables as I should be doing to maintain a healthy diet.	1	2	3	4	5	6	7
2.	My vegetable dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	My lack of vegetable consumption is inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7
	Dissonance	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
4.	I feel bothered knowing that I am not eating enough vegetables as I should be doing to maintain a healthy diet.	1	2	3	4	5	6	7
5.	I feel uneasy knowing that my vegetable dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
6.	I feel uncomfortable knowing that my lack of vegetable consumption is inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7

Appendix C-2-3: Time 2 Questionnaire – Control Condition

SECTION (A): Estimated Actual Vegetable Consumption (Initial Assessment)

It is recommended that individuals consume 2 servings of fruits and 2 servings of vegetables daily. 2 servings of vegetables is equivalent to 2½ cups of vegetables (1 cup = standard 250ml measuring cup – see figure). Estimate how much vegetable you consume daily by making a mark on the following line*:

I----------I

0g (0% of recommendation)

625ml (100% of recommendation)

*Your estimate would be in terms of the percentage of total daily recommended amount of vegetables (i.e., 625ml) consumed. The line is exactly 10cm long – each 1mm represents 1% of the daily recommended amount of vegetables consumed.

Illustration: 1 cup (250ml) of broccoli = Approx. 8 pieces of standard-sized broccoli florets **Instructions**

SECTION (B1): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Healthy Eating

With reference to **healthy eating**, indicate the extent of your agreement/disagreement with each statement along the following scale:

	Cognitive Discrepancy	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I am not eating as healthily as I should be doing.	1	2	3	4	5	6	7
2.	My dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	My unhealthy food choices are inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7
	Dissonance	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I feel bothered knowing that I am not eating as healthily as I should be doing.	1	2	3	4	5	6	7
2.	I feel uneasy knowing that my dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	I feel uncomfortable knowing that my unhealthy food choices are inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7

SECTION (B2): Assessment of Intra-attitudinal Cognitive Discrepancy & Dissonance Related to Attitude towards Vegetable Consumption

With reference to **vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

	Cognitive Discrepancy	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I am not eating enough vegetables as I should be doing.	1	2	3	4	5	6	7
2.	My vegetable intake falls short of the daily serving standards required for adequate vegetable consumption.	1	2	3	4	5	6	7
3.	My lack of vegetable consumption is inconsistent with my beliefs about proper vegetable dietary behaviour.	1	2	3	4	5	6	7
	Dissonance	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I feel bothered knowing that I'm not eating enough vegetables as I should be doing.	1	2	3	4	5	6	7
2.	I feel uneasy knowing that my vegetable intake falls short of the daily serving standards required for sufficient vegetable consumption.	1	2	3	4	5	6	7
3.	I feel uncomfortable knowing that my lack of vegetable consumption is inconsistent with my beliefs about proper vegetable dietary behaviour.	1	2	3	4	5	6	7

SECTION (B3): Assessment of Inter-attitudinal Cognitive Discrepancy & Dissonance Related to Attitudes toward Healthy Eating & Vegetable Consumption

With reference to **healthy eating AND vegetable consumption**, read the following statements and indicate the extent of your agreement/disagreement with each statement along the following scale:

	Cognitive Discrepancy	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I am not eating enough vegetables as I should be doing to maintain a healthy diet.	1	2	3	4	5	6	7
2.	My vegetable dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	My lack of vegetable consumption is inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7
	Dissonance	**Strongly Disagree**	**Disagree**	**Slightly Disagree**	**Neither Agree nor Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1.	I feel bothered knowing that I am not eating enough vegetables as I should be doing to maintain a healthy diet.	1	2	3	4	5	6	7
2.	I feel uneasy knowing that my vegetable dietary behaviour falls short of the standards of healthy eating.	1	2	3	4	5	6	7
3.	I feel uncomfortable knowing that my lack of vegetable consumption is inconsistent with my beliefs about healthy eating.	1	2	3	4	5	6	7

Appendix C-3: Time 3 questionnaire

SECTION (A1): Health & Taste Attitudes Scale (HTAS) – General Health Interest subscale (Final Assessment)

You had previously indicated what your food attitudes were like. You are now given a chance to review those food attitudes and make changes, if any.

We would like to know about your **current** food attitudes.

To what extent do you agree/disagree with each of the following statements?

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I am very particular about the healthiness of food.	1	2	3	4	5	6	7
2.	I always follow a healthy and balanced diet.	1	2	3	4	5	6	7
3.	It is important for me that my diet is low in fat.	1	2	3	4	5	6	7
4.	It is important for me that my daily diet contains a lot of vitamins and minerals.	1	2	3	4	5	6	7
5.	I eat what I like and I do not worry about healthiness of food.	1	2	3	4	5	6	7
6.	The healthiness of food has little impact on my food choices.	1	2	3	4	5	6	7
7.	The healthiness of snacks makes no difference to me.	1	2	3	4	5	6	7
8.	I do not avoid any foods, even if they may raise my cholesterol.	1	2	3	4	5	6	7

SECTION (A2): Attitude toward Vegetables (Final Assessment)

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	I enjoy eating vegetables.	1	2	3	4	5	6	7
2.	It is important to me that I include vegetables in my meals.	1	2	3	4	5	6	7
3.	I feel good when I eat vegetables.	1	2	3	4	5	6	7
4.	It is important for me to meet the daily requirements of adequate vegetable consumption.	1	2	3	4	5	6	7
5.	Eating vegetables comes effortlessly for me.	1	2	3	4	5	6	7

SECTION (B): Estimated Actual Vegetable Consumption (Final Assessment)

You had previously given an estimate on how much vegetables you consumed daily, on average in a week, against the daily recommendation of 2½ cups (625ml) of vegetables.

We would like to know if there had been any changes to your average daily vegetable consumption since then.

Estimate how much vegetable you **currently** consume daily, **on average in the past seven (7) days**, by making a mark on the following line*:

I----------I

0ml (0% of recommendation)

625ml (100% of recommendation)

*Your estimate would be in terms of the percentage of total daily recommended amount of vegetables (i.e., 625ml) consumed. The line is exactly 10cm long – each 1mm represents 1% of the daily recommended amount of vegetables consumed.

Illustration: 1 cup (250ml) of broccoli = Approx. 8 pieces of standard-sized broccoli florets

APPENDIX D: ORIGINAL PAPERS

Appendix D-1: Cognitive dissonance in food and nutrition – A review (see attached)

Appendix D-2: Cognitive dissonance in food and nutrition – A conceptual framework (see attached)