AN EXAMINATION OF THE RELATIONSHIP BETWEEN CONSUMERS' CULTURAL VALUES AND THEIR FUNCTIONAL FOOD PERCEPTION

A Thesis submitted by

Saugat Neupane, MBA, MBSR

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Abstract

There is rising concern regarding the increase in occurrences of chronic health problems attributed to unhealthy food choices. Although functional foods are being recommended as one of the ways to prevent such health problems, the reports produced by the Department of Health, Australia, show that Australians are not consuming functional foods as recommended. Some of the reasons for non-compliance with the recommended functional food guidelines could be linked to the multicultural population of Australia. Consumers from different cultures have shared knowledge or understanding and views about food that might determine how they perceive functional foods. The aim of this study is to investigate the relationships between consumers' cultural values and their functional food perception. The research is driven by the pragmatic philosophical orientation and uses the exploratory sequential research strategy that employs a mix of qualitative and quantitative research. The qualitative stage involves the Grounded theory method and the quantitative stage involves Exploratory Factors Analysis (EFA) followed by correlation analysis and Analysis of Variance (ANOVA). The samples for the study consisted of consumers from three major ethnic groups in Australia: Anglo-Australian, Chinese and Indian. The findings of the study revealed that the following cultural values; self-directed learning, consistency, stimulation, conformity and consumer motives influence consumers' functional food perception. A theoretical framework of functional food perception has been constructed through this research. The cultural values driven framework can be of help to functional food marketers and health policy makers in profiling consumers and developing strategies leading towards functional food consumption.

Keywords: functional food, cultural values, grounded theory, factor analysis, consumer marketing, consumer behaviour, pragmatic paradigm

Certification of thesis

This thesis is entirely the work of Saugat Neupane except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

Principal Supervisor: Dr Ranga Chimhundu

Associate Supervisor: Dr KC Chan

Student and supervisors' signatures of endorsement are held at the University.

Publications arising from this thesis

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Neupane, S, Chimhundu, R & Chan, KC 2019, "Development of a measurement scale for functional food perception", *International Journal of Food Sciences and Nutrition* (manuscript under preparation).

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Glossary

ANOVA	Analysis of Variance
CFA	Confirmatory factor analysis
CINT	Name of the data collection company used in the research
EFA	Exploratory factor analysis
FF	Functional food
KMO	Kaiser-Meyer-Olkin
RP	Research proposition
PAF	Principal axis factoring
PCE	Principal component analysis
PVQ-RR	Portrait Values Questionnaire Revised
SPSS	Statistical Package for the Social Sciences
USQ	University of Southern Queensland

Chapter 1: Introduction

1.1 Background to the research

Cases of heart disease, diabetes, cancer, obesity and respiratory disease have become rather common in recent years (Centers for Disease Control and Prevention 2009). Such diseases incur a considerable cost to a nation's health system and economy. The direct cost of coronary artery disease and stroke to America alone was $313.8 billion in 2009 (Lloyd-Jones et al. 2009). Australia is not untouched by these conditions. According to the census report of 2016, the leading causes of death in Australia are diabetes, cancer, heart-related diseases, and hypertensive diseases. The onset of such conditions is delayed with the proper lifestyle and diet intervention.

The Australian Dietary Guidelines have recommended the amount and kinds of foods that Australians need to eat to reduce the risk of chronic health problems, such as diabetes, obesity, hypertension and cancer. A reasonable number of foods recommended by the guidelines fall under the functional food category, for example, whole grain food products, legumes/lentils, non-starchy vegetables. Functional foods are foods that naturally contain some active components or that have been fortified, enhanced or enriched (Hasler et al. 2009) with physiologically active components (Martirosyan & Singh 2015) by any method, and that when consumed on a regular basis enhance health, well-being and/or reduce disease (Clydesdale 2004; Health Canada 1998).

The Australian census report of 2016 showed that most Australians are not eating enough foods as recommended by the Australian Dietary Guidelines. Being a multicultural country, one of the underlying reasons for such noncompliance could be the diverse cultural background of people living in Australia (National Health and Medical Research Council 2013). Australia is a hugely diverse country with people from 200 different countries, more than 300 languages spoken, more than 100 religions and more than 300 different ancestries (Australian Bureau of Statistics 2017). The people from different cultural backgrounds have values inherited from their tradition, family or parents which can influence their decisions on how or whether they should choose foods recommended by the guidelines (Wright et al. 2001). Cultural

values are embedded in their mind and play a significant role in their perception of food (Carterette & Friedman 2013; Tan et al. 2015; Tan et al. 2016). Functional food perception broadly encompasses what functional food attributes/values/benefits consumers notice or pay attention to, and why; what they think/feel about functional foods or what meanings they assign to the functional food attributes/values/benefits, as well as the underlying rationales (Schiffman et al. 2013, p. 148).

There are a few studies broadly focusing on the relationships of consumers' culture and their perception of functional food products, but most of the studies are either exploratory in nature (Bäckström et al. 2003; Frewer et al. 2003; Cox et al. 2004; Messina et al. 2008; Vassallo et al. 2009; Dolgopolova et al. 2015) or have been studied under different cultural contexts than Australia (Bäckström et al. 2003; Bech-Larsen & Grunert 2003; Teratanavat & Hooker 2006; Niva & Mäkel 2007; Messina et al. 2008; Grunert et al. 2009; Lampila et al. 2009; Hassan 2011b).

Moreover, although some studies tried to establish the relationship of culture with functional food perception, they did not specifically suggest what cultural values affect functional food perceptions. There is a need for a rigorous study to confirm whether and how culture affects functional food perception and what those cultural values are, that specifically influence the perception of functional foods. There is a need to study the relationship between culture and the consumer's perceptions towards functional food (Bech-Larsen & Grunert 2003; Urala & Lähteenmäki 2007; Hassan 2011b; Dolgopolova et al. 2015; Siegrist et al. 2015) and, subsequently, their purchasing behaviour.

Australia, being a multicultural country, has various ethnic groups with different cultural values. Due to the various ethnic groups, it can be challenging to have a common belief about recommended foods across communities in Australia. Use of national cultural values (i.e. Hofstede's values), which assumes everyone across the country uphold same values, may not be able to reflect differences in cultural values among individuals from different ethnicities and the impacts on functional food perception. Therefore, cultural values at the individual level (i.e. Schwartz's value dimensions) are adopted in the study.

The identification of cultural values that affect functional food perception and how these values constitute to form a theoretical framework of functional food perception would pave the way towards integrating the cultural values in the promotion of functional foods in Australia. The framework would help to develop a universal value for functional foods across cultures and subcultures in Australia. Further, this knowledge can be transferred to other critical strategic areas of Australian government where the targeted groups are multicultural groups.

1.2 Research problem

Functional foods fundamentally include a base product, enrichment and communication around the health benefits offered by the enrichment of functional foods. Researchers have had an interest in finding out how these values are perceived by consumers or how these values influence functional food perceptions. The functional food perceptions were found to be dependent on how positive consumers were towards the base product used in the functional foods (Bech-Larsen & Grunert 2003; Sorenson & Bogue 2005; Annunziata & Vecchio 2013). It is not only the base product but the kind of enrichments (active ingredients) added to the base products in functional foods that also influenced consumers' perceptions (Bech-Larsen & Grunert 2003; Frewer et al. 2003; van Kleef et al. 2005).

Some researchers believed that functional food perceptions depend on how well the benefits of functional foods are communicated (Tudoran et al. 2009; Williams 2005; Ares et al. 2009; Urala et al. 2003; Urala and Lähteenmäki 2004). Largely the sensory values and the health values of functional foods have been found to be conflicting, putting most consumers off from functional foods. Although functional foods have health benefits, consumers do not appear to actively seek them out (Annunziata & Vecchio 2013). The sensory values of functional foods were consistently found to be one of the major factors causing consumers to be disinterested in functional foods (Luckow et al. 2006; Verbeke 2006; Sabbe et al. 2009; Grunert 2010; Vidigal et al. 2011; Cruz et al. 2013). Consequently, there have been attempts at masking the odd flavours of functional foods (Luckow et al. 2006; Sun-Waterhouse & Wadhwa 2013; Laokuldilok et al. 2016). The motivation behind most of the research was finding a solution to the problem of functional foods being less flavoursome. Consumers were

not ready to compromise the pleasurable factors for health factors. However, these previous researchers were missing out a key factor—consumers' culture and its influence on functional food perception.

Consumers' perception of food and its values are a manifestation of their culture and cultural values. There is evidence of different ethnic groups unknowingly or knowingly consuming naturally occurring functional foods which may not be palatable to other ethnic groups (Swain et al. 2014; Sõukand et al. 2015; Sujarwo & Caneva 2016). The question is why people from an ethnic group consume certain functional food and find it tasteful while the same functional food might be perceived to be unpleasant by people from other ethnic groups. One of the differentiating factors between the ethnic groups is culture, therefore, the researcher assumes that culture should have some influence over the variation in functional food preferences between ethnic groups.

This study aims to assess the relationships between consumers' cultural values and functional food perception, and to develop a theoretical model for functional food perception. However, initially, general research objectives were set to explore the relationship between consumers' culture and functional food perception. The following research question was formulated: **What is the relationship between consumers' culture and their functional food perception?** The following four sub-research questions are outlined to address the general research question.

1. Does culture affect consumer perceptions of functional food?
2. What cultural values affect consumer perceptions of functional food?
3. How do these cultural values affect consumers' functional food perception?
4. How do consumers' demographic characteristics affect the relationship between their cultural values and functional food perception?

1.3 Justification for the research

The research can be justified based on its contribution to the consumer behaviour theories, the functional food industry and policies related to health and dietary interventions. The study contributes to a greater understanding of the role of cultural values on consumer perception, particularly in the context of functional food and a

multicultural society in Australia. The research further enhances the understanding of the consumer value system and its role in their overall buying behaviour. The study provides a theoretical framework for the functional food perception through cultural values, which can be of use for functional food scholars, producers and marketers. The following sections discuss the research contributions in detail.

According to the National Health Survey (NHS), Australia, in 2014–15, diabetes, heart disease, and cancer are some of the major diseases causing complications and death in the Australian population. As per the NHS, 2014–15, 5.1% of the Australian population had been diagnosed as diabetic and further, 3.1% of adults had impaired fasting plasma glucose results, which means that there will be more cases of diabetes in future (Australian Bureau of Statistics 2015a). The proportion having heart disease increased from 4.7% in 2011–12 to 5.2% in 2014–15 (Australian Bureau of Statistics 2015a). One of the leading causes of diabetes and heart disease is being overweight and obese and, to make the case worse, 63.4% Australians aged 18 years and over were overweight or obese (Australian Bureau of Statistics 2015b).

A balanced diet containing a sufficient amount of functional foods and vegetables can reduce such complications. The Australian Dietary Guidelines recommended certain fruits and vegetables that reduce the risk of developing heart disease and diabetes. Though the guidelines did not explicitly label them as functional foods, there is evidence in the literature that proves them to be functional foods. But, only around half of the population (49.8%) met the recommended daily serves for fruit, 30% met the recommended guidelines for cereals, and only 7% met the recommended servings of vegetables (Australian Bureau of Statistics 2016). The Australian Dietary Guidelines generally mention that one of the barriers to dietary patterns, consistent with the guidelines, is the culture of the consumers. There is no clear information on how culture could affect the consumption of the recommended foods.

The findings of this research can provide more insight into how consumers from a multicultural country like Australia can be encouraged to comply with the recommended food choices. There could be different cultural values and other values influencing functional-food choices of consumers from diverse ethnic groups in Australia. Due to such various ethnic groups in Australia, it can be challenging to have

a common belief about recommended foods for all Australians. If we can identify the cultural values that affect the functional food perceptions and eventually how these values affect functional food behaviour to form a theoretical framework, we can pave a way towards integrating cultural values in the promotion of functional foods in Australia. The knowledge gained from this study would help to develop a common value for functional foods across cultures and subcultures in Australia. Further, this knowledge may be relevant to other health and nutrition-related intervention strategies in Australia.

There are limited studies that are explicit about functional food behaviour and consumers' culture (Hassan 2011b, 2011a; Schnettler et al. 2015; Siegrist et al. 2015). Most of the studies compared cross national differences on functional food perception (Bech-Larsen & Grunert 2003; Messina et al. 2008; Grunert et al. 2009; Lampila et al. 2009). There are few studies that compared functional food perception within one nation or at ethnic levels within that nation (Lee et al. 2014; Schnettler et al. 2015). Some studies although studied functional food perception at ethnic level, there was not much variation between the ethnic groups (Labrecque et al. 2006; Saba et al. 2010; Hassan 2011b, 2011a), and the research methods applied were exploratory in nature (Bäckström et al. 2003; Frewer et al. 2003).

A research very close to this study was done by Hassan (2008). Hassan (2008) focused on consumer behaviour towards traditional vs modern functional foods in a multicultural society. Hassan (2008; 2011b) found that consumers' functional food preference involved prioritisation and balancing of cultural characteristics, their personal health characteristics, and the product's characteristics. However, the product characteristics included health, price and brand, but ignored the taste or the sensory characteristics of functional foods while consumers' perceptions of functional foods are believed to have been affected by negotiation between the sensory benefits and health benefits of functional foods (Grunert 2010). Hassan (2011a) established that cultural values affect consumers' personal values, knowledge, and health, which eventually affects their functional food behaviour. The study sample in Hassan (2008; 2011a; 2011b) were Chinese, Malaysian and Indians living in Malaysia. These three ethnic groups have unique traditional values for food but come from a similar collectivist background. Therefore, by comparing people from similar backgrounds, it

can be difficult to ascertain whether culture influences their functional food perception.

This study includes Australian consumers with an Anglo-Australian background (individualistic background) and consumers with Chinese and Indian backgrounds (collectivist background). Although the study by Hassan (2008) tried to identify the cultural values pertaining to functional food consumption, these values were quite abstract. The researcher might have missed some cultural values, or the data may not have captured the universal value dimensions such as Schwartz's value system. The previous theories of consumer behaviour considered culture as either an exogenous variable having indirect influence on consumer perception or did not consider culture at all. Through empirical analysis, this research will provide more clarity on the relationships of cultural values on functional food perception. This research will pave a path to developing a fully-fledged theoretical model of functional food perception. Future scholars may add more variables to the theoretical framework developed by this research.

1.4 Methodology

The research employs a pragmatic method (mixed methods), combining qualitative and quantitative approaches sequentially (Greene et al. 1989). The sequence for this developmental approach is QUAL→QUAN (Creswell 2003; Johnson & Onwuegbuzie 2004, p. 22). The capital letters denote high priority or weight, which means, both the qualitative and quantitative stages in the research carry equal weight and have the same priority.

The research questions outlined earlier, on page 3 of this thesis, demand a thick description of the cultural values of consumers, and assessment on how they relate to the context of the perception and consumption of functional food. Since there is insufficient prior knowledge about cultural values underpinning the functional food perception; logically, the first approach should be a qualitative search for that information. The researcher first explored the relationship between culture and functional food perception through the Grounded theory method—a qualitative inquiry. Thus, in-depth interviews were conducted using a soft laddering approach

while asking probing questions and further questioning the participants during the interviews. The interview data were analysed using the constant comparative method. The interview participants were from three ethnic groups in Australia: Anglo-Australian, Chinese, Indian. According to the Australian Bureau of Statistics (2018b), overseas migration contributed to 60.6% of the growth in Australia's population in 2018. The top countries of birth for migrant arrivals were China, India, and the United Kingdom (Australian Bureau of Statistics 2018b).

The Grounded theory method was used to identify the cultural values underpinning consumers' perception of functional foods and the relationships between them, and to propose a theoretical framework. The qualitative inquiry in the research encompasses an ethnoconsumerism approach. Ethnoconsumerism is an approach to studying consumer behaviour based on the categories originating from a given culture (Noah & Venkatesh 1995). The categories in the theoretical framework developed in this research originated from the ethnic groups being tested in the research. The variables in the theoretical framework at the qualitative stage were empirically tested and refined at the quantitative stage.

The findings of the qualitative inquiry, with the addition of findings from relevant literature, were used to develop an instrument for further measuring and validating the variables (cultural values and functional food perception variables) identified in the qualitative inquiry. The quantitative stage of the research involved a survey with a larger number of participants from three ethnic groups. The survey data were collected using self-administered structured questionnaires. The data were analysed using the exploratory factor analysis (EFA) method, Pearson correlation analysis, and ANOVA tests. The EFA method was used for the extraction of the underlying cultural constructs about functional food perception, and multivariate tests such as Pearson correlation analysis and ANOVA were used for testing the relationship between those constructs and the effect of demographic characteristics on the extracted variables.

1.5 Outline of the thesis

There are seven chapters in this thesis. Chapter 1 briefly outlines the critical issues of the research, including the research background, objectives, justification of the study,

and the general overview of methodology. Chapter 2 critically reviews key literature related to functional food perception and cultural values. In this chapter, gaps are identified in the literature, and a general focus research question developed. Chapter 3 outlines the pragmatic research paradigm employed in the research and the justification for it. More details about specific methods are provided in Chapter 4 (qualitative study) and Chapter 6 (quantitative study). Chapter 4 is about qualitative data collection, analysis and results, and discussion. Chapter 5 includes information about development of the questionnaire for the quantitative phase of the study. Chapter 6 is about quantitative data collection, analysis, and results. The final chapter, Chapter 7, discusses the findings of the research, its implications and limitations.

Chapter 2: Literature review

2.1 Introduction

The research aims to assess the relationship between culture and functional food perception. It is an essential first to understand functional foods, their importance and characteristics, the existing knowledge about functional food behaviour and its relationship with culture. A thorough review of the literature was undertaken, incorporating facets of the systematic literature review method. The literature was searched and analysed following general guidelines. The review of literature established gaps in the knowledge about the relation of culture and functional food perception. The chapter starts with a description of the general procedure followed for searching the literatures. It then discusses the Australian dietary guidelines and the dietary issues in Australia, defines functional food, reviews literature on consumer behaviour towards functional foods (Figure 1), culture, cultural value dimensions and food culture of Anglo-Australian, Chinese and Indian ethnic groups (Figure 2).

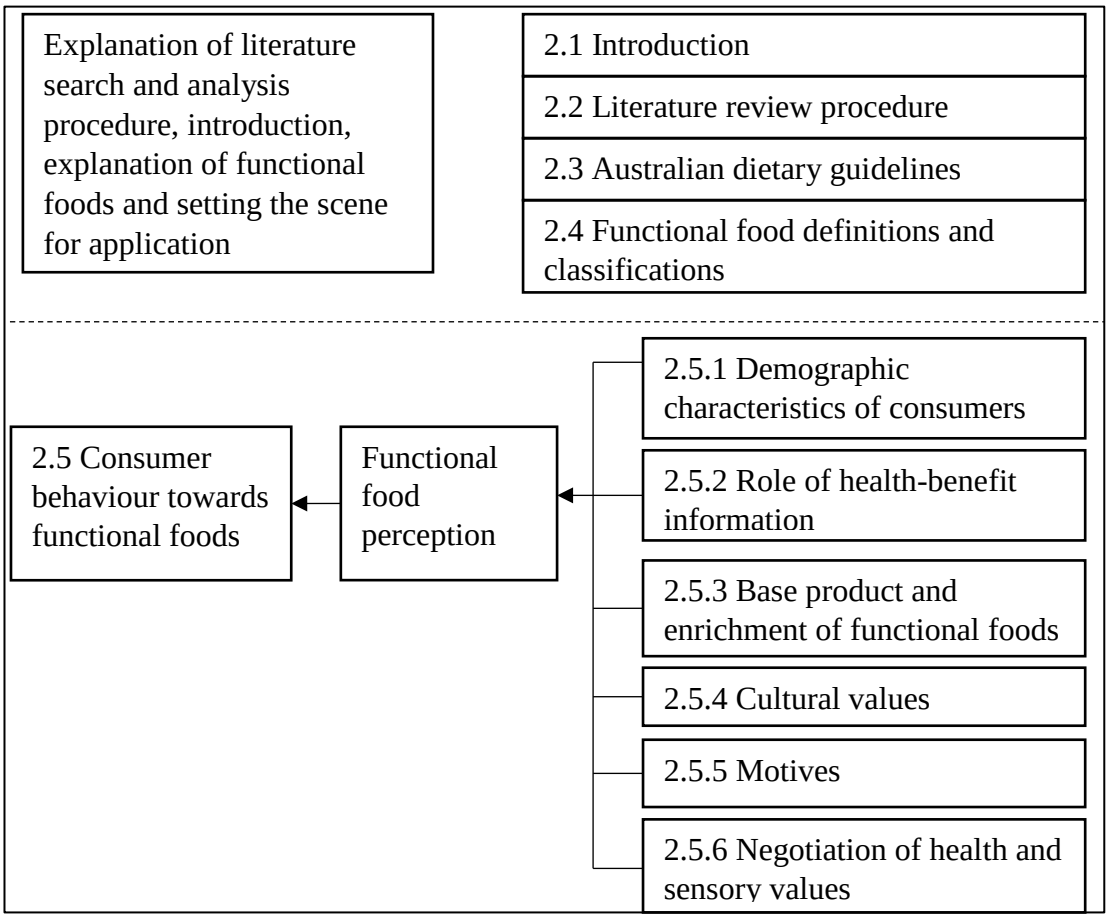

Figure 1 Structure of literature review chapter (Part I)

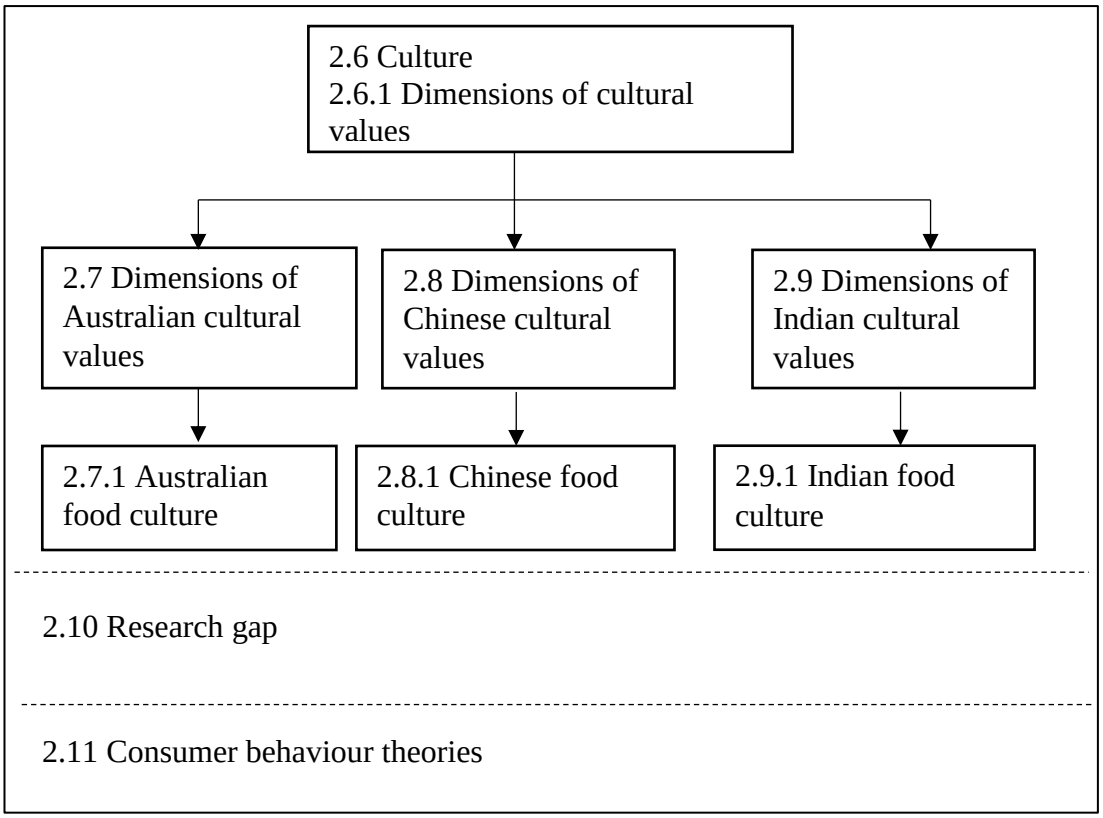

Figure 2 Structure of literature review chapter (Part II)

2.2 Literature review procedure

The review of the literature was done using a general guiding process (please refer to Appendix A for the guideline) where records of the search strings and databases were kept as the review progressed. Search strings included: 'What is a functional food?', 'Functional foods', 'Consumer perception towards functional food', 'Consumer culture and functional food', 'Hindu culture and functional food', 'Buddhism and functional food perception', 'customs of people and their functional food perception', 'Nepalese culture and functional foods', 'Indian tradition and customs and functional foods', 'Consumer culture and perception of sensory benefits', 'Consumer culture and perception of health benefits', 'Culture and food taste', 'Development of taste', 'What is taste?'. Databases searched were Google Scholar, Science Direct, Wiley Online Library, Scopus, Business Source Ultimate. Although the literature search continued throughout the research, the bulk of the search was undertaken from March to the middle of July 2016. Altogether 256 references were initially grouped in my endnote library as shown in Table 1.

Table 1 Sorting of literature in endnote library

Group name	Reference	Nos.
Business Source Ultimate	(Choi & Reid, 2016; Del Giudice *et al.*, 2012; Dobrenova *et al.*, 2015; Hatmal *et al.*, 2018; Manohar & Rehman, 2018; Mirosa & Mangan-Walker, 2018; Mitsunori, 2012; Mpofu *et al.*, 2014; Niva & Mäkel, 2007)	9
Cited in (Hassan, 2008)	(Bistro¨m & Nordstro¨m, 2002; Meijboom, 2007; van Trijp & van der Lans, 2007; Weststrate *et al.*, 2002)	4
Consumer culture and functional food perception	(Abbasi *et al.*, 2012; Abbasi *et al.*, 2010; Abbasi *et al.*, 2009; Abbasi, Arshad Mehmood *et al.*, 2013; Abbasi, A. M. *et al.*, 2013; Abidoye & Akinpelumi, 1997; Acharya *et al.*, 2008; Airhihenbuwa *et al.*, 1996; Allen *et al.*, 2008; Amarra *et al.*, 2008; Arai *et al.*, 2001; Barakhbah, 2007; Capdevila *et al.*, 2003; Ching *et al.*, 2013; Contreras Hernández & Ribas Serra, 2016; de Garine, 1972; Deb & Emdad Haque, 2011; Deshpande *et al.*, 2009; Dolgopolova *et al.*, 2015; Dubé *et al.*, 2016; Eigner & Scholz, 1999; El-Muhammady, 2007; Eves & Cheng, 2007; Frewer *et al.*, 2003; Grey, 2012; Grunert, 2010; Hailu *et al.*, 2009; Hargreaves *et al.*, 2002; Hassan, 2011b; James, 2004; Johansen *et al.*, 2011; Juliano & Hicks, 1996; Kraus, 2015; Lee, PY *et al.*, 2014; Masson *et al.*; Mogendi *et al.*, 2016; Nile, 2015; Niva, 2007; Nygård & Storstad, 1998; Pieroni *et al.*, 2007; Pieroni *et al.*, 2008; Radošević, 2010; Ren *et al.*, 2011; Salleh *et al.*, 2015; Satish Kumar *et al.*, 2013; Schnettler *et al.*, 2015; Siegrist *et al.*, 2015; Siró *et al.*, 2008; Siu-Wan, 2007; Sõukand *et al.*, 2015; Subrahmanyam, 2007; Sujarwo & Caneva, 2016; Swain *et al.*, 2014; van Andel & Westers, 2010; Van Daele, 2016; Yeh *et al.*, 2000; Yoo *et al.*, 2013)	57
Consumer culture and perception of health benefits	(Aguirre, 2016; Betsch *et al.*, 2015; J. van buul & Brouns, 2015; Masson *et al.*; Rozin & Fallon, 1987; Shah *et al.*, 2015)	6
Consumer culture and perception of sensory benefits	(Ares *et al.*, 2015; Ares *et al.*, 2016; Campo *et al.*, 2016; Kenyon & Sen, 2015; Tan *et al.*, 2015; Tan *et al.*, 2016; Torrico *et al.*, 2015)	7
Consumer perception of functional foods	(Aaron *et al.*, 1994; Adams & Engstrom, 2000; Annunziata & Vecchio, 2011, 2013; Ares, Baixauli, *et al.*, 2009; Ares, Barreiro, *et al.*, 2010; Ares, Besio, *et al.*, 2010; Ares & Gámbaro, 2007; Ares, Giménez, *et al.*, 2010; Ares *et al.*, 2008a, 2008b, 2008c; Ares, Giménez, *et al.*, 2009; Ares *et al.*, 2008d; Arihara, 2006; Armstrong *et al.*, 2005; Aschemann-Witzel & Hamm, 2010; Aschemann-Witzel *et al.*, 2013; Asselin, 2005; Azzurra & Paola, 2009; Barreiro-Hurlé *et al.*, 2008; Barrios *et al.*, 2008; Bech-Larsen &	113

	Grunert, 2003; Bogue *et al.*, 2005; Carrillo, Elizabeth *et al.*, 2012; Carrillo, E. *et al.*, 2011; Chema *et al.*, 2006; Chen, 2011a, 2011b; Cox, David N. & Bastiaans, 2007; Cox, D. N. *et al.*, 2008; Cruz *et al.*, 2013; Dean *et al.*, 2012; Dean *et al.*, 2007; Devcich *et al.*, 2007; Dewettinck *et al.*, 2008; Dixon & Shackley, 2003; Falguera *et al.*, 2012; Fernández-Ginés *et al.*, 2005; Frewer *et al.*, 2003; Gracia *et al.*, 2009; Granato *et al.*, 2010; Grunert, 2010; Grunert *et al.*, 2009; Hall *et al.*, 2010; Hartmann *et al.*, 2005; Hassan, 2011a; Holm; John C. Kozup *et al.*, 2003; Korzen-Bohr & Jensen, 2006; Krutulyte *et al.*, 2008; Krutulyte *et al.*, 2011; Krystallis *et al.*, 2008; Labrecque *et al.*, 2006; Lähteenmäki, 2013; Lähteenmäki *et al.*, 2010; Lampila *et al.*, 2009; Landström *et al.*, 2009; Landström *et al.*, 2007; Leathwood *et al.*, 2007; Lee, J *et al.*, 2010; Luckow & Delahunty, 2004; Luckow *et al.*, 2006; Lyly *et al.*, 2007; Marette *et al.*, 2010; Markovina *et al.*, 2011; McConnon *et al.*, 2004; Melo *et al.*, 2010; Messina *et al.*, 2008; Neely *et al.*, 2010; Niva & Mäkelä, 2007; Nocella & Kennedy, 2012; O'Connor & White, 2010; Patch *et al.*, 2005a, 2005b; Peng *et al.*, 2006; Pothoulaki & Chryssochoidis, 2009; Pounis *et al.*, 2011; Rezai *et al.*, 2012; Saba *et al.*, 2010; Sabbe *et al.*, 2009; Saher *et al.*, 2004; Sarkar, 2007; Siegrist *et al.*, 2008; Siró *et al.*, 2008; Sorenson & Bogue, 2005a, 2005b; Sparke & Menrad, 2009; Stern *et al.*, 2009; Sun-Waterhouse, 2011; Teratanavat & Hooker, 2006; Thompson & Moughan, 2008; Tudoran *et al.*, 2009; Urala, 2005; Urala *et al.*, 2003; Urala & Lähteenmäki, 2003, 2004, 2006, 2007; Urala *et al.*, 2011; van Kleef *et al.*, 2005; Varela & Fiszman, 2013; Vassallo *et al.*, 2009; Verbeke, 2005, 2006; Verbeke *et al.*, 2009; Viana *et al.*, 2008; Vidigal *et al.*, 2011; White *et al.*, 2010; Wilkinson *et al.*, 2005; Williams, 2005; Williams *et al.*, 2008; Wills *et al.*, 2012)	
Culture and food perception	(Barrena *et al.*, 2015; Cabral *et al.*, 2017; Deliens *et al.*, 2016; Dikmen *et al.*, 2016; Feldmann & Hamm, 2015; Higgs & Thomas, 2016; Kobayashi *et al.*, 2015; Lyerly & Reeve, 2015; Markovina *et al.*, 2015; Sijtsema *et al.*, 2002; Sobal, 1998; Stafleu *et al.*, 1995; Steptoe *et al.*, 1995; Symmank *et al.*, 2017; Tu *et al.*, 2010; Wang *et al.*, 2015; Wright *et al.*, 2001)	17
What is functional food?	("Position of the American Dietetic Association: Functional Foods," ; Action, 1999; Arai, 2000; Bell & Goodrick, 2002; Bellisle *et al.*, 1998; Contor, 2001; Dalle Zotte & Szendrő, 2011; De Leo *et al.*, 2009; Dórea & da Costa, 2005; European commission, 2010; Gilbert, 2000; Henry, 2010; Hornstra *et al.*, 1998; Iyer & Tomar, 2009; Johanningsmeier & Harris, 2011; Jones & Jew, 2007; Kovacs & Mela, 2006; Labrecque *et al.*, 2006; Marina *et al.*, 2009; Martirosyan & Singh, 2015; Meydani, 2000; Milner, 2000; Niba, 2002; Pothoulaki & Chryssochoidis, 2009; Roberfroid, M, 2002;	29

	Roberfroid, M. B., 1999; Roberfroid, Marcel B, 2000; Yan & Polk, 2006; Ziemer & Gibson, 1998)	
Whole grain food perception	("Whole grain foods: is sensory liking related to knowledge, attitude, or intake?," 2016; Ferruzzi *et al.*, 2014; Heiniö *et al.*, 2016; Laureati *et al.*, 2016; Mattei *et al.*, 2015; McMackin *et al.*, 2012; Mobley *et al.*, 2014; Muhihi *et al.*, 2013; Neo & Brownlee, 2015; Özen *et al.*, 2014; Rødbotten *et al.*, 2015; Sandvik *et al.*, 2014; Sudha *et al.*, 2013; Wedick *et al.*, 2015)	14

The reference articles were then transferred to the NVivo software program for review. In NVivo, I read the articles and assigned a code to any relevant texts. Codes with similar meanings or connections were roughly grouped under a theme to get a better insight into the articles already collected and to identify the gaps in the literature. A rough thematic analysis undertaken during the literature review is presented in Table 2.

Table 2 Thematic analysis of the literature on functional food perception

Acceptance of functional food

- acceptability of functional foods by women during menopause
- acceptance of functional food consumer attitude and acceptance of CLA enriched dairy products
- attitude as a significant determinant of intention to use functional food
- attitudes affecting willingness to use functional foods

Health benefits and health claims

- belief in health benefits affecting acceptance of functional foods
- consumers who believe that functional foods offer health benefits ready to pay twice the price
- effect of health benefit information on attitude towards functional foods
- evaluation of health claim of purchase behaviour

Perceived healthiness of functional food

- perceived healthiness of functional foods
- perception of functional enrichment
- consumers' perceived risks did not affect willingness to use functional food
- convenience, taste and wholesomeness as factors affecting intentions to buy functional food
- dimensions describing consumer attitude towards functional foods
- the feeling of reward affect consumer attitude willingness to consuming functional food
- influence of ingredient, ingredient name and health claim in perceived healthiness and willingness to try functional food
- reward, necessity, confidence in functional food, the safety of functional food as four dimensions for measuring consumer attitude towards functional food

Consumer demography

- age groups more pessimistic towards functional foods
- consumers above age 30 did not discriminate between functional and conventional orange juice
- the difference in emphasis on functional foods between age groups
- effect of age in willingness to use functional foods
- influence of background on functional food perception
- perceived healthiness and willingness to try functional foods varied with age
- differences in the perception of healthiness and willingness to try functional foods exist between genders
- gender differences in perception of specific healthy grain products
- no difference in gender in willingness to use functional foods
- no notable difference between genders

The naturalness of functional food enrichment

- comparison of functional food perception across cultures
- concern for naturalness influencing willingness to use functional foods
- perceived naturalness and willingness to use functional food
- perception of the naturalness of functional food influencing perception
- information about the source of the functional ingredient in an functional food decreased the expected liking towards functional food
- differences of consumer views of functional foods linked to the acceptability of modern technologies
- greater preference for natural additives in functional foods than synthetic

Familiarity with functional food

- confidence in functional foods influencing willingness to use functional foods
- consumers expect to find texture and characteristics like creamy, soft or thick in functional yogurt
- consumers preference between functional and conventional orange juices when no product info like health claims is provided
- control over one's health as motivations for choosing functional foods among American consumers
- experiment showing exposure to functional foods and functional food information had a significant effect on overall liking of functional food familiarity as a key driver in product separation among consumers from different countries
- familiarity as one of the reasons for choosing functional yogurt, spread
- influence of familiarity on functional food perception
- oral tradition influences Malay Muslim consumers' functional food consumption
- reasons underlying older consumers' preference were oriented towards familiarity with product or brand
- the strength of the claim increased the perceived benefit in less familiar functional foods
- yogurt with enrichment perceived as the healthiest product

Motivations of using functional food

- motives related to food consumption
- the necessity of functional foods predicted willingness to use functional foods
- perceived risk as a motivator of consuming functional food

• personal motivation influencing willingness to use functional foods • reasons for choosing functional foods
Education of consumers • least educated consumers sought stricter regulation for functional food • lack of nutritional knowledge limited the acceptance of functional food
Cultural values and functional food perception • cultural values mastery and harmony affecting the perception of enrichment of functional foods • cultural differences cause difficulty in functional food manufacturers • assessing and comparing to which extent Danish, Finnish, American consumer perception of functional food healthiness depend upon health claims, functional enrichments, base-products and processing methods • difference between Australian and Dutch consumers • perception of healthy grain products varied between countries • very small differences in perception of functional foods across cultures
Studies on the Australian context • An Australian study on functional food • a qualitative study in Australian consumers belief towards omega three enriched eggs • role of attitude, subjective norms and dread of risks in willingness to try functional food in Australian consumers
Carrier influence • base product as influencing factor • functional food perception depended upon a combination of carrier and enrichment • health claims evaluated positively when attached to a product with a positive health image • influence of enrichment on the willingness to try functional food investigating the appeal of health claims combined with food carriers in Australia • the benefit claim and carries influence the willingness to buy functional food
Negotiation of health and sensory values • consumers' accepting taste compromises of spreading fats when health benefits info provided • consumers' not willing to compromise taste for health • consumers would not compromise on sensory attributes for eventual health benefits • a defect in sensory characteristics affecting functional food perception • negotiation of taste and health • sensory quality would decide whether consumers would repeat functional food or not • studies pointing taste as a key factor • taste affected the willingness to consume functional food • taste as dominating factor influencing willingness to consume functional food • the factor affecting willingness to compromise taste changed over time or say decreased indicating it as a risky strategic option • willingness to compromise on taste for health

Cognitive factors • consumers' health consciousness and behaviour affecting willingness to pay for functional food functional food use related to health consciousness and perceived effect • health benefit belief as the strongest determinant of willingness to compromise taste but decreased over time • normative beliefs for functional foods • people form an impression that functional food buyers are innovative • willingness to consume functional food offering only general wellbeing need confidence
Health claims' influence • health claims had a small effect on expected liking towards functional food • perception of health claim depended upon the trust of the source of information than the strength of the claim • perception of health claim of Nordic consumers • perception of health-related claims of different strengths of finish consumers, and influence of demographics
Other literature pertaining to methods used • products used in the methods • sample characteristics • studies specifically studying culture and functional food perception • systematic literature review showing different themes studied and sample characteristics

The thematic analysis revealed that there is some interesting research about acceptance of functional foods, the influence of health benefits and health claims or perception of them, and perceived healthiness of functional foods. There is research about the influence of demographic factors, as well as about the impact of consumers' perception of functional food naturalness, and the influence of their familiarity with functional foods. Consumer motivations, the influence of cultural values, carriers, and cognitive factors were evaluated. Researchers discussed the importance of sensory values, and the view that functional food perception depends on the tradeoff between taste and health. Surprisingly, there were very few researchers who talked about the influence of culture and cultural values on different dimensions of functional food perceptions. More specifically, there was no research analysing the importance of cultural values when negotiating the sensory and health values of functional foods.

In the following section of the literature review, I discuss the themes and the gaps in the literature in detail. I start with a review of the problems associated with functional food consumption in Australia followed by a review of definitions of functional foods. Then I discuss the literature on functional food perception and the gap. The latter part

of the chapter includes literature regarding the dimensions of cultural values, and the cultural values of Anglo-Australian, Chinese and Indian ethnic groups along with a discussion of their food culture.

2.3 Australian dietary guidelines

The Australian population is becoming quite diverse as more and more people of different nationalities, cultures, religions and beliefs are migrating to Australia. These incoming populations are bringing in new food cultures and values to Australia. Not only has the population demography become diverse, but the food choices have also become diverse. Australia is facing the challenge of how to engage with people from different backgrounds in a uniform way, and this includes diet and health. Australia is not untouched by the complications related to diet and lifestyle. These complications—such as diabetes, cardiovascular disease, obesity, cancer and many more—are equally common in Australia as they are in other parts of the world. There could be several ways to control health complications, and dietary pattern is one of them. The quality and quantity of the consumption of food and drink markedly affect the health of individuals, and improvement in individual health can help to reduce the health and economic burden at all levels: individual, community and national. It is essential that the government and policy makers in Australia encourage healthy habits in the Australian population. Since people in Australia come from quite diverse ethnic backgrounds, and prioritise their food choices as per their culture and values, it is a challenge to bring all ethnic groups under one universal framework for healthy food habits. However, Australia has developed the Australian Dietary Guidelines that would work as the basis for making a food-related decision across different cultural groups. In such a way, Australia aims to create consistent habits relating to healthy food across different cultural groups. Below are the five basic guidelines set by the Australian Dietary Guidelines (National Health and Medical Research Council 2013):

1. To achieve and maintain a healthy weight, be physically active and choose amounts of nutritious food and drinks to meet your energy needs.
2. Enjoy a wide variety of nutritious foods from these five groups every day.
3. Limit intake of foods containing saturated fat, added salt, added sugars and alcohol.

4. Encourage, support and promote breastfeeding.
5. Care for your food; prepare and store it safely.

The focus of this research is on the second guideline- 'Enjoy a wide variety of nutritious foods from five groups. The five groups of food are as given in Figure 1. They are a) different types and behaviours of vegetables, legumes and beans, b) fruit, c) whole grain cereal foods like bread, cereals, rice, pasta, noodles, polenta, couscous, oats, quinoa and barley, d) lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans, e) milk, yoghurt, cheese and alternatives of cheese.

Figure 3 Australian guide to healthy eating (National Health and Medical Research Council 2013, p. 10)

The guideline has focused on consumption of functional foods as we can see that many of the foods on the list—for example, coloured vegetables, whole grain foods, legumes, lean meat, tofu, nuts and seeds, yogurt—have been repeatedly described as functional foods across different kinds of literature. However, the critical question is

whether or not the Australian population are consuming these foods as recommended by the guidelines. The guidelines make clear that Australian people are not consuming functional foods as recommended or required by the guidelines. There could be several reasons but, Australia being a multicultural country, culture could be one of the key factors influencing consumers to eat functional foods recommended by the Australian Dietary Guidelines. Table 3 presents the healthy food groups recommended in the guidelines and their benefits, plus the deficits in their consumption.

Table 3 Healthy foods recommended by the Australian Dietary Guidelines

Food group	Benefits	Deficits in consumption
Vegetables, legumes/beans, fruits	Non-starchy vegetables for reducing some site-specific cancers, coronary heart disease, reduced risk of stroke, reduced risk of excess body weight, reduced risk of lung cancer	Vegetables, legumes/beans in Australia being consumed less than half of the required quantity.
Whole grain foods e.g. Whole grain wheat, oats, rice, barley, millet and corn.	Reduced risk of cardiovascular disease, type 2 diabetes and excess weight gain	Adults require a 160% increase in whole grain food consumption
Lean meats and poultry, fish, eggs and plant-based alternatives such as tofu, legumes/beans, nuts and seeds	Reduced risk of cancer, lower risks of a range of conditions, including cardiovascular disease, stroke, and macular degeneration, and dementia	Omnivorous adults in Australia would need to consume 40% more poultry, fish, seafood, eggs, tofu, nuts and seeds, and legumes/beans
Milk, cheeses and yogurts, fermented milk products, soy milk, almond milk, fortified milk substitutes	Reduced risk of ischemic heart disease and myocardial infarction, stroke, hypertension, colorectal cancer, metabolic syndrome, type 2 diabetes and improved bone mineral density	Adults need to double the overall consumption of milk-related products. Eat four times more of milk, cheese and yogurt varieties with less fat.

Source: Table developed for this study using the information from the Australian Dietary Guidelines

2.4 Functional food definitions and classification

Functional food products lie on a continuum somewhere between usual food products and medicinal products (Mark-Herbert 2004). They offer *nutritional benefits, sensory benefits*, such as taste, behaviour and texture; and *tertiary benefits* that improve physiological functions in the body, such as its defences, immune system and regulation of biorhythms (Shimizu 2003). Functional foods provide essential nutrients that are required by consumers, as well as prevent diseases (Liisa et al. 2006) and enhance the mental and physical wellness of consumers (Menrad 2003). Functional foods differ from other health-promoting foods in the sense that functional foods contain biologically active components, clinically proven for the treatment and management of chronic diseases (Martirosyan & Singh 2015). However, due to the complex nature of functional foods, there are differences in the understanding of, and the definitions of functional foods.

Table 4 Definitions of functional foods

Authors	**Definition/ description of functional foods**
Action (1999, p. S6)	'functional food can be regarded as "functional" if it is satisfactorily demonstrated to beneficially affect one or more target functions in the body, beyond adequate nutritional effects, in a way that is relevant to either an improved state of health and well-being and/or reduction of risk of disease. Functional foods must remain foods and they must demonstrate their effects in amounts that can normally be expected to be consumed in the diet: they are not pills or capsules, but part of a normal food pattern.'
Hasler et al. (2009, p. 735)	'whole, fortified, enriched or enhanced that should be consumed regularly and at effective amounts in order to derive health benefits'
Health Canada (1998, p. 3)	'similar in appearance to, or may be, a conventional food, is consumed as part of a usual diet, and is demonstrated to have physiological benefits and/or reduce the risk of chronic disease beyond basic nutritional functions'
Martirosyan and Singh (2015, p. 215)	'Natural or processed foods that contain known or unknown biologically-active compounds; which in defined amounts provide a clinically proven and documented

	health benefit for the prevention, management, or treatment of chronic disease.'
Clydesdale (2004, p. 6)	'Foods and food components that provide a health benefit beyond basic nutrition (for the intended population). These substances provide essential nutrients often beyond quantities necessary for normal maintenance, growth, and development, and/or other biologically active components that impart health benefits or desirable physiological effects.'
Thomas and Earl (1994, p. 109)	'Any modified food or food ingredient that may provide a health benefit beyond the traditional nutrients it contains.'

Source: Developed for this study

The terms nutrition and health have been widely used in the definitions of functional foods. To understand the scope of functional foods, it is important to understand the differences between nutrition and health claims. The nutrient is a constituent of food that is required for growth, development and maintenance of life or is a source of energy or a deficiency of which causes the occurrence of characteristic biochemical or physiological changes (FAO/WHO 1985). Nutrition claims is a representation of the nutritional properties such as energy value, the content of protein, fat and carbohydrates, vitamins and minerals (FAO/WHO 1985). Health claim implies that there is a relationship between a food or its constituents and health (FAO/WHO 1997). Codex Alimentarius developed by World Health Organisation and Food and Agriculture Organisation of the United Nations mentions that there are three types of health claims- nutrient functional claims, other function claims and reduction of disease risk claims (FAO/WHO 1997). Nutrient function claims include the physiological role of the nutrient in the growth, development and normal functioning of the body. The other function claim implies specific benefits to health or a positive improvement to body functions, or modification or preservation of health. Reduction of disease risk claim suggests that the consumption of food/food constituents would reduce the risk of developing a disease or a health-related condition.

Based on the definitions in Table 4 and above discussions, a working definition was devised for this study:

> *Functional foods are foods that naturally contain some active components or that have been fortified, enhanced or enriched with physiologically active*

components by any method, and that when consumed on a regular basis enhance health, well-being and/or reduce disease. The food should be consumed as part of a usual diet or as recommended by food and health organisations and health workers. Sometimes, these foods may not be technically defined or identified as functional foods; however, consumers from different backgrounds might have been consuming them due to their health benefits since time immemorial.

Functional meat products (Bhat & Bhat 2011), functional cereals (Ötles & Cagindi 2006), functional drinks (Tuorila & Cardello 2002), functional dairy products, probiotics, prebiotics (Siró et al. 2008), and soy-based functional foods (Champagne & Gardner 2008) are some examples of functional foods that are available. Some more examples of functional foods are a) coloured vegetables, legumes and beans; b) fruits; c) whole grain cereal foods; d) lean meats and poultry, fish, eggs, tofu, nuts and seeds; e) milk, yogurt, cheese and alternatives of cheese. The above examples are some categories of naturally occurring foods with functional components. Avocado is a fruit that naturally contains good fats, while there are artificially produced spreads/margarines with good fats that are sometimes even called cholesterol-lowering spreads. There are several naturally occurring fruits and vegetables, such as berries, plums, and kale, that are rich in antioxidants. Whole grain foods, such as brown bread, brown rice, whole grain cereals are widely consumed as good sources of fibre. Fibre-rich foods are considered healthy for the stomach and for digestion. Artificial functional foods are produced by modifying the naturally occurring conventional foods, either adding functional components, such as vitamins, irons, calcium, probiotics, or reducing fat, salt, sugar and so on. Beverages like juices and milks fortified with vitamins, calcium and probiotics; iron-fortified cereals; skimmed milk; eggs with omega-3; and yoghurts with added probiotics are some examples of commercially produced functional foods. Functional meat products (Bhat & Bhat 2011), functional cereals (Ötles & Cagindi 2006), functional drinks (Tuorila & Cardello 2002), functional dairy products, probiotics, prebiotics (Siró et al. 2008), and soy-based functional foods (Champagne & Gardner 2008) are some general categories of functional foods that are available. The following sections will review the perceptions of consumers towards functional food, and different factors associated with perceptions of functional food.

2.5 Consumer behaviour towards functional foods

Consumer behaviour is the outcome of a consumer's perception of a product, which leads to attitude formation. A positive attitude towards functional food is likely to lead to its consumption, which is usually referred to as consumer behaviour (Armstrong et al. 2014). Most of the reviewed literature regarding functional food largely revolves around the perception and attitude of consumers. Perception and attitude are interchangeable. However, if perception refers to beliefs, perception (beliefs) would be a determinant of the attitude of a person towards people, objects and issues. Individuals' feelings and beliefs (perceptions) about attributes of objects/issues determines whether they will have a positive or negative attitude towards those objects/issues (Ahtola 1975; Loudon & Bitta 1993). The literature focus on how to make consumers accept functional foods, or how to reduce their negative perception or attitude towards functional foods which tends to indicate that functional food may not have been a part of the regular behaviour of consumers. Researchers are still at a stage where they are trying to figure out how consumers build their perceptions towards functional foods or how their perceptions can be influenced to form a positive attitude and drive them into functional food consumption.

2.5.1 Functional food perception and the demographic characteristics of consumers

Functional food perception could be described as consumers' interpretation of the utility of functional food based on the features/benefits received from functional foods (Zeithaml, 1988). Different values are perceived by consumers based on the interpretation of the utilities of functional foods. Emotional, social, functional and functional values are some of the values perceived by consumers from a product (Sweeney & Soutar, 2001). The emotional states raised by the sensory benefits derived from the product features such as taste, flavour and texture of a functional food would be perceived as emotional value. The tertiary benefits or the health benefits offered by functional food would be perceived as functional value.

The role of health, healthy eating, and the perception of the naturalness or the technologies used in functional food were found to vary with the demographic characteristics of consumers. Age (Armstrong et al. 2005; Ares & Gámbaro 2007;

Krystallis et al. 2008), income (Teratanavat & Hooker 2006; Rezai et al. 2012), gender (Bogue et al. 2005; Ares & Gámbaro 2007), and education (Teratanavat & Hooker 2006) have been found to be the key variables affecting functional-food perception (Armstrong et al. 2005). Middle-aged consumers were more positive towards functional foods than elderly consumers (Niva & Mäkel 2007). Middle-age consumers want to know the origin of functional food before making a purchase decision while young consumers are more worried about the price and convenience (Krystallis et al. 2008). However, the old consumers did not see sufficient rationale for the modification of food to functional food when the food is naturally a healthy food (Luckow & Delahunty 2004). Lyly et al. (2007) found in their study that among middle-aged consumers from Finland, Sweden and France, it was only the consumers from Sweden whose perceptions were affected by their age. Niva and Mäkelä (2007) contrasted with other researchers in the literature in the sense that they found age to be an influencing factor for acceptability of functional foods amongst Finnish consumers. Young consumers were more willing to try functional foods that were sugary and tasty (Teratanavat & Hooker 2006).

When it comes to gender, amongst the Scottish consumers, older women were found to be more interested in purchasing functional foods than males or young females (Bower et al. 2003). Similarly, Verbeke (2005), in a study done in Belgium, found that female consumers and all older consumers were more willing to consume functional foods. However, in a Uruguayan study, both male and female consumers were willing to try functional foods, but it depended on what benefits they were looking for. Ares and Gámbaro (2007) found that, although females had positive scores for all functional foods, they were willing to try only the functional foods that catered for their specific needs. Conversely, Dean et al. (2007) reported that functional foods were more likely to be preferred by males because of their specific health benefits and by females because of their general health benefits. But Niva and Mäkelä (2007) and Annunziata and Vecchio (2011) claimed that gender is not a significant factor in terms of acceptability of functional foods.

2.5.2 Functional food acceptance and the role of health-benefit information

The acceptance of functional food depends upon how consumers perceive its health benefits. Knowledge about functional food and its link to health is increasing, and

consumers are showing more interest in foods that claim to enhance health or reduce the risk of diseases. Consumers' belief in the health benefits of a functional food depends on how they perceived the health claims made for the product. Consumers who strongly believed the health claims for the functional food were more likely to believe that they would obtain the claimed health benefits from the product (Peng et al. 2006). Consumers' belief about the health benefits and their knowledge and presence of ill members in the family are more likely to be potential determinants than the demographic characteristics of the consumers (Verbeke 2005). The belief that functional food is going to offer extra health benefits even made consumers willing to pay twice as much for functional food (Dixon & Shackley 2003).

The health benefit information conveyed to consumers determined their belief about the health benefits of functional foods. Researchers have found that health-benefit information is an effective way of changing consumers' attitude towards functional foods (Bech-Larsen & Grunert 2003; Tudoran et al. 2009). The influence of health-benefit information is more profound on consumers who give higher value to their health. Having said that, health-benefit information provided through a product label or package might not be an effective way to change the value consumers place on health and their belief in the benefit to their health. There are varying views about how health-benefit information should be conveyed. Tudoran et al. (2009) believed that health-benefit information should preferably be communicated through education and other forms of communication to be able to influence the health-value orientation of consumers. Although health-benefit information was found effective in increasing the perceived healthiness of functional foods, this information was not effective in raising the hedonic expectations of functional foods (Tudoran et al. 2009). Perception of health claims varied across countries. For example, Saba et al. (2010) found that health claims given on the functional food labels differently influenced the perceived healthiness of functional foods across consumers from Finland, Germany, Italy and the UK. Similarly, van Trijp and van der Lans (2007) reported that consumer perceptions of health claims (health claim types including five types of health claims; content, structure-function, product, disease-risk reduction and marketing claim) varied significantly across Italy, Germany, the UK and USA. However, in general, consumers preferred information came from an authorised source like government and

that the claims were short and succinct rather than complex (Williams 2005; Ares et al. 2009).

Consumers' perception of the benefits of health claims is likely to increase if the information is from a trusted source (Urala et al. 2003). Urala and Lähteenmäki (2004) found that Finish consumers were less confident about the benefits of functional foods when health claims emphaised general wellbeing rather than specific diseases such as cardiovascular diseases. Ares et al. (2009) later reported that Uruguayan consumers had a similar attitude towards both general health claims and specific health claims. Health claims and carrier products for functional foods have a strong relation; however, whether they both are perceived independently, or one is perceived more strongly than the other seems to vary across countries. In one of the studies, Australian consumers were observed giving equally high importance to both the claims and the carriers, while carriers were the better predictor of intention to purchase functional foods among their Dutch counterparts (Williams et al. 2008).

2.5.3 Perception of base product and enrichment of functional foods

Functional food has a base product and an active component added to the base product. The base product usually is a normal product that offers only nutritional benefits while the added active component offers specific/general health benefits. The combination of the two makes a functional food. Consumers would accept functional foods only if they perceived them to be healthy (Bech-Larsen & Grunert 2003; Urala & Lähteenmäki 2004; Verbeke 2005). The perceived healthiness of functional food depended upon consumers' perception of the nutritional qualities of the base product in the functional food and how the base product was enriched to form a functional food (Bech-Larsen & Grunert 2003). The interaction between product type and enrichment was an effective determinant of perceptions of functional food healthiness (Bech-Larsen & Grunert 2003). The interaction between base product, type of enrichment and health benefit proposes different possibilities of combining base product, enrichment and health claims (Bech-Larsen & Grunert 2003; van Kleef et al. 2005). The enrichment of base foods that are usually perceived as non-healthy (e.g. spreads) was recognised as a more justifiable approach than the enrichment of foods that are inherently healthy (e.g. juices) (Bech-Larsen & Grunert 2003). Functional

enrichment influences the perceived healthiness of functional foods, but this may not always be a valid case.

2.5.4 Cultural values on functional food perception

Consumers' perception of the enrichment of functional foods is seen to be driven by the value they place on naturalness. Some enrichment or the processes used for enrichment are perceived as unnatural and unhealthy, and such unhealthy processing methods may eventually result in consumers perceiving functional foods as less healthy (Bech-Larsen & Grunert 2001). These consumers' preference for naturalness is stronger when it comes to health foods (Rozin et al. 2004). Researchers believe that there is a risk of perceiving functional food as less natural due to the modern technologies used in the process of producing a functional food (Frewer et al. 2003). A study among Australian consumers reported that consumers are likely to perceive functional food as unnatural and undesirable when a sophisticated technology like genetic modification is used for enrichment (Cox et al. 2004). Likewise, Bäckström et al. (2003) in their study of Finnish consumers revealed that consumers feel less safe consuming functional foods whose production involved modern technologies. Similarly, Finnish consumers have a higher preference for naturally enriched functional foods or accepted functional food enriched with the methods they are familiar with (Niva & Mäkel 2007; Lampila et al. 2009). However, in the study by Urala and Lähteenmäki (2004), the Finnish consumers did not perceive functional foods as unnatural. The Ohioan consumers are even ready to pay a premium price if a functional food is produced naturally or uses a natural mode for nutrients delivery (Teratanavat & Hooker 2006). German seniors perceived probiotic yoghurts negatively as they thought the yoghurt had additives. This could be because they perceive probiotic yoghurt as unnatural (Messina et al. 2008). Thus, sharing information about the source or method of functional enrichment in functional food might cause consumers to have certain negative perceptions about the functional food (Ares et al. 2008a). Despite so many modern health worries, consumers still preferred functional foods that contained natural additives rather than synthetic ones (Devcich et al. 2007). On the contrary, Ares and Gámbaro (2007), in a study done in Uruguay, reported that despite being some foods like yoghurt being inherently healthy, they might still be perceived positively. Interestingly, the dimensions affecting attitudes towards functional food have been found to be too unstable and changed over time,

which suggests that functional food is continuously evolving (Urala & Lähteenmäki 2007).

Familiarity with the functional ingredient and the source of the ingredient is likely to overcome the uncertainty about the source and the unnaturalness of functional food (Ares et al. 2008a). Familiarity with the ingredient seems to be the key driver in the case of some functional-food consumers (Grunert et al. 2009). Consumers tend to compare functional food with conventional alternative food and expect to get a similar texture and behaviour characteristics (Ares et al. 2008b). The consumers who have been frequently consuming the conventional alternative are highly likely to seek similar characteristics in the functional food. People who are light consumers or who never consume conventional alternatives of functional foods are not unduly concerned by the odd behaviours and textures of the functional foods (Luckow & Delahunty 2004). Even if the consumers, initially, did not like the taste of the functional foods, repeated exposure to functional food combined with health information could increase liking towards the functional foods (Luckow et al. 2006; Teratanavat & Hooker 2006). Consumers, who are exposed to functional food traditionally eaten in their culture, have a preference, learned from their tradition, towards functional foods and tend to repeatedly seek functional foods that fit with their tradition (Hassan 2011a). This again seems to be a manifestation of consumers seeking foods they are familiar with. Familiarity has been repeatedly found as a key driving factor across consumers from different nationalities such as Italian, Spanish, Portuguese, Danish and Swedish (Jaeger et al. 2005). The older consumers' preference for functional food also indicate a manifestation of familiarity-seeking behaviour (Messina et al. 2008). When consumers are provided with information about functional foods, they seem to be more accepting and even ready to compromise on taste and pay more for functional food (Bower et al. 2003). This was especially the case with less familiar functional foods; providing more information about the health benefits and stronger claims increased the perceived benefit of functional foods (Urala et al. 2003).

Functional food consumers seek to prioritise or balance conflicting values when making functional food decisions (Hassan 2011b). Hassan (2011a) investigated whether the information passed from previous generations had a more significant influence on the kind of functional food consumers would now choose. Hassan found

that their choice was influenced by the oral traditions and the type of food beliefs they had inherited. Other researchers believed that functional food perception is a subject of the cultural value mastery vs harmony. According to Schwartz (2008a), among the many societal problems that human beings face, one problem is how we should treat humans and the natural resources. Mastery vs Harmony values rule this problem of treating human and natural resources. The cultural value mastery encourages one to master, change or direct the natural plus social environment with the aim of achieving personal or group goals; whereas, the cultural value harmony promotes appreciation of the social and natural world, accepting them as they are, and trying not to change or direct the surrounding environment (Schwartz 2008a).

Bech-Larsen and Grunert (2003) in their cross-national comparison of functional food perception revealed that although functional foods had a higher market share in America, Finnish consumers were more positive towards functional foods than the American and particularly the Danish respondents. Finnish consumers score for mastery value was higher than American consumers, and possibly due to this reason they were more positive towards functional foods. The correlation test in the study showed a modest correlation between functional food perception and mastery value. However, whether the perception of naturalness in functional food is a result of harmony value or not is not clear (Bech-Larsen & Grunert 2003; Patch et al. 2005).

2.5.5 Motives for using functional foods

Researchers believe that the necessity for functional foods is one of the motivations lying behind the willingness to consume functional foods (Urala & Lähteenmäki 2004). The consumers who were worried about the future risks of disease they were most scared of—such as the risk of cardiovascular disease, cancer, arthritis, obesity—were more into consuming food encircled with functional properties (Krutulyte et al. 2008). One should be aware of one's own role in maintaining personal health. The functional food should be personally relevant to consumers for coping with the health problems they are facing (van Kleef et al. 2005). de Jong et al. (2003) believed functional-food consumption is more dependent upon product characteristics than consumer characteristics. The health claims that were related to the personal health issues were perceived to be more attractive and credible, thus increasing consumers' willingness to consume functional foods (van Kleef et al. 2005). Verbeke (2005) found

that consumers were more motivated to accept functional foods when they had an ill person at their home. Consumers reasons for eating functional foods were related to being healthy. There were different kinds of health requirements. General well-being, prevention of disease and improved performance (Urala & Lähteenmäki 2003) are the three different health-related reasons for consuming functional foods, and these reasons seem to vary with the type of functional foods. Health is not always the reason for choosing functional foods. Consumers were inclined towards functional foods that offered more taste and sensory values, such as functional ice-cream, yoghurt, juice and sweets (Urala & Lähteenmäki 2003). Taste and health benefits seem to be two competing factors in consumers' evaluation of functional food. Mostly taste has been given higher importance.

2.5.6 Negotiation of health and sensory values

The addition of bioactive components to food or increasing the functionality of food usually changes the taste, behaviour and texture of the food, which means the sensory values of the product are altered (Verbeke 2006). Taste is one of the key determinants of functional food preference (Urala & Lähteenmäki 2003, 2004; Messina et al. 2008; Azzurra & Paola 2009; Markovina et al. 2011). The alteration of the sensory values poses the risk of consumers reacting adversely to functional food. Although consumers knew about the health claims of the functional foods, the presence of odd flavour increased the chances of not liking the functional food (Tuorila & Cardello 2002). Consumers are not willing to compromise taste for the health benefits offered by functional foods (Cox et al. 2004; Vidigal et al. 2011). Ares et al. (2008b) assumed that consumers might prefer low fat and low-calorie yoghurt due to the slimming benefits of these yoghurts, but consumers showed an adverse reaction to the texture of the low-fat yoghurt. The texture defect reduced their likelihood of consuming low-fat yoghurts. In the case of the product offering health benefits against most commonly recognised and well-established diseases, such as cardiovascular disease, consumers were even ready to compromise on the taste of functional foods (Urala & Lähteenmäki 2004). If a consumer is buying functional food for the first time, the health benefit would be the critical factor driving their decision to purchase. But when it comes to repeat purchases, and continuous consumption of the functional foods, the sensory values play a key role in determining the continuation of consuming functional food (Barrios et al. 2008; Carrillo et al. 2012). If the consumer likes the sensory values of

the functional food after a trial, they are likely to continue using that functional food. Lyly et al. (2007), in their study of French, Finns and Swedish consumers, found that the willingness to eat functional food decreased once the participants tasted the product. Verbeke (2006) did a study to see if consumers' readiness to compromise the taste of functional food would change over time. Verbeke used similar sample sizes and methods in 2001 and 2004 and compared the results. The results showed that the consumers were readier to compromise on taste than on health in 2001, and the reason for the compromise was the health benefits of functional foods. However, the influence of health benefits in compromising the influence of taste decreased over time and was low in 2004. From every dimension, it seems that sensory values are the key determinants for consuming functional foods. It is a trade-off between health and sensory values (Patch et al. 2005; Grunert 2010). Researchers have tried to increase the influence of health benefits by increasing the strength of health claims—the type of claim, the wording, the media used, the source, and so many other methods to make consumers compromise taste—and this has worked but does not seem to sustain the usage of functional foods. The Figure 2 below is a categories of literature on functional food adopted from Pothoulaki & Chryssochoidis (2009, pp. 225).

Knowledge/ awareness of dietary issues	Effects of health claims on purchase decisions	Effects of health claims on perceptions/ attitudes/beliefs	Sources of information and trust	Framing of health claims	Disease-risk prevention claims and health-enhancing claims
Abbott (1997), Alfieri and Byrd-Bredbenner (2000), Armstrong et al. (2005), Bhaskaran and Hardley (2002), Bogue et al. (2005), Camire and Dougherty (2005), Garretson and Burton (2000), Kim et al. (2001), Wu et al. (2005)	Alfieri and Byrd-Bredbenner (2000), Brecher et al. (2000), Lee et al. (2007), LeGault et al. (2004), Teratanavat and Hooker (2006), Tuorila and Cardello (2002)	Bech-Larsen and Grunert (2003), Burton and Creyer (2004), Croft et al. (2002), Dean et al. (2007), Di Monaco et al. (2005), Ford et al. (1996), Kozup et al. (2003), Luckow et al. (2006), Mazis and Raymond (1997), Patch et al. (2005), Peng et al. (2006), Roe et al. (1999), Schröder and Horsburgh (1997), Urala and Lähteenmäki (2003), Van Trijp and Van der Lans (2007)	Abbott (1997), Bhaskaran and Hardley (2002), Bruhn et al. (2002), Garretson and Burton (2000), Mayer et al. (1998), Patch et al. (2005), Urala et al. (2003)	Bech-Larsen and Grunert (2003), Burton and Creyer (2004), Burton et al. (2000), Corney et al. (1994), Dragicevich et al. (2006), Ford et al. (1996), Garretson and Burton (2000), Kozup et al. (2003), Lohmann and Kant (2000), Mazis and Raymond (1997), Roe et al. (1999), Teratanavat and Hooker (2006), Urala et al. (2003), Van Kleef et al. (2005), Van Trijp and Van der Lans (2007), Wansink (2003), Wansink et al. (2004)	Bogue et al. (2005), Bruhn et al. (2002), Croft et al. (2002), Dean et al. (2007), Van Kleef et al. (2005)

Figure 4 Categories of literature on functional food

Source: Pothoulaki & Chryssochoidis 2009

Food habits and taste preferences are influenced by tradition and family culture, and

by parents (Wright et al. 2001). Cultural beliefs, values, customs, and norms are embedded in an individual's mind and play a significant role in their perception of food (Tan et al. 2015; Tan et al. 2016). Buckwheat sourdough is described as bitter; however, some consumers associate the sourdough with their traditional food and thus like the bitter taste (Campo et al. 2016). In some cultures, some foods may smell or look unpleasant to many, but people from that culture like those foods as they have eaten them as per their tradition and culture. In Thai culture, there is a culture of eating bat soup (Suwannarong & Schuler 2016). Though the food may sound disgusting to people from other cultures, Thai people are likely to enjoy bat soup because it is a part of their tradition and culture. Balut is a bird embryo eaten from the shell. This food also sounds unpleasant; however, it is commonly eaten in the Philippines and Vietnam (Matejowsky 2013). Fermented foods, such as bamboo shoots, fish, and mustard leaves, are eaten in Manipur, India. They smell pungent; nevertheless, these people enjoy eating them (Jeyaram et al. 2009).

Table 5 Examples of functional foods consumed in different cultures

Source	Place/region/culture	Functional foods
Swain et al. (2014)	Asians	Fermented foods, fruits, and vegetables
Zheng and Xing (2009)	Chinese ethnic groups Mt. Yinggeling, Run and Qi	Medicinal plants for health purposes
Subrahmanyam (2007), Barakhbah (2007)	China, India and Malaysia	Honey is considered a traditional medicine
Satish Kumar et al. (2013)	India	Fermented foods, such as dahi, gundruk, sinki, iniziangsang, iromba, fermented rai, kanjika and handua, are a good source of pro-biotics
Nile (2015)	Koreans	Traditional fermented drink called Makgeolli which is a good source of vitamins, minerals, sugars, proteins, organic acids and free amino acids
Eigner and Scholz (1999)	Nepalese	Spices, such as turmeric and asafoetida, in their daily diet as a medicinal product
Deb and Emdad Haque (2011)	Bangladesh	Aquatic foods are used for preventing illness and maintaining good health

Cavender (2006)	Locals of Apalachia in the USA	Plant-based foods, Coffea arabica and Solanum juice, for health benefits
Pieroni (2000)	Italy	Use wild greens in raw form or in boiled mixtures, believing that such foods cleanse their blood and intestines

2.6 Culture

The differences in consumer behaviour across different ethnic groups and cultures can be associated with the differences in their value systems (Grunert & Scherlorn 1990; Tansuhaj et al. 1991). These values are present behind the scene in every decision of consumers, the decisions that involve the formation of attitude or perception towards something (Beatty et al. 1985). The anthropologists have stated that all kinds of social behaviours are determined by the values a person lives by (Rokeach 1973). Social behaviours stem from ideologies and attitudes that involve evaluations, moral judgements, justification of self and the others, presentation of oneself, and comparison of oneself with others. The values are either learned through self-learning and experiences (Rokeach 1973; Novak & Kamakura 1992) or could be acquired through socialisation with leaders, or persons in society, or someone whom one respects, believes or trusts (Schwartz, 1994b). The different events, life experiences, and information from exogenous sources all come together forming a value. These values drive the day-to-day life of a person. Although there can be several values embedded in a person's mind, only a selective organisation of values is operational. Such an organisation of values is called a value system. The values are strongly grounded in the value system driving each behaviour of a consumer (Rokeach 1973).

The consumer's values and value systems create a belief about a situation, the actions and the outcome, and are ordered by relative importance (Schwartz, 1994a). Consumers have their unique ways of prioritising values, and the order of the prioritisation of values reflects their culture. The values play an important role in shaping the motivation, lifestyle, and choices of products in a consumer's life. Values are basically the goals that a person wants to achieve or use as a guiding principle, and achievement of those values through their actions fulfils their desire for being a part of their society (Kaiser 1997). The difference in behaviour of people from different cultures can be explained by examining their values (McCort & Malhotra, 1993).

Tylor (1871, p.1) defined culture as a 'complex whole which includes knowledge, belief, art, morals, law, customs and any other capabilities and habits acquired by man as a member of society'. Culture encompasses the rules and plans people use to live their life and eventually becomes the design of living (Kluckhohn, 1946). The organisation of traditional ideas, values, rules and plans form a cultural template, and the template is carried forward to the next generation. The elements of the cultural model continuously interact with the external forces (politics, natural environment, socio-economic environment, legal environment, technological environment) causing the model to continually evolve and form more changed culture (Kluckhohn, 1946; Kroeber & Kluckhohn, 1952; Fay, 1996). Culture has two layers: the physical layer and the subjective layer (Triandis 1972). The physical layer includes tangible aspects such as artefacts. The subjective layer consists of the intangible web of human environment that binds all the values, attitudes, roles and norms in a society.

The traditional practices and beliefs of ethnic groups accrue over generations to form traditional culture. These traditional practices are transferred over to the next generation through cultural values. When two ethnic groups or two cultures come into contact, there will be some friction, and one culture is likely to influence the other culture (Holliday et al. 2004). The beliefs and values of a culture regulate consumer behaviour (Schiffman & Kanuk 2007). However, the effect of cultural values is so ingrained that consumers do not even notice that their culture influences their behaviour. Consumers use a shared, consumption-related knowledge to behave in ways acceptable to one's society. This shared knowledge system among consumers forms a rule of perception and interpretation, which then is used to infuse objects and behaviours into a meaningful interpretation for the members of the consumer group (Rohner 1984). Without a shared system or socialisation, the transmission of culture from one group to the other or from one generation to the other ceases to exist. It transmits iself through verbal or non-verbal actions through formal or informal methods (Purnell 2018).

Culture is not something naturally disposed to a human being. It synthesises through years of learning and experiences. Culture is a dynamic entity that keeps on changing. The culture, as mentioned earlier, continuously interacts with the internal and external environment and keeps on evolving to meet the needs of the social membership

(Schiffman & Kanuk 2007). Culture is a continuous learning process. It should have the capacity for retaining the traditional values and incorporating modern or contemporary values. If many people, at the same time decide to change their food habit or start picking up a new food habit, the food culture will eventually change. Culture provides rules and systems how one should behave as an individual, and how one should interact with others.

Cultural values remain internalised in the cognition of a person, and most of the behaviours associated with the cultural values become a routine habit for people. Such habitual behaviours occur effortless, without giving a conscious thought, or even without questioning, as one completely believes the way things are done in the past is the best way (Martin & Morich 2011). The same phenomenon applies to food behaviours as well. People in early childhood acquire specific food behaviours from their elders, or their friends and society through socialisation, and these learned behaviours become their habits. People resist changing this ingrained behaviour regarding food unless there are reasons strong enough to replace them (Wood & Neal 2009).

2.6.1 Dimensions of cultural values

Culture contains a hierarchy of different levels nested within one another (Chao 2000; Erez & Gati 2004). The innermost individual level culture is embedded within groups, organisational and national level culture. The levels are interrelated with each other, one level having an impact on the other level. The top-down process of socialisation leads to internalisation of shared meaning system of society (outer level) into the individuals (inner level) belonging to the society (Erez & Gati 2004). Similarly, the shared values at individual levels are aggregated to form higher level cultures at the group, organisational, and national level (Erez & Gati 2004). The internal dynamics and the response to the ecological and socio-political environment, and contacts with people from new culture cause changes and adaptation in a culture (Berry & Sam 1997; Chao 2000).

Hofstede (1984) developed cultural value dimensions at the national level: *power distance*, *individualism-collectivism*, *masculinity*, and *uncertainty avoidance*. Later, Michael Bond introduced a different set of cultural values named *Confucian work*

dynamism, *integration*, *human-heartedness*, and *moral discipline* (The Chinese Culture Connection 1987a). However, the work of Michael Bond was widely criticised due to philosophical flaws and methodological weakness (Fang 2003). Minkov (2007) developed a new set of cultural dimensions: *exclusionism – universalism, indulgence – restraint*, and *monumentalism – flexhumity*. The exclusionism-universalism dimension was closely related to Hofstede's (1984) power distance and collectivism and, thus, this dimension was no longer treated as a new cultural dimension. More recently, Hofstede modelled a value survey module with seven value dimensions combining the value dimensions propounded by him and Minkov (Minkov & Hofstede 2011). However, researchers have been strongly criticising the validity of Hofstede's cultural dimensions (Schwartz 1994; Steenkamp 2001; McSweeney 2002; Williamson 2002; Baskerville 2003; Fang 2003). Schwartz's (1994) criticism is that initially, the survey conducted by Hofstede did not aim at understanding the large national cultures. Moreover, the samples constituted employees from within IBM, who did not wholly reflect the cultural dimensions of the representative countries. Over and above that, significant changes have occurred in the culture of people lately, and thus the four dimensions proposed by Hofstede, which were based on data collected from 1967 to 1973, may not represent current, contemporary cultural dimensions (Ōmae 1999).

Schwartz and Bilsky (1987) and Schwartz (1992b) identified a new set of cultural dimensions at the individual level. The dimensions are *self-direction, stimulation, hedonism, achievement, power, conformity, tradition, benevolence, universalism*. The Schwartz value survey model is believed to be better than Hofstede's value model (Brett & Okumura 1998). Brett and Okumura (1998) emphasise that the Schwartz value survey followed a rigorous methodology; the sampling method, measurement and analysis were more systematic. The data were more recent, from 1980 to 1990, compared with Hofstede's survey from 1967 to 1973. Steenkamp (2001) believes that the Schwartz value survey was based on stronger theoretical foundations and can potentially benefit international marketing studies. The dimensions of the latest version of Schwartz's cultural values are shown in Table 6 (Schwartz et al. 2017).

Table 6 Schwartz's value dimensions

Schwartz's value dimensions	
Power	Social status and prestige, control or dominance over people and resources (social power, authority, wealth, preserving my public image)
Achievement	Personal success through demonstrating competence according to social standards (successful, capable, ambitious, influential)
Stimulation	Pleasure and sensuous gratification for oneself (pleasure, enjoying life)
Self-direction	Excitement, novelty, and challenge in life (daring, a varied life, an exciting life)
Hedonism	Independent thought and action choosing, creating, exploring (creativity, freedom, independent, curious, choosing own goals)
Universalism	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature (broad-minded, wisdom, social justice, equality, a world at peace, a world of beauty, unity with nature, protecting the environment)
Benevolence	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact (helpful, honest, forgiving, loyal, responsible)
Tradition	Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self (humble, accepting my portion in life, devout, respect for tradition, moderate)
Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms (politeness, obedient, self-discipline, honouring parents and elders)
Security	Safety, harmony, and stability of society, of relationships, and of self (family security, national security, social order, clean, reciprocation of favours)

Source: Schwartz & Bardi 2001, p. 270

2.7 Dimensions of Australian cultural values

The development of modern Australia started from the settlement of people coming from England in the eighteenth century. The dominant cultural group is Anglo-Australian. The economy, politics and policies in Australia are influenced by Anglo-Australian conceptualisation. Therefore, the following discussion of Australian culture refers to the culture of Anglo-Australians. Australia is a masculine society where people are driven by competition, achievement and success (De Mooij & Hofstede 2011). The roles of males and females are clearly demarcated in a masculine society and males are usually less involved in household work. Australians score intermediate on uncertainty avoidance which probably means they are somewhat threatened by

ambiguity and thus prefer rules and formality and are not very open to change and innovation (De Mooij & Hofstede 2011; Hofstede-Insights.com 2018). Australia is a short-term oriented country (Hofstede-Insights.com 2018). Having a low score on the long-term orientation index (21), indicates that Australians prefer stability, prefer to maintain their traditions and norms, and do not prefer much change. The long-term oriented culture encourages perseverance and wise use of sources today for future betterment (De Mooij & Hofstede 2011). Australia's score on the indulgence index is 71, which means Australians are impulsive. They like to enjoy themselves and have fun (Hofstede-Insights.com 2018), which affirms the earlier discussion where Australians were believed to prefer leisure over commitment, love to go to the beaches, and want to have fun. In a study by Schwartz and Bardi (2001), Australians ranked the values *benevolence*, s*elf-direction* and *universalism* from one to three—meaning these were the highest important values for them. The values s*ecurity*, *conformity*, *achievement* and *hedonism* were ranked four, five, six and seven respectively, indicating moderate importance. The values *stimulation*, *tradition* and *power* were ranked eight, nine and ten respectively, meaning least significant.

2.7.1 Australian food culture

The Australian food culture has been evolving along with the immigration of the first settlers in Australia. Australian food habits have passed different peaks and troughs until today. Eating habits in Australia are believed to have developed through three inclusive stages: first, the outdoor kitchen (1788 to 1870) indigenous food ways, campfire cookery; second, outhouse kitchen (1850 to 1920) pioneer cookery, gadgets and refinements; and third, the respectable kitchen (1800 onwards) gas cooking, the indoor kitchen (Gollan 1978). Australians have always relied on factory-produced food materials since the early period of British colonialism. The early settlers had a scarcity of food resources, and they used to live on the limited amount of food transported to them by the British colonials by ship until they slowly discovered a way of farming and producing agricultural products and became self-sustainable.

The convicts and the free settlers were provided free lands and were encouraged to explore the hinterlands of Australia (Davey et al. 1945). Their food habits and farming practices were based on the traditional methods from England. Slowly, the locally produced Indigenous food products started supplementing the unfulfilled demand for

foods. The availability of local foods gave Australians some feeling of independence and individualism against the dependence on rations. The indigenous foods that fitted well with English food habits were easily adopted, such as tea, berries, cabbage, while less familiar ones were not. Seafood has been a common food since the early arrival of the convicts, as the evidence suggests that the early convicts and settlers had many tools and equipment for fishing (Frost 1994). Food has always been scarce for Australians in the past, and there were instances when food manufacturers contaminated foods to reduce the cost of production. Food insecurity was predominant in the history of Australian food culture (Abbott 1864). Australian commerce is grounded in the struggle for survival and the business of food supply. Even after World War II, new laws were introduced for food security and essential food items were rationed, and people were encouraged to live modestly by observing strict limitations.

Beckett (1984) claimed that Australia never really recovered from the hangover of surviving on rations. Symons (1982) said that Australians always relied on food produced in factories. The modern, efficient production methods pushed the Australian agricultural towards industrialisation. Later the development of railway lines provided great leverage in the further development of the Australian cultivation and food industry. It enabled the storage and distribution of food to larger areas across the country. Not only the food cultivation but the cooking methods and food recipes have also gone through a continuous change since the early colonial periods. Santich (1996) says the early migrants brought their own traditional food recipes different food recipes to Australia. Australians have Australianised these food recipes to suit their palate, and they have developed a unique portfolio of Australianised versions of the cuisines (Santich 1996). Foods, such as sugar, red meat from lamb, and dairy products, have been through the early revolution of Australian society and are closely linked to the economy, politics, and the culture of Australia. Sugar has an interesting history in Australia. Sugar has been a matter of supremacy in the history of Australia (Chant 2016). Australians are among nationalities who consumed a high amount of sugar, as reflected in the cookbooks and the culture in the past (Symons 2007; Chant 2016). Sugar evolved from a rare medicinal food to a luxury food and then to a daily commodity, along with the evolution of sugar production technologies (Pomeranz & Topik 2014). Sugar becameused as a sweetener in food that was otherwise considered tasteless. English people believed that eating red meat was necessary for a strong

healthy nation. Red meat has a strong cultural significance around the globe. Eating meat is a potent symbol of man's control over nature (Fiddes 2004). However, in the case of Australians, who were struggling for food, eating lamb meat was a matter of survival—a food reflecting familiarity, simplicity, honesty, and wholesome comforts from home (Santich 2011). Lamb is considered a superfood in Australian culture. Eating meat three times a day became a symbol of pride back in the nineteenth century (Symons 2007). The lamb meat meant familiarity and was popularly accepted as a symbol of Australian culture. Now the foods that were once a form of survival became the cultural expression of Australia. Rice was introduced into Australia by Asian travelers. There has always been a strong influence of Asians in the food habits and culture of Australians (Hsu-Hage et al. 1995). The major foods, such as rice, different kinds of vegetables, tropical fruits, citrus, stone fruits, Chinese gooseberry or kiwi fruit, herbs, and spices, have been introduced into Australia by Asian immigrants (Chant 2016).

The increase of urbanisation, industrialisation, commercialisation, and immigration over the past few decades has caused a significant change in Australian food habits. The migrants from different parts of the world, from different cultures and subcultures, have introduced their traditional food items and, over time, these food items have found a place in the mainstream food chain in Australia (Finkelstein 2003). The technological advancements have given rise to genetically modified crops and grains, processed foods with highly extended shelf lives, fortified foods, and convenience foods that are easy to prepare (Uzogara 2000; Monteiro et al. 2013). These foods have been dominant in the kitchen of today's busy Australian families who have less time for cooking foods. More than 23% of Australians buy takeaway meals or dine outside. The nutrition of Australia has transitioned from a fibre-rich diet and unrefined carbohydrates towards fats and refined carbohydrates (Drewnowski & Popkin 1997). The adoption of the western diet pattern is to blame for this transition. Finkelstein (2003) argues that this transition in Australia is a result of adoption of foods from Asian and European cultures. In recent times, the cheaper vegetable-based products, vegetable oils, animal products, and sugars are more used in Australian diets (Kearney, John 2010). Because of the nutrition transition, the traditionally healthy foods, such as whole grains, fruits, and vegetables are more expensive than fat and sugar-rich foods (Drewnowski & Popkin 1997; Kearney 2010).

2.8 Dimensions of Chinese culture values

The Chinese in Australia originally come from China and it would be more logical to first go back to their roots and identify the cultural values they come from. Because Chinese people rate high on power distance (80) (Hofstede-Insights.com 2018) they believe in the inequalities of power between people. The seniors and superiors have more power and authority and are to be obeyed which is a manifestation of their high value for obedience and conformity (Ho 1986). They give high importance to harmony in the hierarchy (Bond & Hwang 1986). Chinese people give importance to filial piety and, for children, this implies being loyal and submitting to parental wishes. This eventually increases the power distance (Rosenthal & Feldman 1990; Matthews 2000).

The Chinese come from a highly collectivistic culture (Hofstede-Insights.com 2018). Family members make collective decisions. People are worried about saving face in society and try to maintain that respect and face (Ho 1986; De Mooij & Hofstede 2011). Family life is vital in Chinese culture. Family solidarity, dependence upon one another, accepting and not questioning parental authority, the status quo and loyalty are the values that preserve the family in Chinese culture (Bond & Hwang 1986). Chinese people are success- and achievement-oriented, meaning they give high importance to the masculinity value dimension (Hofstede-Insights.com 2018). The Chinese are tolerant of ambiguity. They do not seek orderly and more systematic processes as Australians do. The score for uncertainty avoidance among Chinese is 30 (Hofstede-Insights.com 2018). China scores high for long-term orientation (87), meaning the Chinese look for future health and happiness, and are mostly ready to compromise immediate gratification for a better future (De Mooij & Hofstede 2011; Hofstede-Insights.com 2018). The score for indulgence is quite low, which means Chinese people restrain their desires and impulses. They are encouraged to learn to control their impulses and strong feelings (Kriger & Kroes 1972). They give less emphasis to leisure time and indulgence. They feel as if they are doing something wrong if they indulge. Researchers argue that the value dimensions developed by Hofstede, Rokeach and Schwartz may not be sufficient to understand the values of the Eastern part of the world or say Chinese culture (The Chinese Culture Connection 1987b; Bond 1988; Matthews 2000). The Chinese Value Survey was designed to

complement the value survey model developed by Rokeach and Schwartz (The Chinese Culture Connection 1987b). It is believed that Chinese culture has values buried in the Confucian ethos which may not be captured by Western value survey models (Matthews 2000). The Chinese people try to avoid being assertive because they think it will produce conflict and a lack of harmony, which is not acceptable in their society. Their personal goals are sublimated to the collective goals, promoting the values of harmony, humility, courtesy, patience, obedience and modesty (Matthews 2000). These values are deemed important for the development of self as well as the group. These values are derived from the Confucian ethos and still seems to remain intact in Chinese societies. Chinese people give more emphasis to self-control and discipline to avoid conflict which does not fit well with Australian culture (Chiu et al. 1998). The people from a collectivist culture focus on preserving the traditional beliefs and cultural values. The values derived from the Confucian ethos are the ones that differ from the Western understanding of values. Loyalty to superiors, benevolent authority, non-competitiveness, keeping oneself disinterested and pure, contentedness with one's position in life, being conservative, protecting face, chastity in women, having less desire, respect for tradition are the values derived from Confucian ethos (Matthews 2000).

Chinese settlement in Australia has a long history, beginning soon after the discovery of gold in Australia in 1851. According to the census of 2016, more than 1.2 million people are living in Australia who are of Chinese descendent. Of the Chinese population in Australia, 41% were born in China, 25% were born in Australia, 8% were born in Malaysia, and 6.5% in Hong Kong (Australian Bureau of Statistics 2018a). Whether the Chinese people in Australia still retain the values as the Chinese in China do is an interesting question. Researchers have noted that some Chinese people try to maintain their cultural values when they are in Australia, and that this depends on how much time they have spent in Australia. The longer they stay, the more likely they are to adapt to Australian values (Rosenthal & Feldman 1990; Mellor et al. 2013). Young Chinese are more influenced by Anglo-Australian values (Feldman et al. 1992). The second generation of Chinese in Australia is found to be giving less importance to an organised family where parents monitor the activities of adolescents (Rosenthal & Feldman 1990). People of Chinese descendent want to avoid a conflict of values with dominant Australian values and the stress caused by the

difference of values and, thus, prefer to assimilate themselves to the Australian values (Matthews 2000). Chinese families are found accommodating autonomy and promoting norms from the Anglo-Australian culture (Rosenthal & Feldman 1990). Compared with Chinese youths who remained in Hong Kong, Chinese youths in Australia are reported as giving less value to tradition and the family as a residential unit (Feldman et al. 1992). The increasing magnitude of differences between first-generation Chinese and second-generation Chinese indicates that the acculturation continues until the Chinese consumers completely assimilate themselves to the values of the host country, Australia (Feldman et al. 1992).

2.8.1 Chinese food culture

The Chinese public has rich knowledge about dietary rules that are not even covered by Western medicine (Koo 1984). Chinese traditionally believed in having a balance in everything. This concept drives from the philosophy of yang (hot) and yin (cold)(Ho 1985). Based on this philosophy, the Chinese have categorised foods into hot and cold foods (Gould-Martin 1978; Koo 1984). Usually, vegetables, most fruits, and broths are yin or cold foods, and the foods rich in starch and protein are considered yang foods or hot foods. For good health, one must eat both hot and cold food in a balanced way. This concept of hot and cold applies to health and medicines as well. The terms hot and cold refer to the effect of the food on the body. Chinese food is influenced by the 300 BC philosophy that food and medicine are from the same source. Since the early introduction of farming, Chinese started investigating the medicinal properties of foods. According to the Chinese, foods can be cold, cool, warm or hot in nature (Ni et al. 2007). The cold and cool foods are yin foods, and warm and hot foods are yang foods. Yin foods are believed to cool the body and reduce tension, and the yang foods are considered to create tension and warmth in the body. Depending upon the condition of the body or the nature of the disease, Chinese people choose foods opposite to the state of the body, either hot or cold food. For instance, yang foods are used while suffering from a common cold (Ni et al. 2007; Liu et al. 2012). In application, traditional Chinese medicine categorises nutrition into four parts: food as diet, food as a tonic, food as medicine, and food abstention (Weng & Chen 1996). The concept of abstention refers to the avoidance of certain foods in certain health conditions—for instance, avoiding foods like pepper, ginger (yang foods or hot foods that produce heat in the body), during inflammation, high fever, or avoid cold foods

like watermelon during diarrhea, asthma. Food choices also depend upon the geographical location and the climate.

2.9 Dimensions of Indian cultural values

India's score for Hofstede value dimensions is 77, 48, 56, 40, 51, 26 for the values power distance, individualism, masculinity, uncertainty avoidance, long term orientation, and indulgence, respectively (Hofstede-Insights.com 2018). Indians are believed to be collectivistic people with high power distance. The family members hold a strong bonding and take collective decisions. The youngsters respect and obey elders and parents. Indian people value success and achievement; however, social acceptability is more critical for them than their achievements (Banerjee 2008), which is a manifestation of valuing masculinity. Indians give low value to indulgence and try to restrain their impulses. India scores 40 on uncertainty avoidance which is a medium-low score. Indians are believed to be very patient, accepting ambiguity and welcoming uncertainties. Indians have a high tolerance and live in harmony with a large diverse population. Group affiliations are given priority as long as they fit with the family traditions and values (Khare 2011). Individuals in India are so closely connected to their society that they can hardly identify themselves as a separate individual independent from the group. The groups are so embedded in Indian culture that they prefer the status-quo and try to avoid or restrain any actions that can diffuse solidarity (Schwartz 2006; Schwartz 2008b). The unequal distribution of power, roles, and resources is considered legitimate (Schwartz 2008b). Having said that, Schwartz (2008a) found India rated high for valuing *mastery*, which means they can express themselves strongly to change the natural or social environment for the attainment of personal goals. Traditionally, men have higher status them women in Indian society, and thus women may be reluctant to express their view, opinion or choices. Indians have been reported as endeavouring to retain their core values, such as respect for elders, faith in God, and caring for the extended family, even when they are in Australia (Manuelrayan 2012). Indians in Australian still hold the values of loyalty to family, respect for elders and adherence to the wishes of parents (Faria 2001; Naidoo 2005). However, Indians in Australian hold a dichotomic view: they want to retain the Indian culture but yet at the same time feel it is essential to accept the Australian culture for better functioning of their lives (Faria 2001). The filial culture between Australia and India is different and thus many parents find it challenging to rear

children in Australia. The parents and children have a different magnitude of acculturation to Australian culture, and this difference of values may cause conflict between them (Naidoo 2005).

2.9.1 Indian food culture

The concept that food can help prevent diseases has been prevalent for many years. The food and health beliefs in India are based on the old Ayurveda, a traditional Indian medicinal literature written thousands of years ago (Achaya 1997). Food is considered a source of strength and God in India. The Indian food culture is based on the 'Vedas' which are very important religious textbooks in India. There are four Vedas Rigveda, Samaveda, Yajurveda, Atharva Veda which describe different kinds of cereal foods and their usage in one's daily life (Achaya 1997). Barley, wheat, lentils, millets and sugarcane are some popular items mentioned in the Vedas.

2.10 Research gap

Schnettler et al. (2015) established that willingness to buy functional food is discriminated by the ethnic origin of consumers. The study was done on consumers from Southern Chile only. Siegrist et al. (2015) went a little further comparing two completely different cultural groups, the Germans and the Chinese, and suggested that one should be cautious in generalising the functional food outcomes from one culture to another, which means culture could alter functional food perception. Some studies intentionally or unintentionally assessed the influence of the perception of naturalness (Bäckström et al. 2003; Bech-Larsen & Grunert 2003; Frewer et al. 2003; Cox et al. 2004; Teratanavat & Hooker 2006; Devcich et al. 2007; Messina et al. 2008) and familiarity of functional foods (Luckow et al. 2006; Niva & Mäkel 2007; Messina et al. 2008; Grunert et al. 2009; Lampila et al. 2009) on the perception towards functional foods. Perceived naturalness and familiarity point towards values, such as universalism and conformity, or some form of normative values (Schwartz et al. 2017). However, the studies did not mention whether or not the perception of naturalness and familiarity were antecedent of consumers' cultural values. The studies were designed to assess the perception of healthiness (Bech-Larsen & Grunert 2003), the influence of demographic variation (Cox et al. 2004; Teratanavat & Hooker 2006; Niva & Mäkel 2007), acceptance of enrichment of functional foods (Devcich et al. 2007; Lampila et

al. 2009), perception of health claims (Grunert et al. 2009), effect of exposure to health information (Luckow et al. 2006) across consumers from different countries, and demographic characteristics. Most of them were conducted in Nordic countries (Bäckström et al. 2003; Bech-Larsen & Grunert 2003; Niva & Mäkel 2007; Messina et al. 2008; Grunert et al. 2009; Lampila et al. 2009), among American consumers (Bech-Larsen & Grunert 2003; Teratanavat & Hooker 2006) or among consumers from other European countries (Luckow et al. 2006; Lampila et al. 2009). Some of them were qualitative studies (Bäckström et al. 2003; Frewer et al. 2003; Vassallo et al. 2009; Dolgopolova et al. 2015) or only a review of the literature (Messina et al. 2008). A few studies were about Australian consumers (Cox et al. 2004; Cox & Bastiaans 2007; Devcich et al. 2007; Cox et al. 2008), but they were not on the cultural context.

One of the closely related studies done by Hassan (2008) assessed how culture influences functional food consumption in a multicultural society. This research emphasised the negotiation of different factors during consumption of functional food from different cultures in a multicultural society. The study was on Malaysian Muslims, Muslim being the dominant culture. The investigation established culture as one factor, and 'oral tradition' as one cultural value influencing consumers' perception of functional food (Hassan 2008). The limitation of the study is the lack of diversity in the study groups. The study population of Chinese, Malaysian, and Indian Muslims all come from a collectivistic cultural background (Hofstede 1984; Hofstede-Insights.com 2018). It is clear there is not enough literature assessing the relationship between culture and functional food perception (please refer to the mapping of the literature in Appendix B which shows the gap in the literature). Even if there is some literature that generally touched upon culture and functional food perceptions, the explanation is not explcit. It is not clear what and how cultural dimensions influence variables associated with functional foods. Particularly, there is a lack of understanding of functional food behaviour in the Australian context. This study aims to investigate the relationship between consumers' culture and their functional food perceptions and to construct a theoretical framework of functional food perception encompassing cultural values. The following are the sub-research questions developed for answering the general research question.

1. Does culture affect consumer perceptions of functional food?

2. What cultural values affect consumer perceptions of functional food?
3. How do these cultural values affect consumers' functional food perception?
4. How do consumers' demographic characteristics affect the relationship between their cultural values and functional food perception?

2.11 Consumer behaviour theories

Consumer behaviour is 'the behaviour that consumers display in searching for, purchasing, using, evaluating, and disposing of products and services that they expect will satisfy their needs' (Schiffman et al. 2013, p. 4). The marketers are usually very keen to understand what consumers buy, where, how, how much, when, and why they buy (Kotler & Armstrong 2012). Such decisions by consumers are affected by different stimuli and senses that enter consumers' cognition creating unique responses. The stimuli could be the 4Ps—product, price, place and promotion—or it could be the environment around consumers: economic, technological, political, and cultural. The cultural, social, personal and psychological characteristics of the consumer significantly affect their purchase decisions. The psychological factors that affect their decisions are motivation, perception, learning, beliefs and attitudes (Kotler & Armstrong 2012). Freud believed that psychological forces subconsciously affect consumers' decisions; thus, consumers may not even be aware of the overall decision process (Sayers 1991; Freud & Ragg-Kirkby 2003). A consumer who is motivated is ready to act on stimuli. However, their action is again influenced by how they perceive the particular situation or stimuli (Babin & Harris 2014). Consumers learn from the information received through seeing, hearing, smelling, touching and tasting (Yakup & Diyarbakirliglu 2011). Everybody has their way of receiving, organising and interpreting the information gained from the five senses.

Perception is defined as 'the process by which an individual receives, selects and interprets stimuli to form a meaningful and coherent picture of the world' (Schiffman et al. 2013, p. 148). The three key processes of perception are sensation, selection, and interpretation (Schiffman et al. 2013). Consumers demonstrate selective attention, selective distortion, and selective retention and thus the perception of stimuli may vary among consumers (Kotler & Armstrong 2012). In day-to-day life, consumers are exposed to different kind of stimuli affecting their five senses, such as seeing, hearing, touching, smelling or tasting. This is referred to as exposure in a perceptual process.

Consumers could be exposed to products, product information and so on. Once the senses of consumers are close to those stimuli, consumers tend to allocate some form of attention to that stimulus to process and understand the stimulus (Babin & Harris 2014). The sensation and attention to a stimulus lead to a stage where a consumer assigns a meaning to the stimulus, which is called comprehension or interpretation. The stimulus has no value unless a consumer interprets that stimulus and attachs a meaning to it. Comprehension refers to the interpretation or understanding a consumer develops about a stimulus based on the way meaning is assigned (Babin & Harris 2014, p. 65). Consumers subconsciously add to or subtract from that raw information to generate their personal view of the world outside (Yakup & Diyarbakirliglu 2011; Schiffman et al. 2013). The interpretation of a product or a stimulus leads to a stage where consumers make a decision or demonstrate a particular behaviour towards the stimuli (Khaniwale 2015).

There are various theoretical models of consumer behaviour in different contexts and products. It is not possible to review all of them. This section will include review fundamental consumer behaviour theories. The earliest theoretical model developed for consumer behaviour was the Andreasen model (Andreasen 1965) developed in 1965. This model emphasises the sources of information and consumer attitudes (Prasad & Jha 2014). The Andreasen model encompasses the constructs regarding information attributes, personal or impersonal sources, dependent or advocate sources. The model suggests that consumers form a certain attitude towards information and sources; this attitude serves in filtering the sources of information along with the involvement of other factors, such as consumers' beliefs, disposition, feelings, and needs. This then influences the perceived beliefs and norms of consumers which eventually brings consumers to a position where they need to either select a product or search for more information or take no action. Even if the consumers select a product, the final purchase decision has to filter through income considerations, budget priority, household priority. The model uses perpetual constructs: beliefs, feelings and learning constructs, such as predispositions, direct experience, and *wants* as a notion of motive or need. The model is quite complex with arrows going back and forth between the constructs. The strong emphasis on information sources limits the applicability of this theoretical model to my research.

Nicosia' model of buyer behaviour followed the Andreasen model (Nicosia 1966). Nicosia's model emphasises the buying behaviour for a new product. The model does not specially mention perception and learning constructs. According to the model, the consumer's experience of a product creates a predisposition toward the product which affects their attitude towards the product, which then leads to search and evaluation, and the search and evaluation affects the consumer's decision which is mediated by motivation. The model has four fields, where Field 1 focused on the retail firm's efforts to communicate with the consumer, and consumers' disposition to act in a certain way, and the combined effect of these two, leading to the formation of consumer attitude. The attitude influences the second field of the model, which is about search and evaluation. After the search and evaluation, consumers are believed to act; however, some level of motivation drives this action after the evaluation process. The decision act falls under field three named as an act of purchase. Field 4 is feedback, which involves feedback from both consumer and the company after purchase. Firms can use this feedback for future marketing and sales, while consumers will have this feedback as a predisposition for the future purchase of any product from the firm.

Unlike the other consumer behaviour models, the Nicosia model tried incorporating the dynamics involved in decision making. The model has been presented in a flow chart, which tried to cover the series of decisions involved before buying a product. The variables are connected both through direct loops and feedback loops (Prasad & Jha 2014). The model seems to be more inclined towards consumers' experience and how the predisposed experience is going to affect consumers' future relationship with the company, and how can a company influence consumers' predisposition through messages or other communication (Nicosia 1966; Prasad & Jha 2014). The model focuses on an iterative process of a repurchase cycle and is more relevant to a services context (Milner & Rosenstreich 2013). Further, empirical works have suggested that the relationships between the constructs in the model are not valid (Tuck & Herriot 1976). The model does not fit with this research, as this research does not involve any firm or company as a subject of the test.

In 1968, another model was developed which is called the Engel-Blackwell-Miniard model of customer behaviour (Engel et al. 1995). The model has beliefs, attitudes, and

normative compliance decision variables affecting the decision process, involving problem recognition, search, evaluation, choice and purchase of a product. Cultural norms are set as external factors influencing the decision process. The model is more process-oriented. It includes stages, such as exposure to stimuli, information processing, decision processing, and variables affecting the precision process (Engel et al. 1995). It is argued that the model is a mechanical overview of human r and thus is difficult to apply for practical purposes in varied decision-making situations (Jeff 2008b; Viksne et al. 2016). The model includes too many factors and many of them are not defined clearly, and thus cannot be validated (Loudon & Della Bitta 1984). The relationship between the variables is multidimensional, making the model too complicated to comprehend.

According to Jeff (2008a), there are two types of consumer behaviour models—analytical and prescriptive. The analytical models include a wide range of variables and multidimensional relationships between variables and, therefore, are called grand models (Kassarjian 1982; Bray 2008). These models include the traditional five-step decision-making process—problem recognition, information search, alternative evaluation, choice and outcome evaluation—as the key construct (Erasmus et al. 2001). The two most used analytical models of consumer behaviour are the Theory of Buyer Behaviour (Howard & Sheth 1969) and the Consumer Decision Model (Blackwell et al. 2001). The prescriptive models most cited in consumer behaviour studies are the Theory of Reasoned Action (Fishbein & Ajzen 1977) and the Theory of Planned Behaviour (Ajzen 1985).

The theory of buyer behaviour has three fundamental elements: stimuli as inputs, processes, and output as purchase behaviour (Howard & Sheth 1969). The model emphasises the influences of exogenous variables and stimuli on the cognitive state represented in a large central rectangular box. The central box of the model contains internal variables and factors, representing the state of the buyer, and the perceptual and learning constructs. The consumers' motives, evoked set, decision mediators, predisposition, inhibitors and satisfaction are the learning constructs. The consumers' motives, evoked set, decision mediators form the learning construct 'predisposition'. According to the model, in the early stages of the use of a product, consumers do not know much about the product, and they have a low predisposition, but as the

experience grows, and consumers have more information about the product, the predisposition towards the product is high, and the decision mediators are firmer. The perceptual constructs in the model are sensitivity to information, perceptual bias, and search for information. The sensitivity to information is a process controlling the uptake of information. The consumer decides what information to pay attention to and what information to ignore. If the information is too simple and unambiguous, and very familiar to consumers, they will not pay attention to the information, and if the information is too complicated to comprehend, consumers will ignore the information. Moderately ambiguous information is well attended to by consumers. As the learning increases, consumers will find the current information too simple and seek more complicated information. Consumers' predisposition towards the product, the sources of information, the medium, and other factors act as feedback to the sensitivity towards the information. Once the information enters consumers' minds, they can distort the information and interpret it in their own way, based on their frame of reference, which is labelled as a process of perceptual bias in the theoretical model. The third perceptual construct constricts the search for information. Buyers can either actively seek information or passively receive information. When the ambiguity is high, learning is limited; consumers do not have a clear idea about their motive, are unable to discriminate the alternatives clearly, and, therefore, actively seek information. Also, when the purchase has become repetitive, and consumers are too familiar with the product and start getting bored, they might begin exploring alternatives, which eventually leads to actively seeking more information. These learning and perceptual constructs are believed to form an attitude towards the product and, ultimately, a decision to buy or not.

In the Howard and Sheth (1969) model, the central rectangle box is preceded is preceded by a box containing input variables about marketing and social stimuli. The output box contains various responses of the buyer to the stimuli, based on the state of the buyer. The central box on the buyers' state is also shown to be influenced by a set of seven exogenous variables kept in a rectangle box at the top of the model. These variables are responsible for adjusting the interpersonal differences between buyers. The strength of this model is the coverage of the variables and the way they interact with each other (Loudon & Bitta 1993). The Theory of Buyer Behaviour is questioned widely for its validity because of the lack of empirical work (Haines 1970; Hunt &

Pappas 1972; Neman 1972). Most of the intervening variables in the model are said to be unobservable and are difficult to measure (Foxall 1990b; Loudon & Bitta 1993). The theory has not evolved much since its initial publication (Loudon & Bitta 1993). The model, although, contains culture as one of the exogenous variables (Loudon & Bitta 1993).

Another grand analytical model was developed which is called the Engel-Blackwell-Miniard Model (also known as the Consumer Decision Model) of customer behaviour (Engel et al. 1995). This model incorporated the effect of individual factors— social influences such as culture and situational influences—on decision making. The model is more process-oriented. It includes stages like exposure to stimuli, information processing, decision processing, and variables influencing the precision process (Engel et al. 1995). It is argued that the model is a mechanical overview of human behaviour and, thus, is difficult to apply for practical purposes in varied decision-making situations (Jeff 2008b; Viksne et al. 2016). The model includes too many factors and many of them are not defined clearly, and thus cannot be validated (Loudon & Della Bitta 1984). The relationship between the variables is multidimensional, making the model too complex to comprehend. The Consumer Decision Model is criticised for not having the capacity to sufficiently accommodate different kinds of consumer decision situations (Loudon & Bitta 1993; Erasmus et al. 2001). The critics argue the model ignores the effect of environmental and individual variables on the wider processes (Loudon & Bitta 1993; Jeff 2008a).

The prescriptive models of consumer behaviour originated from the Fishbein model, which shows how an attitude is formed (Ahtola 1975). The Fishbein model showed that attitude towards an object is based on an individual's feelings and beliefs about the characteristics of the object (Ahtola 1975; Loudon & Bitta 1993). This model was widely used and further extended even to measure people behaviour; this extended model was called the Theory of Reasoned Action (Fishbein & Ajzen 1975; Ajzen & Fishbein 1980). According to the Theory of Reasoned Action, behaviour is determined by the behavioural intention, which depends upon the attitude towards the behaviour and the subjective norms about the behaviour. The belief about the consequences of the behaviour and evaluation of those consequences determines the attitude towards a

behavior. The subjective norms are derived from beliefs about the perceptions of others and consumers' motivation to comply.

The introduction of the subjective norm in this model shows the acknowledgement that other people have the power to influence behaviour, and how much a person is willing to comply with the views of others (Hogg et al. 2006). However, researchers believed that behaviour is not always within the control of consumers, meaning the intention to act may not always result in actual behaviour (Warshaw 1980). Scholars criticised the relationship between behavioural intention and actual behaviour in the Theory of Reasoned Action as being too simplistic (Oliver & Berger 1979; Sheppard et al. 1988). An additional variable was added to the model *perceived behavioural control* which is predicted by control beliefs (Ajzen 1985). The Theory of Planned Behaviour seems to underpin the objective of my research. This research aims to assess the influence of culture on functional food perception. The subjective norm in the model is believed to be a perceived social pressure to perform or not to perform (Ajzen 1991). Culture includes different socially acceptable behaviours, and the pressure to conform to that behaviour could be a manifestation of subjective norms. The critics argue that the Theory of Planned Behaviour neglects the fact that emotion, spontaneity, habit or cravings could influence the purchases (Bagozzi et al. 2002; Hale et al. 2002). Some scholars are not entirely confident about the efficacy of this model in cultures other than Western cultures (Bagozzi et al. 2000; Hogg et al. 2006). Table 7 contains a summary of the strengths and weaknesses of the theoretical models of consumer behaviour.

Table 7 Critical review of models of consumer behaviour

Theory	**Strengths**	**Weakness**
Andreasen model (1965)	Contains a wide range of variable	Complex and too much emphasis \on information sources
Nicosia model	Good for services and repeat purchase context	More focused on consumer's experience and impact on its relationship with retailer (not so relevant to this study)
Theory of Buyer Behaviour by Howard	Contains a wide range of variables and their relationships (Foxall	Questioned widely for its validity because of the lack of empirical work (Haines 1970; Hunt & Pappas 1972; Neman 1972).

and Sheth (1969)	1990b; Loudon & Bitta 1993). The linkage between the variables are developmental (Hunt & Pappas 1972; Loudon & Bitta 1993)	Most of the intervening variables in the model are said to be unobservable and are difficult to measure (Foxall 1990b; Loudon & Bitta 1993) The theory has not evolved much since its initial publication (Loudon & Bitta 1993).
Consumer Decision Model by Blackwell et al. (2001)	This model can be useful in application to both extended problem-solving and limited problem-solving behaviours of consumers (Kollat & Blackwell 1968) It is based on a 7-point decision-making process (Jeff 2008a) It has continued to evolve since original publication in 1968 (Schiffman & Kanuk 2007; Peter & Olson 2008) The model presents the consumer decision-making processes with much clarity (Foxall 1990a)	The model cannot sufficiently accommodate different kinds of consumer-decision situations (Loudon & Bitta 1993; Erasmus et al. 2001) The model ignores the effect of environmental and individual variables on the wider processes (Loudon & Bitta 1993; Jeff 2008a).
Theory of Reasoned Action by Fishbein (1979)	The model is more focused on attitude toward behaviour and subjective norms about the behaviour (Hogg et al. 2006).	Critics have said that the relationship between behavioural intention and actual behaviour is too simplistic (Oliver & Berger 1979; Sheppard et al. 1988)

Theory of Planned Behaviour by (Ajzen 1985)	Most widely used and a meta-analytic review has claimed that this model offers stronger predictive validity (Godin & Kok 1996; Sutton 1998)	Theorists' criticism is that the predictive ability of the model depends upon the ability of the researcher to identify and measure the variables affecting consumer attitude (Hogg et al. 2006) The model seems to neglect the fact that purchases may also be influenced by emotion, spontaneity, habit or cravings (Bagozzi et al. 2002; Hale et al. 2002) Researchers are not quite confident about the efficacy of this model in cultures other than Western (Wong & Bergami 2000; Hogg et al. 2006)

Source: Developed for this study

2.12 Conclusion

The review of the literature showed that, among Australian consumers, there is a gap in the consumption of healthy foods recommended by the Australian Dietary Guidelines. Most of the foods in the health guidelines are functional foods. One of the reasons for such a gap could be Australia's multicultural environment. The different ethnic groups in Australia have their own culture and ways of dealing with healthy foods. The literature lacked sufficient information on how culture influences functional perception. The theoretical models of consumer behaviour also place little emphasise on cultural constructs. Thus, the aim of the research has been set to assess the relationship between consumers' culture and functional food perception.

Chapter 3: Methodology

3.1 Introduction

Every researcher has a view about the nature of reality. This view about the nature of reality influences the approaches a researcher adapts in the research. This section of the thesis outlines the philosophical orientation of the research and the paradigm underpinning the research. It further delineates the kind of methodology driven by the influence of the research paradigm of the study. A proper understanding of the research paradigm and the selection of relevant methods is likely to enhance the validity and reliability of the outcome of the research. However, validity and reliability are more applicable to the positivist part (quantitative stage) of the research. The parallel construct for validity and reliability in a qualitative study is the *trustworthiness* of the research. Each of these dimensions of research quality is described in detail in the following sections.

3.2 Research paradigm

Paradigm is the researcher's view about the nature of truth and knowledge, and the world (Schwandt 2014). The researcher's beliefs about the world and the nature of reality (ontology) influence how a researcher would go about acquiring truth and knowledge, and how they should interpret the results of the study (epistemology) (Guba & Lincoln 1994; Patton 2002). This philosophical orientation of the researcher about the nature of the reality has implications for the type of methodology and methods chosen for the study (Lincoln et al. 2011).

A research paradigm has four elements: ontology, epistemology, methodology and axiology (Guba & Lincoln 1994). The belief that there is one verifiable reality or there are multiple socially constructed realities refers to ontology (Patton 2002). Epistemology refers to how we come to know the reality. Epistemology raises questions, such as: Is knowledge something which can be acquired on the one hand, or, is it something which has to be personally experienced? What is the relationship between the knower and what can be known? How do we know what we know? How do we know what we know? (Guba & Lincoln 1994; Krauss 2005; Kivunja & Kuyini 2017). The questions raised by epistemology are about 'the possibility and desirability of objectivity, subjectivity, causality, validity, generalisability' (Patton 2002, p. 134).

Ontology raises questions, such as: 'Is there reality out there in the social world or is it a construction, created by one's mind? What is the nature of reality? In other words, Is the reality of an objective nature, or the result of individual cognition? What is the nature of the situation being studied?' (Kivunja & Kuyini 2017, p. 27). If a researcher assumes that there is a singular verifiable reality or truth, then the appropriate approach for the researcher would be to seek detachment from the object of the study and discover 'how things are' and 'how things work' (Guba & Lincoln 1994, p. 108). Whereas, if a researcher believes that truth lies in socially constructed multiple realities, the notion of studying human beings as objects of natural sciences is rejected, and the researcher would rather be involved with the people being studied and try to understand the social phenomenon in a study group's context (Guba & Lincoln 1994).

The thesis underpins the pragmatic paradigm and uses a mixed methodology. The pragmatic paradigm gives primary importance to the question of the research (Biesta 2010). It uses 'abduction' which 'moves back and forth between induction and deduction-first converting observations into theories and then assessing those theories through action' (Morgan 2007, p. 71). The paradigm comes together with the permutation and combination of the strengths/weaknesses of the positivist and constructivist paradigm. It breaks the dichotomy between *complete objectivity* and *complete subjectivity* (Morgan 2007; Teddlie & Tashakkori 2009; Creswell 2013). The pragmatic paradigm emphasises the purpose and nature of the research questions. The researcher aims to apply the research tactics that work with the research, allowing them to better address the research questions rather than choosing either a quantitative or qualitative approach or choosing a positivist paradigm or a constructivist/interpretive paradigm. In simpler terms, the pragmatic paradigm implies mixing of data collection methods and analysis in the research (Creswell 2013). The pragmatic paradigm is believed to be the foundation of mixed methodology.

Pragmatists reject the idea that truth lies out there and needs to be proved through objective or subjective methods, rather they pose the idea that truth is what works or what proves itself to be true. Pragmatists, of course, believe that there is a reality, but the reality keeps on changing and is dependent on our actions (Morgan 2014). The actions we take build our experiences around things which becomes a reality for us. Therefore, the philosophy that pragmatists hold is that one needs to adapt actions as

they see fit with the changing reality (Powell 2001). The pragmatic paradigm is therefore more focused on methods we adapt to reveal the truth (Powell 2001; Morgan 2014). Emphasis is on adapting the methods and techniques that will give useful findings in relation to the research questions or problems being raised (Hanson 2008; Yvonne Feilzer 2010).

The area the research aims to explore is a complex area involving human behaviour which continuously interacts with different dimensions in the environment and keeps changing. It aims to explore consumer perception, which is a complex cognitive process, and also aim to explore the association of consumer perception with their cultural dimensions, which is again a complex shared cognitive process. Such multidimensional dynamic complex realities may not be easily understood through a single lens of a positivist or constructivist paradigm. The research attempts to explore realities pertaining to consumer perception of functional foods through subjective evaluation (constructivist paradigm) and further prove the existence of the realities through empirical tests (positivist paradigm). The researcher believes that neither a wholly quantitative or qualitative approach is desirable. This mixed method philosophy of the research provides a reasonable ground to say that the research employs a pragmatic approach (Morgan 2014). Using a mixed methods approach allows the researcher to employ a collection of qualitative and quantitative data concurrently or sequentially as the researcher sees it fits with the research problem (Creswell 2003; Creswell 2013).

3.3 Methodology

The research employs a sequential exploratory strategy which involves qualitative data collection and analysis in the first stage, followed by quantitative data collection and analysis in the second stage that builds on the findings of the first stage (Creswell 2009). Such a strategy is believed to be applicable to study where the aim is to assess the elements of emergent theories. The sequential exploratory strategy is often the chosen method when the aim is to develop a new instrument and discover a theoretical model of the phenomenon under study (Creswell 2009). The research follows the three-phase approach of sequential exploratory strategy where the researcher first collects and analyses qualitative data (stage 1), and uses the findings and analysis of

the qualitative stage to develop a survey instrument (stage 2), which is then administered to the sample of population (stage 3) (Creswell & Clark 2007) Table 8 represents a sequential design adopted by the research.

Table 8 Exploratory sequential research design of the research

<table>
<tr><td colspan="4">STAGE 1</td></tr>
<tr><td>Qual data collection</td><td>Qual data analysis</td><td colspan="2">Qual data results</td></tr>
<tr><td>Purposive sampling
Theoretical sampling
In-depth interview
Interview guide</td><td>Coding
Constant comparative analysis
Grounded theory method
NVivo</td><td colspan="2">Probable latent variables
Proposed theoretical framework</td></tr>
<tr><td colspan="4">STAGE 2</td></tr>
<tr><td colspan="4">Development of survey instrument</td></tr>
<tr><td colspan="4">Consider themes from qual data and literature
Developed survey instrument</td></tr>
<tr><td colspan="4">STAGE 3</td></tr>
<tr><td>Quan data collection</td><td>Quan data analysis</td><td>Quan data results</td><td>Interpretation</td></tr>
<tr><td>Convenience sampling
Recruitment through third party CINT
Online LimeSurvey</td><td>Descriptive statistics
EFA
ANOVA
Multiple regression analysis</td><td>Theoretical framework</td><td>Interpretation of results
Discussion
Implications</td></tr>
</table>

Source: The table has been based on the methods employed in the research and exploratory sequential strategy (Creswell 2003; Creswell & Clark 2007)

The research has two phases: qualitative and quantitative. The samples for the qualitative phase are recruited using a purposive and theoretical sampling strategy. The interview data were analysed by using a constant comparative data analysis method. The qualitative data proposed a hypothetical, theoretical framework. The proposed theoretical framework from the qualitative stage, interview responses, codes and texts were used to develop a research instrument for the quantitative stage of the research. The samples for the quantitative stage were recruited through a third party called CINT using an online survey developed on the LimeSurvey platform. Recruitment was undertaken using convenience sampling. EFA was used for reducing and identifying the underlying latent variables from the quantitative data. Further, ANOVA tests were done to assess the relationship between the variables and the

demographic characteristics of the study population. Also, a regression model was developed using multiple regression analysis. More details about the methodologies and justification are outlined in the relevant chapters for the qualitative stage and quantitative stages of the thesis.

3.4 Trustworthiness of the qualitative phase of the research

Unlike the quantitative phase, which emphasises the validity and reliability of the findings of the study, the qualitative phase of the study emphasises the trustworthiness of the study. Trustworthiness refers to how the researcher can justify or convince the readers that the findings of the study are worth paying attention to (Lincoln & Guba 1985). There are few models for the assessment of the trustworthiness of qualitative data; however, the research focuses on the trustworthiness criteria suggested by Lincoln and Guba (1985). The trustworthiness model of Lincoln and Guba (1985) is well conceptualised and is a widely used model (Krefting 1991). Lincoln and Guba (1985) produced credibility, transferability, dependability, and confirmability as the criteria for approving the trustworthiness of qualitative research. These criteria are parallel to the concept of validity and reliability in the quantitative study.

Credibility is a parallel term used for the internal validity in the quantitative study. It refers to the confidence of the researcher in the *truth* of the research findings based on the research design, informants and context (Lincoln & Guba 1985; Krefting 1991). Prolonged engagement, persistent observation, triangulation, referential adequacy, member checks and thick description are ways of increasing the credibility of qualitative research (Lincoln & Guba 1985). Prolonged engagement is about the amount of time a researcher spends with the participant to understand the issues of interest and to build trust between them. The only times I met the participants were during the time of initial recruitment and when interviewing them. Although it was not feasible to physically spend time with participants, the researcher tried to spend more time during the interview. Some interviews in the research were more than 60 minutes, and the average time of the interviews was 46 minutes. Such extended in-depth interviews allowed enough time for me to build rapport with the research participants and to obtain their trust. Although the interviews were conducted based on the questions in the interview guide, I used probing questions during the interviews.

The researcher keenly listened to the participants' views and observed their expressions and behavioural cues so that he could probe the participant to obtain more insightful information. Also, the researcher made use of soft laddering questions. The interview questions were thus continuously updated to gain more relevant information on the research questions. Such persistent observation adds to the credibility of a qualitative study (Lincoln & Guba 1985).

The interview involved consumers from Anglo-Australian, Chinese and Indian ethnic groups in Australia. The views of the consumers from these three ethnic groups were compared at several points during the data collection and analysis of the qualitative stage. I also adapted theoretical sampling which allowed me to purposively recruit participants of different viewpoints from each of those ethnic groups. The views of one ethnic group were compared with another, and the participants were even asked to give their opinion about the view of participants from another ethnic group. Such triangulation of sources enriched the researcher's knowledge about the socially constructed multiple realities (Lincoln & Guba 1985).

The qualitative study stage of the research was based on the Grounded theory method, a method that is believed to be flexible and not having any specific ways of doing it. However, the researcher has adopted guidelines by Charmaz (2006) which gives a more standard form of applying the Grounded theory method. Since the analysis of the data started from the beginning of data collection, the themes began emerging from the very beginning, and thus the interview questions were continuously updated to get more information to fill the gaps in and between the themes. The research has attempted to give reasons for the change in interview questions. The iterative process used in the research is explained in detail and the results are presented through diagrams, tables, figures and thick description. The procedures followed for open coding, axial coding and selective coding are clearly outlined. The thesis also incorporates the annotations, memos, and coded text along with the description of the theoretical constructs in the interpretation section. This detailed description of the methods, analysis and results should enhance the transferability of the research to different contexts (Lincoln & Guba 1985).

Moreover, the coding of the interview text was done using qualitative data analysis software called NVivo. With the use of NVivo, the coding process was straightforward, and the memos and annotations for the relevant codes and texts were easily created. NVivo makes the research more dependable. The interview guide was developed with repetitive discussions with my research supervisor and an expert from the Statistical Consulting Unit at the University of Southern Queensland. Researcher kept sharing the data coding, analysis and results with my supervisor and the statistical expert for their feedback and comments. Later, the instrument for the quantitative study was also developed through consultations with members of the Statistical Consulting Unit. Since the research instruments, processes and findings were subjected to evaluation by research experts, it makes the research more reliable (Lincoln & Guba 1985). Such review processes, and use of memos and annotations reduced researcher bias, making the findings more objectifiable (Lincoln & Guba 1985).

3.5 Validity and reliability of the quantitative stage

Validity is defined as the 'extent to which a quantitative study captured the objective of the study' (Heale & Twycross 2015, p. 66). Content validity, construct validity, and criterion validity are the measures of validity in a quantitative study (Carmines & Zeller 1979; Heale & Twycross 2015). The instrument designed for the research should be measuring what it is supposed to measure to have content validity (Carmines & Zeller 1979). The research supervisors and two lecturers at the Faculty of Business, Education, Law and Arts at the University of Southern Queensland reviewed the research instrument. An expert from the Statistical Consulting Unit reviewed the instrument more specifically. Checking of the instrument with the statistical expert and my supervisors continued until researcher was convinced that the instrument covered all the dimensions that arose from the qualitative stage of the study, and incorporated scales/ items feasible for statistical analysis. The survey instrument was then pre-tested among a few participants (five) and experts in the field. A pilot study was done using the pre-tested questionnaire. The pre-test and pilot test helped in the refinement of the items in the questionnaire, their direction, and their relevance to the context of the research.

Construct validity is another measure of validity in the quantitative study. This measure emphasises the correlation between the items/variables in the questionnaire (Flynn et al. 1994; Heale & Twycross 2015). The items in the research questionnaire should be correlated for construct validity. I employed the exploratory factor analysis method that reduces the questions in the survey questionnaire into a simpler structure with a definite number of variables. Each factor contains internally correlated items. The correlation between the items is strong if the Cronbach alpha value is > 0.7. Such a high correlation between the items in the instrument means the items are internally consistent, and the instrument is more valid and reliable (Heale & Twycross 2015).

3.6 Research ethics

The research involves human participants, and thus human research ethics approval was received from the ethics review committee at the University of Southern Queensland. The research was deemed to meet the requirements of the National Statement on Ethical Conduct in Human Research by the committee. The human research ethics approval number for the research is H17REA200. The research was scored as low risk research. There was no foreseeable risk to the participants except for the time they would need to spend participating in the survey. Consumers may find it inconvenient to fill in the questionnaire at malls, shopping centres or public places, or to give a set time for participating in an interview or filling out the questionnaire. Therefore, the participants were free to determine a convenient venue and time to fill out the online survey. They were informed through a participant information sheet (refer to Appendix C) about the objectives of the interview/survey, associated risks and benefits before the interview/survey. The participants were also informed that their identity and the information provided by them would remain confidential and anonymous. The survey participants were also informed the data was being collected by a third party. However, they were also informed about the data confidentiality agreement with the third party. The participation in the interviews/survey was voluntary. Participant's expressed their consent to participate in the interviews through a consent form (refer to Appendix D). Survey participation employed implied consent. The consent form and participant information sheet contained contact details of the research team and the research ethics committee for the benefit of participants. Only participants above the age of eighteen years were recruited for the study. It is essential

that the data obtained for the research should remain secure until discarded. After the completion of the study, a primary copy of the research data was stored in QCIF Nextcloud, a secure data centre for research data storage service located onshore in Australia, and a secondary copy was stored in QRIScloud as recommended by the University of Southern Queensland.

3.7 Conclusion

This chapter outlined the pragmatist philosophy that the researcher holds about the existence of the truth. The study aims to explore and identify the socially constructed values that influence functional-food perception, and the right kind of tools and techniques are needed to yield those realities. This pragmatist view of the research led to the selection of a mixed methodology for the study. Research emphasises dimensions of trustworthiness in the qualitative stage, and validity and reliability in the quantitative phase to enhance the rigour of the study. The following sections will provide more details about the qualitative and quantitative phase of the study including particular methods applied for data collection and analysis, and results of the studies.

Chapter 4: Qualitative study

4.1 Introduction

As per the review of the literature in the previous section, there is not much information available on the relationship between culture and functional food perceptions. The lack of information on this topic warrants a need for exploratory study. Further, the research questions of the study seek answers to *what*, *how* and *why* questions. The *what* questions would help to identify the consumers' functional food behaviour while *how* and *why* would tease out the underlying frame of reference that causes consumers to demonstrate the specific behaviours toward functional foods. Such issues demand explanations and reasoning which is possible through qualitative studies, including in-depth data collection techniques. This section covers the qualitative stage of the research, where details about how the information on the influence of cultural values on functional food perception were obtained and analysed. The chapter starts with a description of the research design, which incorporates the Grounded theory method, followed by the data analysis, the outcomes of the investigation, and finally the research propositions for the quantitative stage.

4.2 Research questions

The research first aims to investigate the relationship between consumers' culture values and their perceptions, and to then develop a theoretical framework of functional-food consumption. The general research question for the study is: **What is the relationship between consumers' culture and their functional food perception?** The following four sub-research questions are outlined to fulfill the general research question:

1. Does culture affect consumer perceptions of functional food?
2. What cultural values affect consumer perceptions of functional food?
3. How do these cultural values affect consumers' functional food perception?
4. How do consumers' demographic characteristics affect the relationship between their cultural values and functional food perception?

4.3 Qualitative research design

4.3.1 Grounded theory method

The research aims to develop a theoretical framework of functional food perception that explicitly establishes the position of cultural values against other constructs of functional-food perception. The Grounded theory method is the most widely used method for developing a theory (Charmaz 2006). There is a diverse understanding among researchers about how the Grounded theory method should be carried out. There are different versions from Corbin, Strauss to Charmaz. Thus, there is obviously no one way of conducting research using a Grounded theory method. The critical aspect of the Grounded theory method is that data collection and analysis are simultaneous. Simultaneous collection and analysis allow the researcher to look at any gaps in the emerging theoretical constructs and causal relationships between them, and further seek specific data to fulfill the gap.

The sampling in Grounded theory method is determined depending on what new information is required to fill the theoretical gap and is called theoretical sampling (Corbin & Strauss 1990; Charmaz 2006). The Grounded theory method uses an inductive approach which lets theoretical constructs emerge from the data. Cultures are dynamic and can evolve over time (Berry & Sam 1997; Chao 2000). Each ethnic group has a unique culture and values. It would be irrelevant to impose a template from the study of one culture to other cultures. The Grounded theory method was considered suitable as it would allow the values to emerge from the data and make it more relevant to the study population. Usually, other qualitative methods, like thematic methods, are linear processes and do not allow data analysis until all the data is collected (Clarke 2006). The linear process of data collection and analysis leaves no room for further data collection and analysis if the collected data is not enough to understand the problems. Grounded theory allows data analysis from the very beginning, and researchers can constantly compare their data, codes, and samples until the theoretical framework is saturated (Corbin & Strauss 1990; Charmaz 2006). Grounded theory gives more control over data analysis.

The challenging part of Grounded theory is that it is not a linear process (Charmaz 2006). The ideas can pop up at any stage of data collection and analysis. Sometimes

the ideas can emerge at the end of the analysis, and the researcher may again decide to go back to the data and collect more data concerning that idea. The researchers keenly look for a lead in the data and follow that lead as it emerges from the data. From its early inception by Glaser in 1978, there have been several interpretations of the processes involved in the Grounded theory method. My research has adapted the Grounded theory method endorsed by Glaser (1978) and Charmaz (2006). The Grounded theory method was adapted in the sense that the constant comparative method was used for data analysis; coding was done at three-stages (open, axial and selective coding) and memos were written; interviews were intensive, with the questions following the leads given by the respondents; and to some extent participants were recruited on a theoretical basis.

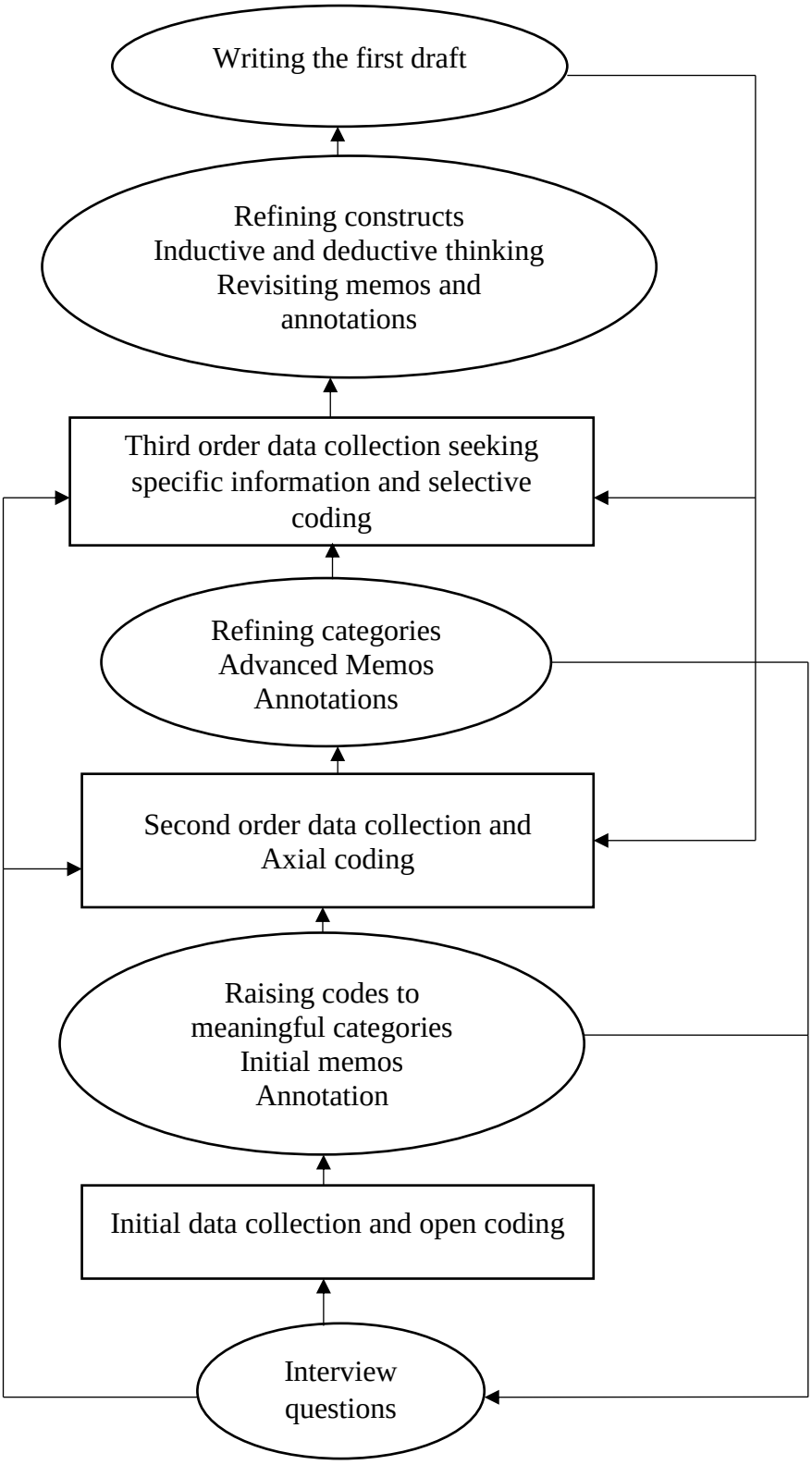

Figure 5 The Grounded theory process adapted to this research (Charmaz 2006)

4.3.1.1 In-depth interviewing

My research aims to investigate a complex subject relating to consumer perception and culture. Human behaviour is in itself a very complex phenomenon associated with various dimensions, visible or invisible, from within the individual's inner self or the outer world. Researchers attempt to try to understand, through apparent behaviours, the invisible theories/values lying deep inside the consciousness of a consumer. The challenge is that the espoused theories in a consumer's mind and the theory in use, or the behaviours they express, can be incongruent (Argyris & Schon 1974). The consumers may not be aware of the value dimensions ingrained in their psychology and behaviour Therefore, structured questions with multiple choice questions or dichotomic answers where the researcher uses a predefined parameter, or makes some speculations, are less likely to unravel those underlying values of the complex human process (Smith & Albaum 2005; McNabb 2015).

A researcher needs to be aware of the values underlying the responses of consumers and tease out/stimulate those values to come up to the surface. The researcher should be observing the verbal and emotional cues, bodily movements, context, environment and other many factors to probe people further to explain more about their views and perceptions, and to note the leads that are coming out of those explanations. Any, even if subtle, feelings of threat, insecurity, or stress can lead to the hiding of real views or thoughts. The participants should feel that they have control over the interview, they should feel comfortable, safe and secure to express their real views (Charmaz 2006).

During the in-depth interviews, interviewers usually use an interview guideline with a general statement of interview questions. The interviewer can ask participants for a more elaborative explanation on specific topics of interest as they arise during the interview process. Interviewers can ask participants about their thoughts, feelings and actions. In-depth interviews allow the interviewer to a) keep the participant on the subject, b) come back to an earlier point, c) restate the participants' point to check for accuracy, d) slow or quicken the pace, e) shift the immediate topic, d) validate the participants' humanity, perspective, or action, e) use observational and social skills to further the discussions, f) respect the participant and express appreciation for participating (Charmaz 2006).

4.3.1.2 Interview guide

When a researcher is trying to develop a theory, it is fruitful to have less structured questions that allow the researcher to ask questions from various angles and seek a rich description of any specific phenomenon of interest. It would be best to have an instrument that allowed flexibility and is open-ended and can tolerate a fair amount of stretch. An interview guide with generally open questions would be useful in this research. The interview guide should only be used as a guide, and the researcher should not feel pressurised to rigidly follow the interview guide. The leads provided by the participants should drive the interview; however, the guide should be used to direct the interviewer back to the main point in case some information is missing or the interview is diverting from the topic.

Before designing the interview guide, the researcher had an informal conversation with staff members from the University of Southern Queensland with expertise in functional foods and statistics. The researcher also visited retail stores, such as Woolworths and Coles in Coorparoo, Brisbane, to see what kind of functional foods are available in the stores. Informal conversations with colleagues from English, Nepalese, Indian and Chinese backgrounds gave a sense of their food habits and provided insight on where to focus and what kind of questions to ask. The initial interview guide was sent to research supervisors and the expert from the Statistical Consulting Unit for a review, and their feedback was incorporated into the interview guide. The questions in the interview guide were reworded, removed or added as the coding and analysis progressed. The iterative process of refinement and modification of the interview guide resulted in five versions of the guide. Not all questions were asked to all participants.

4.3.1.3 Participants

One of the critical features of the Grounded theory method is theoretical sampling (Corbin & Strauss 1990; Charmaz 2006). The iterative process of theory building involves a constant comparison of the emerging themes/codes, refining them into theoretical constructs. Researchers continuously search for information that helps complete the theory. Generally, in other research studies, such as thematic analysis, data analysis does not start unless all the interviews are completed. Whereas, with the Grounded theory method, a researcher looks for theoretical constructs and underlying

constructs, and then further examines how each of those constructs relates to each other. Therefore, one of the sampling methods used in the Grounded theory method is theoretical sampling, where participants are chosen based on the emerging theories and the information lacking for the completion or saturation of the theory. Sampling is an iterative process in Grounded theory, where the researcher constantly searches for right sources to obtain information required for saturation of the theory. In the Grounded theory method, the first few participants are chosen using a purposive sampling method, and then the following participants are recruited according to the need or where the data leads (Charmaz 2006). The data collection tools are updated accordingly, and new participants are recruited who can give more information in and around the emerging theory or fill the gaps in the emerging theory.

After obtaining the ethics approval from the Human Research Ethics Committee at the University of Southern Queensland, 20 (Anglo-Australian, Chinese and Indian) consumers were interviewed. General inclusion criteria for participation was provided during the ethics application process. Although theoretical sampling was going to be used in the research, it was necessary before recruiting began to obtain approval of the criteria from the ethics committee. It was not practically possible, as demanded by theoretical sampling, to obtain ethics approval before every new kind of human participant was recruited. The researcher tried to keep the inclusion criteria broad to allow room for applying theoretical sampling within the perimeters of the inclusion criteria. The inclusion criteria supplied to the ethics committee were a) participants should either be from Anglo-Australian or Chinese, or Indian ethnicity, b) should be living in the Brisbane region, Queensland, Australia, c) should be above 18 years of age.

The researcher set the criterion Anglo-Australian, Chinese and Indian because Australia (66.7%), England (3.9%), China (2.2%) and India (1.9%) were the most common countries of birth reported in the most recent Australian census (ABS 2016). The Anglo-Australians come from an individualistic cultural background which contrasts with the collectivist culture of Indians and Chinese. The interesting part about choosing Anglo-Australian, Chinese and Indian ethnic groups, is that Anglo-Australians are predominantly ingrained with an individualistic culture, while Chinese and Indians are ingrained with a collectivistic culture. There is also difference in the

languages of the three ethnic groups. Furthermore, Chinese and Indian migrants come from different political environments. Chinese migrants come from a political environment influenced by communism, while Indian migrants come from a democratic political environment. Such differences are going to provide an interesting insight into how cultural values influence functional food perceptions in this research.

The first six participants for the interviews, two from each ethnic group, were recruited through the purposive sampling method which is a common approach used in initial sample recruitment in the Grounded theory method (Charmaz 2009). These six participants were recruited as a part of the pilot study. The rest of the participants were selected using a theoretical sampling approach. However, the participants were recruited either through the researcher's contacts or through snowballing. Table 9 provides information regarding the number of participants from each ethnic group and their sex. All the interview participants were from 18-50 years of age group.

Table 9 Participant demographics

Ethnicity	Sex		Total
	Male	Female	
Anglo-Australian	-	6	6
Chinese	2	6	8
Indian	3	3	6
Total	5	15	20

Source: Developed for this study

4.3.1.4 Interview procedure

The research process, interview guide, participant information sheet, and the consent form were reviewed and approved by the Human Research Ethics Approval Committee at the University of Southern Queensland. Participants were contacted one to two days before the interview and given an overview of the research and the purpose of the interview. The participants were provided with an invitation letter, participant information sheet (refer to Appendix C), and a consent form (refer to Appendix D) either through email or in person before the interview date. Once the potential participants had consented to the interview, a date, time and place suitable for them was fixed. The interviews were conducted either in person at public places, such as cafes and parks, or over the phone.

The interviews generally started with open questions, for example: ‘What is your favourite food?’ or ‘What are the different kinds of food that you eat for breakfast, lunch and dinner?’ Such questions allowed participants to recall the different kinds of healthy foods or normal foods they ate throughout the day. The participants’ explanation of their favourite food or daily food habits gave the researcher a lead to probe further. The researcher noted the healthy food mentioned by the respondents and asked them about their experiences with that food. In the case where respondents did not mention any functional foods in their daily list or did not know much about functional foods, the researcher explained what functional food is and what functional foods that consumers might be eating without knowing it is a functional food. Avocado, wholegrain bread, cereals, rice, kale, berries were some of the commonly mentioned functional foods. The average interview duration was 46 minutes. The researcher carefully noted responses by participants that could be related to culture or cultural values, and asked participants to explain more about those statements.

In some cases, participants were even requested to share the story of their first experience of eating functional food. Sometimes participants were asked what they thought about the views or statements provided by another interview participant. For example, Indian respondents cited lentils. Subsequently, Chinese and Anglo-Australian respondents were asked about their views and experiences of lentils. Similarly, Anglo-Australians mentioned foods such as kale and avocado; and, thus, Indian and Chinese respondents were asked to share their views or experiences with these foods. To gain an understanding of participants’ perceptions, the researcher discussed with them the different health foods from different cultures. The participants were asked about their food habits in different contexts, such as at their workplace, home, or social event, and how their choices varied. Questions were formulated, keeping in mind how the underlying cultural values would emerge from the responses. The interviews were recorded using a digital audio recorder.

4.3.1.5 Constant comparative analysis

Grounded theory allows for quite a flexible process that does not demand adherence to strict methods for analysing data (Corbin & Strauss 1990; Charmaz 2006). However, some fundamental elements should be maintained to be able to call it the

Grounded theory method. Some of those essential aspects are simultaneous data collection and analysis, conceptualisation of raw data, refining constructs and identifying relations between them, theoretical sampling, constant comparative analysis, and writing memos (Corbin & Strauss 1990; Charmaz 2006). The constant comparative analysis is a prescribed method of data analysis for the Grounded theory method, although the technique is flexible within limits (Corbin and Strauss 1990). Researchers are free to adjust or adapt the technique as per their circumstances but should also be aware that too much stretch may lead to questioning of the rigour of the Grounded theory method.

The constant comparative method is a continuously growing process where the analysis starts with a comparison of incidents (codes) to each category, which then leads to integrating categories and their properties that lead to delimiting of theory, and eventually writing a theory (Glaser 1965). The earlier processes remain in operation until the writing of the theory at the end of the analysis. The analysis starts by coding, where the researcher compares any incident for a category, then compares the incident with the previously coded incident in the group. Such a constant comparison of incidents while coding starts generating theoretical properties of the categories. The researcher begins thinking about the category and its properties, its types and dimensions, its relationship with other categories. Such introspection will create conflict in the researcher's mind about how to create a meaningful theoretical notion out of the category and its dimensions. The researcher will try coding the texts in alternative ways and comparing the codes. Researchers may stop this process for a while, write memos and try to see the categories from a fresh and new perspective. It may take a while for the researcher to come to the most logical conclusions for the categories. The findings should, however, be based on the data and not the researcher's speculation. There are three types of coding used in this research. All these processes so far discussed are integrated with the process of coding. The coding starts with open coding, which then leads to axial coding and, finally, selective coding (Corbin and Strauss 1990).

4.3.1.5 Open coding

Initial coding involves open coding of the qualitative data. The interview data is read line by line during the open coding. Researchers should keep their minds open while

reading through the lines, without having a preconceived concept, but should be aware of the aim of the research, and the methods of coding (Charmaz 2006). The researcher reads through the text and assigns a meaningful code to any part of the text that indicates some concept related to the research question or the theory that the researcher is looking for. The assigned codes should describe action lying behind the texts rather than merely being a topic of the text. For example, the following text in one of the interview transcripts is about how the respondent believed that good health is related to one's belief and lifestyle, and the belief that alteration of lifestyle can make changes in health:

> *Just the mere fact, because, I work in an industry where I deal with elderly people who have diseases and I see people at dying age, so see a lot of cases where people based on their lifestyle they have lived, because lifestyle is one thing where you can alter, where you can make changes, so this is what I've learned out of my experience from what I do and what I've learned.*

In short, the respondent is talking about belief and how belief can make a difference to health. The text was coded as 'believing in one's ability to prevent health problems through healthy eating'. The codes should not be too far beyond the actual interview texts, and at the same time, they should not just be a paraphrase of what is there in the text. Codes should mirror actions happening in the text (Charmaz 2006). Such coding helps to make conceptual leaps and start giving the picture of the theory—even before the start of actual analytical work. The initial coding requires one to be open, continuously following up on the codes to check that they fit with the data, and further exploring data to fill the holes in these codes. Initial coding leads the researcher to the area where there are not enough data prompting the researcher to locate sources of that data. The data collection and analysis are thus carried out simultaneously, which gives the researcher a deeper idea of the research problem and engages the researcher in developing the theoretical categories from the very beginning. The initial coding process is a provisional process allowing the researcher to reword the codes to improve the fit. Coding helps the researcher to look at the participant's words in a new way, a way which the participant may not even have realised. The researcher's analytical skills and disciplinary knowledge can make the fundamental processes more explicit

and make the hidden assumptions more visible, ultimately giving new insight into participants' responses.

4.3.1.6 Axial coding

Axial coding is another type of coding presented by Strauss and Corbin (1990). Axial coding is building 'a dense texture of relationships around the 'axis of a category' (Strauss 1987, p. 64). The open coding identifies the underlying concepts, ideas and constructs in the data, but it is a scattered form and not connected. It merely is harvesting the codes or the underlying concepts. Now, the axial coding involves sorting those codes into a more theoretically meaningful structure; categories are related to their subcategories, bringing back the data together again in a coherent whole (Charmaz 2006). Strauss and Corbin have suggested a guide for grouping participants' responses and linking them together: responses are grouped as conditions (the circumstances forming the structure of the phenomenon), actions/interactions (participants strategic/routine responses to issues) and consequences (outcomes of actions/interactions). However, Strauss and Corbin (1990) did not mean the guideline to be followed strictly. They mentioned that the guideline is only a frame of reference for those who are not comfortable working without a guide (Charmaz 2006). The guide can be a limiting factor for researchers who prefer *flexibility*, one of the critical principles of the Grounded theory method.

4.3.1.7 Selective coding

Selective coding is where all the categories are linked to a core category. Some categories may lack enough detail to fit with the core category, and the researcher may decide to go back to the data or even go back into the field to collect data and fill in the descriptive detail for the category. The core category should represent the central phenomenon of the study. To identify the core category, the researcher should ask themselves the following questions: 'a) What is the main analytic idea presented in this research? If my findings are to be conceptualized in a few sentences, what do I say? What does all the action/interaction seem to be about? How can I explain the variation that I see between and among the categories?' (Corbin & Strauss 1990, p. 14). The core category could be from one of the categories identified already or the researcher may need a new term to explain the core.

4.3.1.8 Memos

The coding process will result in several codes with various properties. As the research codes the incidents in the data, it is very likely that ideas of a theoretical notion pertaining to categories, their properties, and hypotheses will emerge; the researcher will even have generative questions evolving from the coding and analysis process. These ideas, hypotheses, new questions if not recorded are lost. It is not possible for the researcher to keep track of them without having a proper system of record keeping. Memos are one of the ways of keeping records and tracking ideas. Memos are written from the very first stage of data analysis to the end of the research. Memos need not have a fixed length or size. They can be of any length. As the categories are refined and the theory becomes more elaborate and advanced, so will the memos. If a researcher skips the process of writing a memo, a great amount of information about the theory is lost. It can be hard for the researcher to track the links between the concepts/categories, and the outcome will be a less grounded, lean and weak theoretical structure.

4.3.1.9 Theoretical sorting, diagramming and integrating

Theoretical sorting involves sorting of the memos linked to categories and sub-categories. The analytical memos written during the process of coding provide a lot of information about the codes, as well as the relation between the categories and sub-categories and the core category. Memo writing at each stage of the analysis makes the categories more refined, the relationships much clearer, and the theory more visible. The sorting of the memo provides a comparison of categories at an abstract level. The memos are compared with each other, sorted and integrated in a way that reflects a more meaningful and logical combination. The sorting of memos is again an iterative process, and the researcher may need to try different sorting processes. The general guidelines for sorting, comparing and integrating memos are: a) sorting memos by category, b) comparing categories, c) using categories carefully, d) considering how the order of the memos reflects the study, e) thinking how the order of memos fits with the logic of the categories, f) creating a balance between the study, categories, and theoretical statements about them (Charmaz 2009, p.117). Diagramming can also be quite helpful in sorting and developing the categories into a more meaningful theory. Diagrams provide a visual representation of the constructs and their relationship which is easy to interpret and can be easily changed to see

alternative ways of presenting the relationships between the constructs until the best model is achieved. Researchers can try different diagrams such as charts, maps, figures to tease out the relationship while they analyse the data and present them in their final works.

4.4 Data analysis

The data collection and analysis in the research started with the recruitment of the first six participants. Since the researcher was comparing Anglo-Australian, Chinese and Indian consumers, six candidates—two each from Anglo-Australian, Chinese and Indian backgrounds—were recruited purposively through personal contacts. These six interviews were conducted using the first version of the interview guide as given in Table 10. Later these interview responses were merged with the main study data. As soon as the interviews were completed, the recordings were sent to professional transcribers for transcribing the interview recordings verbatim. The researcher compared the interview transcripts by listening to the audio recording and reading through the transcript at the same time, and any errors were corrected. All the interview transcripts were uploaded to NVivo 11.

Table 10 Interview guide, version 1

Interview guide for consumers, version 1
Perceived need for functional foods:
1. Could you please tell us about your daily food intake?
2. How do you decide what to eat for breakfast, lunch and dinner? Give reasons. What sort of things influence your choices?
3. In general terms, what are the purposes of food for you?
4. Please share with us your view of an ideal diet plan.
5. Have you heard of functional foods? What do you know about functional foods?
Perception of functional foods
Let us talk more about the products that we mentioned earlier.
1. What do you know about whole grain products/legumes/lentils/non-starchy veggies?
2. How do you usually consume or would like to consume whole grain products, soy-based products, honey and avocado product? product? Why? Please specify some reasons.
3. Please share your last purchase experience of whole grain products/legumes/lentils/non-starchy.
4. If you should list the benefits offered by whole grain products/legumes/lentils/non-starchy, how would you list them? How did you know about those benefits? Did you hear, read or see them somewhere? Explain a little more about where and what you did hear/read/saw exactly.

5. Do you know about the chemical constituents or components found in whole grain products/legumes/lentils/non-starchy or what is it in these products that make them health-promoting foods? **Influence of cultural values on functional food perception** 1. Tell us some interesting things about your culture in relation to food. A little about the history of typical foods in your culture. 2. How have your food habits and choices changed or not changed over time? If they have changed how would you describe that change? What could have caused those changes? Give some examples of the changes. 3. Do you remember the first time you started eating this food (the food chosen from whole grain products/legumes/lentils/non-starchy)? How did you happen to start eating this food? 4. How common is this food in your culture? What is the significance of this food in your culture? 5. Do you consider this food to be tasty?

Source: Developed for this study

The coding and analysis of the data started from the very beginning. The researcher read through the interview texts thoroughly and coded the text into relevant codes. The initial codes were explanatory, long and written in action form. During the open coding, the researcher also used the annotations function on the NVivo software. Whenever researcher identified any relevant or interesting incident in the text, the researcher wrote an annotation for the text. The following is an example of how the researcher added annotations during the open coding process. The annotation made the researcher's thoughts clearer, and as the researcher finished writing the annotation, it became obvious how to name the code of the respective text.

Table 11 Example of annotations during open coding

Interview text	Annotations
Yea, I think will be the spices, not even i know spices and the different places, if i say different states, they have different variety habit or eating. Some of the state they prefer sweet, and some of the other place they prefer like a spicy, very spicy, and some other place prefer salty, and it's not like any other , like all Australians should be pretty much same thing but they might have something specific in this area, but they taste pretty much same, but back in china it's a totally different. Each state they have like each condition or each	The consumer is contrasting his culture of seeking a variety of food against Australian food. Consumers tend to compare their food with foods from another culture in a multicultural society.

habit of taste.	
When I came over to Australia, when I was like eighteen or nineteen, so we are more resilient, with this age we are more resilient in compared with the old people, if my parents come over here, my parents come over here last year and they could not really, they could eat, they say it's good, but it's not like a will happen on the daily basis, but for me, coz i want, if you wanna change my habit, you can coz, our resilience is much more stronger than my parents, because they have been in China for 60 or 50 years. But for me I have just only been here for like sixteen years, I did my high school somewhere else as well.	More resilient consumers in a multicultural environment can withstand the unfavourable circumstances or say different cultures and their influence. Consumers who have been living in a multicultural environment for a long time are readier to accept new functional foods. They have the capacity to compromise their past choices, move out of their comfort zone, accept the change and try new foods. But consumers who are in the multicultural environment for a short period cannot like new foods. It seems that preference of functional foods from other culture depends upon exposure to that functional food and duration of exposure. The participant has contrasted young age and old age, which again indicate the length of time spent in one culture.
I think it depends on like a which country or what year you bring the kid over to that country, if i have a kid in Australia, i think they will pretty much like Australian, like they eat in.....they totally accept the western culture in the meals, but they still accept Chinese meals as well coz we gonna cook something at home. So, yea that's my conception.	Kids readily accept both Australian and Chinese functional foods, which means probably kids are less judgmental, they are at the formative stage of life, and they follow whatever their parents and others do. They have no preconceived notion which also makes it more open to functional foods.
Healthy food is like a, what do you call, is it a, when the kids were like going to sport, you wanted to give them like a low GI so it gave you energy for longer so they had pasta and that when they were doing sports and stuff so something that kept you going like for longer.	Looks like the mother they are worried about their children's achievement and functioning; hence they want to make sure that their children get enough energy for a long time. Mothers usually worry too much about children. The worry can be productive or either unproductive. Productive worries are when they worry about things they can change, and they have control over while unproductive worry would be worrying about things that can't be avoided. However, the aim is to cope with the worry of children's' health, wellbeing and performance. So, to an extent, it can be said a manifest of uncertainty avoidance.

Well I want to live a long life, I want to be there for my children, stuff like that, that's why we've always maintained a healthy regime and stuff like even though there are lots of things out there that you can get but really, I just want to be able to just have the energy and have fun and eat, sometimes good This and sometimes bad.	Prioritisation seems to be an important factor. Consumers need to make priorities what is essential to them. The consumers who care for family, their loved one, they focus more on other happiness and are ready to compromise their desire for unhealthy foods. So, there should be some other factor that would motivate consumers to think why they should eat healthy, for whom. So, these are probably consumers who not only think about themselves, but they think about their family and close ones. consumers should be connected to someone loved ones to eat functional foods. Also, it is about thinking long term rather than seeking happiness in the short term.

Source: Developed for this study

The first participant to be interviewed was a Chinese male who was recruited purposively through personal contact. This participant said that he was not a frequent eater of functional foods. He ate functional foods because he was doing fitness training and not because he liked to eat functional foods. The participant said that functional food was not tasty and, if he had options, he would surely choose non-functional foods. The participant also mentioned functional foods such as brown rice. He also provided information about how Chinese from the north and south part of China have different food choices. From this, the researcher noted a few points, particularly that brown rice could be one of the functional foods that might be an easy example to use during future interviews. The response indicated that functional food consumption is sustainable if there is a compulsion to eat functional foods, and the consumption of functional food possibly involves a trade-off between taste and health. The other Chinese respondent talked about how she had been coping with the new environment in Australia. This respondent was contrasting Chinese food culture with Australian and was continually favouring healthy Chinese foods. She also told about different kinds of myths about healthy foods in China and the traditional concepts of hot and cold food. This female participant shared that functional foods like avocado and kale are not common in China, and that she only knew about them after she came to Australia. The Anglo-Australian respondent mentioned how she likes to follow a healthy regime, but that does not mean she stops herself from eating tasty foods. This female participant talked

about how she would prefer to eat functional foods that give more sustainable energy. She talked about having a balance of healthy foods, exercise, and entertainment. She also mentioned her preference for foods from other cultures. Another Anglo-Australian was also of the opinion that functional food habits could have been inherited from parents. Unhealthy food habits in early childhood are likely to result in poor eating habit in adulthood. However, it also depends upon willpower. Strong willpower and perseverance may help overcome unhealthy habits. From the words of this participant, it was clear that learning is essential when it comes to functional food consumption. One should be able to learn new habits, and this becomes more serious when one starts getting older. The Indian consumers were more of the opinion that they like to eat functional foods if it is Indian. They talked more about how they prefer familiar foods. The Indian participants expressed views about their need for variety in their food, and that they would be more interested in functional foods if there was variety. However, they also mentioned that they have been trying to eat some of English foods, as they are easy to prepare and readily available. In Table 12 are examples of some of the codes generated from the open coding of the initial six interviews.

Table 12 Examples of open codes in pilot interviews

Ethnicity	Codes
Anglo-Australian consumers	Changing eating habits Changes in the mental and physical state with age Changing food habits Consumers eating junk food for easiness Consumers lacking proper healthy rules being easily carried away by takeaway foods Alternating healthy and unhealthy food Criticising the cooking process of tv shows Feeling lazy to cook healthy food More convenient and quicker to eating junk foods Alternating healthy and unhealthy food More convenient and quicker to eating junk foods
Chinese	Being unaware of kale and avocado in China Thinking functional food, a western concept Talking about myths in Chinese culture Searching information for health food Preferring traditional functional food Classifying Asian vegetables and broccoli not included in Asian Cooking differently in Chinese culture Comparing features of brown rice with white rice

	Describing brown food as chewy Explaining how kids born to Chinese immigrants in Australia easily accept Australian foods as well as Chinese foods
Indian	Buying interesting health foods Eating a variety of vegetables Eating most abundant health food in the Eating seasonal and freshly produced health Eating seasonal fruits Looking for easy options for breakfast in Australian

Source: Developed for this study

Since a relevant line of inquiry was pursued in the first six interviews, the results from these interviews were merged into the main study. From the pilot study, some of the categories like negotiation of taste and health, resilience, learning, control or discipline were emerging. The researcher wrote memos for the categories to keep track of the arising theoretical notions. For example, from the memo shown in Table 13, the researcher formed the idea that functional-food perception is based on taste and health features. Consumers evaluate the taste of functional foods based on their experience or tradition; if the values of functional food conform to their experience and tradition, consumers are likely to eat functional foods. So, familiarity and tradition seemed to be emerging categories. However, it would have been be too early to come to this conclusion at the initial stage of the analysis.

Table 13 Example of a memo during open coding of the first six interviews

Memo
Traditionally Asians have a habit of eating sticky rice. So, when CR1 said brown rice is not sticky, I think that is one of the reasons. Here he is comparing the functional food with a similar food that he has been eating traditionally. Since brown rice is not sticky, he does not find it as tasty as white rice. But he thinks brown rice is healthier. From his statement 'Does not matter how long you cook, brown rice is not going to be sticky' it seems that he has tried cooking brown rice for long to make it sticky, and he failed. All this indicates that he is eating brown rice for health, but at the same time he keeps on searching the essence of his regular food on functional food. At a point, CR1 is trying to say that functional food/health food habit depends on the ability to making decisions for oneself. The decisions regarding how we want to make ourselves look like. If we want to stay healthy, we need to be able to make the decision to stay healthy and should be able to make compromise other factors. Should be determined to stay with healthy food, however, eating healthy again is strongly related to healthy habits. So, he is saying that we first need to make a commitment for a healthy lifestyle. Also, he is saying that it is a discipline that we need to learn.

Source: Developed for this study

The researcher started exploring the categories and their relationships from the initial stage of the coding (codebook is provided in Appendix F for reference). The diagram below is an example of mapping of categories and their relationship. Some of the concepts that were emerging from the initial analysis were perseverance, convenience, discipline, and planning. Figure 5 represents the idea that there are pathways to eating healthy food—the path of least resistance and the path of perseverance. If consumers perceived that eating functional food would require more effort and perseverance, consumers were likely to choose alternative foods that were quick and easy—a path of least resistance. Whether a consumer was ready to persevere determined whether a consumer chose functional food or not. The diagram is only a representation of a part of the data analysis. Discipline and planning would help consumers' determination to use functional foods. However, the constructs were very raw and less grounded at this stage. The categories were further refined as the data collection and analysis progressed, and some categories evolved into more advanced categories later in the research.

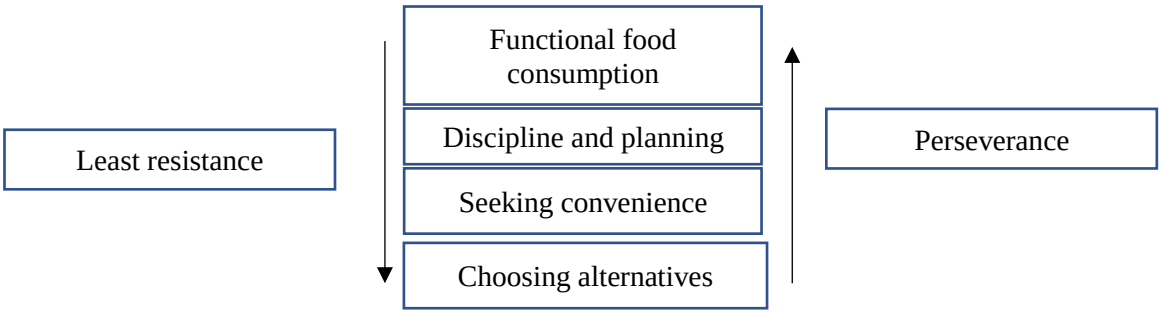

Figure 6 Representation of initial mapping and refining of categories
Source: Developed during the data analysis in this research

The researcher was now ready to go into the field and collect more data. This time the researcher wanted a more information about some of the categories evolved in the analysis. A second version of the interview guide with more refined and specific probing questions was prepared. Now that researcher knew consumers were especially

concerned with the taste and health of functional foods, the researcher wanted to gather more information about how consumers decide whether a food is tasty or not. The researcher focused more on the questions: 'How do you identify a tasty food, healthy food and unhealthy food?' 'What should we expect from a food?' In the earlier pilot interviews, the researcher asked about consumers' last experience of functional foods but, this time, researcher wanted to know about the first functional food experience of consumers because the first experience is going to determine whether they will be eating functional foods in future or not. Also, researcher was interested to find out how their perceptions had changed over time. The analysis of the data from the pilot study revealed some ideas, such as consumers' functional food perception is influenced by their traditions and food habits of their parents, and they have certain foods commonly accepted in their home and culture. Tradition was now emerging as a category; however, more information was necessary to make the category more grounded. Therefore, the questions about tradition were refined. An extract from version 2 of the interview guide is presented in Table 14.

Table 14 Interview guide with refined questions for tradition and culture

Extract from interview guide version 2
1. Tell us some interesting things about functional foods in your culture or in your family. Probe: Tell us what is so unique in your culture? Or how does it differ from other cultures? 2. Why is a particular functional food so common in your culture or tell us about some very popular functional foods in Chinese culture? Probe: Why is it so important for people to eat that functional food in your culture. 3. How would you compare your food habits and your parent's food habits in terms of functional foods? Probe: Do your parents or friends or relative advise or insist you to use any functional food? Does that make a difference in your choices? 4. Does your functional food choices differ when you are at home or with friends? 5. How have your functional food habits and choices changed over time? What could have caused those changes? Probe: Do you remember the first time you started eating this food (the food chosen from whole grain products/legumes/lentils/non-starchy)? How did you happen to start eating this food? Probe: How common is this food in Chinese/Indian/Anglo-Australian community? Why?

Source: Developed for this research

Once again six interviews were conducted, two for each ethnic group. During the interviews with the Indian respondents, they mentioned their healthy food habits had been passed onto them by their parents, particularly by their mothers, as culturally in India, it is the mother's role to cook food for the family. These participants shared the stories of how their mothers insisted that they eat healthy foods, and that they tried different ways of cooking and feeding them. They said that they still try to conform to those values. Therefore, the researcher thought it would be appropriate to interview an Indian mother who would be able to provide more information about Indian food values and culture. The researcher interviewed a mother of three children from an Indian background who was born and brought up in India but had been living in Australia for a decade. This respondent gave quite useful information about how her mother raised her while in India, and how she still tried to conform with those values, and how those traditional food values which she holds differ from the food values of her children who grew up in Australia.

During their interviews, the Anglo-Australian participants mentioned foods such as avocado, kale, and cereals as common functional foods they knew. I was interested to know what it was like for consumers from other ethnic backgrounds (Chinese and Indians) to eat these foods. Again, the Anglo-Australian participants mentioned how they had friends from different cultures, who sometimes shared their foods, or even brought home-cooked foods for them. The researcher went back into the field to interview Chinese and Indian respondents about how they felt sharing their foods with their colleagues? Two Indian respondents—unmarried, single and students—mentioned that it was difficult for them, far away from home, to maintain healthy food habits, and work and study. There was one person from my network who was an Indian, unmarried, living alone but had maintained quite a healthy lifestyle. Researcher thought it would be beneficial to interview this person to learn more about what are the values that keep him motivated to eat healthily and maintain a healthy regime, unlike his Indian counterparts.

The interviewed participants said that fitness was important to them and thus they ate healthy food. It was imperative to know why consumers would want to stay fit? There could be different motivations behind staying fit. The obvious one was keeping healthy, but several other reasons could have been desire to look good, enhancing

personality, increasing self-confidence, and so on. The researcher wanted to know more about these values and, thus, the questions were refined as the interviews progressed. In the interviews using the earlier versions of the questionnaire, the participants were asked what they knew about functional foods. It was now considered important to know how they got information about functional foods. The researcher wanted to learn how much effort consumers would put towards searching functional-food information. A more specific question about the negotiation of taste, flavour and health was added to the interview guide. Participants were further asked about the conditions that affect such negotiation, with the aim of discovering the underlying values associated with the process of negotiation. Similarly, other interview questions were also refined for the last time, with more specific and probing questions in different sections. The third version of the questionnaire is presented in Table 15.

Table 15 Interview guide, version 3

Interview guide for consumers, version 3
Major Questions: 1. What does food mean to you? What are the different functions that you expect from a food? 2. How would you describe a healthy food? Why do you eat healthy food? Why is it important/not important for you to be for example 'fit'/ 'prevent disease'? How do you feel being 'fit' and 'disease free'? *(here fit and disease free are just examples taken from previous interviewees' responses. These two values should be chosen listening to interviewee response to the question 'Why do you eat healthy food)* 3. What do you know about functional foods? How do you get information about healthy foods? 4. Why is it important for you to stay healthy? What do you know about the different complications caused by improper food habits or say unhealthy food habits? How did you know about them? How important is it for you to avoid those complications? Why? How do you think these complications could be avoided? 4. Do you think you need to add some functional foods in your daily meals? Why? What kinds of food do you eat for breakfast, lunch and dinner? Why did you choose a particular functional food? What benefits do you expect from this functional food? Why is it important/not important for you to 'get that benefit'? How do you feel after getting that benefit? 5. Would you tell us any of your favourite food? Do you consider it healthy? Why is it your favourite food? How does it make you feel after having this food? 6. How would you describe unhealthy food? Why is it important for you to avoid fat or sugar or carbs? How do you feel not eating these items? **7.** What stops you from eating healthy food or functional foods? (previous respondents have mentioned 'taste' 'time' 'don't know how to prepare' 'work' as some reasons) Why don't you put extra effort and time to eat these foods?

8. How do you compare a pleasurable factor like taste, smell, behaviour and health factors of a functional food? On what conditions do you choose pleasure over health or health over pleasure?
9. Would you let us know any functional food that is very common in your community? Why is it so common is your community? How often do you use this functional food, and why (not)? How do you feel after using this functional food?
10. Do you know about functional foods from any other culture? Would you tell us more what do you know about this culture? How is this functional food perceived in your culture? How did you know about them? Do you use that functional food? Would you like to share your first experience of using that functional food? How did you feel trying this functional food from another culture? How do you feel (not) continuing that food?
11. How would you compare your functional food habit with your parent's food habit?
12. Who cooks food at your home? Why? Who decides what food to eat? Why? Does this affect your functional food choices?
13. How would you compare your food habits when you are at home and when you are out with your friends or colleagues or relatives? In terms of functional foods or healthy foods.
14. Have your functional food choices changed over time? How did it change or did not change? Why do you think it (did not) changed? How do you feel after the change?
15. Apart from the health and pleasure, what could be the other reasons that might have affected your choice of functional foods?
16. Would you like to share any unique/interesting facts about your community in terms of health food that we might have missed in our discussion?

Source: Developed for this study

In total, the researcher did 20 interviews. By the end of the third set of transcripts (n = 8) and coding of those transcripts, there were 244 initial codes. The codes and the coded text were read and compared analytically multiple times, reducing the number of codes to 105. The researcher printed the codebook, again re-read the codes and the text, and then compared the codes and grouped them under categories denoting a specific theoretical notion. This iterative process continued until all the codes were assigned to a category. Then, one more time, researcher grouped all the codes under each category and put them in a table form. The codes under each category were again read and compared to see whether the codes fitted well under that category. This provided one last opportunity for any codes that had been placed under a wrong category to be placed under a more appropriate category. The aim was to have a strong fit between the codes and the categories. The decision on the level of fit of the category was based on the properties of the category and the researcher's knowledge of the concepts emerging from the data so far. The researcher also went back to the raw data

to search for new codes in case categories were lacking some information for saturation. Figure 5 shows a photoshoot of the paperwork done during the axial coding.

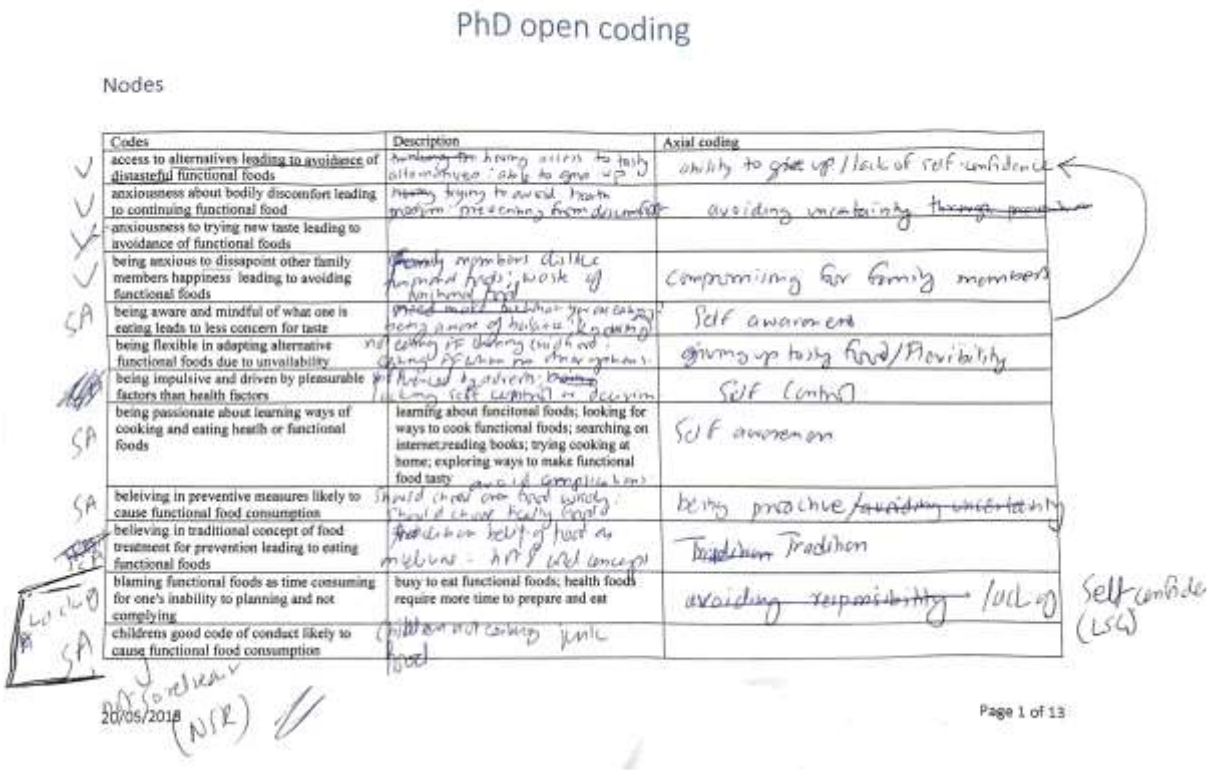

Figure 7 Photoshoot of the axial coding done on the printed codebook
Source: Photo taken during axial coding in the printed codebook

The researcher went back to the categories and the codes within them to determine a core category that would summarise these categories (selective coding). The core categories should usually come up clearly without being forced (Charmaz 2009), and should be an easy process. Through inductive and deductive thinking, researcher tried to conceptualise each category within the core theoretical category. The researcher mulled over the categories and wrote some advanced memos as his thought process progressed. Table 16 is an example of advanced memos written during axial and selective coding.

Table 16 Memo, need for security* motive of eating functional food

Need for security*Motive of eating functional food
This lady at this point is thinking of mental health. She mentioned that she is personally worried about her mental health and so she read about mental health and

blueberries somewhere and started eating blueberries due to her need for security or to avoid uncertainty. Now the fear of losing memory is so deeply seated in her mind that she thinks her children and everyone should eat healthy for their brains. Thus, consumers might try to transfer their perspective of eating functional foods to others or their children and so on. This transfer of functional food perception to their children becomes something that their children would prefer to conform with or be consistent with.

Source: Developed for this study

The categories—*need for stimulation* (desire for new experience, stimulation seeking), *need for conformity* and *need for security*—are the reasons for functional food consumption. The more appropriate conceptual term for *reasons* of consumption would be *motive* and, therefore, the three categories were linked to a core category *motives of eating functional food*, and motives would eventually influence how consumers negotiated health and taste factors associated with functional foods. Self-directed learning, self-confidence and self-control were found to be determining factors for perseverance towards consuming functional food. Consumers' need for consistency in functional foods and their traditional beliefs seemed to develop cultural predispositions in consumers' minds. The consumers' motives for eating functional food, the kind of cultural predisposition they had, and their level of perseverance would eventually influence their negotiation with health and taste values in functional food. Table 17 demonstrates open codes, categories and the core categories that evolved in the data.

4.5 Results

Functional food perception depends upon the negotiation of sensory and health values offered by functional foods. The negotiation of sensory and health values in functional food, and whether such negotiation will result in functional food consumption is dependent upon the level of perseverance consumers are ready to put towards functional food, their cultural predisposition, and motives for functional food consumption. Perseverance is the level of effort consumers are ready to put into learning, searching and accepting. Cultural predisposition is how someone prefers to behave in a certain way due to the culture that is ingrained deep into their minds. Cultural predisposition makes people behave in a certain way or demonstrate a certain attitude to specific circumstances, situations or objects. Functional food motive is about the reasons or motivations for eating functional food. These three factors—

perseverance, cultural predisposition, and motives of functional food consumption—seem to be convergent and discriminant. The ideal situation for functional food consumption would be when the motivations are high, theperseverance level is high, and the functional food fits well with the culture. The Table 17 illustrates the open, axial and selective coding done in the study.

Table 17 Tabulation of open, axial and selective codes in the data

Open coding	**Axial coding**	**Selective coding**
The desire for new experience may lead to functional food consumption Stimulation-seeking behaviour affecting functional food perception and use Eating functional food for aesthetics Being impulsive and driven by pleasurable factors than health factors Seeking a variety of food in consumers leading to the inclusion of functional foods in the food. Creative cooking methods making functional food more interesting Versatile functional food picked up and consumed well although not familiar to consumers Using functional food diversity as a source of expressing oneself Eating functional food to remain competitive than other	Stimulation through functional food	Functional food motives
Eating functional foods as an early intervention Anxiousness about bodily discomfort likely to increase functional food consumption Eating functional food as a secure alternative to home cooked food rather than eating restaurant food Compulsorily eating functional food to reduce the impact of an existing health problem Eating functional foods in the morning to staying positive and active throughout the day Eating functional food for a sustainable source of energy than taste Eating functional food for adverse health but giving up the desire to fulfil hunger Selectively choosing functional food as a coping mechanism for an adverse health problem	Need for security	

Need for avoiding health uncertainty leading to consuming functional food although did not conform with functional food from own culture The anticipation of possible mental health complication leading to believing and consuming functional foods		
The desire to be connected with other leading to trying functional foods ignoring the taste Eating functional food to confirm with peer habits and suggestions Functional food should fit with personal, and work life of consumers Being open to new cultures and good relationship with them leading to acceptance of functional foods from other social groups Feeling shy about eating pungent smelling functional foods while with other social groups Consumers' resilience and need for assimilation into dominant social group leading to acceptance of functional food although not tasty Cooking functional foods in creative ways reducing the need for conformity with traditional concepts	Need for conformity	
Lack of knowledge of functional food reduced the confidence to evaluate functional food values although liked the taste Awareness of limitations of one's body and health complications to rationally select functional foods than for taste Consumers' updating oneself with the latest developments of functional food in terms of health affecting the decision to continue functional food Self-motivated learning of benefits of functional food for health complications leading to acceptance of functional food although not tasty Knowledge of the nutritional value of functional food leading to eating them in original form rather than flavoured A self-motivated search of functional food information leading to functional food consumption Being passionate about learning ways of cooking foods in creative ways leading to acceptance of functional food although not tasty	Self-directed learning of functional foods	Perseverance towards functional food

Lack of active learning leading to less care about health and functional food Learning inconsistent information about functional food reducing confidence in making functional food decision Conscious effort required to remembering and buying functional food in spite of a taste for it Setting the priority straight that functional food should be eaten for health not pleasure Training oneself to like the taste of functional food Consciously trying to develop a palate for functional food Long-term thinking leading to giving up concern for a taste of functional food Evaluating functional food against time and effort required for choosing most convenient option Responsible parents putting more effort encouraging children to eat health food Parent's worry for children' overall development causing functional food consumption		
Ability or compulsion to follow a routinely habit or commitment to a routine habit increase compliance with functional food although not tasty Lack of planning and willpower causing consumers to make impulsive decision to choosing junk foods Families lacking discipline being driven by convenience and taste of unhealthy foods Blaming functional foods as time-consuming for one's inability to planning and not complying Lack of internalisation of health education causing less motivation to start functional food Lack of control over one's emotions leading to less confidence in giving up on unhealthy food habits Freedom to make self-decision in terms of functional food leading to trying functional food although not tasty Control over one's priorities making easy to switch between health and taste according to the context	Self-control over behaviour associated with functional food	

Need for achieving social image leading to eating a balanced controlled diet of healthy and unhealthy foods Consumers' preference towards functional food although not tasty is reinforced by experience of adverse health and warning from a valid source Balancing functional food, physical activities and fun Feeling of guilt of eating unhealthy leading to eating functional food and less concern for taste Prioritisation of health leading to eat functional food although unfavourable taste Sense of powerlessness reducing the confidence to keep up with functional food habits Eating functional food to convincing oneself as a healthy eater Standing on one's ethical values leading to selecting functional food from non-animal sources		
Being sceptical about the production and marketing of functional food leading to avoiding functional food Carried away by less credible sources of functional food information although liked the taste of it Encouragement from peers giving the confidence to try functional foods Perceiving future risk as less likely to occur leading to avoiding health food for pleasurable foods Believing in preventive approach to health leading to eating foods with health properties than pleasure Validation of functional food from multiple sources leading to consuming functional food Compelling situation causing to choose functional food although the taste is not familiar Validation of functional food from multiple sources leading to consuming functional food	Consumer self-confidence on functional food	
Seeking functional food with values that fit with traditional cooking methods Consumers seeking functional food texture consistent with non-functional alternative Trying functional food in own traditional way of cooking for better taste Eating familiar functional food for confidence	Need for consistency	Cultural Predisposition

Eating functional food familiar to consumer to avoid being anxious of trying functional food with new taste Taste for the functional food consumers were exposed during early stages of life Habits inherited from parents driving consumers' decisions to whether to choose healthy or tasty foods Exposure of functional food at formative stage increase preference to functional food taste Following specific cooking instructions Need to follow specific instructions of cooking functional food for each individual		
Eating functional foods that are traditionally believed to be healthy and beneficial The traditional concept of hot and cold food influence functional food perception Believing in the traditional concept of food treatment for prevention leading to eating functional foods Believing own traditionally cooked foods as healthy and nutritious Selecting whole grain that is consistent with the traditional concept of eating foods Consumers seeking functional food offering sensory values consistent with their traditional foods	Traditional beliefs in terms of food	

Source: Developed for this study

4.5.1 Perseverance towards functional food consumption

Functional food perception, as discussed in earlier sections, is dependent on how consumers negotiate between sensory values and health values offered by functional foods. Consumers seem to be readily accepting functional food if they find it tasty. However, consumers from different backgrounds have different perceptions of the taste of functional food. The consumers from Anglo-Australian backgrounds find avocado delicious while consumers from Indian and Chinese background did not find avocado equally tasteful. When one of the Chinese respondents was asked what was wrong with the taste of avocado initially, her response was:

> *It is tasteless. Yes, it is tasteless and there I think started great swing in thought. You saw okay it tastes good and for beetroot, I think beetroot, I don't*

like the beetroot taste but now I do try to manage to have several slice if possible so in my meals normally in the breakfast. (Chn-J)

The key thing to note is that such negotiation of functional food values is dependent on the level of perseverance consumers put towards functional foods—perseverance in terms of how much effort consumers are ready to put towards eating functional foods and embrace a healthy food habit. Consumers may eat functional foods out of coincidence but may not develop a liking towards them. Consumers need to eat functional foods multiple times to develop some level of preference towards them, and this takes some level of effort or perseverance. The high level of perseverance comes through looking at the long-term value of eating functional foods rather than at short-term gratification or taste. Consumers need to take the tougher option of compromising their need for taste in the short-term and develop their mind and body towards accepting functional foods for long-term gratification. Due to perseverance, consumers may start eating functional foods, but it is highly likely that they may find it difficult to maintain the change and fall back to where they were. There should be a certain discipline about food habits and lifestyle to form a sustainable functional food habit. Perseverance demands self-directed learning about functional foods, self-confidence about their functional food choices, and self-control over behaviours associated with functional food perception. Table 18 is an illustration of the memo written during analysis in the context of the perseverance.

Table 18 Memo for Perseverance*Negotiation

Perseverance*negotiation
The consumers were either choosing the least resistance pathway or a long-term pathway. These two sounded like a continuum of level of perseverance. The consumers with a low level of perseverance would choose functional foods that are easily acceptable to them or will avoid most of the functional foods, while the ones with high level of perseverance would try eating functional foods despite the bad taste of functional foods. The level of perseverance was again affected by the level of self-confidence and self-control.

Source: Developed for this study

4.5.1.1 Self-directed learning about functional foods

In the earlier section, I discussed the influence of the level of perseverance on the negotiation of functional food values (taste and health). Self-directed learning about

functional food is one of the antecedents of perseverance towards consuming functional food. Self-directed learning means consumers actively search and learn about functional foods by themselves. Consumers have consumed functional foods on different occasions. Some have consumed them accidentally, some have consumed them due to not having any other alternatives, and some have consumed them at a friend's place or similar occasions, but none of those behaviours is going to turn into a sustainable habit unless consumers learn about those functional foods. Some consumers are actively searching and learning about a healthy lifestyle, healthy foods and functional foods. These learnings eventually make them more strongly determined to take up eating functional foods irrespective of their taste. Self-directed learners find it more rewarding to persevere and eat functional foods. Self-directed learners are passionate to learn about different creative ways of cooking and to eat functional foods rather than lamenting about the taste of functional foods.

> *I came across some Chinese program on YouTube and I think, actually, it's Taiwanese it's a TV program by Taiwan I mean Asian, so I found actually what they taught and discussed to be more research base. So, I started to follow that program and I tried to read. And, also because I like I like food. So, what I tried to do, whenever my husband and I went out my we tried good food and I tried to learn, I tried to say okay I'll cook it? how they did it? i try to figure it out. Also, i read books about light food, watch the cooking show on TV. Sometimes I though okay this might be the way actually to make the food tastier, I think to my understanding, the I kind of the way I prefer to cook is to cook lightly and then I can learn from TV program about how to make it so.* (Chn-J)

4.5.1.2 Self-confidence in choosing functional foods

Consumers want to be self-confident about choosing functional foods before they buy. They want to make sure that they have made the right decision. Consumers who give high value to their self-confidence are more likely to closely evaluate functional foods. These consumers are interested in knowing how the food is produced, processed and marketed. This builds their confidence about functional foods. The more confident they are about the functional food they have chosen, the more likely they are to eat that functional food irrespective of the taste. The consumers who are less self-

confident find it hard to make the right decision and are easily driven by less valid information about functional foods. Consumers tend to look at their peers and social circle to cross-validate the functional foods they have chosen, or they choose functional foods recommended by their peers. Such recommendations make them confident enough to try out the functional foods. It is important for some consumers to refer to multiple sources for functional food information and cross-validate that information:

> *I never ate asparagus until I tried it, either. Like I always thought I hated asparagus. And then my girlfriend cooked up some ... she cooked up some fish in lemon butter, and the side was asparagus. I thought, oh, I don't know. She's going, "Shut up, just try it." And I tried it, and I really like it. And now I eat asparagus all the time. In a tin, I even fry it up, I even boil it up.* (Ang-M)

> *I check. Usually I read medical articles before making a conclusion or drawing any conclusion. Sometimes, I just feel that from a single source or single article the information cannot be trusted. If all the people on all the articles say the same thing, it means that this information can be trusted. I trust. That's all. I would read many articles, yeah, to find out what I should eat or what I shouldn't. I usually also, if I got some symptoms like some issue symptoms, I would just type the symptoms into Google or some other searching engines and also type the keywords like what I should eat to treat this symptom.* (Chn-C)

Table 19 Memo for Confidence*Perseverance

Confidence*Perseverance
Consumers who have high self-esteem or confidence perhaps don’t worry much about the future. However, confidence is not a constant thing; it can change throughout the age. Young people may have high self-confidence compared to the old age groups. Low confidence can make one doubt their own choices and instead follow the peer choices (an easier path), or the ones who seek to look confident would probably choose the foods that are popular. In both case they lack confidence.

Source: Developed for this study

4.5.1.3 Self-control over behaviours associated with functional food

Functional food perception depends upon consumers' control over their actions and choices related to functional foods. Consumers should have willpower or control over their emotions to be able to comply with functional food behaviour. Consumers lacking control over their emotions are found to be easily carried away by short-term gratification and will eat junk food or other non-functional foods. These consumers choose the more convenient pathway. Consumers may not necessarily eat healthy foods all the time. There are times when they do not want to worry about eating healthy foods, for example, at social functions or outings. However, it is essential that they do not fall back to eating unhealthy food again. Consumers with self-control over their choices and emotions can easily switch between functional and non-functional foods. Their priorities are clear. Consumers who prefer having control over their health feel guilty when they cannot eat healthy foods like functional foods.

> *There's a lot of advertising about obesity and all that, especially with the children and that's done that over the last few years. It's like it's been a really big thing to get people to eat healthy. You've got commercials of people telling you to eat healthy and then you've got commercials and ads say come to Hungry Jack or Big Macs and have $2 meals. I think it's really sad out there now because the take-away places are making it easier for people to eat junk and it's hard for the families that don't have a good regime and ideas of fitness and healthy, it's just easier for them to pull into a take-away place and have take-away food than maybe boil some vegies and things like that.* (Ang-R)

Table 20 Memo for Self-control

Self-control
As consumers grow older, they fear of losing their physical and mental ability, and confidence to perform a daily task which would make them worried about their independence or control over their personal activities. If they are not fit, they will have to be dependent upon others for most of their basic things. Consumers want to stay in control of their basic activities, avoid being dependent upon others and thus perhaps start eating more functional foods to keep fit.

Source: Developed for this study

4.5.2 Cultural predisposition

In the context of this study, cultural predisposition means the deeply ingrained, preoccupied, cultural notion in one's mind that influences every way of eating foods or functional foods. The disposition arising from a consumer's culture can consciously or subconsciously change their functional food perceptions. Consumers are possibly biased towards functional foods common in their culture. Consumers readily accept functional foods from their culture and perceive them to be tasty, while consumers from other cultures may not consider the same food as delicious. The lifestyle, beliefs and stories in a culture seemed to be influencing how consumers viewed a particular functional food. For instance, consumers from a culture that seeks high-context communication would search and scrutinise how functional foods were prepared, and they would question themselves as to whether they need functional food and whether it is worth buying or not? To sum up, they tend to be more rational. While they scrutinise this information, they always compare the information they gain with the functional food habits they believed for a long time, the one that is popular in their culture. A need for consistency and the traditional beliefs of consumers are two values that give rise to cultural predisposition affecting negotiation of functional food values.

Table 21 Memo for Tradition*Cultural predisposition*Negotiation

Tradition*Cultural predisposition*Negotiation
Storytelling seems to build a particular way of eating foods, and later people find it difficult to go away from that story. This disposition makes them more biased towards values established through those stories that were passed from generation to generation. Therefore, stories or information passed from generation to generation raises consumer's need for conforming with traditional values which eventually affects how they negotiate the values of functional foods.

Source: Developed for this study

4.5.2.1 Need for consistency

Consumers seek functional foods that are consistent with their usual food habits. Accordingly, consumers from different ethnic groups have their own way of cooking and eating foods. They expect functional foods to fit with their fundamental ways of cooking or eating foods. For example, one of the Indian participants (Ind-Su) said that she could not eat avocado without adding some spices to it. Consumers also use foods of a non-functional nature that they usually eat as a benchmark for comparing the taste and health values of the functional foods. This was the case with one of the Chinese

participants who said that brown rice is not as sticky as the regular rice they eat. Indian participants reported that if they happen to eat brown rice, they would eat only basmati brown rice, as they usually would eat white basmati rice. So, it seems that foods that are closer to the taste and characteristics of the usual food consumers eat are likely to be perceived as tasty. Consumers are anxious to try new food, and thus they would choose a more familiar functional food:

> *I eat whole grain bread, toast. We'll eat instead of the white. You know the white toast. I [inaudible 00:03:48] bought the whole grain bread. I ate wheat, because I'm originally from China. [inaudible 00:04:02] without that, it's good to cook some porridge of different grains. Like, you could cook some wheat porridge or sometimes you also put potato, not potato, but sweet potatoes into this porridge, because sweet potatoes are also a kind of food promoting health. I think also can help a lot of fibre.* (Chn-C)

Table 22 Memo consistency

Consistency
When consumers are at the young stage, they look at their parents, father and mother, they want to be like their parents, as their parents are the head of the families. So, if the head of the family eats functional foods, they tend to eat functional food and if unhealthily then they would eat unhealthily. Children sub-consciously would perceive that eating (unhealthy/healthy) would make them like their parents. But, when they reach an age where they are confident enough to make their own decisions and choices, they may try to eat healthy, but it might be too late for some to be able to change that habit they have picked up or they do not want to avoid that comfort or certainty of eating the things they are used to. They happen to seek foods consistent with what they have always been eating.

Source: Developed for this study

4.5.2.2 Tradition

Tradition develops a strong predisposition in consumers towards certain food. The Chinese healthy food concept was found to be influenced by the concept of hot and cold from traditional Chinese medicine. Traditional Chinese medicine is based on the concept of yin and yang, which means every dimension of a natural world has a dual aspect: Yin means cold, and Yang means the opposite. The concept of hot and cold is also highly influenced by the concept of humours from Buddhism (one of the widely followed religions in China). The concept means that the human body has four

conditions—heat, cold, wet and dryness—and one must keep a balance of these four conditions for good health. Therefore, traditionally Chinese have been placing foods into categories of hot and cold foods. Chinese participants preferred eating cooked and warm foods and thus avoided eating cold salads with functional foods. Anglo-Australian participants easily accepted raw and cold functional foods. Indian participants were also found to be influenced by this traditional concept of hot and cold food. The Indian participants were found to be influenced by the Ayurveda as well. Functional foods were chosen, based on whether they fitted with the traditional way of cooking food or not. Some of the functional foods such as kale did not go well with traditional cooking. When one of the Indian respondents tried cooking it, he found that it ruined the flavor and texture of the meal. Chinese participants also mentioned how foods with certain shapes are considered beneficial to the bodily organs with similar shapes.

> *[Because], I am still Chinese, [I do not like eating salad as the western people do]. For me, just, [I] still use Chinese cooking style, but just more green vegetables. Different kind of vegetables in one meal, that's just for I use Chinese cooking style [which is] not like eat salad. [May be boil or stir fry in just Chinese style and lots of vegetables]*. (Chn-W)

> *Yeah, because to our culture, I believe that we have very, because foods are very important in our culture. We have different methods of cooking foods, no matter if it is meat or vegetables. We were also taught that different food has different functions. Like, there are four seasons in a year. Yearly, for example for summer, in summer, because your body, due to the temperature, you're very dry in summer in China, especially in my hometown, Northern China is very hot and dry in summer. The hot and dry temperature raising of the weather and cause the body to appear [inaudible 00:39:35] and can [inaudible 00:39:37] of the body, leading to dry skin and constipation and some other health issues. It is good to eat some food with cooling nature such as watermelon, pear, cucumbers, spinach and beet and whole wheat or whole grain foods.* (Chn-C)

The Anglo-Australian participants mentioned about the traditional concept of one meat and three veggies, which seems to influence how they try to eat functional vegetables in their meal.

4.5.3 Functional food motives

The term motives refer here to the motivations or reasons for consuming functional foods. The motive of functional food consumption can be fulfilling one's need for stimulation through eating different functional foods, need for security in terms of health, need for conformity with society, adhering to peer-group norms, and so on. These needs will be discussed in more detail in the following section. The stronger the motives for functional food consumption, the more likely consumers are going to consume functional food despite not liking the taste of it. Strong motives for consuming functional foods may overcome any cultural predisposition holding consumers back from eating functional foods and may even help them persevere with eating more functional foods.

4.5.3.1 Need for stimulation

Consumers need for stimulation is when they seek excitement and thrill from their actions. Consumers who like stimulating experiences try new kinds of foods, irrespective of the taste of the food. Such consumers try functional foods to gain a new experience. Some consumers eat a variety of foods which increases the chance of them including functional food in their list. These stimulation-seeking consumers will find several creative ways of eating functional foods even if they are not tasty, but the reason for eating functional food is not about health. These consumers merely want to experience different kinds of taste and behaviour. For these consumers, variety and excitement are a way of expressing themselves. They can readily accept functional foods from other cultures.

> *It's just really tasty, yeah; it's good for you and it just bumps the salad up or the burger up to another level, or toasted sandwich, it just makes it so much nicer. Well, I think the blueberries if you like have Weet-Bix and stuff, you can put some blueberries or any berries on the top and it just gives you another texture, another behaviour. It gives you that healthy-like sweetness rather than putting lots of sugar on, so it replaces the sugar or whatever plus it makes you fuller.* (Ang-R)

It depends on what I have eaten over the last few weeks, and what seasonal veggies are for the next few weeks then buy them. Already we have had leafy veggies, and actually I have not been to the market the last two to three weeks. So, whatever is coming up I will buy them this time, and then the next time it depends on what I have left, or what I have eaten in the last few weeks, that will make me decide. I need a change. I have not had those beans, and the summer time is coming up so it will be like a change of veggies that will be coming up with new veggies in the market. (Ind-S)

Table 23 Memo for stimulation

Stimulation
Consumers eat food for stimulation. The consumers who seek stimulation out of food may usually eat tasty and behaviour some food irrespective of if it functional or not. On the other hand, if consumers have had learned functional food during a stimulating environment, they tend to pick up that food later. For instance, they ate functional food when they were having an exciting time with friends or having fun or had some good experience associated with functional food earlier in life. Consumer stimulation-seeking behaviour leads them to try new functional foods as this increases the likelihood of getting introduced to different functional foods and continuing them. This would even make consumers seek functional foods from another culture which they think is not quite common in their culture. And such trying can break other barriers and feel more comfortable with try the functional food next time. This learning eventually builds a habit of eating that functional food in them.

Source: Developed for this study

4.5.3.2 Need for security

Participants liked to avoid uncertainty and feel secure about their present and future. This value was found to be influential in other aspects of human life such as functional food consumption. Due to the need for security, consumers demonstrate positive affinity towards healthy foods like functional foods. Now the question is how urgent the need for security is. Some consumers may just think a day or two, while some consumers may think a year or several years ahead. The consumers who think of security for a day might think of functional foods that keep them active and fit for the day only, while consumers who look at long-term results eat functional foods to avoid long-term complications and diseases. Consumers, who already have health issues or who are at the brink of having health issues, accept functional foods readily although they are not tasty. Some consumers eat functional foods to prevent health complications, which is a preventive approach, while some choose functional foods

because they have already suffered from certain health complications, which is a reactive approach. However, both cases indicate that consumers' need for security motivates them to eat functional foods.

> *Also, quite often the whole grain foods, or the whole grain bread, a bit more expensive than the white toast, right here. Do to the price factor, and, also the taste of the bread, I didn't really purchase. But from about 2015, I think, I started to, mainly from eating full grain bread, rather than just the normal whole grains, normal bread, or white toast or oatmeal, [crosstalk 00:09:18] toast. Yeah, because the reason I have. I did one haemorrhoid surgery in 2008, earlier 2008, before I came to Australia. I thought that I would get rid of, I already get rid of the haemorrhoids or the problem. After 2014, due to some bad life of working habit, I again, I got the haemorrhoid issue. I started to consume the fibre rich, and, also whole grain food again. Now I continue to buy whole grain bread, even it sometimes it doesn't taste that good.*

Table 24 Memo for the need for security

Need for security
Consumers eat healthy food to feel secure. They don't exactly know what is going to happen to their health in the future, so, to avoid that uncertainty or feel more secure, consumers eat healthy foods, and the ones who have a high degree of uncertainty avoidance nature, they tend to eat more functional foods, and treat all functional foods equally because they find all functional foods similarly important.

Source: Developed for this study

4.5.3.3 Need for conformity

Participants were found to want to conform to their social groups during the consumption of functional foods. They reported that when they are in social groups, they try to eat functional foods that are acceptable to the group. Participants even mentioned that they try to avoid any functional foods with a strong smell while with their peer groups. The longing for connectivity with social groups was so high in some participants that they would compromise taste and other values and accept functional foods to be in the group. For the group of participants who were working, it was quite challenging to maintain a balance between health, personal life, and work life. Now, functional foods should be compatible with the lifestyle of this group of working

participants. Any functional food that takes a lot of time to prepare was avoided during work hours or working days. The consumers while eating in a group, are likely to eat functional foods from the dominant social group to assimilate themselves into that dominant group. Therefore, the need for conformity is another reason why consumers eats functional foods, or the factor that influences the negotiation between taste and health values offered by functional foods.

> *I'm from Asian country so we've got different menu, different diet, Australia is a western culture. I like to blend them into the culture, like, you should be able to eat it – you may not like it, but you should be able to eat it.* (Chn-Z)

4.6 Proposed theoretical framework

The following is the theoretical framework developed from the qualitative analysis. Through the Grounded theory method, the study revealed that the negotiation of sensory and health values in functional food, and whether such negotiation will result into functional food perception is dependent upon the level of perseverance consumers are ready to put towards functional food, their cultural predisposition, motives of functional food consumption.

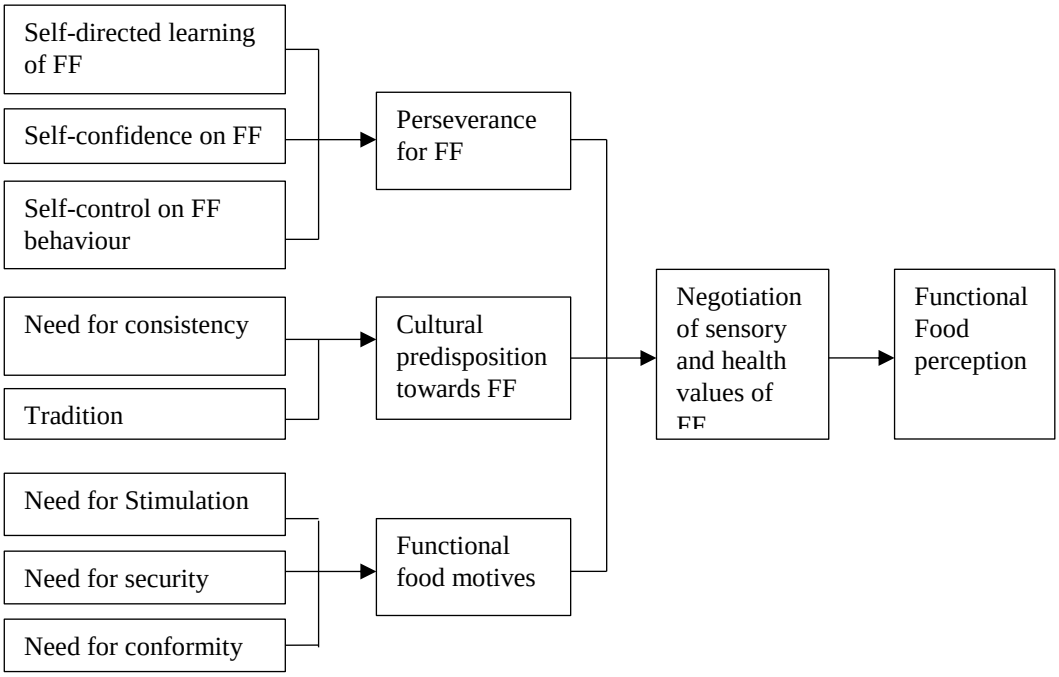

Figure 8 Proposed theoretical model for functional food perception

Perseverance is the level of effort consumers are prepared to put into learning, searching and accepting. Cultural predisposition is how someone prefers to behave in a certain way due to his/her culture that is ingrained deep into their minds. Cultural predisposition makes people behave in a certain way or demonstrate a certain attitude to specific circumstances, situations or objects. Functional food motive talks about the reasons or motivations for eating functional food. The three factors -*Perseverance, cultural predisposition, and motives of functional food consumption* could be either convergent and discriminant depending on the situations. The ideal situation for functional food consumption would be when the motivations are high, and perseverance level is high and functional food fits well with the culture. However, there can be situations where one of the other factors is weak, and functional food perception is more influenced by the strength of the rest of the factors. When motives are strong enough, consumers may not necessarily wait or feel a need to learn about functional foods nor do they worry about the fit of a functional food with their culture. When functional food is a culturally well-accepted food, consumers may not necessarily need strong reasons to eat them or need to learn much about them. The three factors complement and contrast each other in different situations. Therefore, it seems that the elements do not act in isolation or a simple linear relationship may not be enough for explaining the structure of the variables and needs further exploration. This conceptual framework has been developed based on the limited qualitative inquiry providing a general representation of the variables underlying functional food perception and their structure. The causal relationship between the variables in the framework still is at a crude stage and needs further exploration. But at this stage researcher aims only further to assess the existence of the variables through quantitative inquiry.

4.7 Discussion

The theoretical model proposed based on the qualitative study in this research is a simplistic representation of a complex phenomenon of functional food perception based on cultural values. Functional food perception is found to be depended upon the cultural values promoting ‘openness to change’ or ‘conservation’ (Schwartz 2017). Functional food perception is determined by the negotiation of health and sensory values of functional foods. Whether consumers will compromise sensory or health values depends upon the level of perseverance, cultural predisposition, and the

motives for functional food consumption. The predisposition to culture is derived from consumers' need for being consistent with their traditions or their past behaviours associated with functional foods. Tradition and consistency are cultural values of conservation (Schwartz 2017; Guadagno & Cialdini 2010). Such predisposition to culture seems to explain the reason why earlier researchers found consumers sought for familiarity in functional foods (Luckow et al. 2006; Niva & Mäkel 2007; Messina et al. 2008; Grunert et al. 2009; Lampila et al. 2009).

Urala and Lähteenmäki (2004) believe that functional food perception depends upon the reasons for consuming functional foods. The motives of functional food consumption in the given model (Figure 5) represents the underlying rationale (needs/wants) for using functional foods. This study found that need for stimulation, need for conformity and the need for security are some of the motives affecting functional food perceptions. These motives are derived from the individual cultural values- stimulation, conformity and security. Stimulation is a cultural value of openness to change while security and conformity are cultural values of conservation (Schwartz et al. 2017). The need for stimulation would potentially make functional food consumers open to adopting different functional foods while conformity and security make one conservative to change (Schwartz et al. 2017). The consumer's goal behind the need for security is safety, harmony, and stability of society, of relationships, and of self (Schwartz 1992a; Schwartz & Bardi 2001). Security can be a conservative factor in case consumers want to conform with their society and maintain social security but when it comes to health security, it makes consumers open to more functional foods. The consumers in the study sought functional foods as a measure of prevention from diseases or for reducing the anxiousness of illness or avoiding bodily discomfort, or keeping themselves active, or to minimise the impact of existing health problems. Avoidance of disease or seeking good health could be a manifestation of consumers seeking safety. Health enhancement has already been established as a reason to consuming functional foods by multiple researchers (Ares et al. 2008b; Krutulyte et al. 2008; Krystallis et al. 2008; Siegrist et al. 2008; Azzurra & Paola 2009; Annunziata & Vecchio 2011, 2013). The need for security among participants in this thesis ranges from general well-being and avoiding specific diseases in future to reducing the impact of existing health problems. Krutulyte et al.

(2008) and Annunziata and Vecchio (2013) were also of the view that consumers are attracted to functional food that provided general health benefits.

Cultural predisposition inhibits change or acceptance of new functional foods while perseverance emphasises learning leading towards openness to change. Whether consumers will eat functional food despite not liking the sensory properties is determined by the level of perseverance they can exhibit. Perseverance here means the level of effort consumers are ready to invest in order to learn and focus on long term goals (Duckworth et al. 2007). Persevering consumers are ready to invest more time and effort in searching, learning (self-directed learning) and endure (self-control) functional foods for long term health benefits. Self-directed learning promotes openness to change (Schwartz 2017) making consumers open to more functional foods. Self-directed learning makes consumers more familiar to the functional foods and the benefits and increases their confidence to use those foods. Confidence in functional foods was found to be one of the predictors of willingness to use functional foods by Urala and Lähteenmäki (2004) as well.

Although consumers have learnt about functional food and are confident about functional foods, they may not be able to continue learning and eating functional foods unless they have self-control. Self-control makes consumers more determined and increases their ability to continue eating a chosen healthy food. Through self-regulation, they set a goal and make a rule or discipline themselves to achieve that goal (De Vet et al. 2014). Self-control increases one's self-esteem, inhibits anti-social impulses and encourages conformity to the norms of the group life (Freud 2015; Tangney et al. 2018). It is likely that perseverance would lead consumers to accomplish their goal of eating functional foods, and the need for consistency would make them consistently interested in the same functional food over time. Perseverance and consistency are believed to be the breadth and depth of interest (Christensen & Knezek 2014).

In the past, cultural values mastery vs harmony has been found to influence functional food perceptions (Bech-Larsen and Grunert 2003). The cultural value 'mastery' encourages one to master, change or direct the natural and social environment with the aim of achieving personal or group goals; whereas, 'harmony' promotes acceptance

of the social and natural world as they are and trying not to change them (Schwartz 2008a). The perseverance construct in the model (Figure 5) could be the antecedent of the mastery value, driving consumers to master functional foods through self-directed learning, self-confidence and self-control.

The perseverance factor in the model developed in the study is closely related to the *perceived behavioural control* factor from the theory of planned behaviour (TPB). The TPB notes that consumers' intentions depended upon the perceived behavioural control, which means consumers' perceived ease or difficulty in performing an activity (Ajzen 1991). The perceived behavioural control increases if a person perceives that they have more resources and confidence (Ajzen 1985; Hartwick & Barki 1994). The functional food consumers could be trying to increase their perceived behavioural control by accessing and controlling information about functional food through self-directed learning and developing more self-confidence. The cultural predisposition is related to the *subjective norm* construct from TPB. The subjective norm is one's belief about how one is expected to behave in a situation: what is desirable and what is not. It refers to the social environment around the behaviour (Ajzen 1985, 1991).

4.8 Conclusion and limitations

The qualitative stage of this research aimed to explore whether there is a relationship between consumer's cultural values and their functional food perception; and if there is a relationship, what cultural values affect consumer perceptions of functional foods? How do these cultural values affect consumer perceptions of functional food? How do consumers' demographic characteristics affect the relationship between their cultural values and functional food perception?

The data collected through in-depth interviews followed by constant comparative analysis of the interview data has revealed that there is a relationship between the consumer's cultural values and functional food perception. The cultural values such as stimulation, security, conformity are ingrained into consumers motives of functional food consumption, influencing the negotiation of sensory and health values; and the negotiation of sensory and health values determines the functional food perception. Cultural value conformity and tradition combine to form a cultural predisposition factor affecting the negotiation of sensory and health values. Similarly,

the cultural value self-directed learning combined with the values self-control and self-confidence form the perseverance factor influencing negotiation of sensory and health values in functional food. The perseverance towards functional foods, cultural predisposition, and functional food motives are the three competing forces influencing the negotiation of sensory and health values, and eventually the functional food perception.

This study has provided a theoretical model for functional food consumption emphasising cultural values. It has attempted to fill the gap in the extant literature about the relationship between culture and functional food perception. The developed theoretical model is closely related to the theory of planned behaviour or could be considered as an extension of the theory of planned behaviour developed in the context of functional food perception. The findings have further strengthened the Schwartz model of cultural value dimensions and confirmed that the values such as security, stimulation, conformity, self-directed learning, tradition are prevalent in the study sample; although, the study included only three ethnic groups. The limitation of the study is that it includes only three ethnic groups when there are more than 200 ethnic groups in Australia. The respondents from the three ethnic groups have been living in Australia for some time, and they might have accultured to the dominant culture which is ignored by this research. The research assumes that the three ethnic groups are a unique group while it is very likely that the values from one culture might have permeated through the boundaries of the other ethnic groups while living in Australia.

The data in the study include in-depth interviews only. The consumers' non-verbal responses, and the observation of the interview context, and other situations during the time of the interview could also reveal information that the participants didn't mean to express or could not express through words. Although the interviews were taken in stages depending upon ongoing analysis, the participants were recruited from within the predetermined inclusion criteria, which means the theoretical sampling was not applied to a full scale. The latent variables proposed by the qualitative inquiry can be a good starting point for understanding the influence of cultural values on functional food perception and the underlying structure, but it needs more rigorous testing before generalising to the population of study.

Chapter 5: Development of research instrument

5.1 Introduction

Chapter four proposed that functional food perception involves an interaction of 13 latent variables. However, the proposed model is at an early stage and the variables, and their structure needs further assessment. It is essential first to prove through empirical methods whether the variables exist or not. These variables are based on the exploratory analysis of the qualitative data and, so, they need to be further tested through empirical study or, put another way, these variables are guiding factors for developing an instrument for the quantitative stage.

Although construction of the questionnaire is part of the methodology, it is discussed in a separate chapter due to the process being extensive and rigorous — this chapter outline how survey items for measuring each variable in the model were prepared. In the next stage of the research, the quantitative phase, factor analysis is used to test the structure underlying the survey items. The survey questionnaire was not only based on the qualitative data, but some relevant questions from pre-existing instruments were also adapted and incorporated to make the instrument stronger. The following are the research propositions set for the quantitative stage of the research. These propositions reflect the variables identified in the qualitative phase of the study.

RP1. Functional food perception involves the negotiation of sensory and health values offered by functional foods.
RP2. Consumer perception of functional food is influenced by the perseverance of consumers towards functional foods.
RP3. Consumers' self-directed learning of functional food influences their perception of functional foods.
RP4. Consumers' self-confidence on functional food influences their perception of functional foods.
RP5. Consumers' self-control on their behaviours associated with functional food influences their perception of functional foods.
RP6. Consumers' cultural predisposition affects functional food perception.
RP7. Consumers' need for consistency affects functional food perception.

RP8. Consumers traditional beliefs about functional foods affect their functional food perception.

RP9. Functional food perception is influenced by consumers' motives for functional food consumption.

RP10. Consumers need for stimulation affects their functional food perception.

RP11. Consumers' need for security affects their functional food perception.

RP12. Consumers' need for conformity affects their functional food perception.

5.2 Preparation of survey instrument

5.2.1 Scale of measurement

The survey questionnaire was based on a 7-point Likert scale of agreement where 1 = strongly disagree, 2 = somewhat disagree, 3 = disagree, 4 = neither agree nor disagree, 5 = agree, 6 = somewhat agree, and 7 = strongly agree. The seven-point Likert scale is believed to more reliable and internally consistent than scales with fewer categories (Symonds 1924; C Preston & Colman 2000). It is also believed that the span of an immediate memory of human being is seven and humans can absolutely judge and distinguish seven items at a time, and so an increase in response categories above seven could be problematic (Miller 1956). The research is in a new area, functional food behaviour, and researcher was not sure about how precise consumers would be regarding their expression of functional foods. A seven-point scale offered more options for participants to choose from and it may have increased the variance in responses.

5.3 Operationalisation of the questionnaire

The following section describes the preparation of the questionnaire for the quantitative study. Content analysis was used for the operationalisation of the survey. The aim was to develop questionnaire items that measured the latent variables in the framework. The researcher went back to the qualitative data analysis records to retrieve the codes under each latent variable. The variables, the codes under each variable, the text coded under each code, and the linked memos and annotations were grouped accordingly in a table. The researcher looked under each variable for the words and phrases in the interview responses (coded text) that showed the different dimensions or nuances. The objective was to detect the actions and expressions of respondents that underpinned a notion of each of the variables from the framework.

The words, phrases and actions from these sources that were most closely aligned with a variable in the framework were used to form a relevant survey question. The idea behind using the codes was that because the code names were based on the action in the text or incident, they had a conceptual meaning lying behind. Moreover, the codes reflected the researcher's inference drawn from the interview texts. The coded text is the actual responses of the interview participants and it helped the researcher to remain grounded in the data. However, the researcher also used some items from the literature if they fitted with the latent variables or added value. The researcher transferred all the codes and coded text for each variable onto a separate table. The researcher then highlighted the relevant wordings or phrases from the qualitative data analysis and literature and modelled them into survey questions.

5.3.1 Questions for demographic characteristics

There were two sections in the survey questionnaire. The first section was about demographic characteristics, and there were five questions, D01 to D05. The questions were about age, gender, annual income, ethnic group and education (Table 25).

Table 25 Questions about demographic characteristics of the respondents

D01. What is your age group?	18–50	
	51–70	
	70 years and above	
D02. What is your gender?	Male	
	Female	
	Indeterminate/Intersex/Unspecified	
D03. What is your annual income level?	Nil	
	0 – $18,200	
	$18,201 – $37,000	
	$37,001 – $90,000	
	$90,001 – $180,000	
	$180,001 and over	
D04. Which ethnic group do you belong to?	Anglo Australian	
	Indian	
	Chinese	
	Other, please specify…….	
D05. What is your highest level of education?	Postgraduate Degree Level	
	Graduate Diploma and Graduate Certificate Level	
	Bachelor degree Level	
	Advanced Diploma and Diploma Level	

	Certificate Level	
	Secondary Education	
	Primary Education	
	Pre-Primary Education	
	Non-award courses	
	Miscellaneous	

Source: Questionnaire prepared for this research

The age groups were adapted from those used in the Australian Dietary Guidelines. The gender grouping was adapted from Sex and Gender Classification in Australian Government Records as published in the Australian Government Guidelines on the Recognition of Sex and Gender. The income groups were adapted from the income groups used by the Australian Taxation Office. The ethnic groups were chosen purposively as the research was designed to compare these three ethnic groups. The level of education was the same classification used by the Australian Bureau of Statistics.

The second section of the questionnaire contained questions about consumers' functional food behaviours. There were 74 questions in the first version of the survey. The questionnaire also included background information about the research, and information about functional food.

5.3.2 Pre-testing of the questionnaire

The survey questionnaire was subjected to a pre-test. The questionnaire was sent to my research supervisors and an expert from the Statistical Consulting Unit. Three individuals of Indian background were personally asked to fill out the survey and give their feedback. The statistical expert suggested that the survey was too long, and redundant questions should be either removed or reworded.
Some of the feedback received from the pre-test was:

1. Questions related to motives were redundant.
2. The questionnaire lacked clear instructions on whether to tick or circle.
3. Two female respondents found the questionnaire well-timed, said can be completed in less than 20 minutes.
4. Male respondent took more time than female but did finish within 30 minutes.

5. The background seemed to be a little long, as one of the respondents spent relatively more time reading the background.
6. The respondents found the questions clear and understandable.

The researcher went back to the data and relevant codes and interview texts to find a better way of rewording the redundant questions. During the process, the researcher constantly compared each question with another question in the group, and then reworded or removed redundant questions. The researcher tried to reduce the number of items in each group to four or five. The second version of the questionnaire was then drafted. This version was an improved version of the first version. No change was made to the demographic group of questions. The second section (functional food behaviour) contained 58 items which mean 16 questions were removed from the earlier version. The second version of the questionnaire was subjected to a pilot test.

5.3.3 Pilot Study

A short pilot study was undertaken using the second version of the questionnaire. The online version of the survey was made using the Limesurvey platform. The respondents for the pilot study were purposively recruited from the researcher's personal contacts and from snowballing. The survey link was posted on the Facebook page of Indian Community in Queensland with the permission of the administrator. The research aimed to collect 600 responses for the main study, and therefore, the aim was to recruit at least 60 (10% of the 600) for the pilot study. The questionnaire was completed by 62 respondents; however, seven of them did not mention their ethnicity but completed the rest of the questions in the survey.

Table 26 Frequency distribution of data from a pilot study

Which ethnic group do you belong to?			
		Frequency	Per cent
Valid	Anglo Australian	11	17.7
	Chinese	20	32.3
	Indian	24	38.7
	Total	55	88.7
Missing	System	7	11.3
Total		62	100.0

Source: Pilot data analysis in the study

A frequency of responses for each question was calculated using IBM SPSS 25. The Cronbach alpha value for the items of each variable (sub-section) was calculated. The researcher then assessed the scalability, the variation in responses, words used in the questionnaire, and the Cronbach alpha value for each group. The items with low variation and low Cronbach alpha values were either reworded or removed. The researcher left the questionnaire as it was for some time and came back after a couple of days which helped the researcher to see the nuances in the survey questions and reword them more appropriately. All this helped to improve the questionnaire.

5.3.4 Questions about self-directed learning of functional foods

The questions about self-directed learning were constructed based on the qualitative data and items on self-directed learning from the Portrait Value Survey (PVQ-RR) (Schwartz 2016). The item 'SQ1 It is important to him to figure things out himself' is adapted from item number 39 of the PVQ-RR. PVQ-RR had items such as ,'It is important to him to form his views independently,', 'It is important to him to develop his own opinions', 'It is important to him to plan his activities independently', 'It is important to him to be free to choose what he does by himself', 'It is important to him to make his own decisions about his life'. These items were compared with the interview texts and codes in the qualitative data, and SQ02, SQ03, and SQ04 were worded in such a way that they reflected both the notion of self-directed learning and functional food perception. The reason for adopting the one item (SQ01) from the PVQ-RR was because later it would be easy to define any item similar to this item. There were four items in this construct. The Cronbach's alpha for this construct was 0.745 and the Cronbach's alpha based on standardised items was 0.765, which is an acceptable value for Cronbach's alpha. Statistically, there is no need to make many changes in these items. Looking at the frequency distribution on each item, the responses were seen to be more on the higher side or more agreement side. The responses chosen from options 1 to 7 were either 4 or more than 4. Reducing the response bias was important. The use of a word like 'it is important' could have led respondents to believe that the items are essential, and they should score high on those items. The questions were reworded with less use of such words or phrases. A more refined set of items was made for this construct for the parent study.

Table 27 Questions about self-directed learning before and after a pilot study

Before pilot study	After pilot study
SQ01. It is important for me to figure out things myself.	SQ01.It is important for me to figure out things myself.
SQ02. It is important to figure out myself what functional foods to choose or not to choose.	SQ02. I would prefer to figure out myself what functional foods to eat.
SQ03. It is important to self-learn about health benefits from functional foods to accept functional foods.	SQ03. I like to search for information about functional foods.
SQ04. I am interested in searching for and learning about functional foods.	SQ04. Learning by self makes easier to decide what functional foods to eat.

Source: Developed for this study

5.3.5 Questions about self-confidence on functional foods.

For the self-confidence questions, researcher referred to the qualitative data and consumer self-confidence items developed by Hardesty et al. (2001). The questionnaire by Hardesty et al. (2001) had a section for information acquisition, including items such as: 'I know where to find the information I need prior to making a purchase, I know where to look to find the product information I need, I am confident in my ability to research important purchase, I know the right questions to ask when shopping, I have the skills required to obtain needed information before making important purchases'. These items were compared with codes from the qualitative data such as *Being sceptical about the production and marketing of functional food leading to avoiding functional food, carried away by less credible sources* of functional food information although liked the taste of it, *Encouragement from peers* giving the confidence to try functional foods, *Validation of functional food from multiple sources* leading to consuming functional food. Four items, SQ05–SQ08, were constructed for consumer self-confidence of functional foods. The questions were influenced to some degree by Hardesty's items about information acquisition and the emphasis on the notion of consumer confidence relating to functional food and having confidence in the sources of information. The Cronbach's alpha for this construct and the Cronbach's alpha with the standardised item were 0.745 and 0.748, which is an acceptable value. There was very little to revise in these items. However, the responses were found to be more agreement than disagreement. This response bias could also have been because the pilot study had more Indian participants than the other two ethnic groups. Also, as previously mentioned, words such as important could have caused some level

of response bias. The slight refinement of the items further enhanced the reliability of the survey.

Table 28 Questions about self-confidence before and after a pilot study

Before pilot study	After pilot study
SQ05. It is important for me to know trustworthy sources of functional food information.	SQ05. I would prefer to know the trustworthiness of sources of functional food information.
SQ06. I feel encouraged to try functional foods suggested by my peers.	SQ06. I feel encouraged to try functional foods suggested by my peers.
SQ07. I cannot trust functional food information based on a single source.	SQ07. I would refer to more than one sources for a functional food information.
SQ08. It is important for me to verify functional food information posted on a social forum.	SQ08. I cannot rely on functional food information posted on a social forum.

Source: Developed for this study

5.3.6 Questions about self-control in terms of functional foods.

In developing questions about self-control, researcher referred to the tempest self-regulation questionnaire for eating (TESQ-E) (De Vet et al. 2014). The questionnaire had different items about temptations and controlling temptations. The items—'I have an agreement with myself about how many candies I can have per day, I use willpower to stay away from unhealthy snacks'—were specifically chosen from the self-regulation questionnaire. Further, I referred to items on the Brief Self-control questionnaire by Lindner et al. (2015). The items— 'I am good at resisting temptation', 'I wish I had more self-discipline', 'Sometimes I can't stop myself from doing something, even if I know it is wrong'—were chosen from Lindner's questionnaire. The following were the some of the relevant codes chosen from the qualitative data: Ability or compulsion to follow a routine habit or commitment to a routine habit increase compliance with; Lack of planning and willpower causing consumers to make impulsive decision to choosing junk foods; Families lacking discipline being driven by convenience and taste of unhealthy foods, lack of control over one's emotions leading to less; Control over one's priorities making easy to switch. Similarly, some relevant texts from within the codes were also selected for the preparation of questions for this item such as '*We've always maintained a healthy regime and stuff like even though there's lots of things out there that you can get, we*

went on holidays, and just haven't gotten into the routine again, when I go out I eat what tempts me but when I eat at home I always think about if it's healthy food; having a willpower'. Comparing the items from the two literature, and the codes and the texts, five items were initially prepared and eventually reduced to four items (SQ9–SQ12) after the pilot study.

There were some minor issues with these items. The Cronbach value was 0.643 which was still acceptable because 0.5 to 0.7 are considered moderate consistency. The Cronbach value was also checked when an item was deleted. When any of the items were deleted, the Cronbach values decreased which is statistically sound. Then the inter-item correlation was evaluated. Items 10 and 13 had week correlation with item 09. Item 09 was a previously tested item in the literature. So, it was reliable to check correlations with item 09. Item 13 was removed. Item 10 was reworded. Item 11 was reworded because a few respondents during the pilot study found difficulty in understanding the wording in this item.

Table 29 Questions about self-control before and after pilot study

Before pilot study	After pilot study
SQ09. It is important for me not to lose control of myself.	SQ09. It is important for me not to lose control of myself.
SQ10. I feel guilty if I don't eat functional foods.	SQ12. I feel guilty if I don't have any healthy food like functional food for some days.
SQ11. A health regime would make it easy to eat functional foods.	SQ10.It can stick to functional foods if I am doing fitness training.
SQ12. I can't resist eating what tempts me.	SQ11. I don't think of foods like functional foods when I go out for a dinner.
SQ13. One should have the willpower to eat functional foods.	

Source: Developed for this study

5.3.7 Questions about consistency in terms of functional foods

For the construction of questions about consistency with respect to functional food perception, I referred to the literature and the qualitative data. The Preference for Consistency Scale prepared by Cialdini et al. (1995) had various items relevant to consistency, but only a few were relevant such as: 'It is important to me that those who know me can predict what I will do, I don't like to appear as if I am inconsistent', I typically prefer to do things the same way'. Item 12 (I typically prefer to do things

the same way) from the Cialdini's consistency questionnaire was adopted as a question (SQ13). This item was considered as a core item that would help to define any other similar items after the factor analysis. The remainder of the items were designed, incorporating the notion of functional food and consistency. The interview text: '*I don't think this bread tasted good compared to the whole grain foods in China, I used to eat the same thing every day, I knew I liked it, because I was raised on those foods, you have to grow up eating it to like it.*' was compared with the items from the literature mentioned above. Items SQ14 to SQ16 were constructed by incorporating the meaning of the underlined words from the qualitative data emphasising the notion of consistency as reflected by the literature items. The Cronbach value was 0.734 which is good. There was nothing significant to change in these items. However, item 17 was deleted, resulting in the Cronbach value rising to 0.783 which indicated higher internal consistency. Item 17 also had a weak correlation with item 14 which is a checkpoint in this construct. Rather than deleting this item, rewording it was considered to be more fruitful. The remainder of the items were left as they were.

Table 30 Questions about consistency before and after pilot study

Before pilot study	After pilot study
SQ14. I typically prefer to do things the same way.	SQ13. I typically prefer to do things the same way.
SQ15. I would cook functional foods the way I usually cook my foods.	SQ14. I would cook functional foods the way I usually cook my foods.
SQ16. I prefer functional food with a familiar taste.	SQ15. I prefer functional food with a familiar taste.
SQ17. I would prefer to eat the same functional food on most occasions.	SQ16. I would not prefer to eat functional foods with a strange smell.

Source: Developed for this study

5.3.8 Questions about traditional beliefs in terms of functional foods

Four questions were constructed about traditional beliefs (SQ17 to SQ20). Item SQ17 was adapted from the question— 'It is important to him to maintain traditional values and ways of thinking'—from the PVQ-RR. The word *him* was changed to the word *me* to fit with the questionnaire design. The item SQ19 — 'I think information passed from generation to generation is a trusted source of information on functional food'– was adopted from Hassan's questionnaire (Hassan 2008). The other two items, SQ18 and SQ20, were based on the codes from the qualitative data of this research. The

following codes were referred to while constructing these two items: 'Eating functional foods that are traditionally believed to be healthy and beneficial, 'The traditional concept of hot and cold food influence functional food perception, 'Believing in the traditional concept of food treatment for prevention leading to eating functional foods, 'Believing own traditionally cooked foods as healthy and nutritious. Before the pilot study, there was one more item (SQ22) in this section: 'I do not trust traditional beliefs when it comes to functional food decisions'. This item was prepared as a reverse of what other items were asking but was removed after the pilot study due to problematic responses from the participants.

The Cronbach alpha values for these items was 0.622. If item 22 was deleted, the alpha was 0.814. Item 22 also had a weak negative correlation with item 18. Item 18 was an item from the literature that was tested for *traditional belief*. Due to all these factors, it was deemed necessary to remove item 22 for the betterment of the questionnaire.

Table 31 Questions about traditional beliefs before and after pilot study

Before pilot study	After pilot study
SQ18. It is important for me to maintain traditional values and ways of thinking.	SQ17. It is important for me to maintain traditional values and ways of thinking.
SQ19. My belief in the traditional concept that food can be used for the treatment of disease affects my functional food decisions.	SQ18. My belief in the traditional concept that food can be used for the treatment of disease affects my functional food decisions.
SQ20. I think information passed from generation to generation is a trusted source of information on functional food.	SQ19. I think information passed from generation to generation is a trusted source of information on functional food.
SQ21. I would prefer to eat functional foods that have been consumed for generations.	SQ20. I would prefer to eat functional foods that have been consumed for generations.
SQ22. I do not trust traditional beliefs when it comes to functional food decisions.	.

Source: Developed for this study

5.3.9 Questions about consumers' need for stimulation in terms of functional foods

When constructing questions about stimulation, the researcher referred to stimulation items from the PVQ-RR questionnaire: 'It is important to him always to look for different things to do', 'It is important for him to take risks that make life exciting', 'It is important to him to have all sorts of new experiences'. The item, 'It is important for

him to have all sorts of new experiences' was adapted and included in the questionnaire. For the rest of the questions on this topic, the researcher referred to the interview texts in the qualitative data. The following underlined texts were used for the construction of other questions in this section:

> *It just bumps the salad; you can put some blueberries or any berries on the top and it just gives you another texture, another flavor, we were cooking something different from a different culture, I always like to try new things, I try to keep it interesting sometimes with the type of cereal.*

Cronbach's alpha values for these items were 0.326 and 0.378 which is quite low. If item 27 was deleted, the alpha reached 0.632. Item 27 was thus removed. Item 25 has a negative correlation with item 23 which is a checkpoint for these items here. The frequency distribution showed that although all the scales were used, the response was slightly skewed towards an agreement. Some refinement of the words of the items were considered to be beneficial. Thus, the remaining questions were reworded for better clarity.

Table 32 Questions about stimulation before and after pilot study

Before pilot study	After pilot study
SQ23. It is important for me to have all sorts of new experiences.	SQ21. It is important for me to have all sorts of new experiences.
SQ24. I think it would be exciting to try functional food.	SQ22. I would prefer mixing functional foods with other foods to make it exciting.
SQ25. I think it would be boring to eat functional food all the time.	SQ23. I would try a variety of functional foods to keep it interesting.
SQ26. I think it would be interesting to try functional foods from different ethnic groups.	SQ24. I think it would be interesting to try functional foods from different ethnic groups.
SQ27. I do not find functional foods exciting.	

Source: Developed for this study

5.3.10 Questions about consumers' need for security in terms of functional foods

An item about security from the PVQ-RR— 'It is very important to him to avoid disease and protect his health'—was reworded to fit the functional food context: 'SQ25 I would eat functional food to prevent diseases'. The items S26, Sq27, SQ28 were based on the interview texts from the qualitative data. The following are some of the interview texts referred to while constructing the items: *I got the hemorrhoid issue.*

I started to consume the fiber rich, If I didn't do like eat healthily most of the time it would be like such a hard going if kids eat healthily, their mind is healthy and if they're fit, they're happier kids.

The Cronbach alpha value for these items was 0.946. Any value above 0.7 is considered good. However, the literature also says that a high value could be an indication of redundant questions. The frequency distribution was fairly skewed towards more agreement. However, there was no scalability issue. The was a high correlation between item 29 and 30 (0.803) and between item 29 and 32 (0.812). Similarly, there was a high correlation between 31 and 32 ().929). To reduce the Cronbach value, the items with high correlation should be removed or reworded to minimise the chances of redundancy. Therefore, the questions were made more specific and reduced to only four items.

Table 33 Questions about self-directed learning before and after pilot study

Before pilot study	After pilot study
SQ28. It is very important for me to avoid disease and protect my health.	SQ25. I would eat functional food to prevent diseases.
SQ29. I would eat functional food to avoid diseases and protect my health.	SQ26. I pay attention to functional foods when I have a health issue.
SQ30. I would eat functional food to feel healthier.	SQ27. I would expect the functional food to keep me active throughout the day.
SQ31. I would eat functional food for being active throughout the day.	SQ28. I expect functional foods to improve my mental health.
SQ32. I would eat functional foods for fitness.	

Source: Developed for this study

5.3.11 Questions about consumers' need for conformity in terms of functional foods

The Cronbach value for items about conformity was 0.801, which is a good value. Therefore, the items were left untouched. The item SQ33 was adapted from the PVQ-RR: 'It is important to him to avoid upsetting other people'. The word *him* was changed to *me* to fit with the questionnaire design. The researcher also found some relevant items in a questionnaire designed for measuring motivation for alcohol use in an article by Cooper (1994). The items—'To fit in with a group you like', 'So you won't feel left out', 'Because your friends pressure you to drink'—were asked to

understand the motivations of alcohol consumption, and this notion of desire to conform with friends was used as a guide to developing the rest of the items. The codes from the qualitative data—'The desire to be connected with other leading to trying functional foods ignoring the taste, Eating functional foods to confirm with peer habits and suggestions, Functional food should fit with personal, and work life of consumers, Being open to new cultures and good relationship', leading to acceptance of funtional foods from other social groups, 'Feeling shy about eating pungent smelling functional foods while with other social groups'—were re-arranged and reworded to form the items SQ34, SQ35, SQ37. The following texts from the interview—'*It was all over the news and current affairs; fads I guess; I thought i should be trying soy milk sometime because everyone is always talking about soy milk; Someone else gave it to me to try; I tried it at a girlfriend's house*'—were the basis for the construction of item SQ36.

Table 34 Questions about the need for conformity before and after the pilot study

Before pilot study	After pilot study
SQ33. It is important for me to avoid upsetting other people.	SQ29. It is important for me to avoid upsetting other people.
SQ34. I eat/would prefer to eat functional food that everyone is talking about.	SQ30. I eat/would prefer to eat functional food that everyone is talking about.
SQ35. I avoid functional food with a strong smell when I am in a social circle.	SQ31. I avoid functional food with a strong smell when I am in a social circle.
SQ36. I prefer functional food that is in the current news/affairs.	SQ32. I prefer functional food that is in the current news/affairs.
SQ37. It can't deny functional foods suggested by my friends.	SQ33. It can't deny functional foods suggested by my friends.

Source: Developed for this study

5.3.12 Questions about perseverance in terms of functional foods.

The item 'SQ 34 When I don't understand a problem, I keep working until I find the answer' was adopted as it is from the grit scale items by Christensen and Knezek (2014). The following interview texts—*'I read something, I stopped eating it; I learned from YouTube; learning from reading and I tried to read; tried to learn; I do try to manage; I've read a lot through the years I didn't like the taste, was feeling there's no taste, but now I really like the taste; if I like it, I'll eat it over and over again, you can choose what food you eat and prevent something; only thing you can change is the food you choose; I read medical articles before making a conclusion; I just feel*

that from a single source or single article the information cannot be trusted' —were used to construct items SQ35, SQ36 and SQ37.

The Cronbach values for the perseverance construct were 0.736 and 0.747, which is a good value. However, if item 40 was removed, the Cronbach value reached 0.777. Item 40 had a very week or no correlation (0.053) with item 38. Item 38 had a good correlation with the rest of the items. Therefore, it was deemed more appropriate to reword item 40 than to remove it. Also, minor changes in the wording of item 35 were made because the phrase 'I am ready' could cause response bias.

Table 35 Questions about perseverance before and after a pilot study

Before pilot study	After pilot study
SQ38. When I don't understand a problem, I keep working until I find the answer.	SQ34. When I don't understand a problem, I keep working until I find the answer.
SQ39. I am ready to put more effort to understand functional foods.	SQ35. One should be ready to put more effort to understand functional foods.
SQ40. I think one should try functional food multiple times to like it.	SQ36. Eating functional foods multiple times may possibly increase my liking towards it.
SQ41. I think one should look at the long-term benefit of functional foods.	SQ37. I think one should look at the long-term benefit of functional foods.

Source: Developed for this study

5.3.13 Questions about cultural disposition in terms of functional foods

The items SQ38 and SQ41 about cultural disposition were adapted from the questionnaire used in Hassan's research (Hassan 2008). Hassan's questionnaire item, 'I think functional food from my ethnic culture is more effective than those from other ethnic groups', was reworded as 'I find functional food in my ethnic group more effective'. The latter part of Hassan's question 'than those from other ethnic groups' was omitted because it could sound offending, and respondents may be reluctant to comment on other cultures. Similarly, item SQ39 was constructed based on the codes from qualitative data: 'Taste of functional foods consumers were exposed to during early stages of life; Habits inherited from parents driving consumers' decisions to whether to choose healthy or tasty foods. The following text from an interview was referred to while constructing item SQ40: '*Like if I compare my culture background and a western background I think they cook in a very different way; brown rice is not*

going to be sticky'. SQ41 was adopted from Hassan's questionnaire (Hassan 2008). The Cronbach values for these items were 0.608 and 0.646 which is acceptable but over 0.7 is considered good. When item 46 was deleted, the Cronbach value reached 0.710. Therefore, item 46 was deleted.

Table 36 Questions about cultural predisposition before and after a pilot study

Before pilot study	After pilot study
SQ42. I find functional food in my ethnic group more effective.	SQ38. I find functional food in my ethnic group more effective.
SQ43. I think one must grow up eating a functional food to like it.	SQ39. I think one must grow up eating a functional food to like it.
SQ44. I find functional food from my culture tastier.	SQ40. I find functional food from my culture tastier.
SQ45. I have no problem with consuming functional foods from my ethnic group.	SQ41. I have no problem with consuming functional foods from my ethnic group.
SQ46. I am not comfortable consuming functional food from other culture.	

Source: Developed for this study

5.3.14 Questions about motives of functional food consumption.

The item, 'SQ42 I would expect food with functional properties to obtain offer specific benefits' was constructed based on the question 'I consume food with functional properties to obtain specific benefits' in Hassan's questionnaire (Hassan 2008) and from the interview texts '*makes me feel better, healthier; it clog your arteries up and stuff, it's very bad for you; I think it helps with the constipation; some days if you don't have a chance to have that green vegetable I feel uncomfortable*'. The codes from the qualitative stage—'Anxiousness about bodily discomfort likely to increase functional food consumption; Considering functional foods in the morning to staying positive; Eating functional foods to confirm with peer habits and suggestions; Functional food should fit with personal, and work life of consumers'—were rearranged and reworded to form the items SQ43–SQ46.The Cronbach value was 0.847 which is good. There was very little to change in these items. However, during the survey, participants had difficulty understanding the meaning of item 48 and 51. Therefore, these two items were refined for more clarity. Item 47 was reworded, with the inclusion of the word 'expect' because there might be consumers who do not consume functional foods.

Table 37 Questions about motives of consumption before and after pilot study

Before pilot study	After pilot study
SQ47. I consume food with functional properties to obtain specific benefits.	SQ42. I would expect food with functional properties to obtain offer specific benefits.
SQ48. It is important for me to know how functional properties would affect my experience of the food.	SQ43. It is important for me to know what functional food experience would be like.
SQ49. It is important for me to know how functional food would make me feel.	SQ44. It is important for me to know how functional food would make me feel.
SQ50. It is important for me to know how functional food would affect my body.	SQ45. It is important for me to know how functional food would affect my body.
SQ51. It is important for me to know how functional foods would affect my life.	SQ46. It is important for me to know how functional foods would affect my social life.

Source: Developed for this study

5.3.15 Questions about the negotiation of sensory and health values

The item SQ48 'I am prepared to compromise on the taste of a food if the product is functional' was adopted from Urala and Lähteenmäki (2004) as it is. The question 'For me, good taste is more important than health effects in a food product' from Urala & Lähteenmäki (2004) was reworded as 'For me, good taste is more important than health effects in a functional food'. These questions were adopted as they readily represented the relevant codes and interview texts in the qualitative stage, for example, '20 years ago, you are in your 20s or early 30s, you don't pay much attention to what you eat, etc but as you age you are aware of the deterioration of your health. You start to pay more attention to it; I put garlic in my runner beans and asparagus and all that because it's like a different taste and texture; I only ate food for pleasure. Now when you grow older, you just want to stay healthy that's all'. Question SQ47 was constructed based on the code 'Control over one's priorities making easy to switch between health and taste according to the context and interview texts such as '*I don't like it [but] because [it's] healthy, because, it is really good for skin, sometimes I try to have; To be honest, rule of thumb is accepting the truth that anything that is tasty is not healthy, so definitely the reason I go for brown rice is because of health reasons. But, if you asked me if I got the same benefits from white rice as I get from brown rice, I would go for white rice.'*

The Cronbach value for these items was 0.690. The values are acceptable. But as mentioned earlier, 0.7 is more reliable. If item 55 is deleted, the Cronbach value reaches 0.753. Therefore, item 55 was deleted. The items 52, 53, and 54 contained similar wording— 'Functional food decision involves…'—which might confuse respondents or may influence them to respond to all questions similarly. These items were therefore reworded for more clarity.

Table 38 Questions about negotiation before and after pilot study

Before pilot study	After pilot study
SQ52. Functional food decision involves a choice between health and taste.	SQ47. Functional food is chosen based on the evaluation of health and taste values offered by it.
SQ53. Functional food decision involves a compromise between health and taste.	SQ48. I am prepared to compromise on the taste of a food if the product is functional.
SQ54. Functional food decision involves a balance of taste and health.	SQ49. For me, good taste is more important than health effects in a functional food.
SQ55. I would go for tasty foods if they offered similar health benefits to functional foods.	

Source: Developed for this study

5.3.16 Questions about consumers' functional food purchase behaviour.

The survey questions for this section were based on the interview texts such as '*accepting; I really like the taste; prefer to buy; I would try it*', and consumer behaviour–related constructs such as expectation, intention, consumption (Armstrong et al. 2014). The Cronbach value for these items was -0.789. This shows the items are correlated, but negatively. However, there is controversy in the literature whether a negative Cronbach value is acceptable. Usually, Cronbach values are expected to be positive. Looking at the correlation matrix, item 56 and 59 were positively correlated. Item 57 was negatively related to item 56 and 59. Also, item 58 was negatively related to item 56 and 59. This could be because participants said during the interview that responding *agree* to item 56, left them unsure how to respond to item 58. The participants who often consume functional foods would obviously choose agree in item 56 and 58. The two items did not provide much variation in responses. This could have created confusion in participant responses. Therefore, item 56 was kept as it was. The remaining three items were replaced by new items SQ51, SQ52 and SQ53. The

new items 51 and 52 were based on previously tested items regarding consumption behaviour.

Table 39 Questions about consumption before and after the pilot study

Before pilot study	After pilot study
SQ56. I do eat functional foods often.	SQ50. I do eat functional foods.
SQ57. I do not eat functional foods at all.	SQ51. I expect to purchase functional foods.
SQ58. I sometimes eat functional foods.	SQ52. I want to purchase functional foods.
SQ59. I have an interest in eating functional foods.	SQ53. I intend to purchase functional foods.

Source: Developed for this study

The final version of the questionnaire contained two parts: demography and functional food behaviour. The demography part contained five questions about demographic characteristics. The functional food part contained 13 sections with 53 items in total. During the pilot study, some of the participants were found to be a little confused with the description of functional foods. The background was improved by adding more specific examples of naturally occurring functional foods and commercially produced functional foods. In each section, I included tips, explaining the complex terms used in the questionnaire such as self-directed learning, self-confidence, self-control, consistency, stimulation, conformity, tradition, perseverance, cultural predisposition.

5.4 Conclusion

After a thorough analysis of items from the literature, interview codes, and texts, a survey instrument with 53 items was developed for the survey. There are 13 sections and 53 questions in the survey. Each item in the questionnaire is related to one of the latent variables from the framework proposed by the qualitative stage. The survey questions were transferred to an online survey platform called Limesurvey platform. The Limsurvey was then linked to third party called CINT for collecting data. More details about the survey data collection and analysis is given in the next chapter 6.

Chapter 6: Quantitative study

6.1 Introduction

The research started with an exploration of the relation of consumers' culture and their functional food perception. The exploratory study focused on answering the overarching general research question and four sub-research questions about culture and functional food perception. A theoretical framework with 13 latent variables was developed from the qualitative study, and 12 research propositions were constructed based on how the relationship between the constructs was proposed in the theoretical model (Figure 7). Since the framework is based on qualitative research; it requires further verification through empirical methods. It is important to test through empirical methods whether the variables proposed through the Grounded theory method are valid and reliable. Accordingly, a 53-item survey instrument about the 13 variables was designed and subjected to exploratory factor analysis. Six factors were extracted from the exploratory factor analysis. A theoretical model was designed using the six factors, where functional food perception was the dependent variable, while self-directed learning, consistency, stimulation, conformity, and motives were dependent variables. The following sections in the chapter will provide detailed information regarding the methods used in the quantitative stage, the preparation of the survey instrument, analysis of survey data, results of the factor extraction, regression modelling, and ANOVA tests.

6.2 Research methods for the quantitative stage

6.2.1 Recruitment of sample

As the qualitative study involved participants from Anglo-Australian, Chinese and Indian ethnicity living in Australia, at this stage of the research I recruited consumers from the same three ethnic groups. The inclusion criteria for the survey participants were: a) belong to Anglo-Australian or Indian or Chinese ethnicity b) be living in Australia c) be 18 years or above. Recruitment of participants was undertaken by a third-party online survey company called CINT. I did the scripting of the online survey, and the LimeSurvey platform was used for hosting of the online survey. The online survey was integrated into the CINT system using a *panel integration* facility in the LimeSurvey platform. One of the strong reasons for using CINT was that it was the only company in Australia known to have profiled consumers based on their

ethnicity. The research aimed to collect around 600 complete responses which would require a lot of time for the researcher to collect them by himself. The online surveys are fast and timely, convenient, easy for data entry data and transfer, and easy to obtain large sample. They allow control of answer order and due to the reach of the internet, have less survey bias (Evans & Mathur 2005). The online survey allowed me to easily recruit consumers from different parts of Australia. The online survey allowed participants to fill out the survey at a convenient time. It also allowed them to stop the survey and then later return to complete the survey from where they left off, which made the survey very convenient for the participants. The online survey reduced the administrative burden. The responses of the participants were readily available as soon as the survey was completed, and the transfer of the survey data from the LimeSurvey platform to the SPSS program was quick and easy.

6.2.2 Exploratory factor analysis

The survey instrument for the research contains a large set of variables—53 items. The survey instrument was mostly based on the responses of interview participants during the qualitative stage of the research and existing literature. Since the instrument is new and has not been previously tested philosophically, it warranted exploratory factor analysis to reduce the number of variables (Worthington & Whittaker 2006; Yong & Pearce 2013). Exploratory factor analysis helps to uncover the underlying structure and relationship between the variables in a large set of variables. It is a widely used method for the reduction of the psychometric properties of a research instrument. It extracts the latent factors in a research instrument by pairwise comparison of the research instrument items and their dimensions.

The principal axis factoring (PAF) method with promax rotation was chosen for the exploratory factor analysis. Principal component analysis and principal axis factoring are more reliable factor extraction methods (Gerbing & Hamilton 1996; de Winter & Dodou 2012). However, this study employs principal axis factoring as this method extracts factors even if the factors are weak (de Winter & Dodou 2012). Moreover, it is a robust method as it gives generally satisfactory results even if the assumptions of the factor analysis, such as the normal distribution of data, is violated (Fabrigar et al. 1999).

The orthogonal variables initially extracted by factor extraction are difficult to interpret (Reise et al. 2000). Therefore, the factors should be rotated to get a more straightforward and interpretable factor pattern (Thurstone 1947; Reise et al. 2000; Yong & Pearce 2013). Although there is no specific criterion for selecting the right kind of rotation, the researcher should aim for a rotation that gives the most simple and informative factor pattern (Asparouhov & Muthén 2009). A simple structure is where each variable load on only one factor has either no cross loading or has a small cross-loading, that is, < |0.30| (Sass & Schmitt 2010). There are usually two kinds of rotations: orthogonal and oblique. The orthogonal rotations, for example Varimax, may not always give a psychologically logical structure of factors (Reise et al. 2000). The orthogonal rotations do not allow factors to correlate, or the assumption underpinning the test is that the factors are not correlated (Yong & Pearce 2013). This rotation forces the factors to be uncorrelated even if they are inherently correlated, and thus may not offer a practical solution. Orthogonal rotations, for example Varimax, are thus not appropriate for studies involving tests of circumplex models of interpersonal behaviour, traits or motive (McCrae & Costa 1989). The factors in this study involve personality traits, motive and behaviours, which are believed to be correlated. Therefore, the oblique rotation was the preferred method of rotation in the study.

The oblique rotation assumes that factors are correlated (Costello & Osborne 2005; Yong & Pearce 2013). Moreover, it is believed, in social sciences, there is always some level of correlation between factors and thus to deduct a more realistic and accurate factor structure, oblique rotations should be used (Fabrigar et al. 1999; Costello & Osborne 2005). The good aspect of the oblique rotation is that it does not force factors to be uncorrelated, which means if the factors were inherently orthogonal (uncorrelated) it will give an orthogonal solution (Reise et al. 2000). The researcher chose the promax oblique rotation technique as it is the commonly used oblique rotation technique and is believed to provide more replicable results than the oblimin oblique rotation technique. Promax rotation raises the factor/pattern structure coefficient to a power of three to four and generates a parsimonious simple pattern structure (Yong & Pearce 2013).

6.2.3 Statistical tests

After the exploratory factor analysis reduced the items in the questionnaire into six latent factors, further statistical tests were conducted on those factors to determine the influence of participants' demographic characteristics. The questionnaire contained questions about age, gender, income, ethnicity and education. The researcher was interested to assess what demographic characteristics of participants influence their responses on a 7-point Likert scale in the second part of the questionnaire, and whether the differences are significant. ANOVA tests whether the means of the factors between study groups are equal or not. A statistically significant result in the ANOVA test would infer that compared groups had statistically significant variance in their responses. ANOVA suits when there are two or more categories in each group (age, gender, income, ethnicity, education). One of the fundamental assumptions for ANOVA tests is approximately normally distributed data and homogeneity of variances (meaning the variances in each group of the independent variable should be equal). However, ANOVA is robust and can be applied even if the assumption of normality of distribution and homogeneity of variances is violated (Schmider et al. 2010). Pearson correlation analysis was used for the estimation of the relationship between variables among the extracted factors and to formulate a theoretical model.

6.3 Data screening and cleaning

The survey was live from 28 September 2018 to 17 October 2018. In total 758 participants were recruited out of which 305 were incomplete responses and 453 complete responses. The reason for a high number of incomplete responses could be because the online survey was set up in such a way that if the respondents were not from Anglo-Australian, Chinese and Indian ethnicity, they were automatically omitted from the survey. The collected responses were screened, and probable dishonest responses and outliers were excluded from further analysis. The screening consisted of three parts: a) looking for a long string or invariant responding, b) response timing, c) Mahalanobis distance. The lengthy string responses or the invariant responses indicate a low-quality of data. For example, selection of the same option repeatedly for many questions by the respondents indicates a lack of effort from respondents. Respondents are likely to select the same responses repeatedly when the administered survey contains a considerably large number of questions. Therefore, in the SPSS program, the data were selected only if they fulfilled the condition of 'variance > 0'.

There were 21 cases with variance 0 which showed that respondents did not put much effort into responding and simply gave an invariant response and selected the same answer for all items.

The second screening criterion was the time spent by the respondents to complete the survey. It requires some reasonable amount of time to read the questions, response options, and indicate a response. Less time spent on the survey could be an indication that respondents could have possibly spent less time on one of these behaviours. There can be variation in the speed of responses, which is quite normal, but it is also important to be aware of the respondents who have finished the survey very quickly. It is difficult to ascertain a cut-off time for each item due to the variability in their length, and respondents reading speed; however, literature suggests that it is 'unlikely for participants to respond to survey items faster than the rate of 2 s per item' (Huang et al. 2012, p. 106). The median time taken for survey responses was 6 minutes and the average time taken was 10 minutes 39 seconds. If the response cannot be answered in less than 2 seconds, then to practically answer the 53 items, a respondent would need at least 1.76 minutes. Therefore, any responses from participants who answered the survey in less than 1.76 minutes were excluded from the analysis. There were eight respondents who completed the survey in 1 minute, and these cases were excluded from further analysis.

It is difficult to test for outliers in a large dataset with multiple variables or many variables. In an exploratory factor analysis (EFA), it is important to identify if any case is an outlier when all the predictive variables are taken into consideration. Mahalanobis distance is the best way to detect such multivariate outliers. Mahalanobis distance is the length of the distance between a data point P and distribution D, where D is the intersection of the means of all predictor variables. A large distance between P and D means the corresponding case or the observation is an outlier. To calculate the Mahalanobis distance, a fake regression model was fitted to the data in SPSS, putting the case ID as dependent and the items as the independent variables. A new variable MAH_1 was added to the data. Any cases with large Mahalanobis value are to be considered as outliers and should be excluded from the data. The P value for Mahalanobis distance was then calculated using the following steps TRANSFORM > COMPUTE VARIABLE. In the compute variable section, the target variable named

as P, and the numeric expression used was 1-CDF.CHISQ(MAH_1, k), Where k is the number of variables, which is 53 in this research. The observations with P-values less than 0.001 were then excluded from further analysis as they are the potential outliers. There were 59 such cases with P < 0.001. Finally, the following data selection condition was set in SPSS before moving onto the analysis SELECT CASES > if variance > 0 and time > 1.76 minutes and P >= 0.001.

Altogether, 88 cases were excluded from further analysis. The final number of complete responses with outliers was 365. It was a critical point where I had to decide whether or not to collect more responses to compensate for the number of cases lost in data screening. If the researcher had decided to go for the second lot of data collection, the repeated advertisement of the survey could have increased the risk of having response biases. The period between the data before and after the screening would differ which again might have caused response bias, and it could have been difficult to justify that the two sets of data were collected under the same conditions.

6.4 Description of the data

This section provides demographic characteristics of the data. The first part of the included questions related to demographic characteristics of the survey respondents. As seen in the table above the items D1, D2, D3, D4, and D5 were asking about age, gender, annual income, ethnic group and education of the respondents.

6.4.1 Age

There were 219 respondents in the age group 18–50 years (60%), and 111 respondents in the age group 51–70 years (30%). The smallest age group was the ≥ 71 years group, consisting of only 35 respondents and accounting for 9.6% of the total sample size. The reasons for using the age groups—18–50, 51–70 and ≥ 71 years—was because these age groups are the discrete age groups in the Australian Dietary Guidelines. The distribution of data across the age groups seems to be generally following the distribution pattern of the distribution given by the Australian Bureau of Statistics. According to ABS, 65.7% of the Australian population was comprised of the working age group from 15–64 years. People aged 65 years and over comprised 15.4% of the population.

Table 40 Distribution of age groups

What is your age group?		
Age groups	**Frequency**	**Percent**
18–50 years	219	60.0
51–70 years	111	30.4
71 years and above	35	9.6
Total	365	100.0

Source: Developed for this study

6.4.2 Gender

The options male, female and intermediate/intersex/Unspecified were adapted from Sex and Gender Classification in Australian Government Records as published in the Australian Government Guidelines on the Recognition of Sex and Gender. There were 189 males and 175 females in the sample and one intermediate/intersex/unspecified gender. The ratio of males to females in this survey approximately resembles the ratio of sex as given by the ABS. According to the ABS, there were 98.4 males for every 100 females in 2017.

Table 41 Distribution of sample based on gender

What is your gender?		
	Frequency	Percent
Male	189	51.8
Female	175	47.9
Indeterminate/intersex/unspecified	1	.3
Total	365	100.0

Source: Developed for this study

6.4.3 Income groups

The income groups were adapted from the income groups used by the Australian Taxation Office. The largest income groups were $37,001–$90,000 (*n* = 134, 36.7%), $18,200–$37,000 (*n* =102, 27.9%). The groups, 0–$18,200 (*n* =61) and ≥ $90,000 (*n* = 68), had almost equal number of respondents.

Table 42 Income group distribution

What is your annual income?		
Income groups	**Frequency**	**Percent**
0 – $18,200	61	16.7

$18,201 – $37,000	102	27.9
$37,001 – $90,000	134	36.7
≥$90,000	68	18.6
Total	365	100.0

Source: Developed for this study

6.4.4 Ethnicity

There were 173 (47.4%) Anglo-Australian respondents, 102 (27.9%) Chinese respondents and 90 (24.7%) Indian respondents in the final complete list of the responses. According to the Australian Bureau of Statistics, there are over 300 ancestries mentioned in the census. Among the top 10 list of ancestries, the most commonly reported ancestries were English (36%) and Australian (34%), and six other ancestries were of European heritage. Chinese (5.6%) and Indian (4.6%) were also among the top 10 ancestries. The research survey targeted three ethnic groups with the aim of getting 200 responses for each category, and thus the data collected in this research does not reflect the ratio of Anglo-Australian, Indian and Chinese population as given by the Australian Bureau of Statistics (ABS 2016).

Table 43 Distribution of ethnic groups

Which ethnic group do you belong to?		
Ethnic groups	**Frequency**	**Percent**
Anglo Australian	173	47.4
Chinese	102	27.9
Indian	90	24.7
Total	365	100.0

Source: Developed for this study

6.4.5 Education

The highest percentage of respondents had a bachelor degree (27.9%) followed by those with secondary education (24.4%), postgraduate degree (18.4%), and certificate level education (13.7%). Only 0.3% (1 respondent) reported the highest level of education as primary education.

Table 44 Distribution of level of education

Education level	**Frequency**	**Percent**
Postgraduate Degree Level	67	18.4
Graduate Diploma/Graduate Certificate Level	24	6.6

Bachelor's Degree Level	102	27.9
Advanced Diploma/Diploma Level	32	8.8
Certificate Level	50	13.7
Secondary Education	89	24.4
Primary Education	1	.3
Total	365	100.0

Source: Developed for this study

6.4.6 Cross-tabulation of ethnic group and level of education

The Indians and Chinese were more to have degree-level education such as postgraduate degree (Indians = 36, Chinese = 22, Anglo-Australians = 9) and bachelor degree (Indians = 30, Chinese = 54, Anglo-Australians = 18) than Anglo-Australians. Anglo Australians were more likely to have advanced diploma/diploma level education (n = 17), certificate level *(*n = 39), and secondary level (n = 78) than Indians and Chinese. There were only 5 Indians and 10 Chinese at diploma level, 5 Indians and 6 Chinese at certificate level, and 3 Indians and 8 Chinese at certificate level of education.

Table 45 Crosstabulation of ethnic group vs level of education

Ethnic group vs level of education				
Level of Education	Anglo Australian	Chinese	Indian	Total
Postgraduate Degree Level	9 (5.2%)	22(21.5%)	36(40%)	67(18.3%)
Graduate Diploma/Graduate Certificate Level	11(6.3%)	2(1.9%)	11(12.2%)	24(6.5%)
Bachelor's degree Level	18(10.4%)	54(52.9%)	30(33.3%)	102(27.9%)
Advanced Diploma/Diploma Level	17(9.8%)	10(9.8%)	5(5.5%)	32(8.7%)
Certificate Level	39(22.5%)	6(5.8%)	5(5.5%)	50(13.6%)
Secondary Education	78(45%)	8(7.8%)	3(3.3%)	89(24.3%)
Primary Education	1(0.5%)	0	0(0.0%)	1(0.2%)
Total	173	102	90	365

Source: Developed for this study

6.4.7 Cross-tabulation of ethnic group and age group

The respondents from the Anglo-Australian ethnic group were most likely to be in the age group 51–70 years (n = 81), followed by those in the 18–50 years group (n = 59), and those ≥ 71 years (n = 33). The Anglo-Australian respondents were distributed fairly evenly among the three age groups. The respondents from Indian (n=77) and

Chinese (n=83) ethnic groups fell more into the 18–50 years group. There were 12 Indians and 18 Chinese from the age group 51–70 years, which is quite lower than that of the Anglo-Australian ethnic group. There was only one respondent aged ≥ 71 years from each of the Indian and Chinese ethnic groups.

Table 46 Cross-tabulation of ethnic groups by age groups

Age by ethnic groups				
Age	Anglo-Australian	Chinese	Indian	Total
18–50 years	59 (34.1%)	83 (81%)	77 (85.5%)	219 (60%)
51–70 years	81 (46.8%)	18 (17.6%)	12 (13.3%)	111 (30.4%)
≥ 71 years	33 (19.0%)	1 (0.9%)	1 (1.1%)	35 (9.5%)
Total	173	102	90	365

Source: Developed for this study

6.4.8 Graph comparing the ethnic group against their income distribution

Although the figures for age and education varied for Indian and Chinese respondents from Anglo-Australian respondents, their numbers in terms of income were relatively similar. The income for all ethnic groups was fairly evenlydistributed between $18,201 and $37,000 and between $37,100 and $90,000. However, the information in the bar chart may not be a realistic picture of the ethnic groups as the number of participants in each ethnic group is unequal.

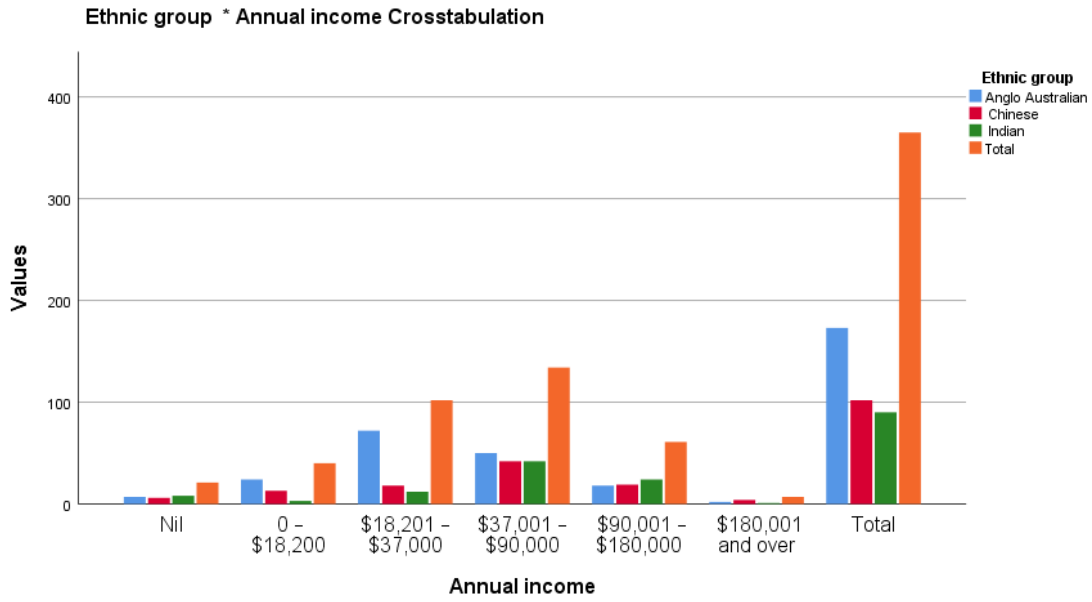

Figure 9 Bar chart representing the income of different ethnic groups

6.5 Exploratory factor analysis

Factor analysis is a process of reducing a large number of items into a small number of variables so that the data makes the analysis easier. Factor analysis identifies latent variables underlying the broad set of items. In the process, different items that are correlated are put together to form more meaningful variables. There are two types of factor analysis, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Exploratory factor analysis is a process of explorations where there is no prior knowledge about the variables, and the researcher tries to identify those latent variables underlying a specific area or context, while confirmatory factor analysis is a process of confirming that the variables are valid in different sets of the study population. Where there is no prior knowledge or theory in a specific area, it is first essential to do an exploratory factor analysis. Thus, I used an exploratory factor analysis method because the area of the research is new, and there is no prior tested questionnaire and variables in the area of the study. Moreover, Grounded theory method is usually followed by exploratory factor analysis.

6.5.1 Assumptions for Exploratory Factor Analysis (EFA)

There are some underlying assumptions to be fulfilled before running exploratory factor analysis.

1. Research question

Before running factor analysis, is it essential to assess whether EFA is suitable for the aim of the research or not? EFA is useful for studies where the research aims to identify key factors or reduce many variables into a more manageable number of key factors. Factor analysis is suitable where the research question aims to identify variables of a theory. The questions of this research are about identifying the cultural values affecting consumers' functional food perception. The research aims to identify cultural values as factors that fit into the functional food–buying behaviour model.

2. Level of measurement

Factor analysis can be conducted well with data that uses or either requires an interval/ratio measure or an ordinal data measure. The survey instrument in this research used a 7-point Likert scale which is an ordinal measure.

3. No outliers present in the data

The data were screened for outliers, invariant responses and suspect responses given in less than normal time.

4. Sample sizes

It is equally important to check whether the number of observations left after the screening was enough for the proposed EFA. There is no consensus on the number of responses required for EFAs. The literature says there should be a large ratio of N/k = 20:1 where N is the size of the sample needed and k is the number of variables. Twenty samples per item is a less realistic approach and is hardly possible to achieve in a real situation for PhD level research (Hair et al. 1979). A more reasonable number of samples for EFA would be N/K = 5:1 (Cattell 1978). There were 49 items in the survey of this research, which means, to be able to do the EFA reasonably, there should be at least 245 (= 49 × 5). There were 365 complete observations in the data which was enough to do an EFA. The adequacy of the sample was also tested using the Kaiser Meyer Olkin (KMO) test. The sample size is adequate if the KMO values are larger than 0.5. The bare minimum KMO value recommended is 0.5, and the value between 0.5 and 0.7 is considered a moderate value, while 0.7 to 0.8 is regarded as a good KMO value (Hair et al. 2006). The KMO measure of sampling adequacy was 0.925, well above the commonly recommended value of 0.6, and is believed to be a superb value (Hutcheson & Sofroniou 1999).

Table 47 KMO and Bartlett's test result

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.925
Bartlett's Test of Sphericity	Approx. Chi-Square	9559.766
	Df	1176
	Sig.	.000

5. Descriptive statistics and variance of the items

The variables for the EFA should have variance, and this should be examined both visually and statistically. Any case with very low variance or zero variance would mean that respondents have answered nearly identically. The maximum and minimum values in the data should look reasonable. A visual inspection of the data

was done to check for such anomaly. Any observation with zero variance or answered in less than a reasonable amount of time (less than 1.76 mins) was excluded from the data.

6. Inter-correlation between variables

It is important in an EFA to examine whether the items are correlated or not before running the actual factor analysis. Since EFA is trying to find out items that have the same underlying dimensions, it is reasonable to assume that the items are moderately correlated. The items should moderately correlate and thus would be considered meaningful data for further EFA. This is important because EFA would provide factors even from data that contain meaningless items or items that are not correlated with each other. This inspection of the correlation between items before doing the EFA is to confirm that the factors generated by the EFA are sensible factors.

Further, Barlett's sphericity test and the KMO Measure of Sampling Adequacy tests were conducted during the factor analysis. The Bartlett test of sphericity measures strength of relationship between variables. It measures the multivariate normality of the set of a distribution. It tests the null hypothesis of whether the original correlation matrix is an identity matrix which is rejected at $P < 0.05$. Bartlett's test of sphericity was significant at $P < 0.05$ (see table above), supporting the factorability of the correlation matrix. When the null hypotheses are rejected, it means the data does not produce an identity matrix and thus is approximately multivariate normal, further approving the data as eligible for factor analysis.

The factorability of the study items was also examined through inspection values of the correlation between items. The factorability of the 49 items with 365 observations was now examined. A correlation analysis was run using SPSS 25. It was practically difficult to fit in the correlation table in the thesis. Therefore, a line graph was plotted, based on the correlation values of the items. Pearson correlation significance at the 0.01 level was flagged with two stars, and correlation significance at the 0.05 level was flagged with one star. From the visual inspection of the line graph (Figure 9) of the correlation matrix, it could be seen that there were a good number of correlations significant at the 0.01 level, and equally at the 0.05 level. Most of the items had at least one sizeable correlation—at least above 0.5 and/or 0.4. Some variables had correlation marginally less than 0.5 but were still close to 0.4 or more than 0.3.

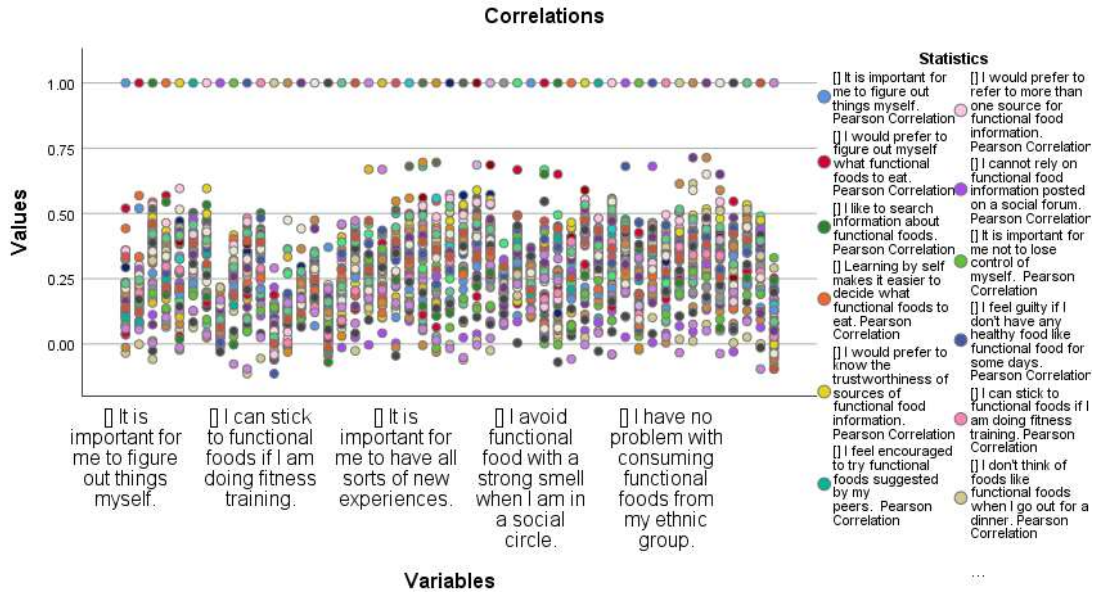

Figure 10 Dot graph representing correlations of items in the questionnaire

6.5.2 Procedure of Exploratory factor analysis

The researcher ran a preliminary factor analysis using Principal Component Extraction (PCE) method with Varimax rotation, Principal Axis Factoring (PAF) method with Varimax rotation and tried using the PAF method with Promax rotation. All the methods proposed a similar number of factors (10 factors) based on eigenvalues. All the extraction and rotation methods initially gave a messy pattern matrix, with several items cross loading on multiple factors. However, after step-by-step removal of low communalities and cross-loading items, a more feasible pattern matrix with clear loading of items was achieved through PAF with Promax rotation. Also, the Pearson correlation test showed that a reasonable number of items had a significant correlation with other items, and most of the items had at least one sizeable correlation above 0.5 and/or 0.4, which suggested that the items are correlated and thus an oblique rotation would be more relevant. Therefore, the decision was made to go with PAF and Promax rotation.

Initially, the data were selected setting up the following condition for data selection in the SPSS 25 version. Data that fulfilled the following conditions were selected DATA > select cases > if variance > 0 and time > 1.76 and P (Mahalanobis factor P value) > 0.001. There was now 365 observations remaining without any outliers. The factor analysis was run using PAF, with Promax rotation. The factor loadings below the 0.3

coefficient were suppressed from view. Although the survey instrument included 53 items originally, after the initial observation of the survey data and responses of the participants, the four items—SQ50, SQ51, SQ52, SQ53—were redundant, and could pose a problem to the factor analysis going forward, and thus were removed from further analysis. Factor analysis was run for 49 items with 365 samples, PAF with Promax rotation; the total variance results suggested that there could be ten factors to be extracted from the data. However, in factor analysis, it is important to check the communality for each item and the cross-loading factors in the pattern matrix with the aim of obtaining a simpler pattern matrix. Communality shows how an item correlates with all other items, and a low communality is an indication that the item could struggle to load on any factor later. A communality value explains how much variance an item shares with all other items or what proportion of the variance of an item is explained by all other similar items underlying the same latent construct (Cattell 1965). The researcher aimed to retain only the items that had a communality value of 0.3 or more. Therefore, the researcher searched for any item with a communality coefficient lower than 0.3, and if such items arose, those items were removed from the items list, and factor analysis was re-run. At every step, researcher first looked for any item with a communality lower than 0.3, and if there was none, the researcher looked at the pattern matrix for any item cross loading on multiple factors. Theoretically, any item loading on multiple factors with a difference of coefficient value less than 0.2 would be a problematic item. The researcher examined the pattern matrix and removed any item cross loading on multiple factors with a difference of less than 0.2. When there were multiple items with cross-loading values, the item with the strongest cross loading was removed first, and factors analysis was re-run. The process was repeated iteratively until the communality coefficients were stable and did not change much and were more than 0.3 (pre-determined coefficient value), and until items loaded on one factor only (no cross-loading factor). The following results are based on the final factor analysis that resulted in clearly loading 6 factors with 39 items. The table below shows the communality coefficient for each item that was retained from the EFA.

Table 48 Communalities of items retained

Communality		
Factor items	Initial	Extraction
[SQ01] It is important for me to figure out things myself.	0.419	0.412

[SQ02] I would prefer to figure out myself what functional foods to eat.	0.522	0.638
SQ04[] Learning by self makes it easier to decide what functional foods to eat.	0.511	0.504
[SQ05] I would prefer to know the trustworthiness of sources of functional food information.	0.538	0.490
[SQ07] I would prefer to refer to more than one source for functional food information.	0.540	0.482
[SQ10] I feel guilty if I don't have any healthy food like functional food for some days.	0.378	0.300
[SQ13] I typically prefer to do things the same way.	0.379	0.517
[SQ14] I would cook functional foods the way I usually cook my foods.	0.336	0.359
[SQ15] I prefer functional food with a familiar taste.	0.432	0.517
[SQ10] I would prefer to eat functional foods that have been consumed for generations.	0.384	0.331
[SQ21] It is important for me to have all sorts of new experiences.	0.511	0.500
[SQ22] I would prefer mixing functional foods with other foods to make it exciting.	0.572	0.589
[SQ23] I would try a variety of functional foods to keep it interesting.	0.683	0.751
[SQ24] I think it would be interesting to try functional foods from different ethnic groups.	0.618	0.646
[SQ25] I would eat functional food to prevent diseases.	0.587	0.563
[SQ26] I pay attention to functional foods when I have a health issue.	0.542	0.535
[SQ27] I would expect the functional food to keep me active throughout the day.	0.629	0.567
[SQ28] I expect functional foods to improve my mental health.	0.628	0.570
[SQ30] I eat/would prefer to eat functional food that everyone is talking about.	0.573	0.587
[SQ32] I prefer functional food that is on the current news/affairs.	0.662	0.749
[SQ33] I can't deny functional foods suggested by my friends.	0.524	0.543
[SQ35] One should be ready to put more effort to understand functional foods.	0.604	0.585
[SQ36] Eating functional foods multiple times may possibly increase my liking towards it.	0.445	0.419
[SQ37] I think one should look at the long-term benefit of functional foods	0.615	0.602
[SQ38] I find functional food in my ethnic group more effective.	0.495	0.474
[SQ41] I have no problem with consuming functional foods from my ethnic group.	0.414	0.342
[SQ43] It is important for me to know what functional food experience would be like.	0.612	0.625
[SQ44] It is important for me to know how functional food would make me feel.	.676	.814
[SQ45] It is important for me to know how functional food would affect my body.	0.603	0.649

[SQ46] It is important for me to know how functional foods would affect my social life.	0.529	0.510
[SQ47] Functional food is chosen based on the evaluation of health and taste values offered by it.	0.530	0.484
[SQ48] I am prepared to compromise on the taste of a food if the product is functional.	0.482	0.464
Extraction Method: Principal Axis Factoring.		

Source: Developed for this study

Table 49 Pattern matrix from PAF and promax rotation

Pattern matrix[a]						
	Factor					
	1	2	3	4	5	6
[SQ01] It is important for me to figure out things myself.				0.645		
[SQ02] I would prefer to figure out myself what functional foods to eat.				0.841		
SQ04[] Learning by self makes it easier to decide what functional foods to eat.				0.576		
[SQ05] I would prefer to know the trustworthiness of sources of functional food information.	0.454					
[SQ07] I would prefer to refer to more than one source for functional food information.	0.402					
[SQ10] I feel guilty if I don't have any healthy food like functional food for some days.	0.497					
[SQ13] I typically prefer to do things the same way.						0.743
[SQ14] I would cook functional foods the way I usually cook my foods.						0.539
[SQ15] I prefer functional food with a familiar taste.						0.636
[SQ20] I would prefer to eat functional foods that have been consumed for generations.						0.342
[SQ21] It is important for me to have all sorts of new experiences.			0.588			
[SQ22] I would prefer mixing functional foods with other foods to make it exciting.			0.778			
[SQ23] I would try a variety of functional foods to keep it interesting.			0.856			
[SQ24] I think it would be interesting to try functional foods from different ethnic groups.			0.793			
[SQ25] I would eat functional food to prevent diseases.	0.835					
[SQ26] I pay attention to functional foods when I have a health issue.	0.752					
[SQ27] I would expect the functional food to keep me active throughout the day.	0.708					

[SQ28] I expect functional foods to improve my mental health.	0.815					
[SQ30] I eat/would prefer to eat functional food that everyone is talking about.		0.649				
[SQ32] I prefer functional food that is on the current news/affairs.		0.936				
[SQ33] I can't deny functional foods suggested by my friends.		0.797				
[SQ35] One should be ready to put more effort to understand functional foods.	0.537					
[SQ36] Eating functional foods multiple times may possibly increase my liking towards it.	0.335					
[SQ37] I think one should look at the long-term benefit of functional foods	0.753					
[SQ38] I find functional food in my ethnic group more effective.		0.467				
[SQ41] I have no problem with consuming functional foods from my ethnic group.			0.304			
[SQ43] It is important for me to know what functional food experience would be like.					0.629	
[SQ44] It is important for me to know how functional food would make me feel.					0.919	
[SQ45] It is important for me to know how functional food would affect my body.					0.716	
[SQ46] It is important for me to know how functional foods would affect my social life.		0.660				
[SQ47] Functional food is chosen based on the evaluation of health and taste values offered by it.	0.356					
[SQ48] I am prepared to compromise on the taste of a food if the product is functional.		0.494				
Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.[a]						
a. Rotation converged in 6 iterations.						

Source: Developed for this study

Five items in factor 1 had loadings more than 0.7 (0.835, 0.752, 0.708, 0.815, 0.753); six had moderate loadings (0.454, 0.402, 0.497,0.537, 0.356, 0.335). There were six items loading in factor 2 with scores 0.649, 0.936, 0.797, 0.467, 0.660, 0.494. The items—SQ21, SQ22, SQ23, SQ24—were loading as factor 3 with correlation coefficient scores of 0.588, 0.778, 0.856, 0.793. The factor 4 had three items—SQ01, SQ02, SQ04—with factor loading scores of 0.645, 0.841, 0.576. Factor 5 also had three items (SQ43, SQ44, SQ45) loading with good scores of 0.629, 0.919, 0.716, respectively. Factor six had four items (SQ10, SQ13, SQ14, SQ15) with scores 0.743, 0.539, 0.636, 0.342. There are different ways of deciding the factors to be retained.

One of the commonly used approaches is an eigenvalue and the total variance. The total variance explained by the six factors was 61.647%. The other criteria would be retaining factors with eigenvalues more than 1. It is also important to note if the eigenvalue is only slightly higher than 1, then the decision to retain the factor could be questionable. In the total variance table below factors 1, 2 and 3 are a clear factor as the eigenvalues are 11.298, 2.961, 1.811, respectively. The decision as to whether the factors 4,5,6 should be retained is critical.

Table 50 Eigenvalues and the variance explained by the factors

Total variance explained							
	Initial eigenvalues			Extraction sums of squared loadings			rotation sums of squared loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	11.298	35.306	35.306	10.849	33.903	33.903	9.701
2	2.691	8.408	43.714	2.274	7.106	41.009	6.028
3	1.811	5.659	49.373	1.320	4.124	45.132	7.935
4	1.590	4.970	54.343	1.118	3.494	48.626	4.507
5	1.297	4.053	58.397	0.939	2.936	51.562	6.903
6	1.040	3.251	61.647	0.617	1.930	53.491	3.323
7	.952	2.976	64.624				
8	.843	2.634	67.257				
9	.791	2.471	69.728				
Extraction Method: Principal Axis Factoring.							
a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.							

Source: Developed for this study

A scree plot is another method of deciding on the factors to be retained. The Y-axis of the scree plot shows the eigenvalues and the X-axis shows the number of factors. The point where the curve starts to flatten or where the curve begins levelling off forming an elbow indicates the number of factors to be retained. There could be different perceptions of where the scree plot is levelling off and, therefore, no definite answer can be gained from the scree plot. The scree plot seems to be levelling off at somewhere between three and four which means four factors could be possibly retained in this case.

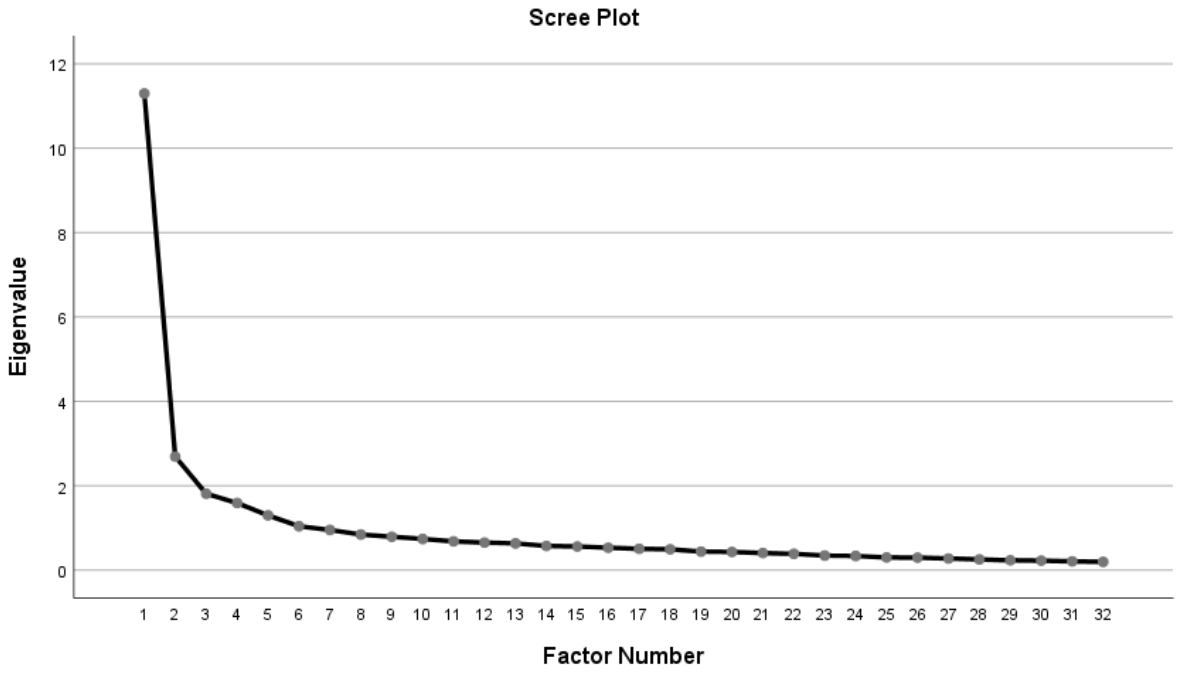

Figure 11 Scree plot for the factors extracted through PAF, Promax rotation

6.5.3 Parallel analysis

Parallel analysis is also another method commonly used in factor analysis to support the decision on which factors should be retained or discarded. The following link was used to do the parallel analysis https://www. statstodo.com/ Parallel Analysis_ Exp. php. At the site, the computer program tab was selected where number of variables (items decided to retain, which was 32 in this research) and the number of cases (365) were entered leaving the iterations as default. A table appeared after clicking the c*alculate* button. The column of interest is the final column (95 percentile). If eigenvalue for a particular factor is above the value in the 95-percentile column for that factor, then the factor is to be retained. The first factor has an eigenvalue above 1.67271, and it was retained; the second factor had an eigenvalue above 1.5748 and was retained; the third factor had an eigenvalue below 1.5078, and it was retained, the fourth factor had an eigenvalue more than 1.4506, and it was also retained, but the fifth factor had an eigenvalue less than 1.4083 and was not retained. The parallel analysis suggested that four factors could be retained.

Table 51 Parallel Analysis

	Mean	**SD**	**95 percentiles**	**Eigenvalue from PAF**	**Decision**
F_1	1.5957	0.0463	1.6721	11.298	Retain
F_2	1.5157	0.0358	1.5748	2.691	Retain
F_3	1.4581	0.0306	1.5087	1.811	Retain
F_4	1.4088	0.0253	1.4506	1.590	Retain
F_5	1.3657	0.0258	1.4083	1.297	Reject
F_6	1.3161	0.0219	1.3522	1.040	Reject
F_7	1.2784	0.0219	1.3147	0.952	Reject
F_8	1.2394	0.0179	1.2689	0.843	Reject
F_9	1.2016	0.0197	1.2341	0.791	Reject

Source: Developed for this study

There was consensus from all the test methods that factors 1 to 4 could be retained in this analysis. Although the statistical methods are widely used for deciding factor retention, they lack my theoretical knowledge. The final decision to retain or reject a factor should be the researchers. I looked at the items loaded on each factor. The items falling on factors 5 and 6 were indicating a meaningful theoretical construct, consistent with the conceptual framework I had initially designed in the qualitative stage of the research. Also, the items were loaded on the factor with good coefficient values. The items on factor 5 were loading with scores—0.629, 0.919, 0.716—which looked strong. The items loading on factor 6 had a coefficient value of 0.743, 0.539, 0.636, and 0.342, which is again a good coefficient score. Due to factors 5 and 6 having items consistent with theoretical constructs in the administered questionnaire, and the item loadings were strong, these two factors were also retained. Altogether, six factors were extracted and retained from the EFA.

Table 52 Factors and their corresponding items

Factor labels	**Items loaded on factors**	**Coefficients of items loaded**
Factor 1	SQ05, SQ07, SQ10, SQ25, SQ26, SQ27, SQ28, SQ35, SQ36, SQ37, SQ47	0.454, 0.402, 0.497, 0.835, 0.752, 0.708, 0.815, 0.537, 0.335, 0.753, 0.356
Factor 2	SQ30, SQ32, SQ33, SQ38, SQ46, SQ48	0.649, 0.936, 0.797, 0.467, 0.660, 0.494
Factor 3	SQ21, SQ22, SQ23, SQ24, SQ41	0.588, 0.778, 0.856, 0.793, 0.304
Factor 4	SQ01, SQ02, SQ04	0.645, 0.841, 0.576
Factor 5	SQ43, SQ44, SQ45	0.629, 0.919, 0.716
Factor 6	SQ13, SQ14, SQ15, SQ20	0.743, 0.539, 0.636, 0.342

Source: Developed for this study

The following is the correlation between factors retained. There is a positive correlation between all the factors extracted.

6.5.4 Reliability test of retained items

The retained items were subjected to a reliability test to check the internal consistency. The Cronbach's alpha value for items in each factor are given in Table 53. For the items in factors 1 to 5, Cronbach's alpha values are clearly above 0.7 which is a good indication of internal consistency of the items. The alpha value for items in factor 6 is 0.695 which is also almost close to 0.7, and thus the items could be considered reliable.

Table 53 Cronbach's Alpha test for 32 items retained

Factors	Items loaded on factors	Cronbach's alpha
Factor 1	SQ05, SQ07, SQ10, SQ25, SQ26, SQ27, SQ28, SQ35, SQ36, SQ37, SQ47	0.897
Factor 2	SQ30, SQ32, SQ33, SQ38, SQ46, SQ48	0.850
Factor 3	SQ21, SQ22, SQ23, SQ24, SQ41	0.838
Factor 4	SQ01, SQ02, SQ04	0.738
Factor 5	SQ43, SQ44, SQ45	0.848
Factor 6	SQ13, SQ14, SQ15, SQ20	0.695

Source: Developed for this study

A figure showing the path diagram for the PAE with Promax rotated factor solution is given in Appendix G. The double-headed arrow between factors represents the correlations among the extracted factors. The numerical values along with double-headed arrows are the correlation value between the factors as given by exploratory factor analysis. The one-headed arrow from factors to the items represents the effects of factors on the variables. The numerical values along with the arrow links are the loadings estimates of each item on the respective factor as shown in the pattern matrix above.

6.5.5 Labelling of factors

6.5.5.1 Functional food perception

Factor 1 had 11 items loading onto it—SQ05, SQ07, SQ10, SQ25, SQ26, SQ27, SQ28, SQ35, SQ36, SQ37, SQ47—with factor loadings 0.454, 0.402, 0.497, 0.835, 0.752, 0.708, 0.815, 0.537, 0.335, 0.753, 0.356, respectively. Among the 11 items—[SQ25] I would eat functional food to prevent diseases, [SQ28] I expect functional foods to improve my mental health, [SQ25] I would eat functional food to prevent diseases,

[SQ28] I expect functional foods to improve my mental health, [SQ37] I think one should look at the long-term benefit of functional foods—have higher factor loadings (0.835, 0.752, 0.708, 0.815, 0.753), and are the most strongly loading items on factor 1. The item labels should be chosen based on the strongly loading factors. These strongly loading factors indicate consumers' expectations about functional foods. Although it comes with a lower loading coefficient, the item [SQ47] Functional food is chosen based on the evaluation of health and taste values offered by it (0.356) represents consumers' expectation that functional foods should offer health and taste values or either of them. The items—[SQ05] I would prefer to know the trustworthiness of sources of functional food information, [SQ07] I would prefer to refer to more than one source for functional food information, [SQ10] I feel guilty if I don't have any healthy food like functional food for some days, [SQ35] One should be ready to put more effort to understand functional foods—have moderate loadings (0.454, 0.402, 0.497, 0.537) on factor 1. These items are about the feeling of insecurity and how these could be reduced by putting a little more effort into finding relevant sources and by consumers understanding what they should be expecting from functional foods. This refers to active seeking of information. There are two more items, The item [SQ36] Eating functional foods multiple times may possibly increase my liking towards it, with the loading of 0.335, is about how the repetitive exposure to functional foods might help consumers adapt to the product. The items in the factor 1 reflect consumer expectation, exposure, attention, and active seeking of information, which, according to theories (as discussed in the literature review, Chapter 2), are indices of consumer perception. Therefore, factor 1 is labelled as *functional food perception*.

6.5.5.2 Conformity

Six items were loaded on factor 2—[SQ30] I eat/would prefer to eat functional food that everyone is talking about, [SQ32] I prefer functional food that is on the current news/affairs, [SQ33] I can't deny functional foods suggested by my friends, [SQ38] I find functional food in my ethnic group more effective, [SQ46] It is important for me to know how functional foods would affect my social life, [SQ48] I am prepared to compromise on the taste of a food if the product is functional—with factor loadings 0.649, 0.936, 0.797, 0.467, 0.660, 0.494, respectively. The items SQ30, SQ32 and SQ33, are the ones that have higher loadings, and these three items fall together in a

group as in the latent variable *conformity* in the survey questionnaire. The new items that loaded in the variable conformity are SQ38, SQ46 and SQ48. SQ46 has a coefficient of 0.660 which is a good score, and this item also talks about the importance of knowing how functional food would affect consumers' social life—meaning conformity with society and its norms. This item adds value to the earlier three items and makes the variable conformity stronger. The item SQ38 has a relatively low score of 0.467. However, this item indicates that consumers are more confident with functional foods from their ethnic groups, indicating they would prefer to conform with their ethnic groups rather than other ethnic groups. The item SQ48 also has a relatively lower loading of 0.494. Although the item does not directly indicate conformity to social norms, it indicates that consumers need to compromise taste which is an indication of conformity. Therefore, factor 2 was labelled as *conformity*.

6.5.5.3 Stimulation

Factor 3 had five items—[SQ21] It is important for me to have all sorts of new experiences, [SQ22] I would prefer mixing functional foods with other foods to make it exciting, [SQ23] I would try a variety of functional foods to keep it interesting, [SQ24] I think it would be interesting to try functional foods from different ethnic groups, [SQ41] I have no problem with consuming functional foods from my ethnic group. The scores for these items were 0.588, 0.778, 0.856, 0.793, 0.304, respectively. The four items SQ21, SQ22, SQ23, SQ24, the strongly loading items, were falling exactly on the latent variable *stimulation* as designed initially in the survey questionnaire. The new item that loaded on this factor was SQ41 with a low coefficient of 0.304, which means the item had a low role in this factor. However, this item seems to be balancing the item SQ24 where consumers indicated that they find functional foods from different ethnic groups interesting, but that is not the case because they do not like functional foods from their ethnic group, SQ41. This factor was labelled as *stimulation*.

6.5.5.4 Self-directed learning about functional foods

Factor 4 had three items loaded onto it—[SQ01] It is important for me to figure out things myself, [SQ02] I would prefer to figure out myself what functional foods to eat, [SQ04] Learning by self makes it easier to decide what functional foods to eat. The

items loaded with scores of 0.645, 0.841, 0.576, respectively. All three items were initially designed to measure a latent variable *self-directed learning* in the survey questionnaire. As the items fall on the same variable with strong loading, this factor was labelled as *self-directed learning*.

6.5.5.5 Motives of functional food consumption

Three items—[SQ43] It is important for me to know what functional food experience would be like., [SQ44] It is important for me to know how functional food would make me feel., [SQ45] It is important for me to know how functional food would affect my body.—were loaded on factor 5 with strong coefficients, 0.629, 0.919, 0.716, respectively. These three items were consistently loading on the latent factor *motives* as designed in the survey questionnaire. Therefore, the factor was labelled as *motives of functional food consumption*.

6.5.5.6 Consistency

Four items—[SQ13] I typically prefer to do things the same way, [SQ14] I would cook functional foods the way I usually cook my foods, [SQ15] I prefer functional food with a familiar taste, [SQ10] I would prefer to eat functional foods that have been consumed for generations—were loaded on factor 6, with coefficient scores of 0.743, 0.539, 0.636, 0.342, respectively. The first three factors with strong loading scores fall together as proposed in the survey questionnaire. These items were proposed to be items measuring the latent variable *consistency* in the survey questionnaire. The new item SQ10 has a low factor score of 0.342, which means the contribution of this item to the overall meaning of the factor is low; however, this factor is still indicating that consumers want to be consistent with what their ancestors have been eating or their parents have been eating in the past. Therefore, the factor was labelled as c*onsistency*.

After the extraction and labelling of the factors, composite variables were formulated by finding the mean of the values of each of the items contributing to a factor for each case. The composite variables were labeled as perception, stimulation, conformity, stimulation, motives, consistency. The average (mean) score for each case, based on the items in each factor, was calculated. It is much easier to interpret the composite scores calculated as the average of the scores for the contributing items because they are measured on the scale of the original variables (1–7 scale), whereas those

formulated using factor scores are not on the 1–7 scale and so it is difficult to interpret effect size. The composite variables would make it feasible to do further analysis such as comparison of subgroups of age, ethnicity, income, gender, and education for the extracted factors. This would also make it feasible to test the correlation between the factors. The standard statistical tests like correlation analysis, ANOVA will be used in the following sections of the data analysis.

6.6 Theoretical model of functional food behaviour

6.6.1 Correlation analysis of the extracted factors

The relationship between the latent variables- perception, conformity, stimulation, self-directed learning, consistency and motives of functional food consumption was further examined using Pearson correlation analysis. Before running the Pearson correlation analysis, the assumptions for the analysis were checked. The following were the assumptions for the Pearson correlation analysis

a. The variables should be continuous: The composite variables were created by summing the means of each case for each item under a factor. Through the process, the ordinal variables are now transformed into a continuous variable. This assumption is believed to be fulfilled, but still, the researcher was cautious while doing the analysis and interpreting the results.

b. There should be a pair of variables: There are six variables which should give 15 pairs of variables.

c. The should be a linear relationship between the paired variables. Scatter plots for all the 15 pairs of variables were drawn (See Appendix H for scatter plots). The scatter plots reasonably showed a linear relationship between the variables which fulfil the assumption of linearity.

d. There should be no significant outliers. The data was initially screened for outliers using variance, time, and Mahalanobis distances which has reduced the outliers to the minimum. However, visual inspection of the specific scatter plots given in Appendix H, show there is a reasonably low number of outliers; the dots are close to the fit line. There are few outliers in the self-directed learning vs consistency plot and the self-directed learning vs conformity plot, and one or two outliers in the perception vs stimulation plot and the perception vs conformity plot; however, the dots are not too far from the bulk of the data. Therefore, it would be safe to assume that there are few

outliers, but due to not having good reasons to remove them, I decided to proceed with caution.

e. The data should be normally distributed. The Shapiro-Wilk test for normality was done. Not all variables were normally distributed, as assessed by the Shapiro-Wilk's test ($P < 0.05$). However, the Shapiro-Wilk test is sensitive to a large sample (> 50) and larger than 50 cases can lead to a statistically significant result (non-normal). It is more appropriate to observe histograms and Q-Q plots for normality. Based on the inspection of the normality plots (See Appendix I), it was assumed that the data is approximately normally distributed and, further, the Pearson correlation test is somewhat robust to deviations from normality. The dots in the Q-Q plots were mostly along the diagonal line. The bulk of the data in the histograms approximately followed a normal distribution. There are some outliers in the perception histogram, one in the histogram of conformity; however, there no good reason to remove these outliers from the data.

Since the assumptions were approximately fulfilled, the correlation analysis proceeded with caution. The correlation analysis was done using both Pearson's correlation analysis (parametric) and Spearman's correlation analysis (non-parametric). Both the analyses had similar results, and thus there was sufficient rationale to choose Pearson's correlation analysis.

Table 54 Pearson's correlation analysis of the variables

Correlations							
		Self-directed learning	Perception	Consistency	Stimulation	Conformity	Motive
Self-Directed learning	Pearson correlation	1	0.461**	0.246**	0.402**	0.267**	0.380**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000
	N	365	365	365	365	365	365
Perception	Pearson Correlation	0.461**	1	0.414**	0.729**	0.541**	0.679**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000
	N	365	365	365	365	365	365
Consistency	Pearson Correlation	0.246**	0.414**	1	0.269**	0.390**	0.358**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000
	N	365	365	365	365	365	365

Stimulation	Pearson Correlation	0.402**	0.729**	0.269**	1	0.423**	0.545**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000
	N	365	365	365	365	365	365
Conformity	Pearson Correlation	0.267**	0.541**	0.390**	0.423**	1	0.437**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000
	N	365	365	365	365	365	365
Motive	Pearson Correlation	0.380**	0.679**	0.358**	0.545**	0.437**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	
	N	365	365	365	365	365	365
**. Correlation is significant at the 0.01 level (2-tailed).							

Source: Developed for this study

Table 54 presents the results of the correlation test between the variables. The Cohen (1988) guideline says that there is a small correlation between variables when $0.1 < | r | < .3$ (where $| r |$ means the absolute value of r), a medium/moderate correlation when $0.3 < | r | < 0.5$, and a large/strong correlation when $| r | > 0.5$.

From the correlation matrix, it is seen that the strongest correlation was between perception and other variables. Perception had moderate to strong correlation with all the variables. It had strong correlation with stimulation ($r = 0.729$), conformity ($r = 0.541$), and motive ($r = 0.679$). Perception had a statistically significant moderate correlation with variables self-directed learning ($r = 0.461$) and consistency ($r = 0.414$).

Henceforth, the following would be the regression model for the six variables. The model includes the Pearson's correlation coefficients as well.

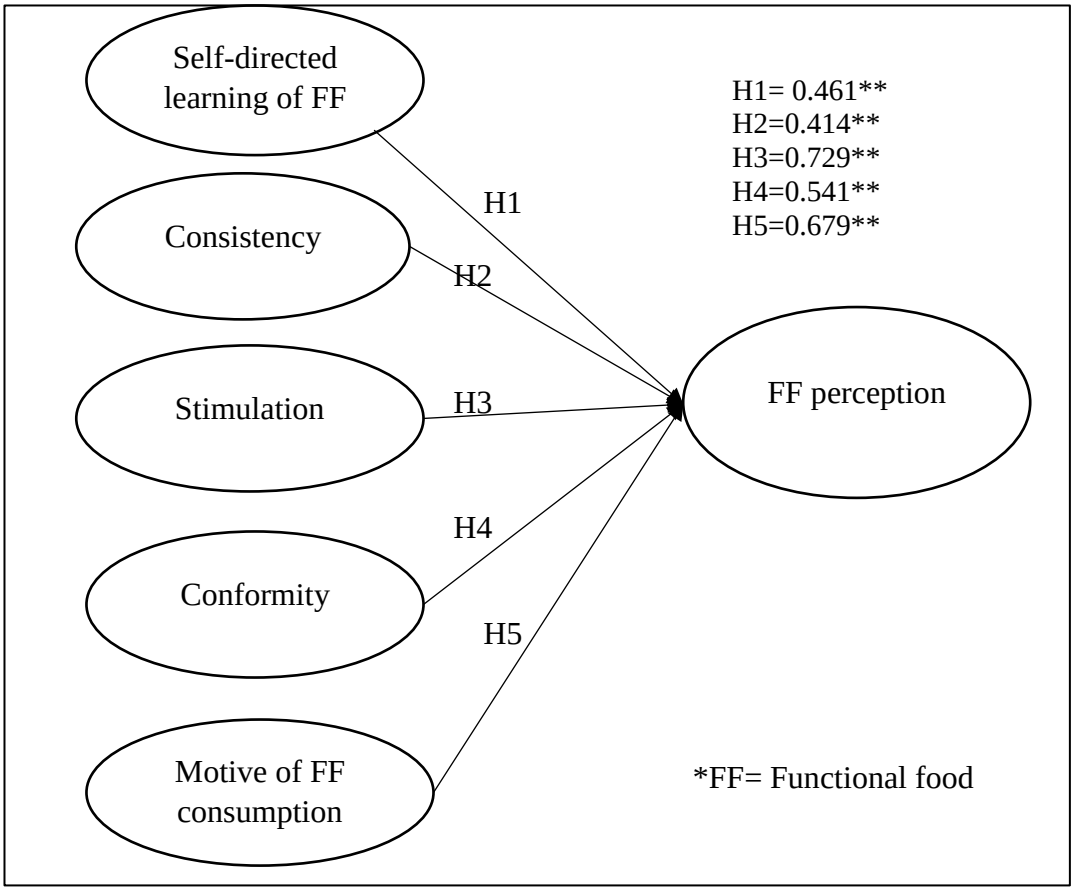

Figure 12 Theoretical model with Pearson correlation coefficient values

6.7 ANOVA tests

The researcher was further interested in looking at the relationship between the age, gender, income, ethnicity, and education of consumers with the latent variables from the correlation model. It is important to see how the consumer demographics did or did not influence the variables self-directed learning, consistency, stimulation, conformity, motive, perception in terms of functional food consumption. One-way ANOVA was conducted for comparing the means of sub-groups for each variable.

The key assumptions for one-way ANOVA are a) there should be no outliers, b) approximate normal distribution of the dependent variable for each group (population) of the independent variable. Since the researcher did not have access to the population the samples of the population were used as the best estimate to check normality of the population, c) homogeneity of variances (the variances of in each group of the independent variable should be equal).

a. There should be no outliers

Box plots of each variable (self-directed learning, consistency, stimulation, conformity, motive, perception) for each sub-group (age, gender, annual income, ethnic group, education) were plotted. There were some outliers in the box plot of each variable for each group. Altogether, the following is a list of cases indicated as outliers across the box plots: 197, 350, 319, 120, 368, 102, 289, 266, 320, 116, 379, 348, 216, 210, 106, 356, 247, 339, 140, 444, 323, 25, 258, 388, 56. However, it is also notable that there were no extreme outliers at all. The researcher did a case-wise review of the outliers and did not find any good reason to remove the outliers. The outliers seemed to be genuinely unusual values and, thus, the decision was made to keep the observations, and one-way ANOVA tests were done with caution.

b. Test of normality

Normality test was done using the Shapiro-Wilk test. The null hypothesis of the Shapiro-Wilk test is that the distribution of the data is normal. If $P < 0.05$, the null hypotheses are rejected, which means data is not normal. If $P > 0.05$, the test failed to reject null hypotheses of normality, and thus data is normally distributed. All the variables except motive were normally distributed for age group 71 years and above, as assessed by Shapiro-Wilk's test ($P > 0.05$). None of the variables were normally distributed for the age group 18–50 years. Perception, consistency and conformity were normal for the age group 51–70 years, as the Shapiro-Wilk test had a $P > 0.05$. In the case of the gender group, all the variables had non-normal data except conformity which had a statistically significant P value for the Shapiro-Wilk test ($P = 0.073$), which means the data is normally distributed. In the case of the income group, all the variables except motive had normally distributed data for the income group \$0–\$18,200 as the Shapiro-Wilk test was insignificant ($P < 0.05$). Other than that, only stimulation had statistically significant results for the income group \$90,000 and over. The normality test result of all variables for the ethnic groups was significant except for perception and consistency, which both had statistically insignificant results ($P = 0.064$ and $P = 0.067$ respectively), meaning the data is normally distributed. The variables had consistently statistically significant results for the education group *bachelor's degree level* meaning the data is not normal. However, for the rest of the variables, there was a mixed result. The Shapiro-Wilk normality test showed inconsistent result, and it was challenging the normality of the subgroups. However,

it is believed that the Shapiro-Wilk test is sensitive to large sample size (> 50) and even a small deviation from normality would result in a statistically significant result for the normality test. With sample sizes of more than 50, it is advised that a visual inspection of histograms and Q-Q plots would be the best way to predict normality of the data.

Moreover, ANOVA is robust and minor deviations from normality would not make much impact on the results. From the visual inspection of the histogram and Q-Q plots, it was concluded that the data is approximately normally distributed. The bulk of the data in the histograms followed an approximately normal distribution. The dots in the Q-Q normality plot were close to the diagonal line and did not sag much above or below the line.

c. Test of homogeneity of variances

Variances were homogeneous, as assessed by Levene's test for equality of variances.

6.7.1 The distribution of variables across age groups

One-way ANOVA test was run to compare the means of the age groups and the six latent variables. In the three age groups—18–50 years, 51–70 years, 70 years and above—the observations were 219, 111 and 35, respectively. The importance of self-directed learning during functional food consumption (self-directed learning score) between the age group 18–50 years (n = 219, 5.59 ± 0.83) and the age group 51–70 years (n = 111, 5.56 ± 0.78) was similar. The age group 71 years and above gave higher importance to self-directed learning (n = 35, 5.65 ± 0.67); however, it is also important to note that the sample size for this age group is much smaller than the two younger age groups. For the variable functional food perception, participants in the age group 18–50 years (n = 219, 5.49 ± 0.74) gave higher scores compared with the other two age groups. Consistency was given low importance by participants in the age group 51–50 years (n = 111, 5.18 ± 0.75). The mean value of stimulation was low for the age group 71 years and above (n =35, 5.16 ± 0.82). Overall, the conformity variable had lower mean across all age groups compared with other variables in the test. The mean for conformity across the age group 18–50 years, 51-–0 years and 71 years and above was 4.8 (± 0.94), 4.07 (± 0.83), 4.06 (± 0.74). Participants in the age group 18–50

years (n = 219, 5.5 ± 0.81) gave more value to their motives for functional food consumption compared with the other two age groups.

ANOVA requires the population variances of the dependent variable to be equal for all sub-groups of the independent variable. The Levene's test of equality of variances was done. The test gave a statistically insignificant result for self-directed learning (P = 0.066), perception (P = 0.966), consistency (P = 0.275), stimulation (P = 0.691), motive (P = 0.671) which means there was the homogeneity of variances of these variables for all age groups. However, for the variable conformity, the assumption of homogeneity was violated as assessed by Levene's test for equality of variances (P = 0.015).

Although the normality of distribution was approximately met, the sample sizes across the age groups were quite unequal. Further, the equality of variances was violated in the case of the variable conformity. Therefore, the mean comparison was done with caution. The mean comparison was done using both the parametric (one-way ANOVA with Tukey post hoc test) and a non-parametric test (Kruskal-Wallis test). Also, the Games-Howell test was performed due to the conformity variable having violated the assumptions of equality of variances (refer to Table 55). All three tests gave similar results and, thus, it increased confidence that the unequal sample size, some deviation from normality, and some violation of equality of variances did not have any effect on the comparison of means of the sub-groups. Therefore, the results from parametric test one-way ANOVA with Tukey post hoc test were considered for further interpretation.

Table 55 Parametric and non-parametric test for age groups

	ANOVA (parametric test)		Non-parametric test
Variables	Tukey post hoc	Games-Howell post hoc	Kruskal-Wallis
Self-directed learning	0.822	0.822	0.796
Perception	0.001	0.001	0.001
Consistency	0.837	0.837	0.724
Stimulation	0.001	0.001	0.001
Conformity	0.000	0.000	0.000
Motive	0.050	0.050	0.001

Source: Quantitative data analysis

Self-directed learning (P = 0.796) and consistency (P = 0.724) had a statistically insignificant result, which suggests that the means of the variables are the same for all the age groups and, thus, show that there is no significant effect of age differences on these two variables. Conversely, perception (P = 0.001), stimulation (P = 0.001), conformity (P = 0.000), and motive (P = 0.001) were statistically significantly different for different age groups. The Tukey post hoc test was done to see a pairwise comparison of the distribution of the variables across the three age groups.

Table 56 Comparisons of the distribution of variables between age groups

Multiple Comparisons							
Tukey HSD							
Dependent Variable	(I) What is your age group?	(J) What is your age group?	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Perception	18–50 years	71 years and above	0.49086*	0.13756	0.001	0.1671	0.8146
Stimulation	18–50 years	51–70 years	0.30648*	0.09337	0.003	0.0867	0.5262
		71 years and above	0.38040*	0.14588	0.026	0.0371	0.7237
Conformity	18–50 years	51–70 years	0.79170*	0.10430	0.000	0.5463	1.0372
		71 years and above	0.79711*	0.16295	0.000	0.4136	1.1806
*. The mean difference is significant at the 0.05 level.							

Source: Developed for this study

The three variables—perception, stimulation and conformity—had a statistically significant mean difference between the age group 18-50 years and 71 years and above. There was a decrease in the perception score from 5.4 ± 0.74 in the 18–50 years group to 5.0 ± 0.8 in the 71 years and above group, a decrease of 0.49 (95% CI 0.16 to 0.81), which was statistically significant (P = 0.001). There was a decrease of the stimulation score from 5.5 ± 0.77 in the 18–50 years group to 5.2 ± 0.85 in the 51–70 years group, a decrease of 0.30 (95% CI 0.08 to 0.52) and to 5.1 ± 0.82 in the 71 years and above group, a decrease of 0.38 (95% CI 0.03 to 0.72). The conformity score decreased from 4.8 ± 0.94 in the 18–50 years group to 4.0 ± 0.83 in the 51-–0 years group, a decrease of 0.79 (95% CI 0.54 to 1.03) and it decreased to 4.0 ± 0.74 in the71 years and above group with a decrease of 0.79 (95% CI 0.41 to 1.18). The partial eta squared value was used as an estimate of the effect size of the outcome. The rule of

thumb is the size effects of $R^2 = 0.02$ is small, $R^2 = 0.13$ is medium, and $R^2 = 0.26$ is large (Cohen 1994). The measure of effect size for perception ($R^2 = 0.041$) and stimulation ($R^2 = 0.039$) are small, while the effect size for conformity is medium ($R^2 = 0.160$).

6.7.2 The distribution of variables across gender groups

A one-way ANOVA test was run to compare the effect of age groups on the six latent variables. There were 189 females, 175 males and 1 intermediate/intersex/unspecified. The means of the variables did not vary much between the gender groups. The mean of self-directed learning was 5.5 ± 0.7 for males and 5.5 ± 0.8 for females. There was a negligible increase in the perception score from 5.3 ± 0.76 for males to 5.4 ± 0.77 for females. Similarly, the scores for the variables- consistency (5.2 ± 0.76 for males, 5.1 ± 0.79 for females), stimulation (5.3 ± 0.81 for males, 5.4 ± 0.81 for females), conformity (4.5 ± 0.92 for males, 4.5 ± 1.02 for females) and motives (5.4 ± 0.83 for males, 5.4 ± 0.86 for females) were very similar. The differences were quite negligible. Howeverr, a one-way ANOVA was run to see if there were any significant differences in the distribution of the variables across the gender groups (Table 57).

The Levene's test of equality of variances was statistically insignificant for all variables: self-directed learning (P = 0.245), perception (P = 0.836), consistency (P = 0.649), stimulation (P = 0.815), conformity (P = 0.052), motive (P = 0.501).

Table 57 ANOVA test for distribution of variables across genders

ANOVA					
Variables	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Self-Directed learning	0.072	2	0.036	0.055	0.947
Perception	0.506	2	0.253	0.426	0.653
Consistency	0.624	2	0.312	0.510	0.601
Stimulation	1.846	2	0.923	1.392	0.250
Conformity	0.705	2	0.353	0.371	0.691
Motive	0.088	2	0.044	0.061	0.941

Source: Developed for this study

The scores for all six variables were statistically insignificant, meaning there was no difference between the means of the two gender groups in terms of the latent variables.

6.7.3 The distribution of variables across income groups

A one-way ANOVA test was run to assess the distribution of the variables across the income groups. The aim is to see if there is any difference in the means of variables across the income groups. This would give some understanding of whether income affects the influence of the variables on functional food perception. There were four income groups $0–$18,200 (n = 61), $18,201–$37,000 (n = 102), $37,100–$90,000 (n = 134), $90,001 and over (n = 68). The Levene's test had P > 0.05, statistically insignificant, for all variables across all income groups, which means the assumption of homogeneity of variances was not violated. As seen in the Shapiro-Wilk test, all variables were normally distributed across all income groups except for the variable motive. Since the assumption of normal distribution was violated in the case of the motive variable, and there were unequal sample sizes in the groups, both one-way ANOVA with Tukey post hoc test (parametric test) and Kruskal-Wallis test was done. The results from the Kruskal-Wallis test were consistent with ANOVA test results. Thus, it gave further assurance that minor deviations from normality and unequal sample sizes, or small violation assumptions have not been influential in the outcome of the ANOVA test.

Table 58 Parametric and non-parametric test for income groups

		ANOVA			**Kruskal-Wallis**
		df	F	Sig.	Sig.
Self-directed learning	Between groups	3	4.106	0.007	0.0200
	Within groups	361			
	Total	364			
Perception	Between groups	3	4.411	0.005	0.006
	Within groups	361			
	Total	364			
Consistency	Between groups	3	0.865	0.460	0.582
	Within Groups	361			
	Total	364			
Stimulation	Between Groups	3	8.903	0.000	0.000
	Within Groups	361			
	Total	364			
Conformity	Between Groups	3	5.270	0.001	0.002
	Within Groups	361			
	Total	364			
Motive	Between Groups	3	0.913	0.435	0.472
	Within Groups	361			
	Total	364			

Source: Developed for this study

Self-directed learning, perception, stimulation, and conformity scores were statistically significantly different between different income groups at P = 0.007, P = 0.005, P = 0.000010, P = 0.001, respectively. Pairwise comparison of the groups for each variable was assessed by the Tukey post hoc test. The following are the results of the post hoc test.

Table 59 Comparisons of the distribution of variables between age groups

Multiple comparisons							
Tukey HSD							
Dependent variable	(I) Annual income?	(J) Annual income?	Mean difference (I-J)	Std. error	Sig.	95% Confidence Interval	
						Lower bound	Upper bound
Self-directed learning	0 to $18,200	$37,001 to $90,000	-0.33178*	0.12302	0.037	-0.6493	-0.0143
		≥$90,001	-0.47943*	0.14046	0.004	-0.8420	-0.1169
Perception	0 to $18,200	$37,001 to $90,000	-0.36259*	0.11720	0.011	-0.6651	-0.0601
		≥$90,001	-0.42237*	0.13381	0.009	-0.7677	-0.0770
Stimulation	0 to $18,200	$37,001 to $90,000	-0.48696*	0.12198	0.000	-0.8018	-0.1721
		≥$90,001	-0.61712*	0.13927	0.000	-0.9766	-0.2576
	$18,201 to $37,000	$37,001 to $90,000	-0.27082*	0.10378	0.046	-0.5387	-0.0030
		≥$90,001	-0.40098*	0.12364	0.007	-0.7201	-0.0819
Conformity	$0 to $18,200	$37,001 to $90,000	-0.38747*	0.14782	0.045	-0.7690	-0.0059
		≥$90,001	-0.55549*	0.16878	0.006	-0.9911	-0.1199
	$18,201 to $37,000	≥$90,001	-0.44690*	0.14984	0.016	-0.8336	-0.0602
*. The mean difference is significant at the 0.05 level.							

The self-directed learning score significantly increased from 5.2 ± 0.88 in the $0–$18,200 income group to 5.6 ± 0.74 in the $37,001–$90,000 group, an increase of 0.33 (95% CI 0.014 to 0.64) and increased to 5.7 ± 0.77 in the ≥ $90,001 income group with an increase of 0.47 (95% CI 0.11 to 0.84). The perception scores statistically significantly increased from 5.1 ± 0.80 in the income group $0–$18,200 to 5.4 ± 7.1

in the income group $37,001–$90,000, an increase of 0.36 (95% CI 0.06 to 0.66), and to 5.5 ± 0.72 in the income group ≥ $90,000 with an increase of 0.42 (95% CI 0.07 to 0.76). The stimulation scores significantly increased from 5.0 ± 0.91 in the $0–$18,200 income group to 5.5 ± 0.75 in the $37,001–$90,000 income group, with an increase of 0.48 (95% CI 0.17 to 0.80), and to 5.6 ± 0.74 in the ≥ $90,000 income group, with an increase of 0.61 (95% CI 0.25 to 0.97). There was a statistically significant difference in mean (0.40) for the stimulation score between income groups $0–$18,201 and ≥ $ 90,001. The conformity score increased from 4.2 ± 1 in income group $0–$18,200 to 4.6 ± 0.97 in income group $37,001–$90,000, with an increase of 0.38 (95% CI 0.0059 to 0.76). The stimulation scores further significantly increased to 4.8 ± 0.94 in the income group ≥ 90,001 with an increase of 0.55 from 4.6 ± 0.97 in the income group $37,001–$90,000. There was an increase of 0.44 (95% CI 0.06 to 0.83) in stimulation score from income group $18,201–$37,000 to income group ≥ $90,001.

The measure of effect size for self-directed learning (R^2 = 0.033), perception (R^2 = 0.035) was small. There was a medium effect size for stimulation (R^2 = 0.069) and a large effect size for conformity (R^2 = 0.42). The general trend seen is that the scores of the variables increased with the higher income groups. The higher earning groups gave more importance to self-directed learning, perception, stimulation and conformity. The groups gave a different level of importance to the variables, and it was statistically significant. However, the effect size was small.

6.7.4 The distribution of variables across ethnic groups

A one-way ANOVA was conducted to determine if the scores of the six latent variables were different for groups with different ethnicity. As already noted, there were three ethnic groups Anglo-Australian (n = 173), Chinese (n = 102) and Indian (n = 90). There were no outliers, as assessed by boxplot; data was normally distributed for each group, for the variables self-directed learning, stimulation, conformity and motive, as evaluated by the Shapiro-Wilk test (P > .05); but not for perception and consistency. However, visual inspection of the histograms and normally plots suggest the approximately normal distribution for perception and consistency as well. Variances were homogeneous, as assessed by Levene's test of homogeneity of variances between ethnic groups for all variables P > 0.05). Both the one-way ANOVA and the Kruskal Wallis test were performed. Kruskal-Wallis results were consistent

with ANOVA, which means that any unnoticed violation of assumptions, inequality of sample sizes, and minor deviations from normality were not influential to the outcome.

Table 60 Parametric and non-parametric test for ethnic groups

ANOVA							**Kruskal Wallis test**
		Sum of squares	df	Mean Square	F	Sig.	Sig.
Self-Directed learning	Between groups	8.792	2	4.396	6.978	0.001	0.001
	Within groups	228.050	362	0.630			
	Total	236.842	364				
Perception	Between groups	13.139	2	6.569	11.754	0.000	0.000011
	Within groups	202.323	362	0.559			
	Total	215.461	364				
Consistency	Between groups	2.142	2	1.071	1.762	0.173	0.096
	Within groups	220.072	362	0.608			
	Total	222.214	364				
Stimulation	Between groups	15.242	2	7.621	12.176	0.000	0.000008
	Within Groups	226.579	362	0.626			
	Total	241.821	364				
Conformity	Between Groups	70.002	2	35.001	46.049	0.000	0.000
	Within Groups	275.150	362	0.760			
	Total	345.153	364				
Motive	Between Groups	10.352	2	5.176	7.445	0.001	0.001
	Within Groups	251.688	362	0.695			
	Total	262.040	364				

Table 61 Estimate of effect size for ethnic groups

Source	**Dependent variable**	**Partial Eta squared (R^2)**
Ethnic group	Self-directed learning	0.037
	Perception	0.061
	Stimulation	0.063
	Conformity	0.203
	Motive	0.040

Source: Developed for this study

The self-directed, perception, stimulation, conformity and motive scores were significantly different between ethnic groups at $P < 0.05$. However, the effect size for the self-directed variable ($R^2 = 0.037$) and for motive ($R^2 = 0.040$) was small. Perception ($R^2 = 0.061$), stimulation ($R^2 = 0.063$) had a medium effect size while conformity ($R^2 = 0.203$) had a large effect size. Consistency score was not significantly different between the ethnic groups ($P = 0.17$). Since there were three ethnic groups, a pairwise comparison using the Tukey post hoc test was done to see which pair of groups were more significantly different.

Table 62 Pairwise comparison of ethnic groups

Multiple comparisons							
Tukey HSD							
Dependent variable	(I) Ethnic group	(J) Ethnic group	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval	
						Lower bound	Upper bound
Self-directed learning	Indian	Anglo Australian	0.31798*	0.10316	0.006	0.0752	0.5607
		Chinese	0.40458*	0.11479	0.001	0.1344	0.6747
Perception	Indian	Anglo Australian	0.43862*	0.09716	0.000	0.2100	0.6673
		Chinese	0.44278*	0.10812	0.000	0.1883	0.6972
Stimulation	Indian	Anglo Australian	0.49721*	0.10282	0.000	0.2552	0.7392
		Chinese	0.41791*	0.11442	0.001	0.1486	0.6872
Conformity	Chinese	Anglo Australian	0.58353*	0.10884	0.000	0.3274	0.8397
	Indian	Anglo Australian	1.05913*	0.11331	0.000	0.7925	1.3258
		Chinese	0.47560*	0.12608	0.001	0.1789	0.7723
Motive	Indian	Anglo Australian	0.40458*	0.10837	0.001	0.1495	0.6596
		Chinese	0.36100*	0.12059	0.008	0.0772	0.6448
*. The mean difference is significant at the 0.05 level.							

Interestingly, the scores of all the variables—self-directed learning, perception, stimulation, conformity, motive—differed highly significantly between Indian and Chinese participants and Indian and Anglo-Australian participants. There was no

significant difference between Anglo-Australian and Chinese groups except for the variable conformity. The self-directed learning score significantly decreased (P = 0.06) from 5.8 ± 0.77 in the Indian group to 5.5 ± 0.77 in the Anglo-Australian group, with a decrease of 0.31 (95% CI 0.75 to 0.56), and it further decreased to 5.4 ± 0.84 in the Chinese group with a decrease of 0.40 (95% CI 0.13 to 0.67). The perception scores significantly decreased from 5.7 ± 0.67 in the Indian group to 5.2 ± 73 in the Chinese group, and 5.2 ± 0.78 in the Anglo-Australian group. Similarly, the score of the variable stimulation decreased from 5.7 ± 0.76 in the Indian group to 5.3 in the Chinese group, with a decrease of 0.41, and to 5.2 ± 0.83 in the Anglo-Australian group, with a decrease of 0.49. In the case of the conformity variable, the scores decreased from 5.1 ± 0.93 in the Indian group to 4.7 ±0 .82 in the Chinese group, a decrease of 0.36, to 4.1 ± 0.86 in the Anglo-Australian group, with a decrease of 0.40. The conformity scores also significantly decreased from 4.7 ± 0.82 in the Chinese group to 4.1 ± 0.86 in the Anglo-Australian group, with a decrease of 0.58 (95% CI 0.32 to 0.83). The Indian group gave a high score for motive, 5.7 ± 0.77, which decreased to 5.4 ± 0.83 in the Chinese group, with a difference of 0.36, and decreased to 5.3 ± 0.83 in the Anglo-Australian group, with a decrease of 0.40.

6.7.5 The distribution of variables across education groups

Table 63 Parametric and non-parametric test for ethnic groups

ANOVA							**Kruskal -Wallis test**
		Sum of Squares	df	Mean Square	F	Sig.	
Self-directed learning	Between groups	11.407	5	2.281	3.624	0.003	0.006
	Within groups	225.368	358	0.630			
	Total	236.775	363				
Perception	Between groups	12.472	5	2.494	4.409	0.001	0.001
	Within groups	202.553	358	0.566			
	Total	215.025	363				
Consistency	Between groups	6.418	5	1.284	2.134	0.061	0.063
	Within groups	215.297	358	0.601			
	Total	221.715	363				

Stimulation	Between groups	18.196	5	3.639	5.827	0.000034	< 0.001
	Within groups	223.578	358	0.625			
	Total	241.774	363				
Conformity	Between groups	81.186	5	16.237	22.145	< 0.001	< 0.001
	Within groups	262.490	358	0.733			
	Total	343.677	363				
Motive	Between groups	12.269	5	2.454	3.535	0.004	0.007
	Within groups	248.475	358	0.694			
	Total	260.743	363				

Source: Developed for this study

A one-way ANOVA was conducted to determine if consumers' scores for functional food perception, self-directed learning, consistency, stimulation, conformity and motive, in association with functional food consumption, were different for groups with different levels of education. Participants were initially classified into six groups: postgraduate degree level (n = 67), graduate diploma and graduate certificate level (n = 24), bachelor degree level (n = 102), advanced diploma and diploma level (n = 32), certificate level (n = 50), and secondary education *(*n = 89). Data are presented as mean ± standard deviation. Self-directed learning score was highly significantly different between education level groups, F (5, 358) = 3.624, P = .006, R^2 = .048. The difference in scores for perception F (5, 358) = 4.409, P = .001, R^2 = .058, stimulation F (5, 358) = 5.828, P = .001, R^2 = .075, conformity F (5, 358) = 22.145, p < .001, R^2 = .236, and motive F (5, 358) = 3.535, P = .007, R^2 = .047 were also highly significant for the education level groups. The consistency score was insignificant in education-level groups, similar to the trend seen in tests with earlier demographic groups. The Kruskal-Wallis test results were consistent with ANOVA tests, thus confirming that minor deviations from normality, or unknown violations of assumptions, and inequality of variances did not have an influential impact to the outcome of the parametric test.

The mean for the self-directed learning variable decreased from 5.8 ± 0.76 in postgraduate degree level to 5.4 ± 0.86 in bachelor degree level, a decrease of 0.43 (95% CI 0.08 to 0.79) and then decreased to 5.4 ± 0.78 in secondary level, with a

decrease of .47 (95% CI 0.10 to 0.84). The score for functional food perception decreased from 5.6 ± 0.70 in postgraduate degree level to 5.1 ± 0.71 in secondary level education, a decrease of 0.43 (95% CI 0.09 to 0.78). Although the ANOVA test did not find any significant difference in the scores of variable *consistency*, the Tukey post hoc test found that there was a difference of means of variable consistency between graduate diploma and graduate certificate level and advanced diploma and diploma level. The consistency score decreased from 5.5 ± 0.85 to 4.9 ± 0.77 (95% CI 0.05 to 1.2). Similarly, the score of the stimulation variable decreased from 5.6 ± 0.79 at postgraduate degree level to 5.0 ± 0.85 at secondary level with a decrease of .6 (95% CI 0.24 to 0.97). There were highly significant differences in stimulation means between graduate diploma and secondary level education, and between bachelor degree and secondary level education. Conformity had more pairs of education level groups that had a significant difference of means. The score of conformity decreased from 4.9 ± 0.91 at postgraduate degree level to 3.8 ± 0.74 at secondary level education, with a decrease of 0.79 (95% CI 0.26 to 1.3), a continuity of trends in earlier variables, but the difference is a little more pronounced. Again, the score for motive significantly decreased from postgraduate degree level to secondary education with a difference of 0.5 at 95% CI 0.11 to 0.89.

Table 64 Pairwise comparison of different education levels

Multiple comparisons							
Tukey HSD							
Dependent variable	**(I) Highest level of education?**	**(J) Highest level of education?**	**Mean difference (I-J)**	**Std. error**	**Sig.**	**95% Confidence interval**	
						Lower bound	**Upper bound**
Self-directed learning	Postgraduate Degree Level	Bachelor degree level	0.43801*	0.12477	0.007	0.0805	0.7955
		Secondary education	0.47230*	0.12833	0.004	0.1046	0.8400
Perception	Postgraduate degree level	Secondary education	0.43968*	0.12166	0.005	0.0911	0.7883
	Graduate diploma and Graduate certificate level	Secondary education	0.59589*	0.17301	0.008	0.1002	1.0916

Consistency	Graduate diploma and Graduate certificate level	Advanced diploma and diploma level	0.65625*	0.20941	0.023	0.0563	1.2562
Stimulation	Postgraduate degree level	Secondary education	0.60865*	0.12782	0.000	0.2424	0.9749
	Graduate diploma and Graduate certificate level	Secondary education	0.61910*	0.18177	0.009	0.0983	1.1399
	Bachelor degree level	Secondary education	0.42891*	0.11463	0.003	0.1005	0.7573
Conformity	Postgraduate degree level	Advanced diploma and diploma level	0.79213*	0.18400	0.000	0.2649	1.3193
		Certificate level	0.67005*	0.16002	0.001	0.2115	1.1286
	Graduate diploma and graduate certificate level	Advanced diploma and diploma level	0.90625*	0.23122	0.001	0.2437	1.5688
		Certificate level	0.78417*	0.21264	0.004	0.1749	1.3934
		Secondary education	1.21840*	0.19695	0.000	0.6541	1.7827
	Bachelor degree Level	Advanced diploma and diploma level	0.73509*	0.17350	0.000	0.2380	1.2322
		certificate level	0.61301*	0.14783	0.001	0.1895	1.0366
		Secondary education	1.04724*	0.12420	0.000	0.6914	1.4031
	Certificate level	Secondary education	0.43423*	0.15134	0.049	0.0006	0.8678
Motive	Postgraduate degree level	Secondary education	0.50545*	0.13475	0.003	0.1194	0.8915
*. The mean difference is significant at the 0.05 level.							

6.8 Conclusion

The factor analysis retained six factors: self-directed learning of functional food, conformity, consistency, stimulation, motives of functional food consumption,, and perception concerning functional food. The factors—self-directed learning, conformity, stimulation, and consistency—are the cultural values affecting functional food perception. From the factor analysis, it is known that there is a positive correlation between consumers' cultural values and functional food perception. The correlation answers the general research question, *Does culture affect consumer perceptions of functional food?* and *What cultural values affect consumer perceptions*

of functional food? The cultural values—self-directed learning, conformity, consistency, and stimulation, along with the motives of functional food consumption—affect the perception of functional food consumers answering the sub-research question- *How do these cultural values affect consumers' functional food perception?* Further discussion on the findings of the study are presented in the following chapter.

Chapter 7: Discussion and Conclusion

7.1 Introduction

The exploratory factor analysis in this study has confirmed that functional food perception depends upon the culture of a consumer. The factor analysis retained six factors about the association between a consumer's culture and functional food perception. The six factors are consumer perception, conformity, stimulation, self-directed learning of functional food, and motives of functional food consumption. The research also developed an instrument with 32 items for measuring those six factors. The correlation analysis of the factors suggested a theoretical model with functional food perception dependent upon the other five factors. The following sections will discuss how the extracted factors and the analysis of variance test of the variables have answered the research propositions proposed for this stage of the research. Table 65 presents some of the key contribution of the research and these contributions will unfold as the discussion progresses in the following sections.

Table 65 Table highlighting key contributions of the research

Previous studies	**Current research**	**Contribution of the research**
Previous studies found that consumers were most willing to compromise the health benefits of functional food for its taste, texture and flavour (Urala & Lähteenmäki 2003, 2004; Verbeke 2006; Messina et al. 2008; Azzurra & Paola 2009; Markovina et al. 2011; Tuorila & Cardello 2002; Ares et al. 2008b; Cox et al. 2004; Vidigal et al. 2011). Functional food consumers seek to prioritise or balance conflicting values when making functional food decisions (Hassan 2011b).	This study found that consumers negotiate sensory and health values during functional food consumption. Consumers' need for stimulation affects their functional food perception. Consumers' need for security affects their functional food perception.	The study validates previous findings that functional food perception involves a negotiation of health and sensory values offered by functional foods.
Functional food perception is a matter of negotiation	Consumer perception of functional food is	The current study suggests that

between cultural values mastery vs harmony (Bech-Larsen and Grunert 2003).	influenced by the perseverance of consumers towards functional foods. Consumers' need for conformity affects their functional food perception	consumers' level of perseverance, a desire to put extra effort and learn about functional foods, could be a manifest of consumers' value for mastery while their need for conformity to functional food consumption could be a manifest of their desire for harmony.
Confidence in functional foods is one of the predictors of willingness to use functional foods (Urala and Lähteenmäki 2004)	Consumers' self-confidence about functional food influences their perception of functional food.	The study supports the fact that self-confidence is one of the cultural values influencing functional food perception.
Self-control makes consumers disciplined towards eating a chosen healthy food (De Vet et al. 2014).	Consumers' self-control over their behaviours associated with functional food influences their perception of functional foods.	The study supports the fact that self-control is one of the cultural values affecting functional food perception.
Multiple studies have confirmed that functional food perception depends upon the hedonic perception, hedonism being a manifest of need for stimulation (Armstrong et al. 2005, Azzurra and Paola 2009, Lyly et al. 2007, Markovina et al. 2011, Messina et al. 2008).	Consumers' need for stimulation affects their functional food perception.	Stimulation is one of the cultural values influencing functional food perception.
Australians value self-direction (Schwartz and Bardi 2001)	Self-directed learning influences consumers' functional food perception.	Functional food perception is influenced by the cultural value 'self-directed learning'.
Consumers seeking consistency in their behaviour could be a manifestation of them seeking familiarity in functional foods (Luckow et al. 2006; Niva & Mäkel 2007; Messina et al. 2008;	Consumers' need for consistency affects functional food perception.	Consistency could be one of complimenting values for Schwartz's conformity value.

Grunert et al. 2009; Lampila et al. 2009).		
There is a conflicting view about whether old aged consumers perceive functional foods positively or not (Niva & Mäkel 2007; Luckow & Delahunty 2004; Ares et al. 2009; Siegrist et al. 2008)	Participants above 71 years were less positive than participants aged 18 to 50 years.	Suggests that functional food perception varies with age, older consumers being more positive.
There is a conflicting view of the influence of gender on functional food perception. Most of the literature indicates that gender does not have a significant impact on consumers' intentions to purchase functional foods (Peng et al. 2006; Urala and Lähteenmäki 2007; Lyly et al. 2007), except Ares et al. (2009) who found women to be more positive towards functional foods.	They give equal importance to self-directed learning, conformity, stimulation, consistency, and motives of functional food consumption	Cultural values do not cause differences in functional food perception across genders.
Income makes a difference in functional food perception (Teratanavat and Hooker 2006; Rezai et al. 2012). Higher earning groups are more aware of functional food than low-income groups (Rezai et al. 2012).	Consumers in higher income groups placed a higher value on self-directed learning, stimulation and conformity.	Cultural values and its effect on functional food perception varies with the level of consumers' income.
The necessity for functional foods is one of the motivations lying behind the willingness to consume functional foods (Urala & Lähteenmäki 2004).	The importance of the motive of functional food consumption differed between Indian and Chinese, and Indian and Anglo-Australian participants.	Cultural values differ across ethnic groups in Australia, and the difference in cultural values causes variation in their perception towards functional foods.
Higher education reflects a habit of persevering for a good future and a habit of active self-learning (Duckworth et al. 2007).	Scores of the cultural values (in terms of functional food perception) significantly decreased from a high level for those with a postgraduate degree, graduate diploma, or	The level of education influences the effect of cultural values on functional food perception, with the highly educated being more driven by

	graduate certificate to a lower level for those with only secondary level education.	personal and cultural values.

7.2 Discussion on the research propositions

The first research proposition —RP1 *Functional food perception involves negotiation of sensory and health values offered by functional foods*—was established with the aim of testing whether consumers evaluate sensory and health values during functional food consumption or not. The item—[SQ47] Functional food is chosen based on the evaluation of health and taste values offered by it—was one of the items designed to measure the negotiation of taste and health values. There were originally another three items to measure the negotiation, but those items were not retained. The retention of item SQ47 indicates that consumers negotiate sensory and health values during functional food consumption. Consumers have been consistently found to be giving value to the taste of functional foods (Urala & Lähteenmäki 2003, 2004; Verbeke 2006; Messina et al. 2008; Azzurra & Paola 2009; Markovina et al. 2011). Any change in the sensory values of functional food increases the risk of consumers disliking functional foods. There have been situations where consumers have disliked functional foods with good health benefits just because of the unattractive flavours (Tuorila & Cardello 2002). Consumers are not willing to compromise taste for the health benefits offered by functional foods (Cox et al. 2004; Vidigal et al. 2011). Ares et al. (2008b) found that consumers were unwilling to eat yoghurt with slimming benefits because they did not like the texture of the yoghurt. Moreover, consumers were even ready to compromise taste for health benefits related to specific diseases such as cardiovascular disease (Urala & Lähteenmäki 2004).

There were four items in the survey about consumers' perseverance towards functional foods. Three items were retained [SQ35] One should be ready to put more effort to understand functional foods, [SQ36] Eating functional foods multiple times may possibly increase my liking towards it, and [SQ37] I think one should look at the long-term benefit of functional foods. This indicates that functional food perception is affected by consumers' perseverance towards functional foods, answering the second research proposition (RP2 *Consumer perception of functional food is influenced by the perseverance of consumers towards functional foods*) that perseverance affects

consumers functional food perception. Although there is no specific information in previous literature about the perseverance factor, Bech-Larsen and Grunert (2003) believed that functional food perception is a matter of negotiation between the cultural values mastery vs harmony. The mastery value is about mastering or changing the natural plus social environment with the aim of achieving personal or group goals, while harmony culture is about accepting nature and society as they are and trying not to change them (Schwartz 2008a). Perseverance towards functional food could be a manifestation of the mastery value.

The items—[SQ25] I would eat functional food to prevent diseases, [SQ26] I pay attention to functional foods when I have a health issue, [SQ27] I would expect the functional food to keep me active throughout the day, [SQ28] I expect functional foods to improve my mental health—were initially designed to measure the research proposition RP11—Consumers' need for security affects their functional food perception. The retention of items SQ25, SQ26, SQ27, SQ28 shows that a need for security affects consumers' functional food perception. Similarly, the following items pertaining to self-confidence—[SQ05] I would prefer to know the trustworthiness of sources of functional food information, [SQ07] I would prefer to refer to more than one source for functional food information, and the item pertaining to self-control, [SQ10] I feel guilty if I don't have any healthy food like functional food for some days—were retained under one factor. This validates the research proposition (RP4) that consumers' self-confidence about functional food influences their perception of functional food, and the proposition (RP5) that consumers' self-control over their behaviours is associated with functional food, influences their perception of functional foods. This is consistent with the previous findings by Urala and Lähteenmäki (2004) that confidence in functional foods was found to be one of the predictors of willingness to use functional foods. Consumers' value of self-control makes them disciplined and increases their ability to continue eating a chosen healthy food (De Vet et al. 2014).

The items—[SQ30] I eat/would prefer to eat functional food that everyone is talking about, [SQ32] I prefer functional food that is on the current news/affairs, [SQ33] I can't deny functional foods suggested by my friends, and [SQ38] I find functional food in my ethnic group more effective—were retained as a conformity-related factor during the exploratory factor analysis. The retention of these factors under one factor

approves the research proposition (RP12) that consumers' need for conformity affects their functional food perception. The retention of items—[SQ21] It is important for me to have all sorts of new experiences, [SQ22] I would prefer mixing functional foods with other foods to make it exciting, [SQ23] I would try a variety of functional foods to keep it interesting, and [SQ24] I think it would be interesting to try functional foods from different ethnic groups—has supported the research proposition (RP10) that consumers need for stimulation affects their functional food perception. There is no information in previous literature about the influence of the stimulation value on functional food perception.

The research proposition (RP3), Consumers' self-directed learning of functional food influences their perception of functional foods, was supported by the fact that the items—[SQ01] It is important for me to figure out things myself, [SQ02] I would prefer to figure out myself what functional foods to eat, [SQ04] Learning by myself makes it easier to decide what functional foods to eat—were retained under one factor during the exploratory factor analysis, clearly strengthening the proposition that self-directed learning influences consumers' functional food perception. Similarly, three items pertaining to motives were retained—[SQ43] It is important for me to know what functional food experience would be like, [SQ44] It is important for me to know how functional food would make me feel, [SQ45] It is important for me to know how functional food would affect my body—supporting the research proposition (RP9) that functional food perception depends upon the consumers' motives of functional food consumption. The items—[SQ13] I typically prefer to do things the same way, [SQ14] I would cook functional foods the way I usually cook my foods, [SQ15] I prefer functional food with a familiar taste, [SQ10] I would prefer to eat functional foods that have been consumed for generations—were retained, supporting the proposition that consumers' need for consistency affects functional food perception (RP7). As discussed in the qualitative stage of this study, consumers' need for consistency would make them consistently interested in the same functional food over time. Consistency increases the depth of one's interest about a product (Christensen & Knezek 2014). Consumers need for consistency in behaviours make them predisposed towards their past behaviors in terms of functional food consumption. Consumers seeking consistency in their behaviour could be a manifestation of them seeking familiarity in functional foods (Luckow et al. 2006; Niva & Mäkel 2007; Messina et al. 2008;

Grunert et al. 2009; Lampila et al. 2009). Consumers predisposition to consistency makes them seek functional foods that have been commonly consumed in their family or tradition.

7.3 Discussion on the theoretical model

The theoretical model (Figure 11) is the first of its kind in functional food perception. Surprisingly, all the items initially designed to measure negotiation of sensory and health values—perseverance, need for security, self-confidence, and self-control—fell together on one factor, giving birth to a completely new factor called functional food perception. Functional food perception is found to be dependent upon self-directed learning, consistency, stimulation, conformity, and motive (Figure 11). The values, self-directed learning, stimulation and conformity reflect the general motives of an individual (Schwartz et al. 2017; Schwartz et al. 2012; Bednar et al. 2006) while the variable 'motive' (Figure 11) refers to specific motives of functional food consumption.

The interaction between the general motivational goals and product-specific motives form consumers' perceptions of functional foods. The model has further strengthened the existence of Schwartz's motivational goals/cultural values- self-directed learning, stimulation and conformity and further confirmed its efficiency in measuring cultural values at the individual level. The research also extended the use of Schwartz's value in the marketing discipline in the context of functional foods. The questionnaire items for self-directed learning, conformity and stimulation developed in this research could be applied as it is or with some modification to assess the influence of Schwartz's cultural values on other products and in different cultural contexts. Schwartz's motivational goals include 'conformity' as one of the values promoting conservation with a social focus (Schwartz et al. 2017; Schwartz et al. 2012). However, the model does not tell us what makes an individual repeatedly conform to social norms or rules. The current study identifies 'consistency' as a potential motivational goal explaining why individuals desire to consistently repeat a behaviour.

Self-directed learning has a weaker correlation with consistency and conformity than with perception and motive. This could be because self-directed learning drives openness to change, while consistency and conformity emphasise conservation

(Schwartz et al. 2017). It has a more significant correlation with stimulation which would probably be because self-directed learning about functional foods makes consumers more excited to try functional foods or put another way being excited about eating functional foods may encourage consumers to self-learn about functional foods. Consistency has a weak correlation with stimulation as well. Stimulation is more of an impulsive factor that excites consumers to try different kinds of functional foods, whereas consistency, due to its focus on conservation, would cause consumers to restrain their desires to try out new functional foods, and make them keep to their old habits (Bednar et al. 2006). Maybe due to this opposing nature, the correlation is weaker.

Stimulation has a moderate correlation with conformity which again could be because conformity emphasises conformity with society, while stimulation seeks excitement. However, sometimes consumers may find functional foods from other cultures or people in society exciting. Conformity allows a trial of new functional foods to some extent when consumers have the desire to conform with habits of consumers from other communities. Therefore, the correlation is moderate. The motive has a relatively stronger correlation with conformity and stimulation compared with other variables. This could be an indication that conformity and stimulation are the two major motives of functional food consumption followed by consistency. This suggests that consumers' motives for functional food consumption are either driven by the subjective norm or due to impulse, but it is less likely to occur as a part of a habit or a consistent habit of eating functional foods.

7.4 Discussion on the influence of demographics on the variables

The importance of the six variables extracted in this study differed with the ethnic groups which is an important achievement. This provides an answer to the research question about whether there is a relationship between consumers' culture and functional food perception. The functional food behaviour depends upon consumers' perception of functional food, and this perception is determined by cultural values such as self-directed learning, stimulation, conformity, consistency and consumers' motives of functional food consumption.

In terms of functional food consumption, Anglo-Australian gave high value to the variables- functional food perception, self-directed learning, consistency, stimulation, conformity and motive. Anglo-Australians come from a highly masculine society where they value competition, achievement and success, which explains why they could have a more positive perception towards functional food (De Mooij & Hofstede 2011). This ethnic groups cannot tolerate ambiguity or uncertainty which could have increased their need for security and raised the need for functional food consumption. However, the need for uncertainty avoidance also has another dimension—that Anglo-Australians are not open to change and innovation (De Mooij & Hofstede 2011; Hofstede-Insights.com 2018). The Anglo-Australian's higher value for stimulation contradicts the traditional belief that Anglo-Australians try to avoid uncertainty. The value for self-directed learning, need for security, conformity and consistency among Anglo-Australian could be the result of their need for avoiding uncertainty. Due to a high uncertainty avoiding culture, Anglo-Australians try to reduce uncertainty by actively searching and learning about functional foods. The retention of self-directed learning in the functional food consumption model is consistent with the findings of Schwartz and Bardi (2001) that Australians value self-direction. The need for stimulation associated with functional food consumption is consistent with the Anglo-Australians' value for indulgence index, which means Australians are impulsive; they like to enjoy life and have fun (Hofstede-Insights.com 2018). Australians low value for the long-term orientation index (21) could be justification of why Australian consumers seek consistency in their behaviours associated with functional food consumption.

The consumers' perception in terms of functional foods seems to vary with age. It is interesting to know that the functional food perception was less positive with the increase in age of participants. Participants above 71 years were less positive than participants aged 18 to 50 years. The older aged consumers probably have less expectation from functional food because elderly consumers have been found less positive towards functional foods in the past (Niva & Mäkel 2007). When consumers grow older, they become more rational and mature and they do not see a satisfying justification for the modification of foods to functional foods when foods are inherently healthy (Luckow & Delahunty 2004). However, it is also a point to note

that the majority of the elderly respondents were Anglo-Australian. Among the 35 Participants in the age group 71 years and above, 33 were Anglo-Australian. The finding contradicts previous claims that older aged consumers are more positive (Ares et al. 2009) and interested (Siegrist et al. 2008) towards functional foods. The finding that stimulation is one of the factors affecting functional food perception strengthens the findings of multiple studies that functional food perception depends upon the hedonic perception (Armstrong et al. 2005, Azzurra and Paola 2009, Lyly et al. 2007, Markovina et al. 2011, Messina et al. 2008). However, the interesting paradox is that although the older aged participants in the study gave less importance to stimulation, they also seemed to have fewer positive expectations concerning functional food. The significance of conformity in the context of functional food consumption seems to decrease with age, which probably means that as consumers age, they make more independent choices and decisions and are less influenced by societal rules and norms, peer group pressures, and so on. Older age consumers are believed to be less susceptible to social influence (Pasupathi 1999), and perhaps this is the reason why they are indifferent when it comes to functional food choices.

There is no significant difference between males and females on how they prioritise the cultural value factors in terms of functional food perception. They give equal importance to self-directed learning, conformity, stimulation, consistency, and motives of functional food consumption. This finding adds to the conclusion of Peng et al. (2006), Urala and Lähteenmäki (2007), and Lyly et al. (2007) that gender does not have a significant impact on consumers' intentions to purchase functional foods. The indifference between genders could potentially be because of the equal importance given to the values by males and females as found in this research. However, it contradicts with findings from Ares et al. (2009) that women are the most positive groups toward functional foods.

The general trend observed was that the significance of the cultural values self-directed learning, stimulation and conformity in functional food perception differed with the income of consumers. Consumers in higher income groups placed higher value on self-directed learning, stimulation, and conformity, supporting the findings of Teratanavat and Hooker (2006) and Rezai et al. (2012) that income makes a difference in functional food perception. Higher earning groups are more aware of

functional food than low-income groups (Rezai et al. 2012). The higher awareness could perhaps increase consumers' knowledge about what to expect from functional foods. Higher income groups are believed to have more awareness of the responsibility for their learning, participate in independent learning, and have initiative (Guglielmino & Guglielmino 2006). Maybe because of that awareness, higher income groups prefer to do more self-directed learning about functional foods rather than trying to conform with what others are doing or eating. The research has found that high-income groups seek more stimulation in the context of functional food perception. The higher income group have more money to spend on a variety of foods, including functional foods and thus have the luxury to seek stimulation (French et al. 2010). Low-income groups are entangled by the burdens of employment, food, and housing insecurity and such exposure to uncertainties leads to reduced cognitive capacity, stress, and poor-quality diets (Laraia et al. 2017).

The importance of the variables self-directed learning of functional foods, stimulation, conformity, motive of functional food consumption differed between Indian and Chinese, Indian and Anglo-Australian participants, strengthening the proposition that there is a relationship between consumers' culture and functional food perception. The point to be noted is that there is a difference between Indian and Chinese consumers which confirms the initial discussion in the literature chapter that although Indian and Chinese both come from collectivistic culture, they have variation in their political paradigm, religion and language. The more interesting finding is that although Chinese and Anglo-Australian come from a different cultural model, there was no difference in their scores for self-directed learning, stimulation, consistency, and motives of functional food consumption—except for the factor conformity. From the literature, it was found that the Chinese give little value to indulgence and restrain their desire/impulses (Kriger & Kroes 1972). However, here in this study, they seem to have given as much importance to stimulation as the Anglo-Australians do, which contradicts the common belief that the Chinese prefer the status-quo and restrict indulgence. However, one of the Confucian ethoses buried in Chinese people's mind is that they try to avoid conflict and a lack of harmony (Matthews 2000). One of the justifications for the similarity in Chinese and Anglo-Australian consumers' perceptions could be that the Chinese participants in this study have been living in

Australia for a while, and the acculturation process, driven by Chinese consumers need for avoiding conflict, could have brought them closer to Anglo-Australian consumers (Rosenthal & Feldman 1990; Mellor et al. 2013). Moreover, the Confucian ethos of humility, courtesy, patience, obedience and modesty might have further motivated Chinese consumers to have accepted many of the Australian cultural values (Matthews 2000). It could be that consumers from Chinese ethnic groups want to avoid a conflict of values (a value derived from Confucian ethos) and could be accommodating autonomy promoting values from the Anglo-Australian culture (Rosenthal & Feldman 1990). It is interesting to see how the adaptation to new values in the Chinese ethnic group was driven by their own Confucian-derived value that emphasised avoidance of conflict and harmony and promoted modesty. Moreover, as discussed in the descriptive section, most of the young respondents were from Chinese and Indian ethnic groups. Young Chinese have been found to be more influenced than Indians by Anglo-Australian values in the past (Feldman et al. 1992).

Indian participants gave higher scores for the variables—stimulation, consistency and motives—than Anglo-Australian and Chinese participants. Indians gave more value to self-directed learning of functional foods than Anglo-Australians and Chinese, which is consistent with the Indian values that promote success and achievement (Banerjee 2008). The surprising fact is that, although Indian consumers were believed to be giving little value to indulgence, which means they try to restrain their impulses, Indian participants gave a high value to stimulation when it came to functional food consumption. Such a mixed result could be accounted for by Indians in Australia having a dichotomic view that they want to retain their Indian culture but yet at the same time they feel it is important to accept the Australian culture for better functioning of their lives (Faria 2001). The older and young Indian population have a different magnitude of acculturation to the dominant Anglo-Australian culture (Naidoo 2005). The study sample included a mix of participants 18 to to70 years old, although the majority were o18 to 50 years old.

Higher education also indicates a habit of persevering for a good future and a habit of active self-learning (Duckworth et al. 2007).The mean scores of the variables significantly decreased from a high level for those with a postgraduate degree, graduate diploma, or graduate certificate to a lower level for those with only secondary

level education, which indicates that higher education leads to more informed decision making with more importance given to personal and cultural values. The highest number of respondents in the survey who studied at postgraduate degree level were Indian (n = 36), then Chinese (n = 22) and, lastly, Anglo-Australian (n = 9), while, the highest number of respondents who only had a secondary level education were Anglo-Australian (n = 78) then Indian (n = 3) and, lastly, Chinese (n = 8). This certainly shows that the greater contribution in scores of variables at postgraduate level is coming from Indian and Chinese participants rather than Anglo-Australian participants, and vice versa for secondary level education.

7.5 Implications

The increasing multicultural environment in Australia has increased the challenges of promoting functional foods to consumers from different ethnic groups as recommended by the Australian Dietary Guidelines. This study has developed a theoretical model that could help in understanding how cultural values could be incorporated in promotion of functional foods. Although the theoretical model was based on the study of only three ethnic groups out of many ethnic groups in Australia, it can be a starting point for further testing and for developing a consumer behaviour model that addresses the functional food behaviour in a multicultural country like Australia.

This theoretical model has emphasised the role that the cultural values of consumers have on their functional food perception. From the model, it is evident consumers' functional food perception is determined by cultural values (conformity, consistency, stimulation, self-directed learning) and motives of functional food consumption. The inference from the model is that what consumers expect in a product depends upon why they want to consume the product (motives) and what shared values they endorse (conformity, consistency, stimulation, self-directed learning). This research has tried to clarify the role of universal cultural values on consumer perception, adding to the previous consumer behavior theories. The values, such as conformity, stimulation, and self-directed learning, come from the Schwartz value dimensions (Schwartz 1992a). Future studies could look into the relation between consumer perception and their actual consumption behavior or the outcome. The model proposed in the study deoes

not tell much about the predictive behavior of the variables. Future studies could assess the predictive relationship between cutlural values and functional food consumption, whether and how the cultural values could predict consumption of functional foods. The instrument and the model proposed by the study could be extended to other areas of study, aiming to investigate the relationship between consumer perception and cultural values.

With the increase in cultural diversity in the population of Australia, the proposed model could be of value to marketers and policymakers. The cultural values can be a useful precursor for segmenting and classifying the consumers. The strategies for communicating about functional food could be embedded with specific cultural values relevant for each segment or class of consumers. Functional food marketers could spread more information about functional food, increase access to that information among the self-directed learners in different ethnic groups. The communications should be designed in such a way that they do not conflict with consumers' need for conforming with their society. Marketers could use affective elements of functional foods to tease out the consumers who seek stimulation.

Similarly, health policymakers could investigate the cultural values that each ethnic group uphold, and design policies reflecting those values. For a long-term strategy, the policymakers could establish framework of cultural values for healthy food consumption, and lead each ethnic group towards those typical values and let them evolve. The blanket dimensions of cultural values for health food consumption and sub-dimensions for sub-ethnic groups could also help binding, otherwise loosely connected, ethnic groups in Australia.

7.6 Limitations

There could be multiple limitations in any research. Similarly, there are some limitations of this study as well. The participants for the study were recruited from only Anglo-Australian, Chinese and Indian ethnic groups in Australia. There are people from various ethnic groups in Australia, and thus the finding may not be generalisable to the Australian population. The Anglo-Australian participants may have come from different European backgrounds which have their cultural values. The research assumed all the respondents who claimed to be Anglo-Australian as one

individual ethnic group. Similarly, the research ignored the subcultural groups in Indian and Chinese ethnic groups. Also, the Indian and Chinese respondents could be either international students who had recently arrived in Australia or could be permanent residents who had been living in Australia. Future research respondents could be based on their length of stay in Australia. This is important as the level of acculturation has an impact on the findings of this study.

The samples were recruited using a panel-members group from a third party in Australia. The panel members might have been motivated to give a higher rating to the survey questions as they might think that is what is expected by the survey company. The participants were again a non-random sample, limiting the generalisability of the findings of the study. Moreover, the sample sizes were unequal, Anglo-Australian being the highest number of participants, and Indians being the lowest number of participants. Since the survey instrument contained 53 items, it might have been exhaustive for the respondents which could have affected the quality of their responses.

7.7 Conclusion

The research started with the aim of investigating the relationship between consumers' cultural values, their functional food perception, and behaviour. There were two stages of research, qualitative and quantitative. The qualitative study was done using a Grounded theory method. The results of the Grounded theory method suggested that there could be 13 cultural values about functional food perception. A survey tool with 53 items was designed which was subjected to exploratory factor analysis in the quantitative stage of the study. From the exploratory factor analysis, six factors were extracted and 32 items were retained. The six factors retained were self-directed learning towards functional foods, consistency in functional food behaviours, need for stimulation, need for conformity, motives of functional food consumption, and functional food perception. The correlation analysis showed that functional food perception could be dependent upon the variables self-directed learning, consistency, stimulation, conformity, and motives. Further, the ANOVA tests confirmed that the value of these cultural factors differed significantly (statistically) between Anglo-Australian and Indians, Indians and Chinese. However, there was no statistically significant difference between Anglo-Australian and Chinese participants. The

difference between the ethnic groups further affirms that culture has a significant relationship with functional food perception and behaviour.

Due to lack of resources, this research could not include more than three ethnic groups. Future studies including more ethnic groups would be more representative of Australian multicultural society. This study used a general term *functional food*, but consumer perceptions may vary with the specific type of functional foods. So, further research on a specific type of functional food would give deeper knowledge about culture and functional food perception. A confirmatory factor analysis could also be done to further test the variables extracted in this study and confirm the structure of the variables.

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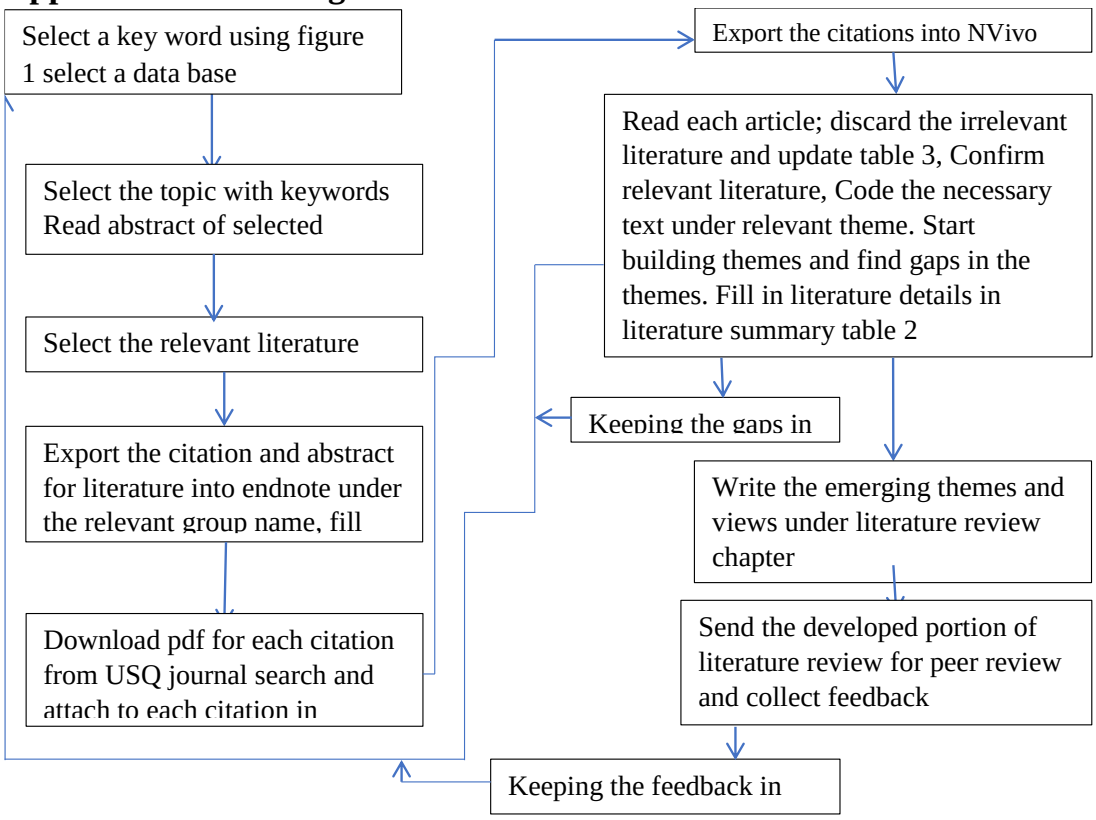
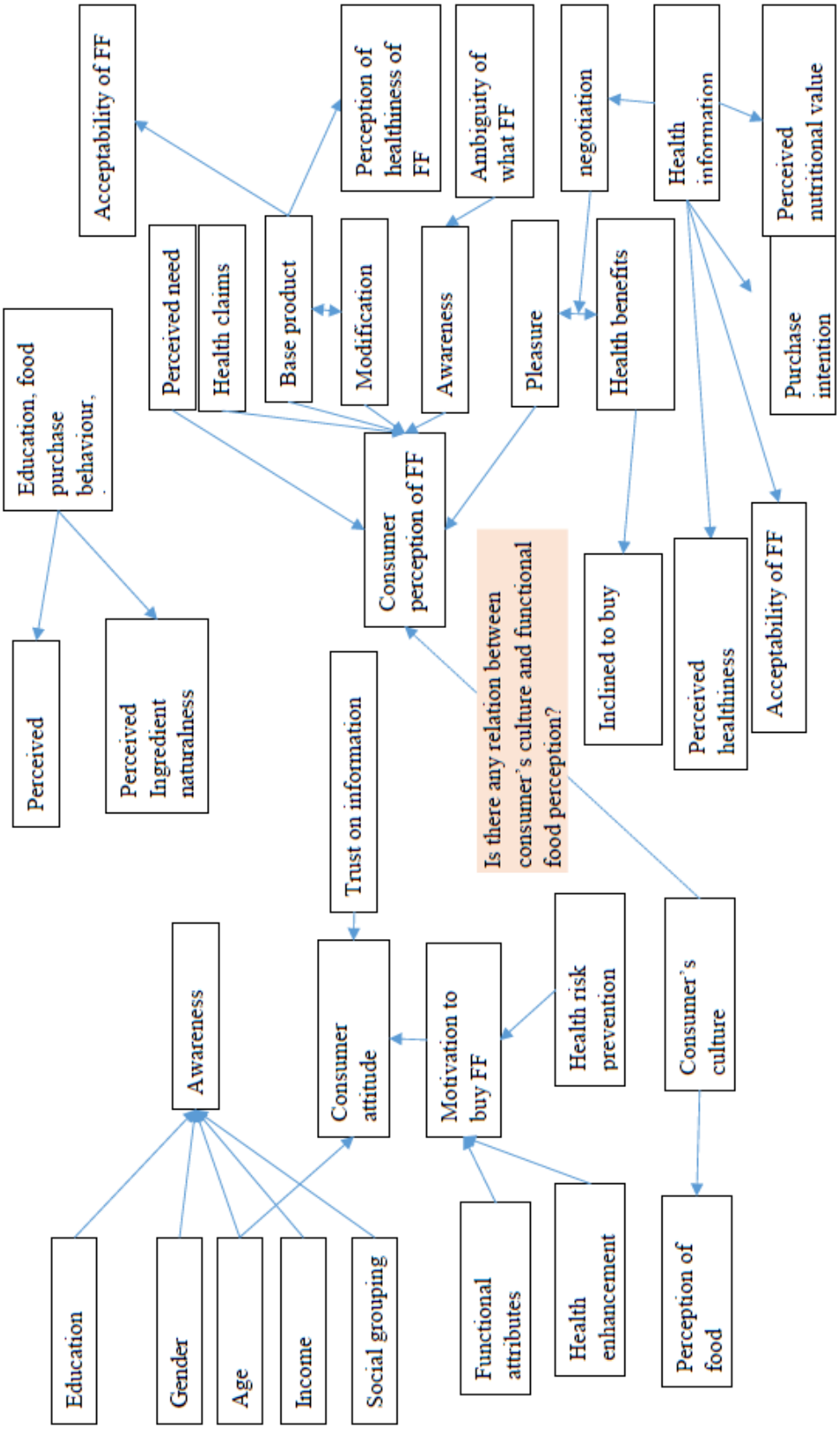
Appendices

Appendix A General guideline followed for literature review



Appendix B Preliminary mind mapping for identifying gap in literature



Appendix C Participant information sheet

[redacted]

Participant Information for USQ Research Project Interview

Project Details

Title of Project: A study investigating the relationships between consumers' cultural values, their functional food perception and behaviour.

Human Research Ethics Approval Number: H17REA200

Research Team Contact Details

Principal Investigator Details

Mr Saugat Neupane
Email: u1056199@umail.usq.edu.au
Telephone: (07) 4631 5840
Mobile: 0432150919

Supervisor Details

Dr. Ranga Chimhundu
Email: Ranga.Chimhundu@usq.edu.au
Telephone: (07) 4687 5759
Mobile: 0416321803

Description

This project is being undertaken as part of a PhD Project.

The purpose of this project is to investigate the relationship between consumers' cultural values, their functional food perception and behaviour.

The research team requests your assistance because your knowledge, experiences and perception or any information related to functional food can provide insights into this research.

Participation

Your participation will involve participation in an interview that will take approximately one hour of your time.

The interview will take place at a time and venue that is convenient to you. It may also be undertaken by teleconference, Skype or Zoom at a date and time that is convenient to you.

Questions will include the types of foods you eat, how you make food choices, whether or not you use functional foods, and what factors affect your perception of functional foods.

The interview will be audio recorded.

Your participation in this project is entirely voluntary. If you do not wish to take part, you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. You may also request that any data collected about you be destroyed. If you do wish to withdraw from this project or withdraw data collected about you, please contact the Principal Investigator (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland.

Expected Benefits

It is expected that this project may not directly benefit you. However, it may benefit the functional food industry and policy makers in general by providing a guide to promoting functional foods that help improve the health and well-being of people.

Risks

There are negligible risks associated with your participation in this project. You may find it inconvenient to spend up to one hour of your time for the research interview. However, the researcher will try to organize the interview in a time that is more suitable and comfortable to you so that you may not necessarily compromise any of your important work for this interview. The interview questions are general questions regarding your food choices and perception, however, in case you find any question uncomfortable, you are free to not answer that question.

Privacy and Confidentiality

All comments and responses will be treated confidentially unless required by law.

- The participants will not have the opportunity to verify their comments and responses prior to final inclusion.
- The recordings will be solely used for this research only.
- University of Southern Queensland and the research team will have access to the recording.
- It is not possible to participate in the project without being recorded.
- The participants can request a summary of the results in writing or verbally (e.g. email, phone, letter). Alternatively, they can access the research results from USQ e-prints.

Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy.

Consent to Participate

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate in this project. Please return your signed consent form to a member of the Research Team prior to participating in your interview either through email Saugat.Neupane@usq.edu.au or by post to the following address- Saugat Neupane, University of Southern Queensland Springfield Campus, PO Box 4393, Raceview LPO, Raceview, QLD 4305, Australia.

Questions or Further Information about the Project

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

Concerns or Complaints Regarding the Conduct of the Project

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email ethics@usq.edu.au. The Ethics Coordinator is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

Appendix D Consent form for the interview

[redacted]

Consent Form for USQ Research Project Interview

Project Details

Title of Project: A study investigating the relationships between consumers' cultural values, their functional food perception and behaviour.

Human Research Ethics Approval Number: H17REA200

Research Team Contact Details

Principal Investigator Details

Mr. Saugat Neupane
Email: u1056199@usq.edu.au
Telephone: (07) 4631 5840
Mobile: 0432150919

Other Investigator/Supervisor Details

Dr. Ranga Chimhundu
Email: Ranga.Chimhundu@usq.edu.au
Telephone: (07) 4687 5759
Mobile: 0416321803

Statement of Consent

By signing below, I confirm that

- I have read and understood the information document regarding this project.
- I have had any questions answered to my satisfaction.
- I understand that if I have any additional questions i can contact the research team.
- I understand that the interview will be audio recorded.
- I understand that i will not be provided with a copy of the transcript of the interview for my perusal and endorsement prior to inclusion of this data in the project.
- I understand that I am free to withdraw at any time, without comment or penalty.
- I understand that you can contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email ethics@usq.edu.au if you do have any concern or complaint about the ethical conduct of this project.
- I am over 18 years of age.
- I agree to participate in the project.

Participant Name	
Participant Signature	
Date	

Please return this sheet to aResearch Team member prior to undertaking the interview.

Page 1 of 1

Appendix E Latest version of interview guide

Title of project: A study investigating the relationships between consumers' cultural values, their functional food perception and behaviour.

Human Research Ethics Approval Number: H17REA200

This project is being undertaken as part of a PhD research study. The purpose of this project is to investigate the relationships between consumers' cultural values, their functional food perception and behaviour. You are invited to participate in this research project. The research aims to study three ethnic groups; Anglo-Australians, Chinese and Indians living in Australia.

Definition of functional food:

Functional foods are foods that naturally contain some active components or have been fortified, enhanced or enriched with physiologically active components by any artificial method, and that when consumed on a regular basis enhance health and well-being, and/or prevent diseases.

Examples of functional food:-

Functional foods are consumed as part of a usual diet or as recommended by food and health organisations and health workers. Some examples of functional foods are: a) colored vegetables, legumes and beans; b) fruits; c) whole grain cereal foods; d) lean meats and poultry, fish, eggs, tofu, nuts and seeds; e) milk, yogurt, cheese and alternatives of cheese. The above examples are some categories of naturally occurring foods with functional components. Avocado is a fruit that naturally contains good fats while there are artificially produced spreads/margarines with good fats that are sometimes even called cholesterol lowering spreads. There are several naturally occurring fruits and vegetables such as berries, plums, and kale etc. that are rich in antioxidants. Whole grain foods like brown bread, brown rice, whole grain cereals are widely used as good sources of fibre. Fibre rich foods are considered healthy for the stomach and for digestion. Artificial functional foods are produced by modifying the naturally occurring conventional foods, either adding functional components like vitamins, irons, calcium, probiotics, or reducing fat, salt, sugar and so on. Beverages like juices and milks fortified with vitamins, calcium and probiotics, iron fortified cereals, skimmed milk, eggs with omega-3, and yogurts with added probiotics are some examples of commercially produced functional foods.

Your participation in this research will require the completion of a survey questionnaire. The survey should take approximately 20 minutes of your time. Your participation in this survey is entirely voluntary. If you do not wish to take part, you are not obliged to. Your decision on whether you take part, do not take part, or take part and then withdraw, will in no way impact your future relationship with the University of Southern Queensland or any member of the research team. You can withdraw from this research at any time. There are no foreseeable risks associated with this survey. It is expected that this survey may not directly benefit you. The

benefits however, may positively impact society by helping to increase knowledge about consumers' perceptions and behaviour in relation to functional foods. All comments and responses will be treated confidentially unless required by law.

- A data confidentiality agreement is in place with regards to any third party involved in the process of data collection.
- Your participation is anonymous.
- You should be 18 years or over to participate in this survey.
- You should belong to one of the following ethnic groups to participate; Anglo-Australian, Chinese and Indian.
- You should be living in Australia to participate in this survey.
- Participants will not have the opportunity to verify their comments and responses prior to final inclusion.
- The survey responses will be solely used for the purpose(s) of this research.
- The University of Southern Queensland and the research team will have access to the survey responses.
- Participants can request a summary of the results in writing (e.g. email; letter) or verbally (e.g. phone). Alternatively, they can access the research results from USQ e-prints.

The completion of this survey implies your consent to participate. Please refer to the Research Team Contact Details to have any questions answered or to request further information about this project. If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email ethics@usq.edu.au. The Ethics Coordinator is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

Research Team Contact Details:

Principal Investigator Details
Mr Saugat Neupane
Email: u1056199@umail.usq.edu.au
Telephone: (07) 4631 5840
Mobile: 0432150919

Supervisor Details
Dr. Ranga Chimhundu
Email: Ranga.Chimhundu@usq.edu.au
Telephone: (07) 4687 5759

Dr. KC Chan
Email: KC.Chan@usq.edu.au
Telephone: (07) 3470 4829

Part A: Demographic profile

D01. What is your age group?	18-50	
	51-70	
	70 years and above	
D02. What is your gender?	Male	
	Female	
	Indeterminate/Intersex/Unspecified	
D03. What is your annual income level?	Nil	
	0 – $18,200	
	$18,201 – $37,000	
	$37,001 – $90,000	
	$90,001 – $180,000	
	$180,001 and over	
D04. Which ethnic group do you belong to?	Anglo Australian	
	Indian	
	Chinese	
	Other, please specify.....	
D05. What is your highest level of education?	Postgraduate Degree Level	
	Graduate Diploma and Graduate Certificate Level	
	Bachelor Degree Level	
	Advanced Diploma and Diploma Level	
	Certificate Level	
	Secondary Education	
	Primary Education	
	Pre-Primary Education	
	Non-award courses	
	Miscellaneous	

Variable	Items	1=Strongly disagree	2=Disagree	3=Slightly disagree	4=Neither agree not disagree	5=Slightly agree	6=Agree	7=Strongly agree
SD1: Questions pertaining to self-directed learning and functional food decisions.	SQ01. It is important for me to figure out things myself.	1	2	3	4	5	6	7
	SQ02. I would prefer to figure out myself what functional foods to eat.	1	2	3	4	5	6	7
	SQ03. I like to search information about functional foods.	1	2	3	4	5	6	7
	SQ04. Learning by self makes it easier to decide what functional foods to eat.	1	2	3	4	5	6	7
SD2: Questions pertaining to self-confidence and functional food decisions.	SQ05. I would prefer to know the trustworthiness of sources of functional food information.	1	2	3	4	5	6	7
	SQ06. I feel encouraged to try functional foods suggested by my peers.	1	2	3	4	5	6	7
	SQ07. I would prefer to refer more than one sources for functional food information.	1	2	3	4	5	6	7
	SQ08. I cannot rely on functional food information posted on a social forum.	1	2	3	4	5	6	7
SD3: Questions pertaining to self-control and functional food decisions.	SQ09. It is important for me not to lose control of myself.	1	2	3	4	5	6	7
	SQ10. I feel guilty if I don't have any healthy food like functional food for some days.	1	2	3	4	5	6	7
	SQ11. I can stick to functional foods if I am doing fitness training.	1	2	3	4	5	6	7
	SQ12. I don't think of foods like functional foods when I go out for a dinner.	1	2	3	4	5	6	7
SD4: Questions pertaining to consistency and functional food consumption.	SQ13. I typically prefer to do things the same way.	1	2	3	4	5	6	7
	SQ14. I would cook functional foods the way I usually cook my foods.	1	2	3	4	5	6	7
	SQ15. I prefer functional food with a familiar taste.	1	2	3	4	5	6	7

	SQ16. I would not prefer to eat functional foods with a strange smell.	1	2	3	4	5	6	7
SD5: Questions pertaining to traditional beliefs and functional food decisions.	SQ17. It is important for me to maintain traditional values and ways of thinking.	1	2	3	4	5	6	7
	SQ18. My belief in the traditional concept that food can be used for the treatment of disease affects my functional food decisions.	1	2	3	4	5	6	7
	SQ19. I think information passed from generation to generation is a trusted source of information on functional food.	1	2	3	4	5	6	7
	SQ20. I would prefer to eat functional foods that have been consumed for generations.	1	2	3	4	5	6	7
SD6: Questions pertaining to consumers' need for stimulation and functional food perception.	SQ21. It is important for me to have all sorts of new experiences.	1	2	3	4	5	6	7
	SQ22. I would prefer mixing functional foods with other foods to make it exciting.	1	2	3	4	5	6	7
	SQ23. I would try a variety of functional foods to keep it interesting.	1	2	3	4	5	6	7
	SQ24. I think it would be interesting to try functional foods from different ethnic groups.	1	2	3	4	5	6	7
SD7: Questions pertaining to consumers' need for security and functional food perception.	SQ25. I would eat functional food to prevent diseases.							
	SQ26. I pay attention to functional foods when I have a health issue.	1	2	3	4	5	6	7
	SQ27. I would expect the functional food to keep me active throughout the day.	1	2	3	4	5	6	7
	SQ28. I expect functional foods to improve my mental health.	1	2	3	4	5	6	7
SD8: Questions pertaining to consumers' need for conformity and functional food perception.	SQ29. It is important for me to avoid upsetting other people.							
	SQ30. I eat/would prefer to eat functional food that everyone is talking about.	1	2	3	4	5	6	7
	SQ31. I avoid functional food with a strong smell when I am in a social circle.	1	2	3	4	5	6	7
	SQ32. I prefer functional food that is on the current news/affairs.	1	2	3	4	5	6	7
	SQ33. I can't deny functional foods suggested by my friends.	1	2	3	4	5	6	7

SD9: Questions pertaining to perseverance and functional food perception.	SQ34. When I don't understand a problem, I keep working until I find the answer.	1	2	3	4	5	6	7
	SQ35. One should be ready to put more effort to understand functional foods.	1	2	3	4	5	6	7
	SQ36. Eating functional foods multiple times may possibly increase my liking towards it.	1	2	3	4	5	6	7
	SQ37. I think one should look at the long-term benefit of functional foods.	1	2	3	4	5	6	7
SD10: Questions pertaining to the cultural disposition and functional food perception.	SQ38. I find functional food in my ethnic group more effective.	1	2	3	4	5	6	7
	SQ39. I think one must grow up eating a functional food to like it.	1	2	3	4	5	6	7
	SQ40. I find functional food from my culture tastier.	1	2	3	4	5	6	7
	SQ41. I have no problem with consuming functional foods from my ethnic group.	1	2	3	4	5	6	7
SD11: Questions pertaining to motives of functional food consumption.	SQ42. I would expect food with functional properties to offer specific benefits.	1	2	3	4	5	6	7
	SQ43. It is important for me to know what functional food experience would be like.	1	2	3	4	5	6	7
	SQ44. It is important for me to know how functional food would make me feel.	1	2	3	4	5	6	7
	SQ45. It is important for me to know how functional food would affect my body.	1	2	3	4	5	6	7
	SQ46. It is important for me to know how functional foods would affect my social life.	1	2	3	4	5	6	7
SD12: Questions pertaining to the negotiation of sensory and health values involved in functional food consumption.	SQ47. Functional food is chosen based on the evaluation of health and taste values offered by it.	1	2	3	4	5	6	7
	SQ48. I am prepared to compromise on the taste of a food if the product is functional.	1	2	3	4	5	6	7
	SQ49. For me, good taste is more important than health effects in a functional food.	1	2	3	4	5	6	7

SD13: Questions pertaining to consumers' functional food purchase behaviour.	SQ50. I do eat functional foods.	1	2	3	4	5	6	7
	SQ51. I expect to purchase functional foods.	1	2	3	4	5	6	7
	SQ52. I want to purchase functional foods.	1	2	3	4	5	6	7
	SQ53. I intend to purchase functional foods.	1	2	3	4	5	6	7

Thank you for your time and effort in completing this questionnaire.

Appendix F NVivo Codebook from the interview data analysis

Node name	Description	Files	References
Ability or compulsion to follow a routinely habit or commitment to a routine habit increase compliance with functional food although not tasty	Having a routine of eating functional food; following a health regime; fitness planning	7	12
Anticipation of possible mental health complication leading to believing and consuming functional foods	Although consumers may not have any heath complications, they may feel they have such problems after reading and knowing about the complications; they may find some instances that multiply their anticipation, and thus lead to consuming functional food	1	1
Anxiousness about bodily discomfort likely to increase functional food consumption	Having health problem; eating healthy foods to avoid health problem or to prevent the health problem; health foods likely to include functional foods	1	1
Awareness influencing functional food behavior	Eat healthier as we grow old; eat less healthy during adolescence; need to balance taste and health;	14	29
Awareness of limitations of one's body and health complications to rationally select functional foods than for taste	Consumers as they become more mature, they have more experience and knowledge of health complications, and they would try to eat more healthy foods rather than tasty foods, or they care less about sensory values of food	2	3
Balancing functional food, physical activities and fun	When a consumer continuously evaluates what he/she has eaten, how much healthy and unhealthy they have eaten? How is their mood? And so on; trying to eat ff as per the demand of the body and work; trying to maintain healthy food if not doing much physical activity.	4	5
Being impulsive and driven by pleasurable factors than health factors	Influenced by advertisement of fast foods on tv; lack of self-control or will power; eating more junk than health foods	1	1
Being open to new cultures and good relationship with them leading to acceptance of new	Person from one culture tried functional food from another culture during dinner or parties; sharing functional foods during lunch hours amongst different cultures; work place	2	2

functional foods from other cultures	colleagues meeting up and sharing functional food information; never tried ffs before; started liking ff from another culture;		
Being passionate about learning ways of cooking foods in creative ways leading to acceptance of functional food although not tasty	Learning about functional foods; looking for ways to cook functional foods; searching on internet; reading books; trying cooking at home; exploring ways to make functional food tasty	5	8
Being sceptical about the production and marketing of functional food leading to avoiding functional food	Packed foods are unhealthy; functional foods can also be unhealthy when packed and sold; questioning the production and distribution process of commercial functional foods; selling functional food at higher price which may not be worth; questioning the whole idea of functional food	1	1
Believing in one's ability to prevent health problems through healthy eating	Believing in eating healthy at first place; controlling the input; worrying of what one is eating	3	3
Believing in preventive approach to health leading to eating foods with health properties than pleasure	Trying to avoid future complications; choosing food wisely; choosing healthy food to avoid health complications	2	3
Believing own traditionally cooked foods as healthy and nutritious	Don't know how nutritious of Italian or English food; cook Asian foods for kids; trust Asian foods as more nutritious and healthier	1	1
Believing in traditional concept of food treatment for prevention leading to eating functional foods	Functional food in old culture; foods eaten to prevent disease in the past; foods classified as per their health benefits; traditional beliefs that functional food are beneficial for different part of the body; traditional belief of food as medicine; food as hot and cold	3	10
Blaming functional foods as time consuming for one's inability to planning and not complying	Busy to eat functional foods; health foods require more time to prepare and eat	1	1
Carried away by less credible sources of functional food	Consumers like the oddities; referring to the information from social media or that are not even a reliable media; the	1	1

information although liked the taste of it	information are neither valid nor from a credible source; consumers refer to that information and question the ability of functional food		
Childhood exposure to ff lead to least resistance for acceptance	Eating vegemite since childhood; never noticed the taste of vegemite to be odd; habituated of vegemite	1	1
Choosing convenient ff out of negotiation between compulsion for functional food, effort and discipline required for functional food	Choosing functional foods that can make smoothies; need to eat ff due to health; ffs require more effort and discipline; therefore, choose more convenient functional foods or the ones that are easy to prepare, like berries are easy and smoothies can be prepared easily out of berries	1	1
Compelling situation causing to choose functional food although the taste is not familiar	Consumer would eat any ff is there are no other options left to eat; otherwise, consumers would choose more tasty or familiar functional food.	2	2
Compulsorily eating functional food to reduce the impact of existing health problem	Faced a health problem recently; realised the benefits of functional food; started eating functional foods	5	9
Consciously trying to develop palate for functional food	Repeatedly trying to eat functional food; not giving up although functional food is not tasty; trying to build preference towards the taste of functional food through conscious efforts	2	3
Considering functional food as sustainable source of energy	Eating functional foods for long lasting energy; eating such foods for sports and achievement	2	5
Conscious effort required to buying functional food in spite of liking the taste of it	Consumers not buying functional food automatically; consumers not remembering to buy functional food from the market; know that functional food is good and like eating them	1	1
Consumers' resilience and need for assimilation into dominant culture leading to acceptance of functional food although not tasty	Being flexible to accept functional foods from other culture; young consumers more flexible; old consumers less flexible, and have less capacity to change their habit	2	2
Consumers seeking familiar flavours and	Using one functional food across different dishes; trying to cook any	2	2

taste leading to using one functional food across different dishes	new functional food in the same old habitual way of cooking food		
Consumers seeking functional food offering sensory values consistent to their traditional foods	Consumers who have been eating a particular kind of food for a long time, they would try to include bit of that food in their other food in order to maintain that consistency, or they would try to find ways on how they can fit functional foods with their usual foods rather than changing their whole food menu.	10	27
Consumers' updating oneself with latest developments of functional food in terms of health affecting the decision to choose functional food	When consumers avoid functional foods because of the realisation of chemicals being used to produce the item; used artificial hormones; naturally produced ffs could be expensive	1	1
Consumers' preference towards functional food although not tasty is reinforced by experience of adverse health and warning from a valid source	Consumers are attracted by tasty foods but when their health problem worsens and are advised by health professionals or some valid source to have a control over their habit, they tend to do so; the message from the health professionals combined with evidence of health problem is strong motivating factors for consumers to eat functional food	1	1
Continues exposure to diseases creating compulsion for eating ffs	People who have seen people suffering from diseases in daily basis makes people more compulsive to eating functional foods	1	1
Contrasting and criticising how other cultures consume functional food against own ways	Avocados are eaten in different ways by other cultures; do not like the recipe or ways how other cultures eat the same functional food	1	1
Contrasting food from another culture with food, taste and variety from own culture	Australian food is bland; Chinese have variety of taste; Chinese use lot of spices compared to Australians; India has different breakfast than Nepal; include more functional foods in Indian breakfast	3	4
Contrasting one's food habit and choices against the choices of other	Mom likes functional food; children and husband don't like functional food; or different members in a family have different choices; conflict of food	3	6

members in the family	choices in family; women compromising		
Control over one's priorities making easy to switch between personal and social needs	Eating non-functional foods during functions knowing that one will eat healthy tomorrow; believing in one's control, over choices and habits	1	1
Cooking functional foods in creative ways reducing the need for conformity with traditional concepts	Disliking cold food; disliking salads because they are cold; Chinese have a concept of cold and hot food; they usually eat warm food	1	2
Creating a value of functional food at early age requiring less effort and more sustainable	Access and exposure to lots of fruits and functional foods during childhood build habit towards them, while not exposure towards functional food in childhood raised consumer to having no feeling of need for functional food in their life	1	1
Creative cooking methods making functional food more interesting	Learned new ways of cooking functional food; spending time with friends cooking functional foods in different ways and sharing with friends	2	2
Desire for new experience may lead to functional food consumption	Trying new functional foods; following the trend; easily buying functional food messages and soon becoming a regular consumer.	2	2
Desire to be connected with other leading to trying functional foods ignoring the taste	Trying a functional food that everyone of talking about just because consumer might feel that he/she is missing something great	2	3
Eating familiar functional food for confidence	Eating familiar food reduces the feeling of anxiousness; lack of knowledge about new functional food increases anxiousness	1	1
Eating functional food familiar to consumer to avoid being anxious of trying functional food with new taste	Tried one functional food, liked it and continued the same; don't want to go through the process of change; not liking change	1	1
Eating functional food for adverse health but giving up desire to fulfil hunger	Have health problem which demands health food; eating health food; but health food does not fulfil hunger and leave the customer starving for more food	1	1
Eating functional food to confirm with	Eating functional foods recommended by friends; asking peers about any	2	5

peer habits and suggestions	functional foods; liking functional foods recommended by friends; sticking to one functional food unless directed to another by someone else		
Eating functional food to convincing oneself as a healthy eater	Consumers usually eating unhealthily, however, they also try to eat small amount of functional food in order to make themselves believe that they are eating something healthy; functional food being used to reduce the anxiety caused due to not eating healthy;	1	1
Eating functional food for aesthetics	When someone eats functional food because they want to lose weight, improve their appearance. The motivation behind is aesthetics. But they may not be able to keep the habit unless they have strong internal motivation.	2	3
Eating functional food acceptable to group norm	Some functional foods smell pungent; trying to avoid eating such functional foods when in group; eating functional foods common in the group or community	1	2
Eating functional food as a secure alternative to home cooked food rather than eating restaurant food	Habit of eating self-cooked food; restaurant food not as healthy as home cooked food; rather eat ff is not home cooked food	1	1
Eating functional food consistent with ones' tradition	Prefer traditional staple diet; like functional food is its flavour and taste is similar to that staple diet	5	6
Eating functional food due to fear of missing out health benefits gained from them	Consumers eating functional food what others are eating due to fear of missing out the opportunity others are getting from eating the functional food, or the fear of being left out, it can also be called social anxiety	5	7
Eating functional food from another culture to reduce the discrepancy	Need to know food from another culture; eating functional food from another culture just to be compatible even if don’t like the taste; eating just for the sake of knowing and being familiar; consumers when they wish to learn the ways of cooking a functional food, they will buy and bring functional food at home and cook them. Usually when they have tried a new functional food, they wish to cook them by themselves. So, it is basically	1	1

	filling the gap of their knowledge about using functional foods		
Eating functional food to remain competitive than other	Eating healthy giving a feeling of better health and person than one who does not eat functional food	1	1
Eating functional foods as an early intervention	Eating functional food to avoid future health complications	1	1
Eating functional foods in the morning to staying positive and active throughout the day	The sense of being productive in the morning is that people want to use their morning in right way and so that it enhances the positivity and keeps on prepared physically and mentally for the day.	6	7
Eating functional foods that are traditionally believed to be healthy and beneficial	Ffs are eaten traditionally; following the traditional beliefs; eating traditional functional foods	7	25
Encouragement from peers giving confidence to try functional foods	Ate functional food first time at friend's place; friend told about them; then started eating functional food by self at other times	3	8
Evaluating functional food against time and effort required for choosing most convenient options	Eating the most convenient functional food; easy to cook functional food is chosen usually	3	4
Exposure of functional food at formative stage increase preference to functional food taste	Liking ff eaten since childhood; eating habitual ffs	1	2
Families lacking discipline being driven by convenience and taste of unhealthy foods	Attracted by commercials of take always; advertisements of junk and unhealthy foods; easily lured by unhealthy food's promotions	2	3
Feeling of guilt of eating unhealthy leading to eating functional food and less concern for taste	Eating unhealthy causing dissonance; eating healthy after eating unhealthily; exercising more and eating more functional food when eaten unhealthy in the past days	5	8
Feeling shy eating pungent smelling functional foods	Consumers avoiding to eat certain foods while in group due to strong flavours of the food, and wanting to avoid the uncomfortable situation	1	1

while with other cultures			
Following a specific traditional way of cooking or consuming functional food	Consumers know a specific way of cooking and consuming functional food; they tend to follow the same procedure	1	1
Following specific cooking instructions	Consumers closely following the cooking instructions they are familiar with	3	3
Freedom to make self-decision in terms of functional food leading to trying ff although not tasty	Put less pressure on oneself and family members to eat functional food; let the make decision whether to eat or not; however, introduce functional food in family every now and then	1	1
Functional food should fit with personal, and work life of consumers	Less time at work for searching functional food; fast foods much easier to eat during work lunch times; eating well prepared full breakfast with lots of functional food when have time; however, during works trying eat functional foods in easiest possible ways like making smoothie; therefore functional food should be chosen in such a way that they fit work and personal life of consumers	2	2
Gradual self-learning and development towards functional food making easier to break traditional belief	Didn't like cheese in china; never eaten or liked cheese in china; slowly tried cheese in some occasions; tried with few foods; slowly started liking;	1	1
Habits inherited from parents driving consumers' decisions to whether to choose healthy or tasty foods	Unable to giving up unhealthy food habits learned from parents during childhood; grown up with same unhealthy habit and continuing the same; difficult to change; unable to giving up some healthy food habit (functional food habits) learned during childhood	10	19
Knowledge of the nutritional value of functional food leading to eating them in original form rather than flavoured	Oat meals can be found in different forms, flavoured and processed, or not flavoured and less processed. Consumers who know about the fact that processed functional foods may lose nutrients prefer avoiding processed and flavoured functional foods	2	2
Lack of active learning leading to	Consumers who have less knowledge about health, and consequences of	1	1

less care about health and functional food	eating unhealthily, do not care about the complications of eating unhealthily. On a broader view, consumer lacking education lack self-realisation of complications of eating unhealthy foods, and this leads to not caring.		
Lack of control over one's emotions leading to choosing convenient path to short term pleasurable foods	Feeling lazy; emotional and comfort eater; avoiding hard work of cooking and eating healthy or finding functional foods; choosing most convenient irrespective of health	1	1
Lack of internalisation of health education causing less motivation to start functional food	Less worry of disease; taking healthy foods too lightly; lack of motivation to eating functional food	1	1
Lack of knowledge of functional food reduced the confidence to evaluate functional food values although liked the taste	Less knowledge of functional food; not a usual habit of buying functional food; less confident about the quality parameters; however, like functional foods	1	1
Lack of planning and willpower causing consumers to make impulsive decision to choosing junk foods	Unable to continue functional foods for a long time; falling back to same old habit of eating unhealthy foods; eating junk foods driven by commercials and advertisements; lacking ability to make self-decision	1	2
Learning inconsistent information about functional food reducing confidence in making functional food decision	Some ffs were considered as unhealthy foods in the past; but now they are promoted as functional foods and believed to be healthy; the prices gone up	1	1
Taste for functional foods consumers were exposed during early stages of life	Raised to eat food in one way of cooking; disliking foods cooked in different ways; finding spices overpowering as they have not been them much and the taste has not developed accordingly	1	1
Long term thinking leading to giving up concern for taste of functional food	functional foods provide more sustainable energy; non-ffs do not last long; need energy for whole day; need good health for long run	3	4

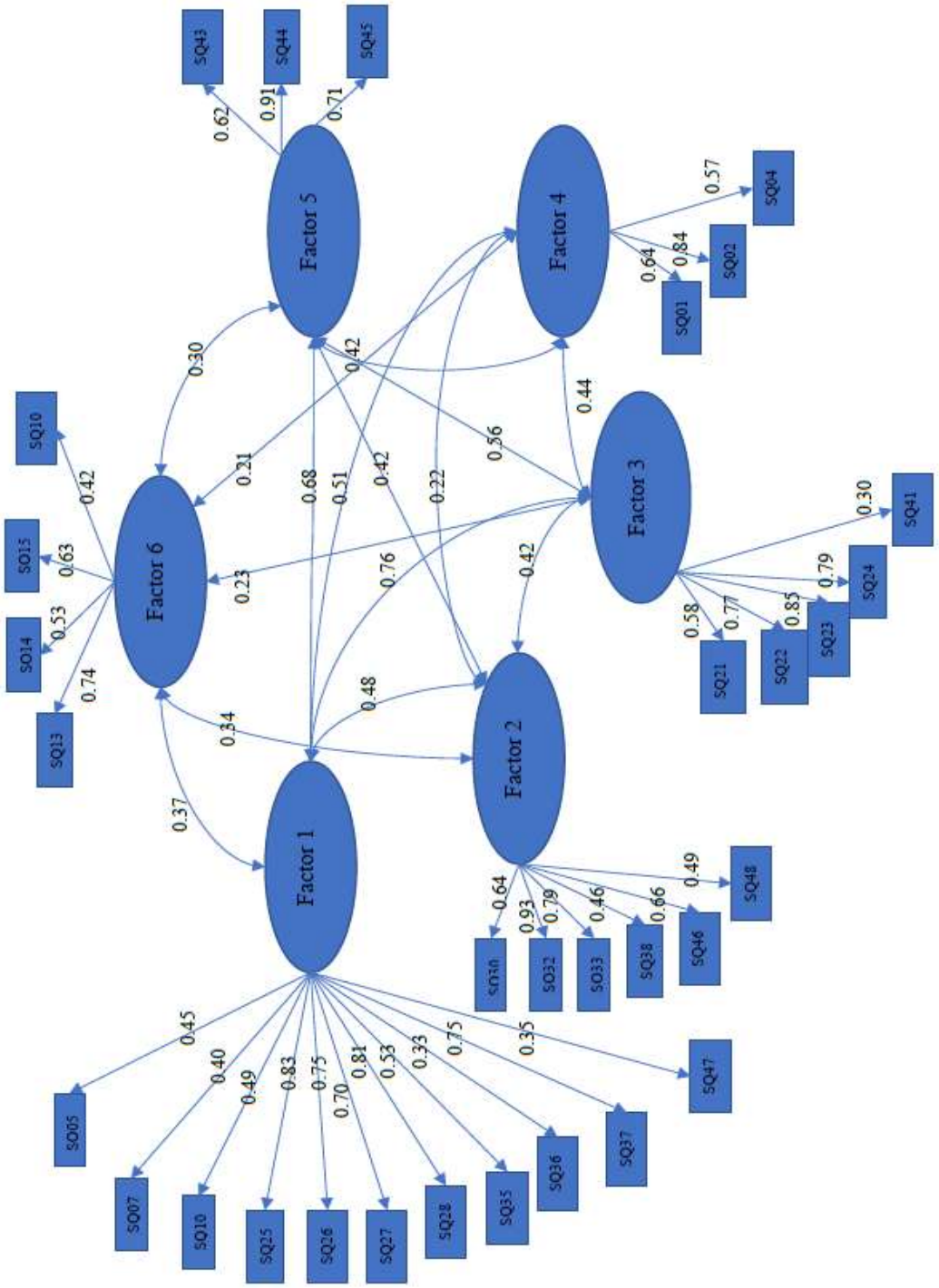
Misleading information about functional food confusing the benefits of functional food	Messages on Facebook about functional food; using functional food for less validated purposes	1	1
Narrow perspective view raising questions over the outcome of functional food	Consumers when they look at the narrow perspective, they see that people are sick and ill at early ages even if they are eating healthy foods ignoring the fact becoming sick and ill could related to different factors. Also, there could be several examples where functional food has helped in delay of health complications.	2	2
Need for achieving social image leading to eating a balanced controlled diet of healthy and unhealthy foods	Consumers eating healthy and unhealthy foods in a balanced manner; eating healthy in order to be healthy, happy and positive, which would enhance their social image	1	1
Need for avoiding health uncertainty leading to consuming functional food although did not conform with functional food from own culture	Gave up eating functional food when health problem subsided, and also moved to Australia where the taste of functional food was not consistent to the taste of functional food in migrant's country; so consumer trying to get an excuse to giving up functional food; but again started eating functional food due to health problem coming back	1	1
Need to follow specific instructions of cooking ff for each individual	Consumers use functional food items while cooking in specific ways they are familiar with; they follow the cooking procedures they know	1	1
Not seeing the unique reasons to persevere for functional food leading to choosing more convenient ffs	Giving up ffs for easy alternatives; don't want to go through the phase of developing taste and habit towards functional foods; substituting functional foods for other alternatives	1	1
Parent's worry for children's' overall development causing functional food consumption	Worrying about kids' health, mental and physical; worrying about their achievement in studies and sports; making them strong; feeding them healthy breakfast with full of functional foods and preparing them for the day.	3	3
Perceived future risk as less likely to occur leading to avoiding	Showing less effort to trying functional food which consumers perceive not tasty; access to alternative foods giving	3	3

health food for pleasurable foods	more confidence to easily give up less tasty functional foods; less worrying about health and disease; consumers not worried about health and health foods, although they know and have seen about complications of unhealthy food habits		
Perceiving functional food as inconvenient	Consumers have less time during workdays; functional food may take more time to prepare and eat during work hours; avoid functional food's during work hours; during leisure time more focussed on healthy eating and may include ffs	6	8
Personal belief developed through personal experiences affecting functional food perception	Belief that certain foods should be eaten in only particular ways; a combination of certain foods is not good; certain health foods should taste in a certain way; these beliefs are personal and develop through personal experiences	1	1
Prioritisation of health leading to eat functional food although unfavourable taste	Complaining of not having time for health food; feeling lazy searching and eating health food; eating more convenient food items	1	1
Responsible parents putting more effort encouraging children to eat health food	Females usually choosing health foods for their family and children; they out effort to cook health food for children; while fathers try to get away with the cooking, and provide the foods that are more convenient and may not be healthy; fathers' letting children eat as they wish	1	1
Seeking functional food with values that fit with traditional cooking methods	Don't know how to cook functional food; functional food that fits with usually cooking style would be more acceptable; not sure of how to eat functional food	3	3
Seeking stimulation leading to interaction with ff from different cultures	Never tried functional foods from other cultures; interacting with other cultures and eating functional foods from other cultures; different cultures living within the community	1	1
Seeking variety of food in consumers leading to inclusion of functional foods in the food.	Consumers eating different variety of foods at a time or mixing different items in their foods	4	10

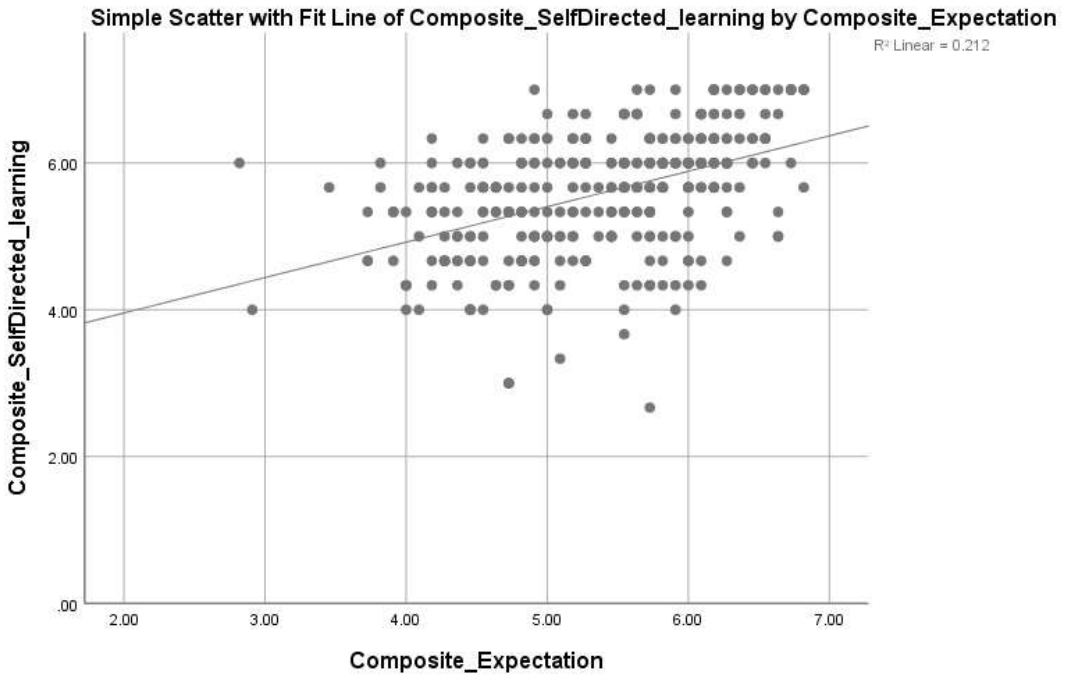
Selecting whole grain that is consistent with traditional concept of eating foods	Eating wheat or rice traditionally; therefore, seeking either brown rice or whole wheat meal depending on the tradition	1	1
Selectively choosing functional food as a coping mechanism for adverse health problem	Having different health problems; cannot eat any random food; need to be selective; selecting and trying functional food which do not cause adverse effect to the worsening health problem	1	1
Self-motivated learning of benefits of functional food for health complications leading to acceptance of functional food although not tasty	Worried about mental health and physical health; reading and learning about functional food benefits over mental and physical health; eating functional food although not tasty	3	3
Self-motivated search of functional food information leading to functional food use	Searching information from different sources and, filtering them based on their reliability and validity	3	5
Sense of powerlessness reducing the confidence to keep up with functional food habits	Feeling lazy and less desire for cooking, and eating, leading to eating unhealthily which turn into habit and addiction slowly decreasing the confidence to giving up such habit	1	1
Sense of pride through efficient utilisation of functional food	Berries eaten by themselves; or used in cereals, and if remained prepared smoothie out of left overs berries	1	1
Setting the priority straight that functional food should be eaten for health not pleasure	Accepting that ffs can be unnasty; realising the importance of health over taste; convincing oneself to eat for health reasons not taste	1	2
Standing on one's ethical values leading to selecting functional food from non-animal sources	Avoiding functional foods from non-vegetarian source; not eating meat products; eating vegetarian; not liking killing animals	1	2
Stimulation seeking behaviour affecting functional food perception and use	Organismic need for variety and stimulation in order to maintain an optimal, positive, rather than threatening, level of activation; experiencing stimulation through addition of functional food complementing the normal food experiencing stimulation from taste of	10	30

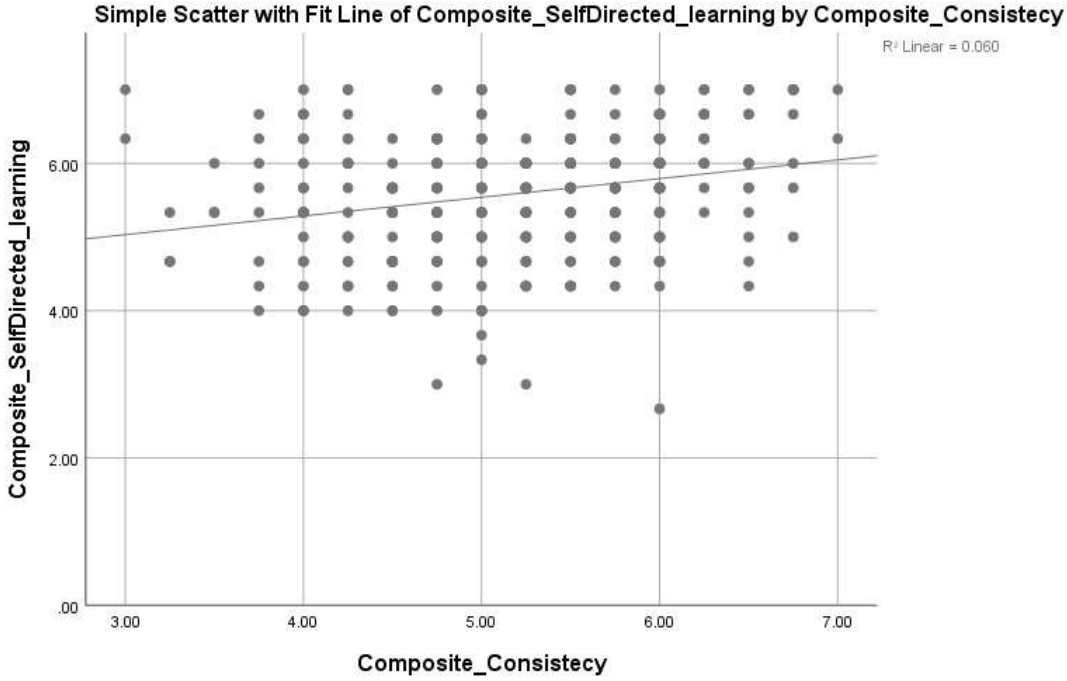
	normal food experiencing stimulation from trying foods from other culture experiencing stimulation through emotional eating experiencing stimulation from eating new foods stimulation through accessibility of food		
Traditional concept of hot and cold food influence functional food perception	Traditionally believed there are hot and cold foods; each body have different health benefits; hot body and cold body; should eat a balance of hot and cold food for good health	2	5
Training oneself to develop a taste for functional foods	Tried functional food for multiple times; tried to learn as much as about functional food; actively searching and putting effort towards functional food; eventually multiple trials developed a taste for functional foods	3	3
Trying ff in own traditional way of cooking for better taste	Choosing ffs common in other culture; cooking and eating them in own way as they would eat other foods usually	1	1
Using functional food diversity as a source of expressing oneself	The variety seeking behaviour is a manifest of self-expression. Consumers want to try variety of foods to show that they are unique, or they want to express. So, it's a result of psychological need for uniqueness and consistency.	6	8
Validation of functional food from multiple sources leading to consuming functional food	Searching functional food information in different sources; collecting information from different sources and looking for consensus or consistent information; if all sources claim similar things about functional food, then it is more acceptable	1	1
Versatile ff picked up and consumed well although not familiar to consumers	Avocados are versatile and can be eaten in several ways; therefore, consumers easily pick up and continue eating avocados; functional foods that are more versatile have higher chances of being picked up and consumed.	1	1

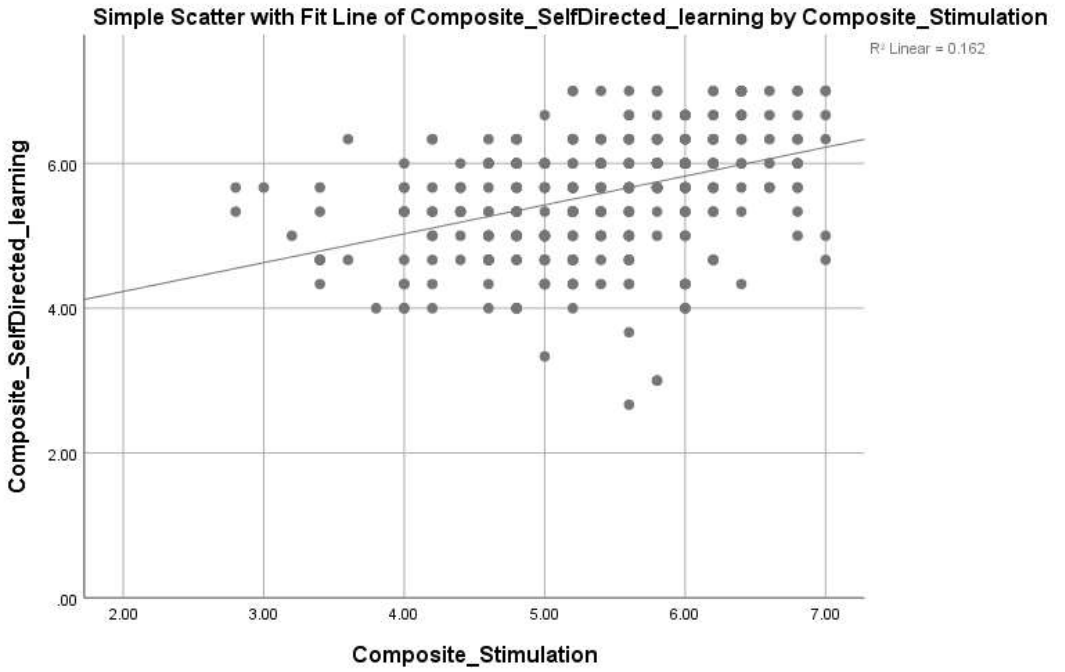
Appendix G Structure of factors extracted



Appendix H Scatter plots for Pearson correlation analysis



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R² Linear = 0.162
Composite_SelfDirected_learning
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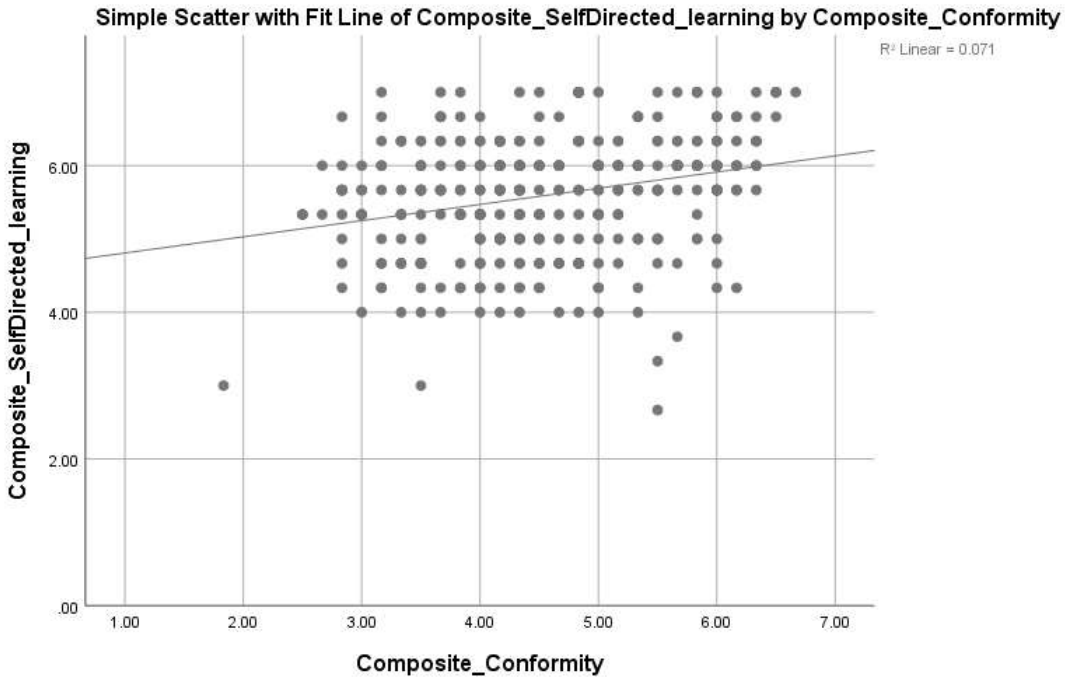
2.00
.00
2.00
3.00
4.00
5.00
6.00
7.00
Composite_Stimulation


Simple Scatter with Fit Line of Composite_SelfDirected_learning by Composite_Conformity
R² Linear = 0.071
Composite_SelfDirected_learning
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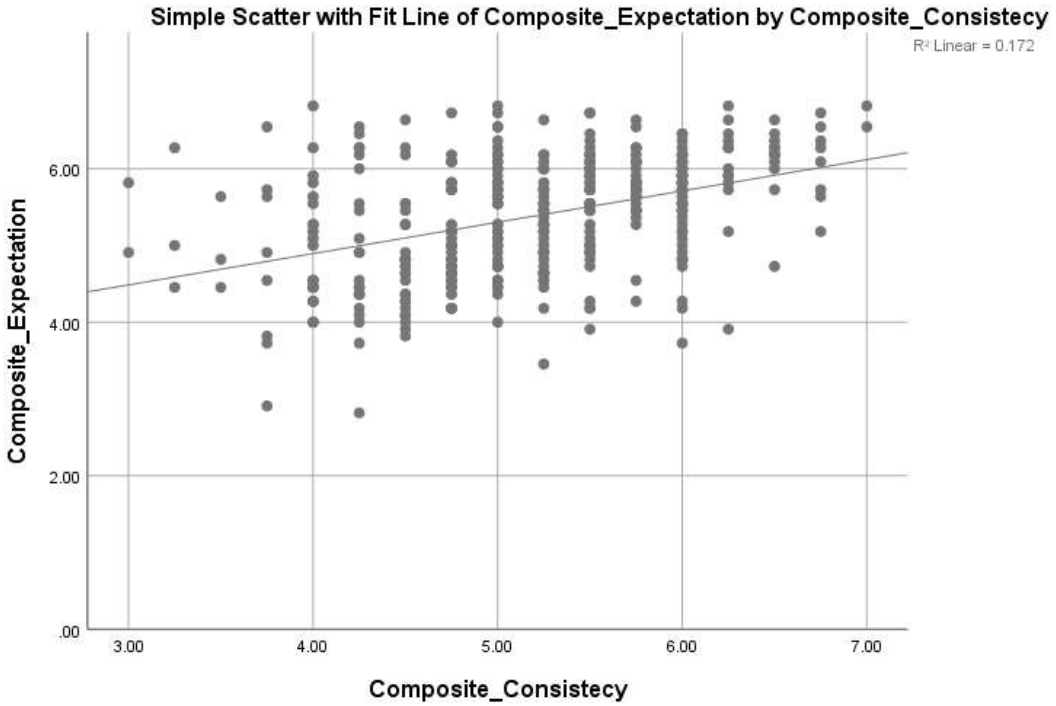
.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
Composite_Conformity


Simple Scatter with Fit Line of Composite_Expectation by Composite_Consistecy
R² Linear = 0.172
Composite_Expectation
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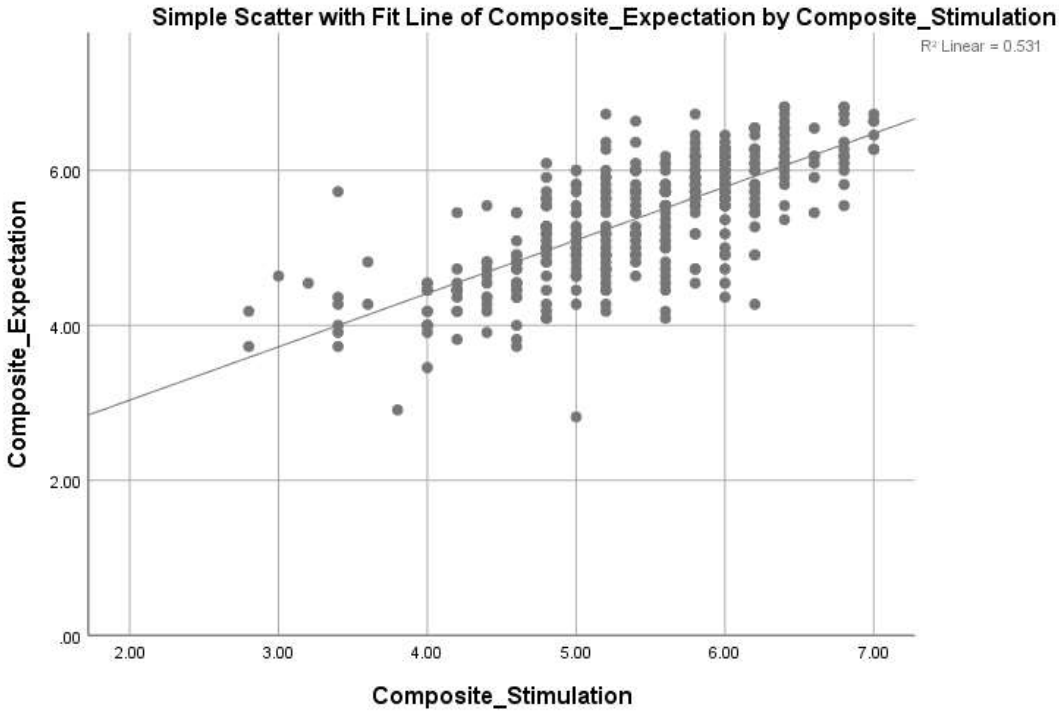
3.00
4.00
5.00
6.00
7.00
Composite_Consistecy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R² Linear = 0.531
Composite_Expectation
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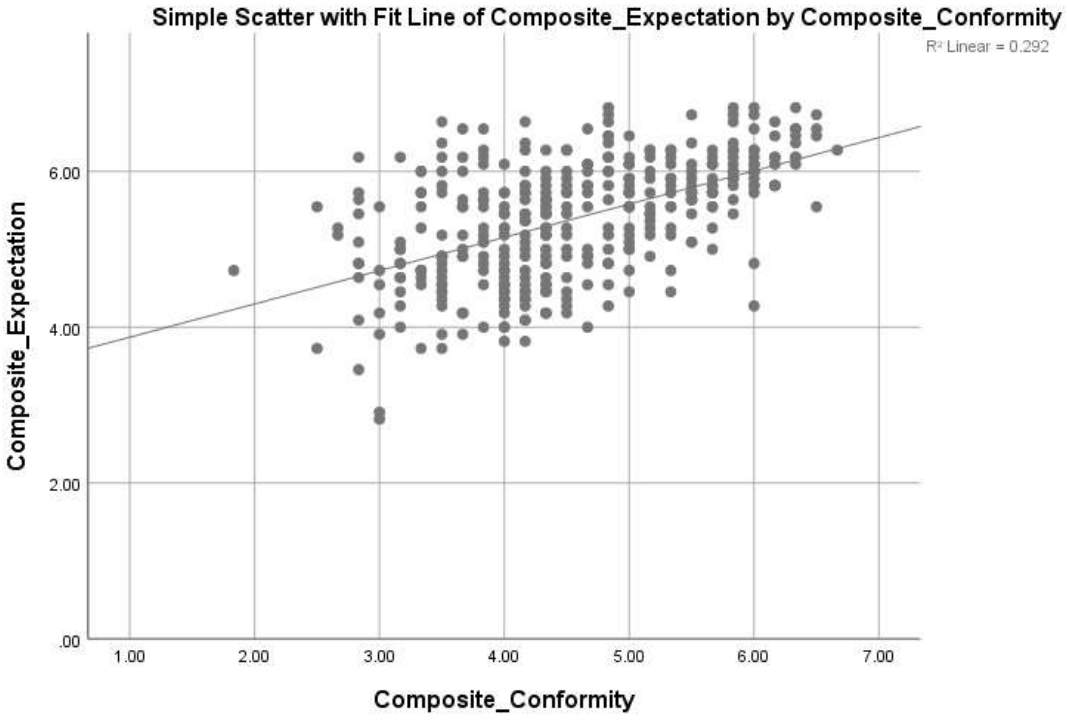
7.00
Composite_Stimulation


Simple Scatter with Fit Line of Composite_Expectation by Composite_Conformity
R² Linear = 0.292
Composite_Expectation
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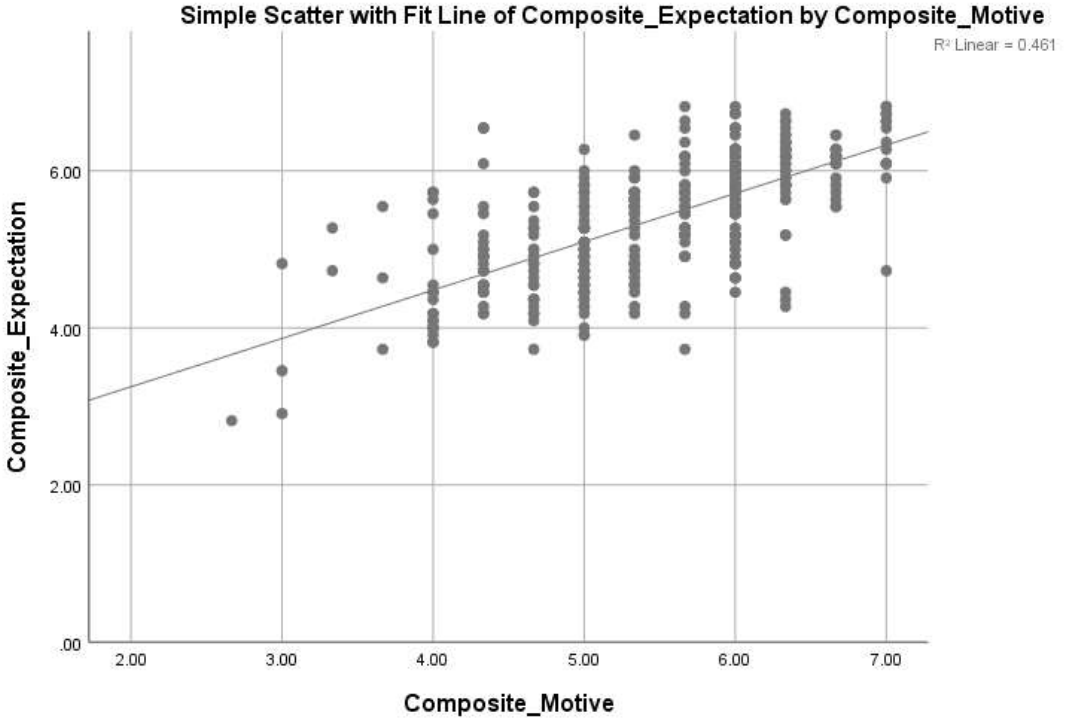
4.00
5.00
6.00
7.00
Composite_Conformity


Simple Scatter with Fit Line of Composite_Expectation by Composite_Motive
R² Linear = 0.461
Composite_Expectation
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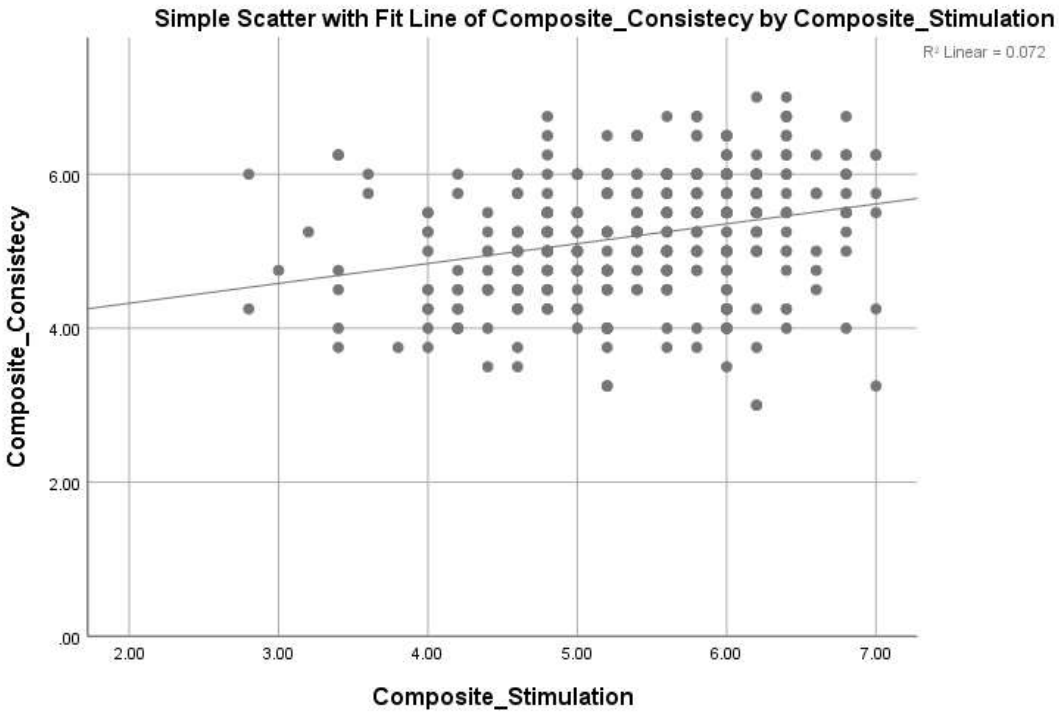
5.00
6.00
7.00
Composite_Motive


Simple Scatter with Fit Line of Composite_Consistecy by Composite_Stimulation
R² Linear = 0.072
Composite_Consistecy
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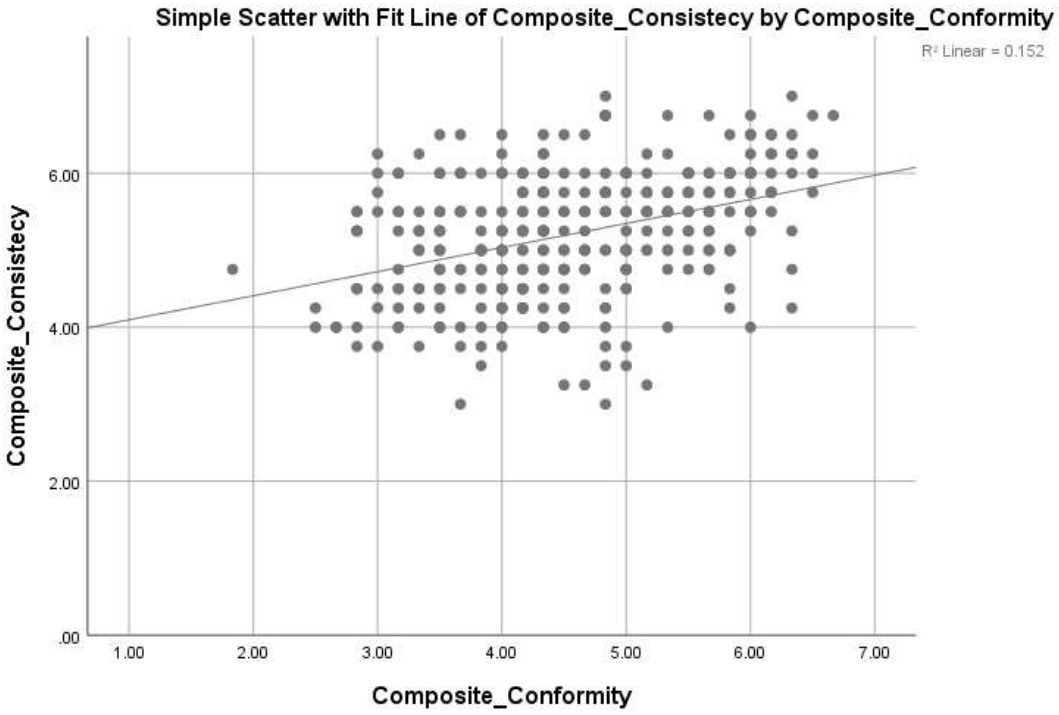
5.00
6.00
7.00
Composite_Stimulation


Simple Scatter with Fit Line of Composite_Consistecy by Composite_Conformity
R² Linear = 0.152
Composite_Consistecy
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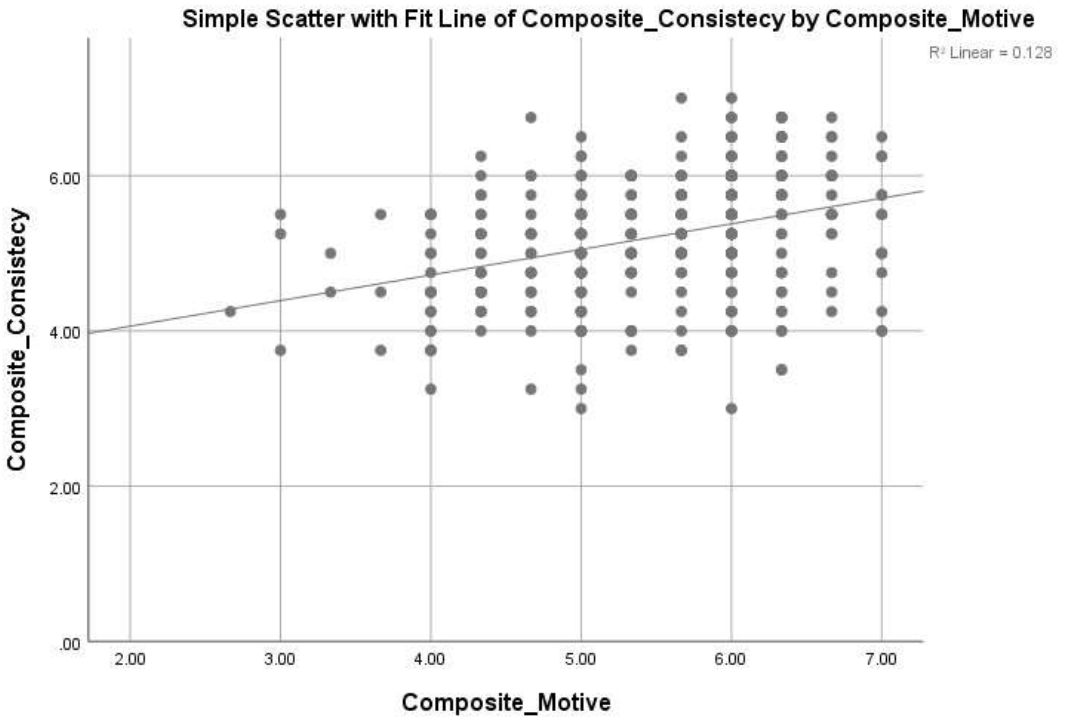
1.00
2.00
3.00
4.00
5.00
6.00
7.00
Composite_Conformity


Simple Scatter with Fit Line of Composite_Consistecy by Composite_Motive
R² Linear = 0.128
Composite_Consistecy
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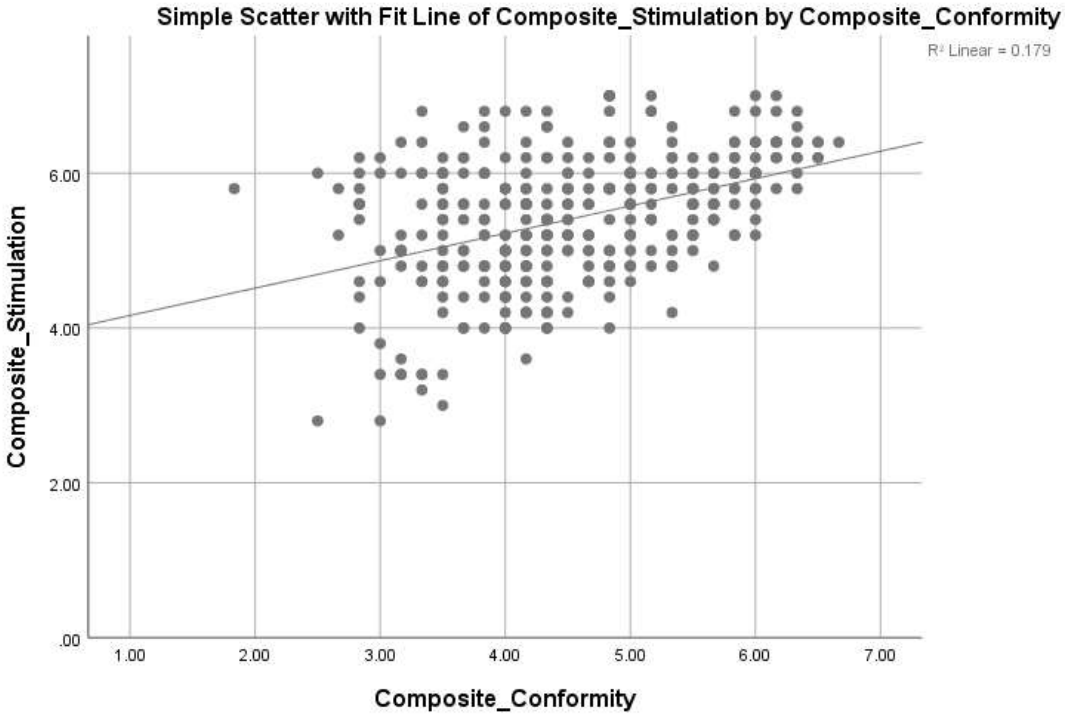
4.00
5.00
6.00
7.00
Composite_Motive


Simple Scatter with Fit Line of Composite_Stimulation by Composite_Conformity
R² Linear = 0.179
Composite_Stimulation
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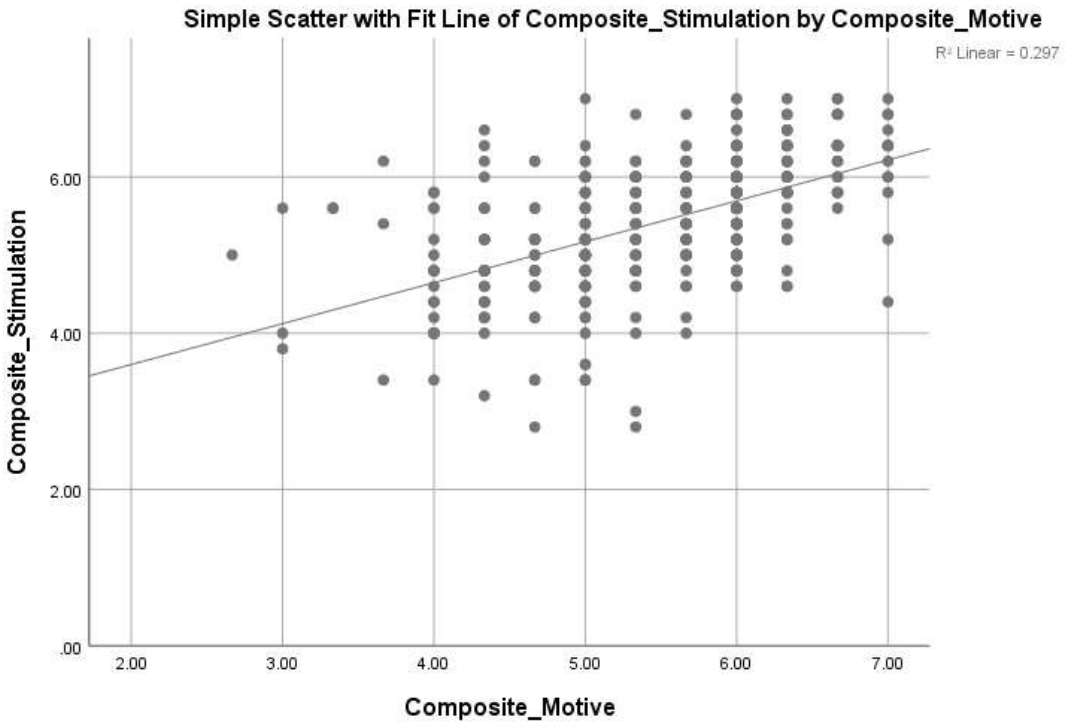
2.00
3.00
4.00
5.00
6.00
7.00
Composite_Conformity


Simple Scatter with Fit Line of Composite_Stimulation by Composite_Motive
R² Linear = 0.297
Composite_Stimulation
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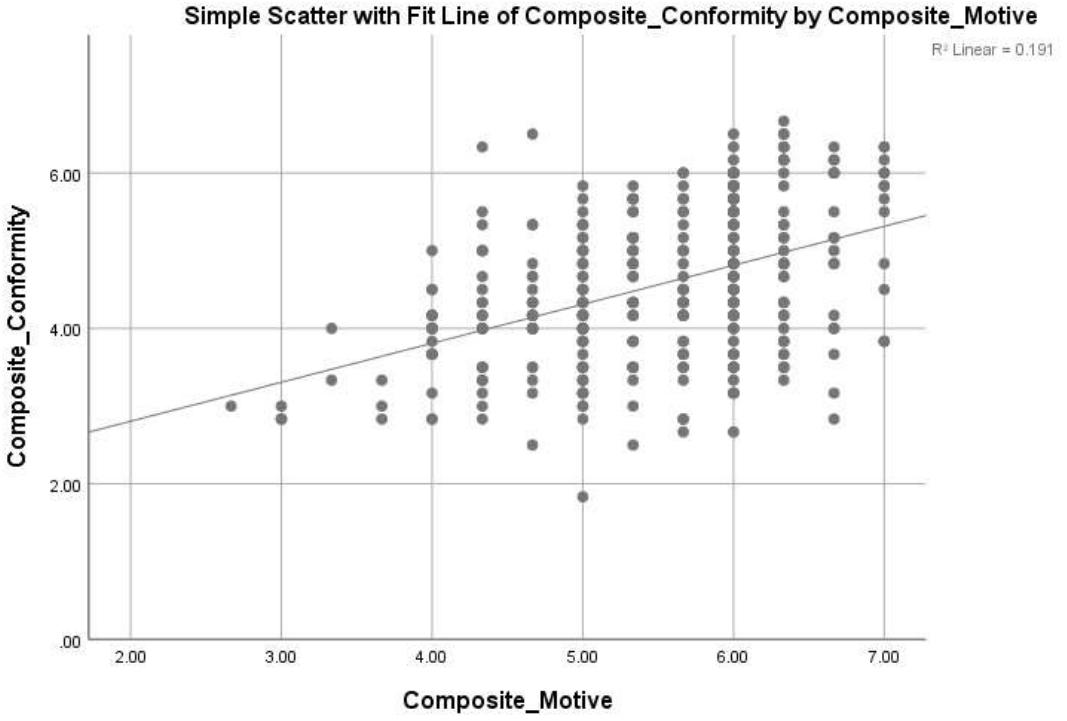
4.00
5.00
6.00
7.00
Composite_Motive


Simple Scatter with Fit Line of Composite_Conformity by Composite_Motive
R² Linear = 0.191
Composite_Conformity
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4.00
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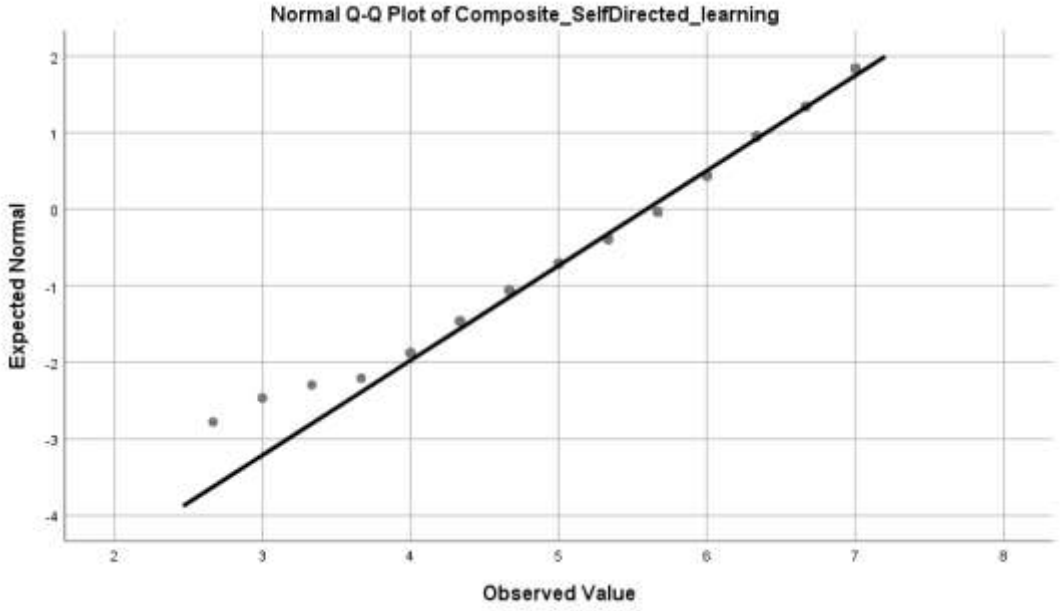
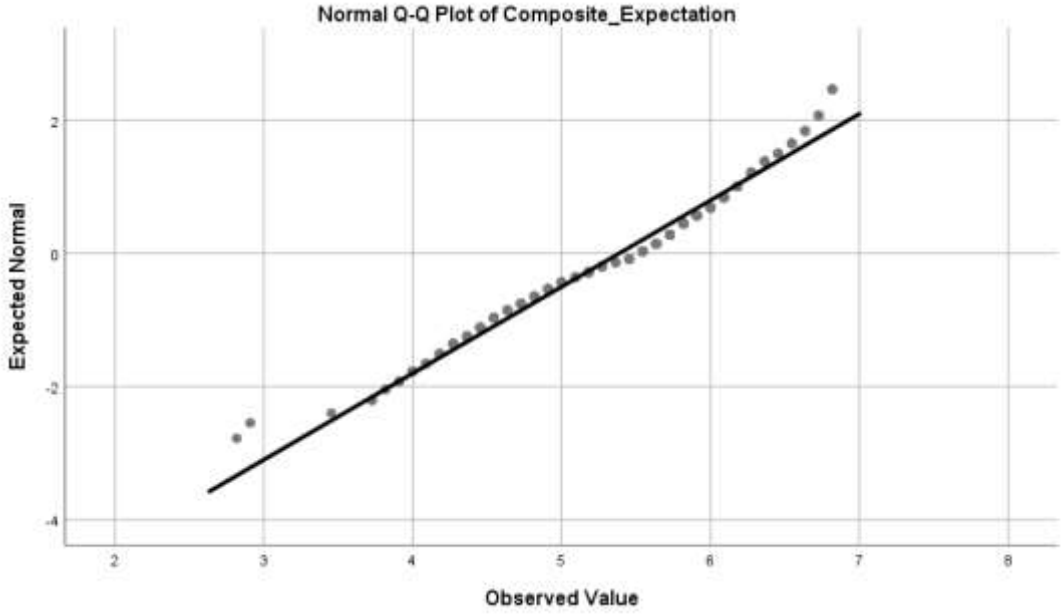
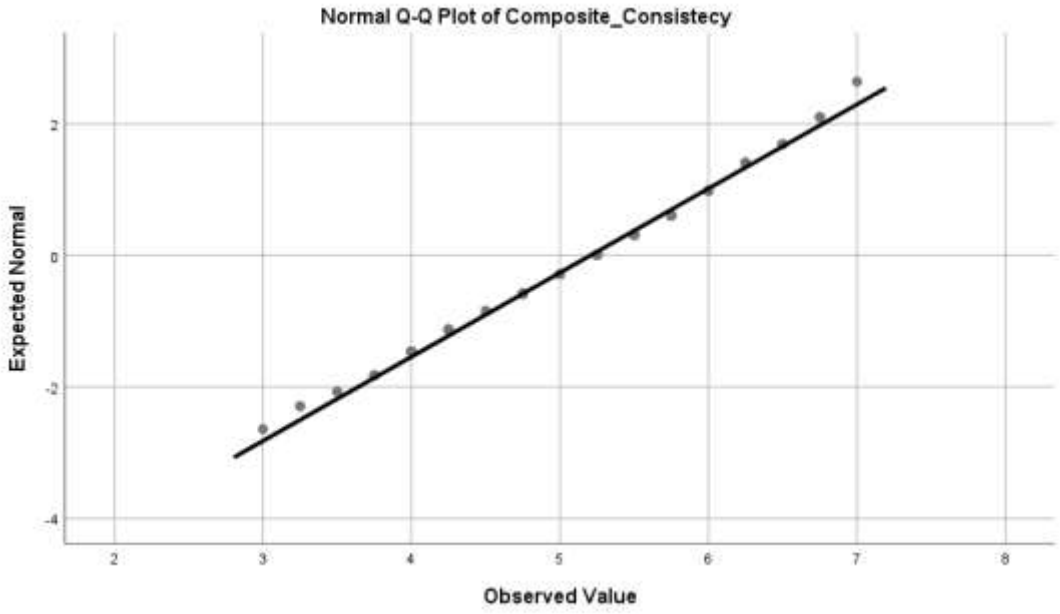
7.00
Composite_Motive

Appendix I Testing normality of data for Pearson correlation test



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Expected Normal
Observed Value
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-4
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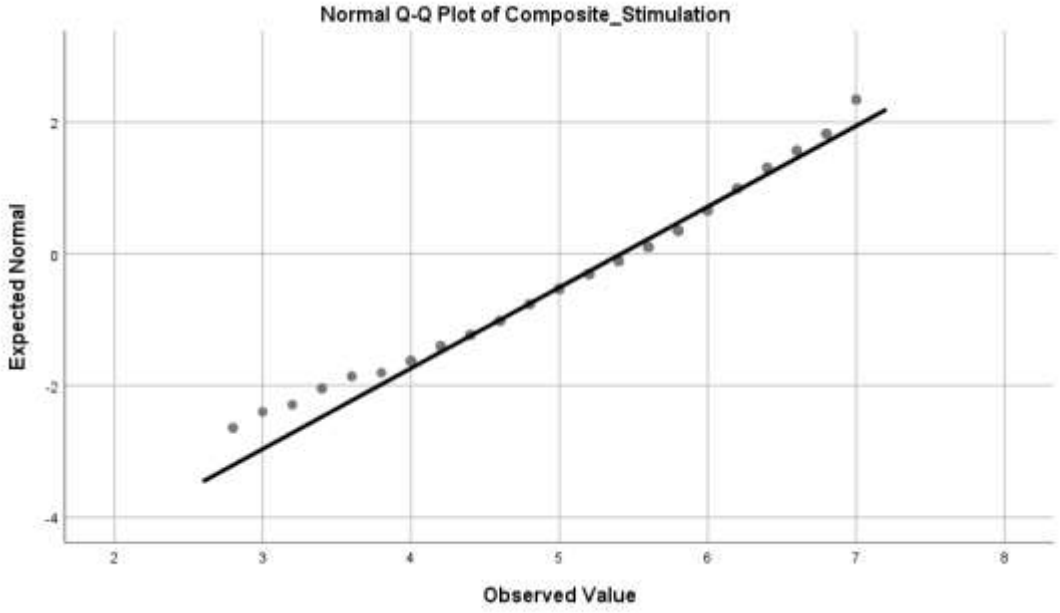
3
4
5
6
7
8


Normal Q-Q Plot of Composite_Stimulation
Expected Normal
Observed Value
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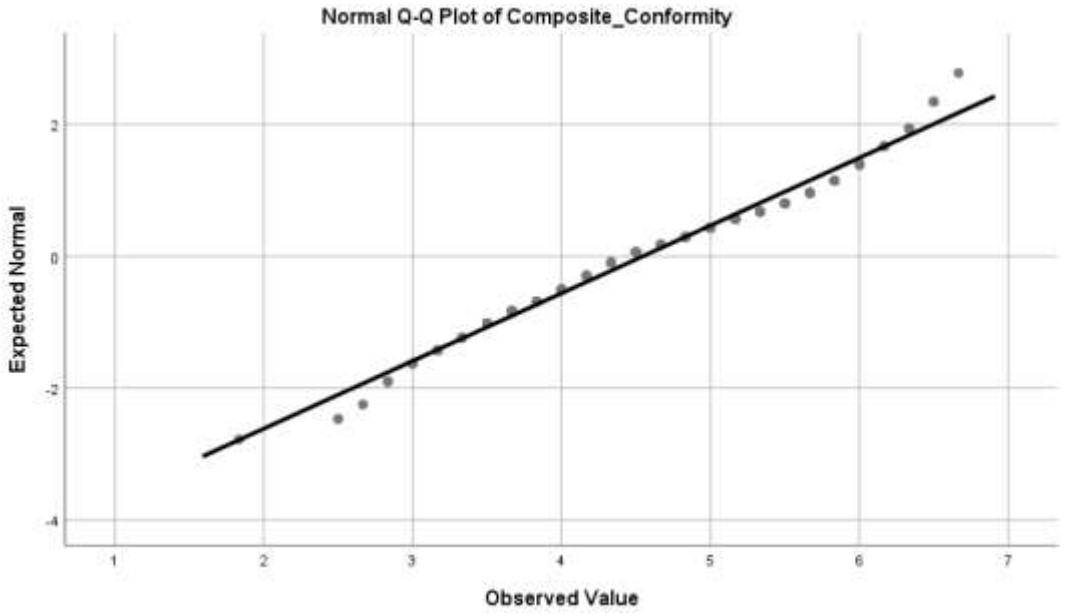
-4
2
3
4
5
6
7
8


Normal Q-Q Plot of Composite_Conformity
Expected Normal
Observed Value
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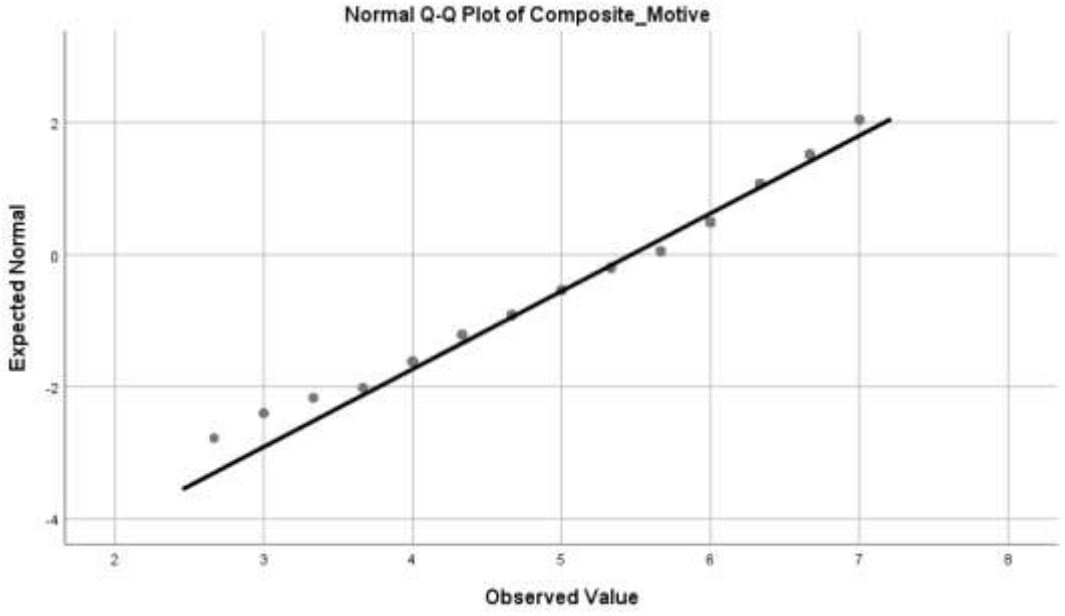
0
-2
-4
1
2
3
4
5
6
7


Normal Q-Q Plot of Composite_Motive
Expected Normal
Observed Value
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-2
-4
2
3
4
5
6
7
8