The possibilities of reducing food choice to improve the economical (profits), nutritional/psychological (people) and environmental (planet) performance of university residential college foodservices

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Abstract

In the contestable field of choice reduction, this research developed an understanding about the dominant attitudes towards the potential of menu choice reduction initiatives in a residential college foodservice case study setting. More specifically, it explored the attitudes and perceptions of stakeholders based on a residential college at the University of Otago in Dunedin, New Zealand (i.e. warden, foodservice staff and residents). Given that choice reduction is likely to be hugely controversial as individuals are inherently attracted to choice, it is important to find out firstly what choice means to stakeholders before developing and implementing practical recommendations.

Q-methodology was identified as an appropriate method for exploring attitudes to such a contentious topic as this. This method incorporated the benefits of both qualitative and quantitative research. It provided a foundation for the study of subjectivity, individuals’ viewpoints, opinions, beliefs and attitudes. Overall, 35 participants, 29 residents and six staff completed the Q-sort activity and post Q-sort interview. Three factors emerged from the Q-study’s inverted factor analysis, representing three dominant viewpoints. These were: the “Believers” (believers in the benefits of choice reduction – environmentally, nutritionally and socially aware); the “Resisters” (meat loving, hungry, choice reduction resisters); and the “Emotives” (choice reduction opponents). Interestingly, there was consensus across the factors that decreasing choice would not necessarily mean that the quality of the foodservice would be decreased. Rather, study participants thought that the quality might actually increase as chefs could focus less on quantity and more on quality.
The majority of the participants agreed that they do not need everything that is currently offered in the buffet menu and indicated that they usually take more than what they need. Participants could see a number of benefits of choice reduction such as reduction in food waste, healthier eating and easier decision making. However, there was still reluctance towards choice reduction. There were attitudinal barriers to adopting choice reduction initiatives that needed to be overcome to avoid dissatisfaction with the foodservice.

Based on the current stakeholder attitudes revealed by this study, the case study residential college could immediately consider implementing less controversial choice reduction initiatives such as smaller trays (or better still no trays), education on portion size in relation to health and “Meatless Mondays”. As residential college foodservice managers come under increasing pressure to improve their foodservices’ Triple Bottom Line performance (3Ps: Profit, People and Planet), more radical choice reduction measures, such as moving away from a large buffet offering may be an option, although staff would have to tread carefully with how any such move would be “sold” to its customers (i.e. the students). The innovative research approach adopted in this research study, in what has to date been a very new and unexplored area, has provided a solid foundation on which to build further research investigating choice reduction within the wider foodservice sector.
Preface

Joint academic supervision of this research was kindly accepted by Dr. Miranda Mirosa from the Department of Food Science and Dr. Heather Spence from the Department of Human Nutrition at the University of Otago. Susan Stockwell, the Foodservice Manager of the supporting residential college foodservice operation, took on the role of Professional Advisor. A shared passion for foodservice, environmental sustainability and pursuit of knowledge initiated this research.

The candidate was responsible for the following:

- Research proposal
- Submission of ethical approval
- Application for funding
- Communication with the Professional Advisor
- Development of data collection tools
- Recruitment of interview participants
- Conducting data analysis and interviews
- Transcribing verbal data
- Development of recommendations
- Thesis write up

This research was undertaken from June 2013 to December 2014.
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Lastly, I dedicate this thesis to God. Thank you for guiding me the whole way through. This thesis is entirely for you.
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1. Introduction

1.1 Background to research

Consumer choice is generally viewed as being desirable (1). It is therefore surprising to
witness a trend towards “no-choice” menus in the restaurant foodservice industry. Media
coverage of this trend indicates that its driving forces are primarily quality-related (i.e. by
offering a set menu at a set price, the restaurant’s chefs can focus their energy on a limited
offering of finely executed dishes) (2-5). Another trend that restaurants are now opting to
do is downsize their menus. Reducing menus options could be a way for restaurants to cut
cost (financial benefits). Restaurants could more easily standardise food quality, avoid food
waste and probably boost their profit margins – either by charging more or spending less
(6). Other papers have concluded that “more isn’t always better, too many choices could be
a problem” (7, 8).

While there is currently no academic discussion about the benefits or limitations of choice
reduction in the areas of dietetics or foodservice, there is a growing body of literature in the
psychology discipline. For example, there is increasing evidence that more choice does not
automatically contribute to more satisfaction (9, 10). Experimental studies show that when
individuals have to make a choice from an extensive choice set, they tend to be less
motivated to choose, less willing to buy and feel less satisfied with their choice (9). In the
last few years, sustainability experts, especially in the area of food policy, have also started
to promote the benefits of choice reduction from an environmental point of view (e.g. less choice results in less wasted food) and they have espoused the need for more choice editing to rid the market of environmentally damaging products (11-13). Health experts are also well aware that more choice can lead to overeating, which is concerning given the abundance of buffet offerings (14) and the current obesity crisis (15).

Given that foodservices are increasingly looking for ways to improve customer satisfaction and improve their Triple Bottom Line performance (3Ps: Profits, People and the Planet) (16), menu choice reduction looks promising as a strategy for foodservice managers to achieve these goals. Since universities have a responsibility (in both curricular and extra curricula activities) to foster a wide range of graduate attributes such as environmental literacy and ethics, university college foodservices are a good place to start investigating the possibilities of, and potential challenges associated with, menu choice reduction. Individuals that rely on college foodservices are mainly first year university students. It is their first year moving away from home to being in a new environment with changing peers and support systems (17-19). Therefore, it is important that they are in an environment that allows them to make healthy and environmentally sound food decisions.

1.2 Overview to research

This research aims to explore stakeholders’ attitudes and perceptions around menu choice reduction and the possible circumstances under which less food choice is acceptable. The research question is “What does choice mean to you at the residential college’s meal times?” The wider choice literature indicates that there are three potential benefits of
reducing menu choice in a residential college foodservice operation: Profits (economical), People (nutritional/ psychological) and Planet (environmental sustainability). However, it is a hugely controversial as individuals are inherently attracted to choice (20). Therefore, it is important to understand the attitudes and perceptions of stakeholders to choice reduction and their limits to reducing choice.

In the context of this study’s residential college foodservice, ‘choice’ refers to hot and cold options on the main menu, a variety of salads on the salad bar and a range of drinks at beverage stations. In addition, ‘choice’ refers to whether or not to use a tray. The study focuses on which types of food offered at meal times (for example, sandwich fillings, salads, beverages and food trays) could potentially be reduced. Although there are possibilities to reduce choice in other aspects of the foodservice operation for example, to source foods from only local farms, this is not the focus of this research. There is room for further research in this area.

The outline of the thesis is as follows:

• Chapter 2: Literature Review
• Chapter 3: Objective Statement
• Chapter 4: Participants and Methods
• Chapter 5: Results
• Chapter 6: Discussion and Conclusion
• Chapter 7: Application to Foodservice
2. Literature Review

This chapter reviews the positive (2.1) and negative (2.2) effects of having choice, explores choice reduction as a means to improve the foodservice’s Triple Bottom Line performance (3Ps: Profit, People and Planet) (2.3) and identifies Q-methodology as an appropriate method for exploring attitudes (2.4-2.5).

2.1 Benefits of choice

Supermarket chains claim that they offer the largest variety of products for shopping. Ice cream vendors race with each other by having the widest range of flavours. Major fast-food chains urge customers to “have it their way”. In addition, with the rise of internet dealers with their unrestricted capacity and reach, consumer choice expands even further (20). The benefits of choice have also been widely documented in the academic literatures in domains such as economics and psychology.

2.1.1 Economical benefits of choice

Rational choice theory portrays humans as rational agents in an economic system. They act within specific, given constraints and on the basis of the information that they have about the conditions under which they are acting. A rational individual chooses the alternative that is likely to give them the greatest satisfaction (21). This implies that when an individual goes through a purchase process, he/she would always choose the product that best matches his/her preference. With more items available, the chance of finding the ideal solution increases.
2.1.2 Psychological benefits of choice

The link between provision of choice and increases in intrinsic motivation, perceived control, task performance and life satisfactions have been well supported by decades of psychological theory and research (9, 22-24). Botti and Iyengar (2006) also found support in psychological models, which implied that more choice leads to improved individual welfare (25). Furthermore, Deci and Ryan (2000) claimed that choice is associated with desirable consequences such as greater satisfaction (22). Individuals are motivated when they are given the opportunity to make their own choices as they feel in control. They feel better as they would be able to positively evaluate the decision outcomes of their own choices. This contributes to an increased psychological well-being and a link between attitude and behaviour (20).

2.1.3 Benefits of having increased choice

Current psychological theory and research affirm the positive effects and motivational consequences of having personal choice. These findings have led to a popular notion that the more choices, the better (9). Having more choices could benefit individuals in at least two ways. Firstly, when individuals have highly differentiated needs, choices available would enable them to satisfy their own particular wants. An example is that different people have different tastes in food preferences and the same person may like different foods at different times. Restaurants that offer multiple choices about food would satisfy these diverse wants and needs (26). Another benefit is when individuals have similar needs, more choice could be beneficial if it promotes competition among providers that leads to
lower prices or improved quality (9, 27). For the benefits of competition to be noticed, consumers must be well informed about the difference in price and quality.

2.2 Negative effects of choice

A study by Iyengar and Lepper’s (2000) challenged the assumption that more options have a positive effect on choice satisfaction. Their study showed that more choice could lead to negative consequences for both retailers and consumers. More choices available led to more complex decisions as consumers might be overloaded by all the information. For the first time, three experimental studies demonstrated the possibility that, although having more choices might appear desirable, it may sometimes have detrimental consequences for human motivation. The first part of the study showed that although more consumers were attracted to a tasting booth with 24 flavours of jam rather than six, consumers were much more likely to purchase jam if they had encountered the display of only six jams. The second part found that students wrote higher quality essays when they picked a subject from a limited list than a more elaborate list. The last part revealed that participants were more dissatisfied and experienced more regret after choosing a chocolate candy from a large assortment (9). These three studies showed that although initially, extensive choice appealed to participants, they experienced feelings of demotivation before choosing and dissatisfaction after choosing. Similarly, a recent study conducted by Ackerman and colleagues (2014) found that when students are asked to engage in the course choice and make an actual decision, students preferred to have more choice. However, when they were required to make a choice, students responded more positively to having fewer choices
The results from the study were aligned with findings from past research showing that more choice could produce negative effects.

2.3 Choice reduction to improve Foodservices’ Triple Bottom Line

Menu choice reduction could be the strategy for college foodservices to adopt as its potential benefits fit the Triple Bottom Line framework. During the mid-1990s, John Elkington strove to measure sustainability by encompassing a new framework called the Triple Bottom Line. This framework went beyond the traditional measures of financial profits, returns on investment and shareholder value to incorporate environmental and social dimensions. It focused on the investment results along with interrelated dimensions of 3Ps: Profits, People and the Planet. Therefore, this framework could be an important tool to support sustainability goals (16). This framework is used to structure the literature review and discussion chapters of this thesis. Three potential categories of benefits for reducing food choice in a residential college are 3Ps: Profits – economical (streamlined service resulting in reduced cost to foodservice provider), People – nutritional (preventing individuals from overconsumption of food) and psychological (less choice resulting in more satisfaction with the chosen option), and Planet – environmental sustainability (less food waste).

2.3.1 Profits: choice reduction for economical benefits

Choice reduction could lead to financial savings. Universities and colleges are recognising how much food waste they are producing and the impact it is having on the environment and economy (29). Worldwide, it has been estimated that one-third of all food produced
gets lost or wasted in the production and consumption system. Almost half is the result of retailers and consumers in industrialised regions removing food that is fit for consumption. This contributes to over 1.3 billion tonnes of food, worth approximately US$1 trillion, which is enough to feed an estimated 870 million people who are hungry each day (29). Furthermore, Dr. Tim Fox, Head of Energy and Environment from the Institution of Mechanical Engineers, commented that it is estimated that 30 to 50% (or 1.2-2 billion tonnes) of all food produced on earth is lost before reaching a human stomach (30).

2.3.2 People: choice reduction for social benefits

Nutritional benefits of reducing choice

In the area of health and nutrition, countries like the United States have banned sugary drinks in public schools and researchers have founded that after the policy change took place, overall, students cut back on sugary drinks (31). This is an example of a choice reduction initiative. “All you can eat” one-price buffets influence the way individuals eat. It is an incentive for individuals to over-consume as there is a wide availability of food and there is no set portion size. To address the relevance of obesity control, default portion sizes could be applied to all foods or education on the appropriate serving sizes could be given (32). A study conducted by Kolodinsky and colleagues (2007) stated that college students are better eaters if they have a higher knowledge and understanding of nutrition education (33).

Portion size influences how much is consumed; research examining the effects of portion sizes has shown that when individuals are presented with more food, they consume more.
A study conducted among young adults by Levitsky and Youn (2004) stated that when larger amounts of food were served, there was a significantly greater amount of food consumed (14). This data was consistent with previous results in adults (34-37) and older children (38) that serving a larger portion contributes to eating more food. In addition, larger portion sizes could increase the total amount of food consumed over the day as individuals do not compensate by eating lesser portions at other times (39, 40). According to a recent systematic analysis published in The Lancet: “Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013”, the rates of being either overweight or obese have climbed among New Zealanders since 1980. Currently, the adult overweight and obesity rate in the country is 66%, up from 50% during the past 33 years (15). In New Zealand, the home economics curriculum exposes individuals to evaluate current issues and theories of nutrition (41). However, these lessons appear to be overlooked.

The trend of larger portions consumed in a single session is described as “portion distortion” and appears to affect the portion sizes that young adults selected for some foods (42). Internationally, links between portion size and energy intake have led to calls for action and greater control over the food industry around portion sizes. As part of the Public Health Responsibility Deal, the Department of Health in England has issued a challenge to reduce the total energy intake of the population by 5 billion calories a day (43).
Psychological benefits of reducing choice

There are various reasons why more choice does not lead to more satisfaction. Choice overload could produce the following: paralysis, information overload and demotivation, time costs, regret, lack of well-determined preferences and increased expectations (20).

Paralysis: According to Schwartz (2004), choice produces paralysis rather than happiness. Adding more options could make it hard for consumers to make a decision. Consumers may not look forward to having to decide from a large and varied assortment (44, 45).

Information overload and demotivation: Decision researchers have identified that there are a number of common errors in decision making that are exacerbated by decision-overload. As the choice increases, consumers are overloaded with the available options, which could have a demotivating effect on the purchase intention (9). Individuals may try to avoid having to make a decision by procrastinating or choosing the default options (26). Consumers with more options to consider may take more time and effort to make the decision. It requires more effort to compare and match preferences (25). Huffman and Wansink (1999) had also reported a negative effect of a large assortment on information overload (45).

Time cost: Time is a limited commodity for most individuals. Therefore, the more time one spends on decision-making, the less one has for other pursuits. This could also impose psychic costs as when the demand on their time increases, individuals become increasingly
anxious about whether they are making the best use of their hours and minutes (26). They could feel regretful about other tasks that are left undone and guilty about the relationships that they neglect (20). This may result in a general decline in enjoyment of the activities that they find time for (26).

Regret: When consumers finally made a decision, they could regret the option that they have decided on. Individuals dislike losing and they feel worse when they feel individually responsible, especially when they could have done better if they had made a different decision (46). These feelings of regret are explained by what Fischhoff (1975) referred to as “hindsight bias” which is the inclination to view outcomes as having to be more predictable than they actually were when the decision was made (47). Several studies have shown that two factors affecting regret are how much one feels personally responsible for the results and how easy it is to imagine a better alternative (9, 25). Desmeules (2002) proposed an inverted U-shape relationship (see Figure 1) between the variety of an assortment and positiveness of the consumption experience. According to this study, a moderate assortment would lead to the highest consumer satisfaction and also positive consumption experience (48).
Other than experiencing regret, individuals also experience anxiety at the time that they make decisions. Researchers have found that anxiety induced by decision making tends to be in situations such as when decision makers feel that they lack expertise in that particular area (49).

Lack of well-determined preferences: According to the rational choice theory (sub section 2.1.1), individuals have well-stated, stable and ordered preferences. However, experts in the economics field have concluded that people might not know their preferences before the actual decision process. Rather, consumers choose their preference during the decision process and can be affected by contextual influences (25). Individuals tend to be shortsighted when they face choices between immediate gratification and long-term gains. In principle, individuals want their lives to improve over time; they want increasing
income over their life-course (27). However, in practice, it is the opposite: individuals are often driven by short-term temptations and costs (26).

High expectations: The amount of choice that individuals have in most situations contribute to high expectations. Schwartz (2000) states that the larger the assortment, the higher the expectations (10). The amount of choice leads the consumer to think that one of the options would meet their preference (50). If choices were limited, the consumer would have limited preference.

2.3.3 Planet: choice reduction for environmental sustainability benefits

There is increasing acknowledgement that the current food system is not sustainable indefinitely into the future and that additional efforts are needed to reverse its damaging ecological impacts (51, 52). Some environmental advocates argue that not only major changes are needed in the food system but that individuals should be modifying their food choices to make them more ecologically conscious to support a sustainable food supply (52, 53). A study conducted by Bissonnette and Contento (2001) found that adolescents did not have strong or consistent beliefs of attitudes about the environmental impact of food production practices (52).

According to a joint document released by the Danish Ministry of the Environmental and Copenhagen Resource Institute, choice reduction for sustainability describes how retailers could eliminate the option of buying products with a poor environmental or social record. Retailers participate by not supplying products that are considered to have an unacceptable
environmental impact (12). It is more than simply deleting what does not work. The UK Sustainable Development Council states that it is about shifting the field of choice for mainstream consumers: removing unnecessarily damaging products and getting sustainable choices on the shelves (13). This is important to achieve overall environmental improvements (12). By reducing choice, the burden of responsibility is shifted from consumers further upstream (e.g. to retailers or to foodservice managers) (12).

If the goal is to move consumers towards less environmentally damaging patterns of consumption, choice reduction delivers. Across the United States, there are a growing number of colleges and universities that have fair-trade coffee on the menu and use renewably generated electricity. These options are often the only choice available on campus (13). There has been an increase in social consciousness and environmental stewardship on college campuses. One of the creative initiatives that have gained attention over the past few years is trayless dining. An ARAMARK (leading United States foodservice company) study of 186,000 meals at 25 colleges and universities found a 25 to 30 percent reduction in food waste per person on trayless days (54). Jonathan Bloom, an author of American Wasteland and an independent food waste consultant, commented the tray-free cafeterias “saves us from our own eyes being too big for our stomachs and forces us to only take what we can carry” (55).

“Meatless Monday” is an international campaign that encourages individuals to eliminate meat on Mondays to improve their health and health of the planet. It was introduced as a
public health awareness campaign that addresses the prevalence of preventable illness associated with excessive meat consumption (56). Out of all colleges that have implemented “Meatless Mondays”, University of California (UC) Davis’ “Meatless Mondays” is regarded as one of the premiere pioneering programmes. The university’s sustainable foodservice progress report 2012 stated that 680 UC Davis students pledged to participate in this campaign. Meat was never entirely pulled off the menu but more vegetarian options are offered on meatless days. At the end of each week, pledges were tallied and a poster was created for the dining room that displayed the new total and how much water, fossil fuels and carbon have been saved. According to the Sustainability Manager of UC Davis, peer-to-peer education with students in dining halls is the most successful method to spark debate and long-term change. She suggested framing the language of meatless advertisements more as a celebration of food variety than as a limitation on meat (57).

Each Monday provides a weekly chance to start fresh, making it an ideal day to begin new initiatives. Two literature reviews led by colleagues at the Johns Hopkins Center for a Livable Future demonstrated that the effectiveness of public health promotion could be improved by leveraging on Monday as a day to begin healthy behaviour (58). A recent study in the American Journal of Preventive Medicine showed a consistent surge in health-related Google searches on Mondays over an eight-year period (59). This research has added to a growing body of literature that Monday could be a powerful leverage point for the promotion of healthy behaviour. This initiative acts as a public education effort that
seeks to overcome consumers’ “attitude-behaviour gap” with regards to environmental behaviour (60, 61).

**2.3.4 Potential additional positive effects of choice reduction**

Recently, Lombardini and Lankoski (2013) conducted a study that discussed food choice restriction as a food policy instrument, using a mandatory Helsinki School District weekly vegetarian day. The research focused on whether restriction of food choice could effectively change food consumption patterns. As pointed out by Botti and colleagues (2008), individuals’ reactions to choice restriction could differ from compliance to rebellion (62). Thogersen and Crompton (2009) suggested that if the intended behaviour is maintained even when and where choice is not restricted, choice restriction produces positive spillovers (63).

Social psychologists describe “positive spillover” as the effect of simple painless steps leading to the adoption of more ambitious behaviour (63). This occurs when the adoption of a particular behaviour increases the motivation for an individual to adopt other behaviour. Individuals can be ushered onto a “virtuous escalator” as one pro-environmental behavioural choice leads to another potentially more significant choice. This approach of “hooking” individuals with a small simple request by encouraging them to consequently accept a more difficult request is called the “foot-in-the-door” technique.

Choice restriction could also help individuals learn about their preferences by forcing them to try different options when the preferred choice is restricted. In addition, the behaviour
could develop an individual’s positive attitude towards it and activate other pro-environmental goals associated with the behaviour (64). Restriction could also make pro-environmental goals more noticeable even in the absence of any communication campaign.

### 2.3.5 Potential negative effects of choice reduction

Choice restriction could produce unintended effects such as non-compliance (64) in the restricted choice environment as well as boomerang effects (65), both in the restricted and unrestricted environments.

Non-compliance occurs when individuals do not adopt the behaviour that the restriction encourages. In the case of bans on soft drink vending machines in schools, students could bring sodas from home, or in the case of a vegetarian school day, they may skip lunch. When individuals do not comply, the intended effect would not be achieved and undesirable adverse effects may emerge. Another scenario would be if students skip lunch, they may not meet their nutritional requirements or they might eat more elsewhere during the day (64). Other than non-compliance, choice restriction could produce boomerang effects, which is a reaction opposite to the intended response of persuasion messages (65, 66).

Boomerang effects could be noticed in both restricted and unrestricted environments. Instead of producing positive spillovers, negative spillovers could occur (64). For example, it is possible that choice restriction could make individuals start to value restricted behaviour more, or alternatively, given them the liberty to eat whatever they please
According to the psychological reactance theory, if individuals’ freedom were being reduced or threatened with reduction, individuals could become motivationally aroused. This would presumably be directed against any further loss of freedom towards the re-establishment of whatever freedom that they had already lost or the ones that are being threatened. For example, in the case of the vegetarian day, individuals could eat more fish and meat.

Other possible reasons for the boomerang effect or non-compliance could be that some individuals disagree with the motivation for choice restriction or do not believe in the ability of the intervention to achieve other benefits, such as reduce environmental impacts.

There are many potential benefits to reducing choice. However, there are attitudinal barriers as individuals inherently enjoy having choice. To begin this discussion on the possibility of menu choice reduction, current attitudes regarding choice reduction need to be explored and understood in order to understand the barriers that individuals may have.

### 2.4 Exploring attitudes

Attitudes are challenging to define. Attitudes may influence behaviour and also possibly be influenced by it. Even though attitude has been a difficult concept to define, research on attitudes remain popular in many disciplines, not the least in the dietetics and foodservice fields. Attitudes could also imply evaluation and are concerned with how individuals feel about a certain topic. Measuring attitudes has an extensive history in social psychology dating back to 1928 when Thurston published a paper titled “Attitudes can be measured.”
At present the most common used methods are self-report measures such as the Likert and Semantic Differential scales. The Likert scale requires individuals to rate the extent of their agreement or disagreement with a set of statements about the attitude object (71). Manstead and Semin (2001) argued that the strength of this scale is the capability to capture different traits of attitude, ranging from beliefs to behaviour (72). However, there are disagreements in the literature about the strengths and weaknesses of this scale (72, 73). The Semantic Differential scale asks individuals to rate the attitude object on a set of bipolar adjective scales (72). This is done by placing a tick or cross in one of the seven spaces on each rating scale. The ratings are scored and scale scores are summed or averaged to find out the overall index of attitude. These self-report measures have several advantages such as their ability to assess psychological constructs in a relatively economical way (72). However, they also have disadvantages. It is not always feasible to collect self-report data discreetly as participants are always aware that they are under investigation and as a result potentially modifying their responses. Q-methodology is a more robust technique for measuring subjective opinions. It is also an appropriate and relevant means of exploring and studying attitudes (68).

2.5 Q-methodology

Q-methodology incorporates the benefits of both qualitative and quantitative research (74, 75). It provides a foundation for the study of subjectivity, individuals’ viewpoints, opinions, beliefs and attitudes (76). The method is designed to identify groups of participants who have similar overall attitudes. It also assesses the differences of participants who have other views (74, 77). By Q-sorting, individuals give their meaning to a set of stated
attitudes towards the research topic (76). It is often a pleasant task for respondents who enjoy re-arranging attitude descriptors on the agree/disagree matrix until they are fully satisfied (78). After the Q-sort, interviews focusing on the reasons why participants put certain cards in the extreme positions are carried out (75). These serve as additional qualitative information that would provide explanations for differences in the Q-sorts between factor groups. A free programme (PQMethod version 2.35) is used for the factor analysis (79). This shows similarities between participants’ sorting of the statements. Participants with similar rankings of statements would load significantly on the same factor as each other, revealing a pattern of statements that defines their subjective views (80, 81). The results of Q-methodology are used to describe a population of viewpoints.

Q-methodology has become a popular method of investigating attitudes (68). In a time when individuals’ willingness to participate in questionnaire-based research decreases, Q-methodology could be a welcome alternative data collection approach (75). However, it has been stated that the method may be time-consuming to participants (82). Q-methodology has been applied in various disciplines such as medical and nursing, where it is used to measure patients’ or professionals’ attitudes toward health-related issues (78, 83, 84). However, it has not yet been applied in dietetics and foodservice research.

There are a number of controversies surrounding Q-methodology. As Q-methodology is a small sample investigation of human subjectivity based on sorting items of unknown reliability, results from Q-studies have often been criticised for their reliability and the
possibility for generalisation (85). Given that the purpose of Q-methodology is to evaluate an individual’s perspective, there is currently no external criterion to assess validity (86). Q-methodology is not intended for large non-randomized participant samples (87) and therefore the results from studies cannot be claimed to be generalisable (85, 88). However, a representative survey could later be conducted to try and generalise the results to a wider population, providing stronger external validity to the Q-study finding (89, 90). The growing number of Q-researchers is accompanied by growth in Q-publications. In a recent database search of Q articles, it was found that in the last 20 years there were 335 publications of which 196 were in the last five years (58%). One hundred and sixty-one of these were peer-reviewed articles and 65 had been cited (80).

2.6 Concluding comments: defining and refining the research question

A good Q-methodological research question should take into account the nature of the method. The research question should allow participants to tell the researcher what a topic means to them in a particular scenario. It has been recommended that the Q-methodological question should focus on either the (a) representation of a subject matter; (b) understanding of it; or (c) conduct in relation to it (91). The research question for this study focused on the understanding of the topic/subject matter. The study’s aims are to explore the attitudes and perceptions around menu choice reduction and the possible circumstances under which less food choice is acceptable. It is important to find out what choice means to stakeholders of the case study residential college before making any recommendations about the amount of choice on the college menus.
The research question guiding this study was:

“What does choice mean to you at the college’s meal times?”

This chapter reviewed the positive and negative effects of having choice, discussed choice reduction as a means to improve the foodservice’s Triple Bottom Line performance (3Ps: Profit, People and Planet). Q-methodology was also identified as an appropriate method for exploring attitudes. The next chapter, Chapter 3, states the research objectives.
3. Objective Statement

A gap in existing literature provides grounding for this research. The majority of choice-based studies have been structured in the psychology, economics and sustainability literatures. There is no academic literature about choice reduction in the areas of dietetics and foodservice. Internationally and locally (New Zealand), the majority of the university residential college foodservices provide a wide variety of choices to university students. However, there is increasing evidence that more choice does not automatically contribute to more satisfaction. In addition, more choice is known to be contributing to the obesity crisis and be economically and environmentally wasteful.

The current study seeks to develop an understanding of the dominant attitudes about the potential of menu choice reduction initiatives in a college foodservice setting. It aims to explore the attitudes and perceptions around menu choice reduction and the possible circumstances under which less food choice is acceptable. It is important to find out what choice means to stakeholders of the case study residential college before developing any practical recommendations to improve the economical (profits), nutritional/psychological (people) and environmental (planet) impacts of residential college foodservices.
4. Participants and Methods

The structure of a typical Q-methodology study was overviewed in Chapter 2. Key steps are summarised in Figure 2 and include:

- identifying the concourse;
- developing Q-sort materials;
- identifying participants (known as the P-set) whose viewpoints/perceptions the research aims to elicit;
- completing of the Q-sort activity by the P-set;
- factor analysis;
- factor interpretation of the data.

Figure 2: Practical steps used in Q-methodology
This chapter describes how each step of the process was carried out and why methodological decisions were made at each step. Before doing this, the ethical considerations within the research are discussed.

### 4.1 Ethical considerations

This study was carried out in accordance with the requirements of the University of Otago Human Ethics Committee (D13/392) (see Appendix 1 for confirmation of ethical approval). These ethical principles were the minimum requirement when designing the study and liaising with participants, and were integral to all decisions. Participants were asked to discuss their perceptions and attitudes around choice reduction. The interview sessions were audio-recorded to allow the researcher to remember and accurately transcribe what was said during the session. Participants were advised that neither the audio recordings, nor the transcripts from the interviews would be shared with anyone outside the study. The transcribed audio file was not labeled with the participant’s name for confidentiality purposes. Throughout the research process, participants were reminded of their right to withdraw from the research at any time without any disadvantage.

### 4.2 Identifying the concourse

The first step in Q-methodology was the collection of relevant ideas, beliefs and opinions that relate to the research question (84). This collection was also referred to as “identifying the concourse”. For the purpose for this study a variety of resources which included academic literature, interviews, editorials and commentaries, internet sites and personal web logs were accessed to identify the ‘concourse’. This procedure is a common practice
in Q-methodology literature (75, 81). The main aim was to provide a representative and balanced coverage of statements in relation to the research question.

One-to-one semi-structured interviews (n=9) were conducted with college staff and residents with the purpose of gathering a wide range of opinions on the possibility of menu choice reduction. Sub section 4.2.1 states the recruitment method for these interviews. Each interview was audio-recorded to allow the researcher to remember and accurately transcribe what was said. After these interviews, a list of general statements that represent the spectrum of attitudes surrounding choice reduction was generated. This list of statements was combined with other statements gathered from the literature search.

4.2.1 Recruitment method for semi-structured interviews

Purposeful recruitment using a convenience sampling technique was used to recruit both college staff and residents. The Foodservice Manager was the main contact for recruitment of college staff. Residential Assistants were asked if they would make recommendations on which residents to approach. The selection criteria are stated in Table 1.
Table 1: Selection criteria for college staff and residents

<table>
<thead>
<tr>
<th>Selection criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Age &gt; 18 years</td>
</tr>
<tr>
<td>• Individuals likely to offer a broad range of opinions on choice reduction</td>
</tr>
<tr>
<td>(for example: different political affiliations, different activities such as</td>
</tr>
<tr>
<td>sport and environmental interests)</td>
</tr>
<tr>
<td>• Even proportion of males and females</td>
</tr>
<tr>
<td>• Diverse ethnic groups (New Zealand European, Maori, Pacific Islanders, Asian)</td>
</tr>
<tr>
<td>• Various job positions within the college (staff)</td>
</tr>
<tr>
<td>o College warden</td>
</tr>
<tr>
<td>o Foodservice manager / head chef / staff</td>
</tr>
<tr>
<td>• A range of disciplines of study (residents)</td>
</tr>
</tbody>
</table>

Nominated potential participants were given the researcher’s contact details to follow up if they were interested in further information. Individuals who expressed interest were emailed an information sheet (Appendix 2), after which the interview date and time (Appendix 3) were agreed upon. All interviews took place at the residential college. At the start of the session participants were asked to sign the consent form (Appendix 4). The researcher’s interview protocol (Appendix 5) guided each session. The protocol contained questions such as, “What does choice and choice reduction mean to you?” and “When do you think choice would be demotivating”. Nine participants were interviewed: 65% were female, 34% were male. Upon completion of the semi-structured interviews, participants were offered a coffee and chocolate voucher. They were asked to sign a form to state they
had received the voucher (Appendix 6). Once the researcher was confident with the resulting concourse, development of the Q-set began.

4.3 Development of Q-sort materials

4.3.1 Q-set

Selection and formulation of a set of meaningful statements resulted in a Q-set. A Q-set of between 40-80 items is the accepted standard (91). A smaller Q-set tends to threaten claims of adequate/comprehensive coverage whilst a large Q-set can make the sorting process very demanding (91). Q-methodologists recommend that the initial Q-set contain a large number of statements, which can be refined and reduced through pilot testing (92). In the current study, 74 statements were generated in total (Appendix 7).

The aim of pilot testing was to achieve optimum balance, clarity, appropriateness, simplicity and applicability (93). Five individuals pilot tested the 74 statements to ensure clarity and general comparability. They were asked during each Q-sort to explain their understanding of the statements and describe their thought processes as they ranked the cards. This helped to clarify the wording of individual statements, reduce statements that were duplicated, generate new ideas and make sure that the Q-set was balanced. It highlighted the importance of valuing participants’ interpretation of each statement rather than being confined by literature search (83). After pilot testing the number of statements was reduced to 42 items. The researcher also considered a Q-set of 42 items as ideal in
order not to make the Q-sorting process too time-consuming. The final statements were randomly numbered and printed on separate cards (Appendix 8).

4.3.2 Range and slope of distribution

It is important to get the range and slope of the distribution right as it helps the participants to feel comfortable. Brown (1980) suggested an 11-point (-5 to +5) distribution for Q-sets numbering 40-60 items. For this study with a Q-set of 42 items, an 11-point distribution (-5 to +5) was used (Figure 3). A Likert scale measure was used as fixed choice response formats to allow participants to express how much they agree or disagree with the statements in the Q-set: -5 represented strongly disagree while +5 strongly agree (71, 94).

A shallower or more flattened distribution (Figure 3) was chosen over the steeper distribution as it offers a greater opportunity to make fine-grained discriminations at the extremes of the distribution. This strategy allowed for maximising the advantages of the participants’ topic knowledge (93). This is important for the present study, as the aim is to explore attitudes and perceptions of choice reduction strategies and find out what is acceptable in such a residential college foodservice.
4.4 P-set participant recruitment method for Q-sort activity

All participants interviewed for the semi-structured interviews (Section 4.2.) were invited to continue in the Q-sort activity. Similar selection criteria to the first part of the study (Table 1, sub section 4.2.1) were applied in this step. Additional recruitment strategies were advertisements (Appendix 9) on college notice boards, personal approaches from the researcher to residents at meal times, and a supportive email from the warden to all residents. Residents who emailed the researcher for further information received an information sheet (Appendix 10) via email, and those contacted at meal times were handed an information sheet. Throughout the recruitment process, the researcher attempted to recruit participants of different genders and ethnic groups. Purposive sampling typically relies on the concept of “saturation”, or the point at which no new information or themes are observed in the data (95). Data saturation was reached in this study after 35 respondents had completed the Q-sort activity. At this stage, the researcher observed that participants were not sorting the Q-set in significantly different ways, nor was new information emerging in the post-sort interviews about why participants had sorted the cards in the way that they did. Thus, the decision was made to cease data collection. Of these 35 participants, 65% were female and 35% male. This smaller number of male participants typifies what other studies have found; that men are less likely than women to participate in research (96).

A practical advantage of Q-methodology is that it requires a relatively small sample of participants (75). Q-methodological studies are designed to sample from a universe of
perspectives rather than from a population of people (97). Therefore representativeness does not depend on a large number of participants. It is about finding participants who have a defined viewpoint to express and more importantly those whose viewpoint matters in relation to the subject at hand (98).

4.5 Q-sorts activities

Participants recruited for the Q-sort activities were involved in a one-to-one session with three activities (a) Q-sort, (b) post Q-sort interview and (c) short survey. Sessions took place in the residential college’s tutorial rooms and lasted 30 to 45 minutes. The researcher’s interview protocol (Appendix 11) guided each session. The activity consisted of three key steps as the following subsections describe in turn.

4.5.1 Q-sorts

At the start of the session, participants were asked to read the information sheet (Appendix 10) and sign the consent form (Appendix 12). Q-methodology was defined and instructions (Appendix 13) were provided on how to perform a Q-sort. The Q-set (Appendix 8) was presented in a random order. Participants were asked to read cards and divide them into three piles: one pile for the statements with which they agreed, one with which they disagreed and one that they felt neutral about. They then placed cards from the “agree” pile at the right-hand end of the distribution with highest rankings given to the statements with which they most strongly agreed. The same procedure was followed for both “disagree” and “neutral” piles. Participants were encouraged to move cards within the distribution until all positions were filled and they were fully satisfied with their final placements (75).
Once the participant was satisfied with the final distribution, the completed Q-sort was photographed (Appendix 14).

4.5.2 Post Q-sort interview

Following the completion of the Q-sorting process, a post Q-sort interview was conducted to increase the richness and quality of the data (99). The interview allowed the researcher to explore each participant’s wider understanding of the issue, to understand why they sorted the items as they had and get them to focus on the meaning and significance of the items (93). The researcher followed the “post Q-sort interview guide” (Appendix 15), which contained questions such as “[with reference to the statements ranked at the extremes] What do these statements mean to you?”, “Why do you feel so strongly about these statements?” and “Could you tell me about why you placed them here?”. After discussing the statements at the ends of the distribution, the focus shifted to the other items more central in the distribution. Participants were also asked about their experience of participating in the Q-study. Each interview was audio recorded to allow the researcher to remember and accurately transcribe what was said.

4.5.3 Short survey

Participants provided demographic information such as gender, age, ethnicity, discipline of study and dietary requirements (Appendix 16). Upon completion of Q-sort activities participants were offered a coffee and chocolate voucher. They were asked to sign a form to state they had received the voucher (Appendix 6).
4.6 Factor analysis

The inverted factor analysis considers the holistic picture of how the statements were sorted (ranked). Participants with similar ranking of statements loaded significantly on the same factor. This revealed a pattern of statements that expressed their subjective views (80).

4.6.1 Data analysis programme

The programme used for this study is an established computer software package called PQMethod 2.35. It is a free programme that is available from the Q-methodology page (79). All the instructions needed for the programme are available in the manual (available from the Q-methodology page). This package standardises and automates data analysis, thereby enhancing the method’s feasibility for researchers.

4.6.2 Coding procedures

Table 2 contains the information used to code participants. For example a participant coded R05F1NZG: R05 stands for participant 5 is a resident of the college, F stands for gender: female, 1 stands for age group: 15-20 years, ethnicity: New Zealand European and she is on a special diet: Gluten Free.
Table 2: Coding for Q-sort participants

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Gender</th>
<th>Age Group</th>
<th>Ethnicity</th>
<th>Special Diets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident</td>
<td>R</td>
<td>Female F</td>
<td>15 – 20 years</td>
<td>Asian A</td>
</tr>
<tr>
<td>Foodservice Staff</td>
<td>FS</td>
<td>Male M</td>
<td>21-25 years</td>
<td>Maori M</td>
</tr>
<tr>
<td>Others (e.g. warden)</td>
<td>O</td>
<td></td>
<td>26-30 years</td>
<td>New Zealand European NZ Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>31 years and older</td>
<td>Others O</td>
</tr>
</tbody>
</table>

4.6.3 Correlation matrix

Firstly, a correlation matrix of all the Q-sorts was calculated. It is a by-person factor analysis to explore attitudinal groupings. It includes all the Q-sorts that had been gathered and therefore all the viewpoints the participants had produced. It represents 100% of the meaning and variability present in the study (98). The correlation matrix was subjected to factor analysis with the purpose of identifying the number of Q-sort groupings that are similar or dissimilar to one another. It examined the number of different Q-sorts (100). Participants with similar views shared the same factor.

4.6.4 Centroid factor analysis over principal component analysis

Two different types of factor analysis that are often used in Q-studies are centroid factor analysis and principal component analysis (98). The main difference between these techniques is the way that variance is dealt with (101). Centroid analysis was chosen as it is considered the most favoured method of factor extraction among experienced Q-methodologists (83) because of the permissiveness that it allows for data exploration (102).
It leaves all possible solutions open and allowed the researcher to explore possibilities through rotation. A factor loading was determined for each Q-sort showing the extent to which each was associated with each factor (76). Watts and Stenner (2012) proposed that seven factors is the default number for factor extraction in PQ method (98). Table 3 shows states the statistical and theoretical guidelines followed in this study for factor extraction.

Table 3: Statistical and theoretical guidelines followed in this study for factor extraction

- Eigenvalue is indicative of a factor’s statistical strength and explanatory power (98). Only factors with an eigenvalue greater than 1.00 should be retained (100) as eigenvalue of less than 1.00 are classified as insignificant to warrant further investigation.
- Factors should have at least two Qsorts that load upon it alone (87).
- A Q-sort should be considered significant in terms of loading upon a factor based on the statistical calculation of \( p<0.01 = 2.58 \times \left( \frac{1}{\sqrt{\text{number of statements}}} \right) \) (100, 102).
  - According to Watts (2012) and Brown (1980), for the purpose of this study, the level of significance was calculated as \( 2.58 \times \left( \frac{1}{\sqrt{42}} \right) = 0.3981 \) rounded up to 0.40 (100, 102).
  - Confounded Qsorts (which load significantly on two or more factors) were excluded (87).
- Factors with a combined variance of over 40% across all factors are considered to be a sound solution (87).

4.6.5 Varimax rotation

After the factor extraction, a factor rotation was carried out to simplify the findings and enhance interpretability of the results (90). The varimax rotation was chosen with the purpose to maximise “the purity of saturation” (90). It is an objective and reliable approach that can be used easily and effectively with larger data sets (102). It is also a preferable choice if the majority of the viewpoints are of major concern. After conducting the rotation, PQMethod ran a new PQROT program (79). This brought up a screen with all of the Qsorts’ loading. For each factor, Qsorts that loaded positively or negatively on one factor
were flagged (this was done by using an algorithm in PQ method software). It was important to flag the Q-sorts, as the final description of each factor would be based on a weighted average of those flagged Q-sorts (103). After flagging the values, three factors emerged. The endpoint of the quantitative analysis was reached when each of the selected factors is represented by a “factor array”. This represents a statistical best estimate of the views of all the Q-sorts clustered on the factor. These factors arrays were then interpreted (87).

4.7 Factor interpretation and communication

The aim of Q-methodology is to understand and explain the view of attitudes and perceptions represented by each factor (91). The order and structure of a factor interpretation is a vital element to communicate the information analysed from the factor extraction. As a means of communicating the factor interpretations, factors were given names, as it helped capture the main essence of the viewpoint for the factor (104). A narrative style was adopted to present the factors. Factors were interpreted by (a) shared viewpoints, (b) distinguishing statements, and (c) through transcribed interviews.

4.7.1 Shared viewpoints

Q-methodology considers statements that have shared viewpoints (consensus amongst the different factors). These consensus statements are useful as they indicate to the researcher that there are areas in the topic that participants agreed and disagreed on. They may agree/disagree positively, negatively or be neutral about the topic (80).
4.7.2 Distinguishing statements

Other than looking at the statements that have consensus, Q-methodology considers statements that distinguish one factor from another. Each factor’s distinguishing statements with significance of $p < 0.01$ were considered. The definition for distinguishing statement is one that contributed to a factor by its placement in a “most agreed” position for that factor, and its position/loading was significantly different to its placement in other factors (80).

4.7.3 Addition of qualitative comments from Q-sort activities

Factor interpretation was further enhanced through the addition of qualitative comments made by significantly loading participants during the Q-sort activity. Information gathered from Qsorts and post Q-sort interviews were transcribed (104). Transcribed interviews were grouped according to the participants that loaded onto each factors. Including the participant’s own words was a simple and effective way of strengthening the first-person nature. It was also a useful way of reinforcing the accuracy and efficacy of the researcher’s own interpretation of specific item ranking. Interviews increased validity of the Q-methodological study by providing the participant’s rationale for the analysis of the factor array (99, 103). It was important to note that the interpretation would have to express what was impressed into the array. The final product would not be perfect but every effort was made to produce a fair and faithful representation of the various factor’s viewpoint (104). Detailed results about the factor interpretation are now described in the following results chapter, Chapter 5.
5. Results

The previous chapter outlined the processes of factor extraction employed in this study. This chapter firstly details overviews the factors extracted, before moving on to discuss the consensus statements (5.1). Detailed factor interpretation and results, including the additional qualitative data gathered through participants’ comments from the Q-sort activity, are then presented for each of the three factors in turn (5.2, 5.3 and 5.4). The chapter concludes (5.5) with a short section on participant feedback of their experience of participating in the Q-sort activity. Overall, 35 participants, of which 12 were male and 23 female (Table 4), completed the Q-sort activity and the demographic questionnaire.

Table 4: Demographic data of the participants involved in Q-sort

<table>
<thead>
<tr>
<th></th>
<th>Number of participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>34%</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>66%</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 - 20 years</td>
<td>24</td>
<td>69%</td>
</tr>
<tr>
<td>21 – 25 years</td>
<td>5</td>
<td>14%</td>
</tr>
<tr>
<td>26 – 30 years</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>31 years and above</td>
<td>4</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Zealand European</td>
<td>29</td>
<td>83%</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Maori</td>
<td>3</td>
<td>9%</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Role in the college</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resident</td>
<td>29</td>
<td>83%</td>
</tr>
<tr>
<td>Foodservice staff</td>
<td>4</td>
<td>11%</td>
</tr>
<tr>
<td>Others (i.e. College warden)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Dietary Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>23</td>
<td>65%</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>5</td>
<td>15%</td>
</tr>
<tr>
<td>Others (i.e. Allergies, Gluten Free)</td>
<td>7</td>
<td>20%</td>
</tr>
</tbody>
</table>
Three factors emerged from the factor analysis, representing three dominant viewpoints. These factors explained 42% of the total variance (Figure 4) between all 35 sorts. This is considered a sound solution as recommendations state that factors should be captured with a combined variance of over 40% across factors (87). Statistical and theoretical guidelines were used to determine factor extraction (Table 3 of subsection 4.6.4). A Q-sort was considered significant in terms of loading upon a factor based on the statistical calculation. The level of significance was calculated as ± 0.40 (Table 3 of section 4.6.4). Out of the 35 participants’ Q sorts, there were 27 defining sorts. These participants loaded significantly on a factor. Eight participants’ Q sorts were excluded as four sorts that had confounding Q sorts. These sorts loaded significantly on two or more factors. The other four did not load on any factors. These sorts were excluded as it would not be an exact match for their personal viewpoint, however, their comments provided were an excellent way to tie up loose ends. (104)
Each factor was named based on a thematic summary of the distinguishing statements (Figure 5). A summary of the shared viewpoints was presented in Table 5 (section 5.1) followed by distinguishing statements in Table 6 (section 5.2), Table 7 (section 5.3) and Table 8 (section 5.4). The full list of statements sorted by consensus (Appendix 17), distinguishing statements for factor 1 (Appendix 18), factor 2 (Appendix 19) and factor 3 (Appendix 20) can be retrieved from the appendix.
Figure 5: Typifying the descriptions for the 3 factors

5.1 Shared viewpoints (consensus)

Shared viewpoints informed the researcher that there were common areas in which participants did and did not agree (section 4.7.1). Table 5 presents statements that had approximate consensus across two or all three factors. There were several statements that all three groups agreed or disagreed with. The items in the Q-sort on which the factors have agreed most have stimulated the greatest consensus. An example on how data in Table 5 was interpreted is: Statement 5 “The more choices I have, the more satisfied I am”, participants that loaded to both factors 2 and 3 marginally agreed with this statement.
However, participants that loaded to factor 1 had an opposite view to this statement. They marginally disagreed with this statement.

All 3 factors had neutral views with the statement that “Reducing choice contributes to environmental sustainability”. Both factors 2 and 3 strongly agreed with the statements “I don’t need everything that’s offered” and “Having a wide variety of choice builds expectations that there will always be a wide variety of choice”. These factors marginally agreed that “The more choices I have, the more satisfied I am”. However, these factors strongly disagreed with the statements “I feel overwhelmed when there’s more than one choice”, “There are too many choices on the menu” and “I prefer not to have a choice, I’d rather there was just one dish on the menu”. Both factors 1 and 2 disagreed that “Having a wide choice doesn’t make any difference to my enjoyment of a meal”. However, these factors strongly agreed with the statement “Because of the huge variety of choice available, I tend to take more than I need”. Both factors 1 and 3 strongly disagreed that “Making choices is hard, so I choose what my friends have”.
Table 5: Factor Q-sort values for statements sorted by shared viewpoints (consensus)

<table>
<thead>
<tr>
<th>Stat no.</th>
<th>Statement</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.</td>
<td>Reducing choices contributes to environmental sustainability</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>I don’t need everything that’s offered</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Having a wide variety of choice builds expectations that there will always be a wide variety of choice</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>I feel overwhelmed when there’s more than one choice</td>
<td>-3</td>
<td>-4</td>
<td>-4</td>
</tr>
<tr>
<td>19.</td>
<td>Having a wide choice doesn’t make any difference to my enjoyment of a meal</td>
<td>-2</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>29.</td>
<td>Making choices is hard, so I choose what my friends have</td>
<td>-5</td>
<td>-3</td>
<td>-5</td>
</tr>
<tr>
<td>7.</td>
<td>There are too many choices on the menu</td>
<td>-3</td>
<td>-4</td>
<td>-4</td>
</tr>
<tr>
<td>37.</td>
<td>I prefer not to have a choice, I’d rather there was just one dish on the menu</td>
<td>-3</td>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>5.</td>
<td>The more choices I have, the more satisfied I am</td>
<td>-2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>24.</td>
<td>Because of the huge variety of choice available, I tend to take more than I need</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: Shaded boxes are statements that had consensus across two or all three factors

5.2 Factor number 1: The “Believers” (believers in the benefits of choice reduction – environmentally, nutritionally and socially aware)

Factor 1 had an eigenvalue of 11.75 and explains 16% of the study variance. Ten participants (participants R02M2NZ, R03F2NZV, R04F2NZ, R05F1NZG, R06F1NZ, R07F1NZA, R08F1NZV, R09F1NZ, R10F1NZ, R12F1NZG) (Table 2 of section 4.6.2 for coding procedures) were significantly associated with this factor: nine females and one male. All the participants were residents of the colleges. Five of the female participants
were on special diets: two of which were vegetarian, two were gluten free diet and one had allergy to fish. The rest of the participants were on normal diets.

Table 6: Distinguishing statements for factor 1

<table>
<thead>
<tr>
<th>Statements</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>34. The choices I make depend on the healthiness of the meal</td>
<td>5</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>36. I would not mind having the vegetarian option once a week</td>
<td>4</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>39. I am willing to try different dishes based on vegetable protein</td>
<td>4</td>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>22. Reducing choice could reduce food waste</td>
<td>4</td>
<td>2</td>
<td>-2</td>
</tr>
<tr>
<td>23. Reducing choice reduces my food consumption</td>
<td>1</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>26. Reducing choice could create negative perceptions about the college</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>25. Reducing choice would make my meal decisions easier</td>
<td>1</td>
<td>0</td>
<td>-3</td>
</tr>
<tr>
<td>1. Too much choice makes it hard to decide what to have</td>
<td>0</td>
<td>-1</td>
<td>-4</td>
</tr>
<tr>
<td>27. Reducing choice would be disappointing</td>
<td>-1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I don’t have a choice when I am living at home so I really enjoy the wide choice here</td>
<td>-2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5. The more choices I have, the more satisfied I am</td>
<td>-2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7. There are too many choices on the menu</td>
<td>-3</td>
<td>-4</td>
<td>-4</td>
</tr>
<tr>
<td>37. I prefer not to have a choice, I’d rather there was just one dish on the menu</td>
<td>-3</td>
<td>-5</td>
<td>-5</td>
</tr>
</tbody>
</table>

Note: “-5” represents strongly disagree and “+5” strongly agree
Distinguishing statements had a significance level of p<0.01

For statement 34, participants who loaded on factor 1 strongly agree (+5) that they made choices that depended on the healthiness of the meal. The other two factors had a completely different view. Both factors 2 and 3 (-1 and -2 respectively) disagreed with this. Participants that loaded on factor 1 commented “I am concerned about my health; therefore, I make healthy food choices.”. Some participants knew the benefits of healthy eating. “Being healthy is important to me as I would be able to function better mentally. This
would contribute to my academic/sport performance.”. They commented that with the college foodservice environment that they are in, they are able to make a healthy choice. “I am able to make a healthy choice with the food choices provided to me.”. However, sometimes when offered an unhealthy choice, for example foods that are high in fat, they commented that they would choose not to have that. “If the meal choice presented looks quite fatty or greasy, I would not choose that.” Nonetheless participants commented that they feel supported to make healthy choices, as a healthy option is always available.

For statement 36, participants who loaded on factor 1 agreed (+4) that they would not mind having the vegetarian option once a week. The other two factors had different views. Factor 2 marginally disagreed (-1) while factor 3 marginally agreed with this statement. The male participant commented, “I would not mind having the vegetarian option once a week, as I understand how meat production can be harmful to the environment.”. This participant is enrolled in an environmental science programme at the University. The majority of the participants that loaded on this factor were females. The participants commented that they are willing to have the vegetarian option once a week based on the following reasons:

- “Meat can be really expensive”;
- “Having more vegetables could be more beneficial to your health”;
- “I don’t need to have red meat every single day”;
- “My family often have vegetarian meals once or twice a week”;
- “Meat portion given are usually huge and I end up throwing it away. The portion
• “I enjoy having vegetarian meals such as lentils, vegetarian quiches and lasagna”;
• “I don’t think people realise that you can make very delicious vegetarian dishes”.

There were also many females who were on normal diets who opted for the vegetarian rather than meat option. Foodservice staff accommodated this request if there was sufficient food for residents who were registered as vegetarians. Some of them commented that sometimes the portion sizes of the meat given could be too large. This is further supported when participants who loaded on factor 1 agreed (+4) that they were willing to try different dishes based on vegetable protein. Factor 3 had similar views (+2) as factor 1. However, factor 2 had a different view. Participants that loaded onto factor 2 disagreed (-2) with this statement.

For statement 22, participants who loaded on factor 1 agreed (+4) that reducing choice could reduce food waste. Factor 2 had similar views (+2) as factor 1. However, factor 3 disagreed (-2) with this statement. The participants that loaded onto factor 1 agreed with this statement as many of them quite often take more than what they need due to the appeal of different meal options and the large portions served. This resulted in having to throw away what they could not finish. “I know that I quite often take more than what I need and in reality I am not that hungry. I would not finish what I have taken.” Participants shared that they could see the benefits of choice reduction. “I think that if there is a reduction in the number of choices, people would think twice if they really need it or if they are hungry. They wouldn’t be able to overeat.”
For statement 23, participants who loaded on factor 1 marginally agreed (+1) that reducing choice reduces their food consumption. Both factors 2 and 3 had similar views (0 and -1 respectively). Participants that loaded onto factor 1 commented that “Because of the wide variety of choices available, I tend to desire to try a little of everything. Therefore, with less choice available, I would not have the opportunity to do that.”.

For statement 26, participants who loaded on factor 1 marginally agreed (+1) that reducing choice could create negative perceptions about the college. Factors 2 and 3 had slightly stronger opinions (+2 and +3 respectively) with the statement. Despite having participants that agree with this statement, some participants stated that this statement might not be true. “I believe that the foodservice staff will have the expertise to reducing choice but yet maintain the quality of the meals” and “I am sure that the foodservice staff are trained to be diverse with their cooking ability. I am confident with their skills.” This comment was further supported when participants marginally disagreed (-1) that reducing choice would be disappointing. Participants commented that reducing choice might not be disappointing as resources such as time and money can be put towards making better quality meals. Participants commented, “I don’t think reducing choice is a bad thing especially around the amount of carbohydrates options” and “We have so much choice available here. I didn’t expect to have so many choices when I first chose this college.”.

For statement 1, participants who loaded on factor 1 had neutral (0) views that too much choice makes it hard to decide what to have. However, they marginally agreed (+1) that
reducing choice would make their meal decisions easier. The other two factors had different views on this. Factor 2 had neutral views (0) while factor 3 disagreed (-3) with this statement. Factor 1 participants commented, “I treat meal times like a buffet. Therefore with lesser choice available I would not able the pile up my plates by taking more than what I actually need.”. Another participant also recognized the benefits of choice reduction as she commented, “I don’t need everything that is offered. I would say that I know rightfully that I don’t need it. But when there are a wide variety of choices sitting in front of me, I will maximise the choices and just take it anyway.”.

For statement 8, participants who loaded on factor 1 disagreed (-2) that they do not have a choice when they were living at home so they really enjoy the wide choice here. The other two factors had different views on this. Both factors 2 and 3 agreed (+4 and +2 respectively) otherwise. The majority of the female participants that loaded onto this factor disagreed with this statement. This is because when these participants lived at home, they helped out with meal preparation and therefore had the opportunity to choose what they would like to have. Participants who were on a special diet commented that sometimes it would be easy to prepare their own meals as they would be able to prepare something that they feel like having. The male participant view was similar to factors 2 and 3. The participant commented, “When I am at home I would not have as much choice and even if I had the choice I would not be bothered to prepare the meal.”.
For statement 5, participants who loaded on factor 1 disagreed (-2) that the more choices they have, the more satisfied they are. The other two factors had different views on this. Both factors 2 and 3 marginally agreed (+1 for both factors). Factor 1 participants commented that “The more choices I have, the more satisfied I am. Well, I would not be. I will only be satisfied with what I take and it has nothing to do with choice. It can be one choice and I will feel satisfied.”.

For statement 7, participants who loaded on factor 1 disagreed (-3) that there are too many choices on the menu. The other two factors had similar views on this. Both factors 2 and 3 disagreed (-4 for both factors) with the statement. Most participants who were on a special diet disagreed with this statement as they would only have one main meal item provided for them. However, they commented, “Sometimes it is easier having one choice as I would just have what I am given.”. They did not seem to mind as long as the food tasted good. Rather than complaining that they are only provided with one choice, they are grateful to the foodservice staff for preparing a special meal for them. However, during the interviews there were some participants that agreed that there are too many choices on the menu. This caused them to take more food than what they usually have. The male participant that loaded onto the factor 1 strongly commented, “Because of the huge variety of choice available, I tend to take more than what I need.”. Therefore they felt that they do not need everything that is offered.
For statement 37, participants who loaded on factor 1 disagreed (-3) that they prefer not to have a choice but rather have just one dish on the menu. The other two factors had similar views on this. Both factors 2 and 3 strongly disagreed (-5 for both factors) with the statement. This statement was not applicable to participants who were on a special diet as currently they were only provided with one main meal item.

5.3 Factor number 2: The “Resisters” (meat loving, hungry, choice reduction resisters)

Factor 2 had an eigenvalue of 2.76 and explains 15% of the study variance. Ten participants (participants FS04M3NZ, FS05F4NZ, R13M1NZ, R16F1NZ, R20F1AA, R25M1M, R26M1NZ, R27M3NZ, R28M1NZ, R29M1NZ) (Table 2 of section 4.6.2 for coding procedures) were significantly associated with this factor: three female and seven males. Two of the participants were foodservice staff while the other eight were residents. One participant was on a special diet.

Table 7: Distinguishing statements for factor 2

<table>
<thead>
<tr>
<th>Statement</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>41. I enjoy having the choice of toast and fruit throughout the day</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>12. I’m making the most of the wide variety in menu choice before going flatting</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>22. Reducing choice could reduce food waste</td>
<td>4</td>
<td>2</td>
<td>-2</td>
</tr>
<tr>
<td>38. I like a meal tray because I can take more food</td>
<td>-4</td>
<td>1</td>
<td>-2</td>
</tr>
<tr>
<td>25. Reducing choice could make my meal decision easier</td>
<td>1</td>
<td>0</td>
<td>-3</td>
</tr>
<tr>
<td>39. I’m willing to try different dishes based on vegetable protein</td>
<td>4</td>
<td>-4</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: “-5” represents strongly disagree and “+5” strongly agree. Distinguishing statements had a significance level of p<0.01.
For statement 41, participants that loaded onto factor 2 strongly agreed (+5) that they enjoy having the choice of toast and fruit throughout the day. The participants loaded on the other factors 1 and 3 had slightly similar views (+3 and +2 respectively). Factor 2 participants valued being able to access toast and fruit throughout the day. “I really do value this as I know that in other halls of residences, you are not allowed to bring any food out of the dining room and that’s horrible.”. A majority of the male participants enjoyed having this option, as they tended to feel hungry in between meals. Participants tended to have fruit as a healthier snack option. “I use fruit as something I can have to perk me up when I am feeling down” and “I like having fruit available all day so that I don’t have to snack on chocolate”. However, some participants enjoyed having this option but do not make use of this due to the following reasons:

• “I do enjoy this, but I don’t really use it a lot as my room is further away from the dining hall and therefore I can’t be bothered to walk to the dining hall”;
• “I don’t feel hungry in between meals”;
• “I don’t feel the need to snack in between meals”.

For statement 12, participants that loaded onto factor 2 agreed (+4) that they are making the most of the wide variety in menu choice before going flatting. The participants loaded on the other factors 1 and 3 had different views. Factor 1 had neutral views (0) while factor 3 had marginally agreed (+1). Factor 2 participants commented, “I am making the most of the food here as I am going flatting next year. I know that healthy foods will be expensive and as a result would be preparing meals which are less healthy, therefore I am making the
most right now.”. However, participants shared that because of this viewpoint, they are taking more than what they need and as a result have gained weight. “I do take more than what I need as I want to make the most out of the meals before going flatting. “I put on weight as I actually eat so much because of the availability of it. There is always toast, milk, fruit and coffee machine” and “Ever since I came to this college, I have definitely gained weight. It is because of the wide variety of choice available.”

When compared with factor 1 participants, factor 2 participants had similar views about the statement that reducing choice could reduce food waste. They also agreed with the benefits of choice reduction. They commented “The more choice available, the more I experiment and try out new foods. However, if it doesn’t taste good, I throw it away. There is a lot of food waste that goes down the rubbish” and “With a lot of choice I tend to take more than what I need and sometimes have to throw away what I can’t finish. With less choice I wouldn’t be able to take them.”.

For statement 38, participants that loaded onto factor 2 marginally agreed (+1) that they like a meal tray because they can take more food. Majority of the male participants agreed with this statement. They commented that a meal tray allows them to carry additional plates and bowls. “I usually fill up my plates till they are pretty full. The foodservice staffs do give us extra plates and bowls to put more food. This is where trays are helpful.”. However, there were some participants that had opposing views. Participants shared “I often end up with more food than I would want because I know that I can carry additional
bowls with the meal tray. Therefore I don’t particularly like it” and “I prefer not to have a meal tray so that I would not overeat.”.

For statement 25, participants that loaded onto factor 2 had neutral (0) views that reducing choice could make their meal decision easier. Participants that loaded onto factor 1 marginally agreed (+1) with this statement while participants that loaded onto factor 3 disagreed (-3) with this statement. Factor 2 participants commented “There is so much choice available and sometimes I feel overwhelmed with the number of choices” and “There is so much choice available and I have to try one of everything.”. Hence there might be an opportunity for choice reduction initiatives to make meal decisions easier. This view was supported by the comments from one of the foodservice staff. He commented “The guys normally take too much food at dinner time and that contributes to a lot of waste. They fill up their plates and want another plate for their salad. It is like having two meals. Therefore I do agree that at dinner, probably it could be reduced, as there are too many choices.”.

For statement 39, participants that loaded onto factor 2 disagreed (-4) when asked if they would be willing to try different dishes based on vegetable protein. Participants that loaded onto factors 1 and 3 had opposing views. Both factors agreed (+4 and +2) respectively with the statement. A factor 2 female participant of Asian ethnicity disagreed with statements as she commented, “I think that vegetarian meals would not be as filling.”. The comments made by the male foodservice staff were very similar to the other male participants. “I
would not be willing to try vegetarian meals and if vegetarian meals were served, I would not choose to come to this college.”. He also commented that “I need meat otherwise it does not feel like one is having a meal.”.

The other comments made by male participants were as follows:

- “I am not keen at all for vegetarian meals and I think most guys will agree. I feel happier when I have meat – it is more satisfying”;
- “I am a meat man. I come off a farm and I am used to my meat. It is a personal view”.

5.4 Factor number 3: The “Emotives” (choice reduction opponents)

Factor 3 had an eigenvalue of 1.90 and explains 11% of the study variance. Seven participants (participants FS02F3NZ, O02F4NZ, R11M1NZA, R15F1NZV, R17F1NZ, R23F1NZ, R24M1M) (Table 2 of section 4.6.2 for coding procedures) were significantly associated with this factor: five female and two males. Five of the participants were residents, one of which was a foodservice staff and the other was the college deputy warden. Two participants were on a special diet.
Table 8: Distinguishing statements for factor 3

<table>
<thead>
<tr>
<th>Statement</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Knowing I’ll be able to choose my meal gives me something to look forward to</td>
<td>-1</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>9. Choice gives me freedom to choose what I want</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>17. Being able to choose what I want at meals influences my subsequent mood</td>
<td>-1</td>
<td>-2</td>
<td>3</td>
</tr>
<tr>
<td>39. I’m willing to try different dishes based on vegetable protein</td>
<td>4</td>
<td>-4</td>
<td>2</td>
</tr>
<tr>
<td>36. I wouldn’t mind having the vegetarian option once a week</td>
<td>4</td>
<td>-4</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: “-5” represents strongly disagree and “+5” strongly agree

Distinguishing statements had a significance level of p<0.01

For statement 18, participants that loaded on factor 3 strongly agreed (+5) that when they know that they will be able to choose their meal, it gives them something to look forward to. Participants that loaded on both factor 1 and 2 had different views with factor 1 marginally disagreeing (-1) and factor 2 having neutral views (0). Majority of the female participants that loaded on factor 3 commented that they have a strong love for food therefore knowing that they will have the ability to choose their meal gives them something to look forward to. A participant commented, “Sometimes if you know that you are having a bad day, just knowing you have a nice meal, gives me something to look forward too.”. They related food as a means of self-reward. Participants also related meal times at the dining hall as an opportunity for social interaction. “I enjoy coming to the dining hall at meal times as it is an opportunity for me to catch up with my friends.”. These views were supported when participants that loaded on factor 3 agreed (+3) that being able to choose what they want at meals influenced their subsequent mood.
For statement 9, participants that loaded on factor 3 strongly agreed (+5) that choice gives them freedom to choose what they want. Participants that loaded on both factor 1 and 2 had similar views (+2 and +3 respectively). Factor 3 participants mentioned that choice allows them the freedom to choose what they want in various circumstances. “I love being able to choose. When there are two options (i.e. red or white meat) available, I find it quite exciting”, “When I don’t feel like having red meat at that time, I will be able to choose another option” or “Especially when I am sick, I am not going to have a big meal. I will be able to choose another option such as soup.”. However, participants recognised that “Having a wide variety of choice brings about a mindset and sets a high expectation that there is always going to be a wide variety of choice.”.

Statements 39 and 36 were not discussed as participants shared similar views with participants in factor 1 (section 5.2). Participants were generally open to the idea of having vegetarian option once a week and they are willing to try out various vegetarian proteins.

5.5 Feedback about Q-methodology

Given that it is a new methodology in the context of foodservice and dietetics, it was deemed important to assess participants’ experiences in completing the tasks demanded of them. A majority of the participants enjoyed Q-methodology. They did not find the Q-sorting process time consuming. Initially, they felt overwhelmed with the number of cards presented to them. However, upon reading the instruction provided (Appendix 13), they did not have difficulty understanding the procedure. Since the Q-sort process was
conducted in the presence of the researcher, the researcher became more familiar with the participants’ feelings about the topic. The participants commented the following:

- “I enjoy being able to sort out the cards. I can relate with many of the statements.”
- “It is an interesting exercise to look at the statements and categorise them.”
- “This method allowed me to sort the cards by my perception of what choices mean and provide for us.”

However, there were several participants who had other emotions evoked.

- “I feel frustrated after sorting as I have some strong views that I agree with but I can’t seem to sort them at just one side.”
- “I found it hard to sort out the statements as I am on a special diet and there were statements that were not relevant to me.”

In conclusion, this chapter has clearly listed the three factors that emerged from the factor analysis, representing three dominant viewpoints (Believers, Resisters and Emotives). The next chapter, Chapter 6, discusses the relationship between the study’s results and the extant literature.
6. Discussion and Conclusion

This chapter critically discusses results and states the research conclusions. The Triple Bottom Line framework (3Ps) introduced in the literature review (section 2.3) is used to critically discuss the results in Chapter 5.0. The conclusion section (section 6.5) includes the strengths (sub section 6.5.1) and limitations of the research and outlines areas for further research (sub section 6.5.2).

Choice reduction is not a new phenomenon and residential halls’ foodservices have already introduced a range of choice reduction initiatives (though they have not until now been referred to using this specific terminology). Colleges focus on the best interests of their residents by planning menus to meet their health and social needs. Food choices are based on food availability and cost, food safety and nutritional value (105). Examples of choice reduction initiatives that had already been made at the case study college prior to the start of this research project included reducing the number of days dessert is served each week and pre-portioning chicken into eight instead of four portions so residents can choose one or two pieces. Another example of an already established forced choice initiative was the introduction of smaller dinner plates. These changes have reportedly contributed to both financial savings for the college and have had nutritional benefits for the students. A somewhat unconventional, but equally valid, example of choice reduction in the college setting is that individuals who are on a special diet are already on a choice reduced menu as they only receive one main meal item.
6.1 Profits: choice reduction for economical benefits

The case study college foodservice has a good reputation so some participants were concerned that reducing choice could create negative perceptions about the college. Interestingly, participants in factor 1 (Believers) commented that this statement might not be true. Decreasing choice would not mean that the quality is decreased. Rather, quality might increase as chefs could focus less on quantity and more on quality. Money saved from producing fewer options could contribute to increased quality. Meals that are of higher quality could also contribute in a decrease in food waste.

Participants in factors 1 (Believers) and 2 (Resisters) could relate to the benefits of choice reduction as it could possibly reduce food waste. Reducing food waste is beneficial for not only the environment but it brings about financial savings. Again, factor 2 (Resisters) could potentially see this benefit. The current choice allows them to experiment and try out new foods. However, they agreed that they have the tendency to throw out more food. Botti (2006) mentioned that when consumers go through the decision process of choosing their preferences, they could be affected by contextual influences. In this study, for example, this could be being influenced by how much individuals around them take. Food waste data was not collected in this study as it fell outside the scope of the project. Residents in the case study college pay college fees at the beginning of the year so they do not know how much the food is costing. Therefore, they have the reason that they can take how much they want. If residents take huge quantities of food, this may encourage the kitchen to supply more food, which would cost the residents more (for example increased college
fees). With choice reduction, it may be possible to reduce the cost of the service.

Participants in factor 2 (Resisters) enjoy having a meal tray as it enables them to take more food. This could potentially contribute to an increase in food waste that results in wasted money. Worldwide, it has been estimated that over 1.3 billion tonnes of food, worth approximately US$1 trillion is contributed by food wasted in production and consumption system (29). Some participants within factor 2 (Resisters) commented that they preferred not to have a tray as it allows them to take more food than what they realistically need. Therefore, removal of meal trays could potentially contribute to a reduction in food waste.

6.2 People: choice reduction for social benefits

Nutritional benefits of reducing choice

Participants who loaded onto factor 2 (Resisters) experienced the consequences of having too much choice made available to them. Some of them gained weight, although this could be caused by other factors such as changes in eating and exercise behaviours (18) and psychological stress (106). According to Loewenstein (1991), individuals tend to be shortsighted when they face choices between immediate gratification (e.g. being greedy and experiencing possible weight gain) verses long-term gains (e.g. healthy lifestyle habits) (27).

A wide range of choices available could possibly lead to individuals loading up their plates (32) which could in turn lead to an increase in their food consumption. Home economics in the New Zealand education curriculum exposes individuals to evaluate current issues and
theories of nutrition (41). Although this is in New Zealand’s education system, the issues and nutrition lessons appear to be forgotten or overlooked when an individual is faced with wide choice and unlimited quantity. Individuals constantly succumb to the temptation of wide availability and accessibility to food. Results from this study showed that with the wide availability of choice, individuals treat meal times like a buffet. They tend to pile up their plates by taking more than what they actually need. These results reflect Levitsky and colleagues’ research that states when larger amounts were served, there was significantly greater amount of food consumed (107). Participants who loaded onto factor 1 marginally agreed that reducing choice reduces their food consumption.

Choice reduction could help to rectify New Zealand’s problem of oversized portions. Results from the study did show that with increased choice individuals tend to over-consume and the foodservice would be partly responsible. These individuals know that they do not need to have everything that is offered. However, due to the wide variety of choice, they want to maximise the choices. They enjoyed having a large variety as most of them pointed out that they would be flattening in the following year. Increase in choice and buffet service could be a contributing factor to obesity in New Zealand (15). Environments of wide choice and buffet service could potentially be difficult for individuals who lack the self-control to make reasonable choices and take sensible portions. Choice reduction would create an environment where there are fewer options to choose from. Individuals would not be exposed to a wide food choice hence may not take more than they need.
**Psychological benefits of reducing choice**

According to Iyengar and Lepper (2000), as choice increases, consumers are overloaded with the options and this could ultimately decrease the motivation to choose and the satisfaction with the chosen option (9). However, some participants from this study strongly agreed that they do not need everything that is offered and that more choice does not mean that they are more satisfied. Participants who loaded onto factor 1 (Believers) marginally agreed that reducing choice would make their meal decision easier. Participants in factor 2 (Resisters), however, had neutral views on this statement. It was interesting that the Resisters could see benefits of this, as sometimes they too feel overwhelmed.

**6.3 Planet: choice reduction for environmental sustainability benefits**

Based on the results, all the factors shared a neutral view that reducing choice could contribute to environmental sustainability. Participants felt that they did not have enough knowledge about how choice reduction may contribute to benefiting the environment. This supports Bissonnette’s finding that adolescents did not have strong or consistent beliefs or attitudes about the environmental impact of food production practices (52).

Secondly, participants who loaded onto factors 1 (Believers) and 3 (Emotives) would not mind having the vegetarian option once a week and they were willing to try different dishes based on vegetable protein. Reduction in meat once a week would contribute to the environmental by reducing individuals’ carbon footprints (108). However, participants who loaded onto factor 2 (Resisters) had strongly views on why they need their meat. Further, choice reduction could potentially contribute to increased plate waste as if residents do not
enjoy the choices selected for them, they could potentially throw the food away. And although plate waste may increase, the overall food waste generated from a reduced choice menu is likely to decrease. Further research such as a comparison of waste analysis between current and reduced choice menus could be conducted.

6.4 Potential barriers towards choice reduction

One benefit of having choice highlighted by Deci and Ryan (2000) was that choice is associated with greater satisfaction (22). A barrier to choice reduction was identified when participants who loaded onto factor 3 (Emotives), strongly agreed that choice gives them freedom to choose what they want. According to Mooymnan and Visser (2007), individuals feel better when they have choices, as they would be able to positivity evaluate the decision outcome of their choices (20).

Another benefit that increased choice offers was that individuals that have highly differentiated needs; choices available would allow them to satisfy their own particular wants (26). The amount of choice contributes to an individual’s thinking that one of the options would meet their preference (50). Interestingly, participants who loaded onto all 3 factors disagreed with statements “There are too many choices on the menu” and “I prefer not to have a choice, I’d rather there was just one dish on the menu”. These disagreements from the participants showed the barriers to choice reduction. Participants in this study included those who are on a special diet; therefore some strongly disagreed with this statement, as they would only have one main meal item provided for them. Choice reduction in this situation may not be relevant as choice is not offered to these individuals.
6.5 Conclusion

The previous sections have reviewed the benefits of choice reduction using the Triple Bottom Line framework (3Ps: Profits, People and Planet) and identified the barriers towards choice reduction. This is important to strategically position possible interventions.

6.5.1 Strengths of this research

Choice reduction is a hugely controversial topic as individuals enjoy having the freedom of choice. There is no literature around menu choice reduction among college foodservice making this exploratory study groundbreaking in this sense. This research acts as a stepping-stone towards long-term benefits to improve profits (economical), people (nutritional / psychological) and the planet (environmental).

Using Q-methodology as a research tool allowed the researcher to investigate the dominant attitudes and perceptions around menu choice reduction and the possible circumstances under which less food choice would be acceptable. Most of the participants enjoyed Q-methodology and did not have difficulty understanding the procedure. Introduction of Q-methodology to foodservice research is a novel methodological contribution.

6.5.2 Limitations of this research and possibilities of future research

This study questioned “What does choice mean to you at the college’s meal times?” However, stakeholders were asked these questions outside of their mealtimes. Results might differ if the researcher asked participants at the point of decision-making. Participants may offer a different option if they were interviewed before or after a meal. If
participants were interviewed after a meal, they could experience fullness, disappointment with their choice or guilt for leaving food on their plate. Therefore, the timing of the interviews might have influenced the results. Acherman and colleagues (2014) supported this as they found that students preferred to have more choice before having to make a decision. However, when they were asked to make a choice, they responded more positively to having fewer choices (28). Further research could be conducted at the beginning of the year to investigate individuals’ attitudes surrounding choice reduction during meal times.

It is also important to note that the three factors found in this study (Believers, Resisters and Emotives) cannot be generalised to the wider population with any statistical certainly because the focus of the research is in the content of the factor (the range of views about choice reduction) and not the characteristics of the participants. For data to the generalisable, further research such as conducting a representative survey could be carried out at the beginning of the year (89).

In conclusion, the introduction of choice reduction initiatives could potentially contribute to improving residential college foodservices’ Triple Bottom Line performance (3Ps – Profits: economical, People: nutritional/psychological and Planet: environmental sustainability). This research has provided a foundation to lead further research on choice reduction within the wider foodservice sector.
7. Application to Foodservice

Choice reduction initiatives require comprehensive communications that educate and inform college stakeholders (i.e. warden, foodservice manager and residents). Initiatives could be made known to the residents through the yearly college handbook and Facebook, which are given to all residents before arriving at the college. The warden could also include in the welcome talk that the foodservice would provide residents with meals that adhere to the New Zealand’s Ministry of Health Nutrition Guidelines for Healthy Young People. It would be realistic to roll out new initiatives at the start of the year before residents experience anything else, especially when coming from home where they may not have expectations of a wide availability of foods on the menu. It is crucial to anticipate that, based on the results of this study, there is likely going to be some individuals (i.e. the Resisters) who may not be pleased with the reduced choice.

In 2015, the college could consider the following choice reduction initiatives: smaller trays, no trays, education on portion size in relation to health and “Meatless Monday”. An initiative that could bring forth economic (Profits) and health (People) benefits would be to have smaller trays so that residents are able to take less food or for the foodservice to go trayless. Residents who participate in trayless dining would receive some form of recognition. In the United States some colleges and universities are going trayless because of the economic, social and environmental social benefits attached to this initiative. This initiative supports the Triple Bottom Line framework (109).
More/better education on appropriate serving sizes would be an added nutritional benefit (People) of choice reduction. Findings by Kolodinsky and colleagues (2007) stated that an increased knowledge of dietary education among college students appears to be positively related to more healthful eating patterns (33). The New Zealand’s Ministry of Health has produced Nutrition Guideline pamphlets titled “Healthy Eating for Young People” (110). These could be made available in the dining hall. These pamphlets describe meal pattern and healthy portion sizes.

The introduction of “Meatless Monday” could contribute to the environmental benefits (Planet) for choice reduction. Various stakeholders of the colleges (i.e. warden and foodservice manager) could first find out about the environmental and nutritional benefits of this initiative. Factors 1 (Believers) and 3 (Emotives) could champion this initiative by working with the Residential Assistants or Environmental Science students to create awareness by framing the wordings used on Meatless advertisements more as a celebration of food variety than as a limitation on meat. Peer-to-peer education with students in the dining hall have been the most successful method described by the Sustainability Manager of University of California, to spark debate and long-term change (57). This initiative should be introduced on a Monday as researchers from the Johns Hopkins Center demonstrated the effectiveness of leveraging Monday as a day to begin healthy behaviours (58). This initiative not only encourages residents to participate in a “green” initiative that has both a personal and community impact but also supports education and awareness of environment issues.
Choice reduction could be a strategy that college foodservice could adopt to improve the Triple Bottom Line (3Ps: Profits, People and Planet) performance of any college foodservice operation. It has been demonstrated that business decisions made by foodservice managers across the US have a significant impact on both the environment and the economy (111). Training foodservice staff to be more conservative and sustainably conscious could be a real asset. This is because staff members are the ones “who make things happen in an foodservice operation”. It is essential to include them in every facet of the planning and implementation of a sustainability program. The most important element in this type of training is to explain outcomes, as this is essential in motivating staff members (111).

Choice reduction could also serve as a public health initiative that improves the health of the community. Foodservice operations should take the lead role in reversing the obesity epidemic by offering less choice. This could reduce individual’s total food consumption. Registered dietitians need to ensure the key participants are engaged in the sustainability plan. This includes the warden, foodservice manager, chefs and the kitchen team. It is crucial to engage the employees who would be the implementers of the plan.

The research results showed that there is reluctance amongst stakeholders to reduce choice. There are attitudinal barriers to adopting choice reduction initiatives that need to be overcome to avoid dissatisfaction with the foodservice. However, due to the many potential benefits that choice reduction brings, it makes sense for college foodservice staff
to not be deterred in their choice reduction initiatives because of these attitudinal barriers. As choice reduction is a controversial topic, it is important to think strategically on how choice reduction initiatives can be framed to ensure their successful adoption in the future. The results of this study have proved guidance here. Given that many of the attitudinal barriers appeared to be from a lack of understanding of the potential benefits of reducing choice, an educational campaign that firstly informed foodservice staff and then the residents about the need for, and benefits of a choice reduction programme would be a beneficial place for the college to start.
8. References


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9. Appendices
Appendix 1: University of Otago ethics approval

Dr M Mirosa  
Department of Human Nutrition  
Division of Sciences

6 December 2013

Dear Dr Mirosa,

I am writing to let you know that, at its recent meeting, the Ethics Committee received a copy of the Reporting Sheet relating to your Category B ethics proposal entitled "The possibilities of reducing food choice to improve the quality of university residential college food services (working title)".

For your future reference, the Ethics Committee’s reference code for this project is: - D13/392.

The Committee appreciates that Category B proposals may commence as soon as approval has been obtained at departmental level and that, in some instances, the research or teaching may be well advanced or even completed by the time the Reporting Sheet is received by the Committee.

Nonetheless, in the case of this particular proposal (D13/392), the Ethics Committee has recorded a status for it of Approved HOD at this stage, and has asked me to pass on it’s views to you as follows:-

The Committee noted that you have included the Human Ethics Committee contact clause twice in the Information Sheets. The preferred location of this clause is at the bottom of the Information Sheet under the researcher contact information. Please remove the repeat clause from the body of the Information Sheet, as it is not necessary to repeat this.

Yours sincerely,

Mr Gary Witte  
Manager, Academic Committees  
Tel: 479 8256  
Email: gary.witte@otago.ac.nz

cc. Emeritus Professor L J Holloway  
Head  
Department of Human Nutrition
Appendix 2: Semi-structured interview – information sheet for participants

“The possibilities of reducing food choice to improve the economical (profits), nutritional/psychological (people) and environmental (planet) performance of university residential college foodservices “

INFORMATION SHEET FOR INTERVIEW PARTICIPANTS

Thank you for your interest in this project. I am Joanne Loh, a Master of Dietetics student in the Department of Human Nutrition. My research interest is in foodservice.

Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate, I thank you. If you decide not to take part there will be no disadvantage to you and we thank you for considering our request.

What is the Aim of the Project?
The aim of this research is to explore the possibility reducing choice on menus and stakeholder attitudes to choice reduction, in order to identify circumstances under which less choice is acceptable. This project is being undertaken by as part of the requirements for my Master in Dietetics.

What Type of Participants are being sought?
Staff and residents of Carrington College, Dunedin, New Zealand

What will Participants be asked to do?
Should you agree to take part in this project, you will participate in an interview with the researcher in a meeting room that I will conduct my interview. This will take approximately 30-45 minutes of your time. Please be aware that you may decide not to take part in the project without any disadvantage to yourself of any kind.
What Data or Information will be Collected and What Use will be made of it?
You will be asked to discuss your perceptions, attitudes and practices around choice reduction on Carrington’s menu. The interview sessions will be audio recorded to allow me to remember and accurately transcribe what was said during the session. Neither the audio recordings, nor the transcripts, will be shared with anyone outside the current research project.

Nothing that you say during the course of the session will be disclosed to any person outside of the group session. After the interview, the audio file will be transcribed and your real name will be removed from the data and replaced with a pseudonym so that outsiders reading the final report cannot identify you.

Any personal information that you provide will only be used only to assist in explaining the study results. Personal information will be published only as aggregate values. Responses will be collected and transferred onto a USB memory-stick that will be stored in a lockable filing cabinet in an office in the University of Otago Dunedin Centre. The data will only be accessible to Joanne Loh (researcher), Dr. Miranda Mirosa and Dr. Heather Spence (academic supervisors), as required by the University's research policy. Any raw data on which the results of the project depend will be retained in secure storage for five years, after which time they will be destroyed.

The results of the project may be published in which case they will be available in the University of Otago Library (Dunedin, New Zealand). You are most welcome to request a summary of the study results.

Can Participants Change their Mind and Withdraw from the Project?
You may withdraw from participation in the project at any time and without any disadvantage to yourself.

What if Participants have any Questions?
If you have any questions about our project, either now or in the future, please feel free to contact either:

Joanne Loh and/or Dr. Miranda Mirosa
Department of Human Nutrition Department of Food Science
Email: lohjo451@student.otago.ac.nz Email: miranda.mirosa@otago.ac.nz

This study has been approved by the Department stated above. If you have any concerns about the ethical conduct of the research you may contact the Committee through the Human Ethics Committee Administrator (ph 03 479-8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.
Appendix 3: Semi-structured interview – interview information for participants

“The possibilities of reducing food choice to improve the economical (profits), nutritional/psychological (people) and environmental (planet) performance of university residential college foodservices “

INTERVIEW INFORMATION FORM FOR PARTICIPANTS

Dear Interview Participant,

Once again, I would like to thank you for participating in an interview to discuss your perceptions, attitudes and practices, in regards to menu choice reduction in Carrington Foodservices. Details of your interview session are outlined below. The interview will take approximately 30-45 minutes.

   Session Date:
   Session Time:
   Session Location:

Following completion of the interview, you will be compensated with a coffee and chocolate voucher for reimbursement towards costs involved in travelling to the research project.

If you have any questions about our project, either now or in the future, please feel free to contact either:

   Joanne Loh and/or Dr. Miranda Mirosa
   Department of Human Nutrition Department of Food Science
   Email: lohjo451@student.otago.ac.nz Email: miranda.mirosa@otago.ac.nz

I look forward to meeting with you,

Joanne Loh
Student Dietitian
Appendix 4: Semi-structured interview – consent form for participants

“The possibilities of reducing food choice to improve the economical (profits), nutritional/psychological (people) and environmental (planet) performance of university residential college foodservices“

CONSENT FORM FOR PARTICIPANTS

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any step.

I know that:

1. My participation in the project is entirely voluntary;

2. I am free to withdraw from the project at any time without any disadvantage;

3. The data will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for at least five years;

4. This project involves an open-questioning technique. The precise nature of the questions, which will be asked have not been determined in advance, but will depend on the way in which the interview develops and that in the event that the line of questioning develops in such a way that I feel hesitant or uncomfortable I may decline to answer any particular question(s) and/or may withdraw from the project without any disadvantage of any kind.

5. Only once I have completed the session will I be compensated with a coffee and chocolate voucher.

6. The results of the project may be published and available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity.

I agree to take part in this project.

..................................................................................................................  ..............................................
(Signature /name of participant)  (Date)
Appendix 5: Semi-structured interview protocol and interview guide

Semi-structured Interview Protocol

1. Set up recorder.
2. Ask participants to read the information sheet and if they agree to participate in the study, to then sign the consent form.
3. Turn on the recorder.
4. Ask the opening question.
5. Follow the Semi-structure Interview Guide for College and Staff Residents.
6. Ask the closing question.
7. Hand out reimbursement voucher and ask participant to sign that they received this.
8. Ask if they are willing to take part in Step 2 of the research.
9. Recommend anyone who may be interested in this research.
Semi-structured Interview Guide for College Staff

Aim of the interview: To explore the possibility reducing choice on menus and stakeholder attitudes to choice reduction, in order to identify circumstances under which less choice is acceptable.

Duration of the interview: Up to 30-45 minutes

Opening Question:
• What’s important to you in providing a quality foodservice?
*Asking for the personal opinion from the chef / foodservice stuff (their views, not what they think the students views are)*
*After asking each question – to pause and give respondent time to answer.*
• Why is that important to you?
*Restate what the respondent just said (this should take no more than a sentence).*
*If participants don’t mention choice, prompt them about choice.*

Choice Questions
• What does choice and choice reduction mean to you / foodservice?
• Is the current choice appropriate? Do you think that residents are happy with it? Is there enough choice?
• When do you think choice is demotivating?
• Do you think that there is scope in the foodservice to reduce choice? Why/ why not?
• What would potential choice reduction possibilities be?
• How effective do you think these would be in improving the quality of the foodservice?
• How acceptable to the residents do you think these would be?
• How would you feel about having a regular vegetarian day?
• How would you feel about reducing carbohydrate or meat options but improving food quality?

Closing Question:
• I am about to close the interview. Is there anything else you would like to add before I do so?
Semi-structured Interview Guide for Residents

Aim of the interview: To explore the possibility reducing choice on menus and stakeholders’ attitudes to choice reduction, in order to identify circumstances under which less choice is acceptable.

Duration of the interview: Up to 30-45 minutes

Opening questions:
- What’s important to you in the foodservice? (5 minutes)
- List 5 most important areas about the foodservice
- Why are these things important to you?

After asking each question – to pause and give respondent time to answer
Listen to all of their responses and go back to choice if they mention it
Restate what the respondent just said (this should take no more than a sentence).
If participants don’t mention choice, prompt them about choice.

Choice questions:
- Is choice/variety in food important to you? Why/why not?
- Is the current choice appropriate? Are you happy with it? Is there enough choice? Too much choice?
- When do you think choice is demotivating?
- Could the choice be reduced without compromising the quality of the foodservice? Any ideas on how this could be done/why this might be done?
- Do you see any benefits or advantages?
- Do you think that there is scope in the foodservice to reduce choice? Why/why not?
- What would potential choice reduction possibilities be?
- How effective do you think these would be in improving the quality of the foodservice?
- How acceptable do you think these would be?
- How would you feel about having a regular vegetarian day?
- How would you feel about reducing carbohydrate or meat options but improving food quality?

Closing Question:
- I am about to close the interview. Is there anything else you would like to add before I do so?
## Appendix 6: Vouchers received sheet

<table>
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<th>Date</th>
<th>Participants name / signature</th>
<th>Amount</th>
<th>Description</th>
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<td></td>
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<td>$5.00</td>
<td>“I have received a voucher to the value of $5 being reimbursement of costs involved in traveling to this research project. The University and the volunteer do not intend the participation in this research project to form an employment relationship”.</td>
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Appendix 7: Preliminary Q-set (74 statements)

Research title:
The possibilities of reducing food choice to improve the economical (profits), nutritional/psychological (people) and environmental (planet) performance of university residential college foodservices

Research question for Q set
What does choice mean to you at meal times at the college?

Final outcome
What are the different perceptions about choice in a university residential college setting?

General choice
1. Choice stops me from getting bored
2. I feel overwhelmed when there’s more than one choice
3. I don’t care about whether there’s much choice
4. I need a lot of choice
5. Choice gives me freedom to choose what I want
6. I sometimes regret the meal choice I made
7. There are too few choices on the menu
8. There are too many choices on the menu
9. I prefer choice over no choice
10. I considered the quality of the meals before choosing this college
11. I choose seconds every day as I’ve paid college fees and want my money’s worth
12. I choose seconds so I don’t get hungry
13. Each choice reinforces my perception of control
14. I prefer to make my own choices rather than having someone else make them for me
15. I’m “making the most” of the wide variety in menu choices before going flatting
16. I’m not used to having choices
17. I’m used to having choices when I live at home
18. I don’t have a choice when I am living at home/flat so I really enjoy the wide choice here
19. I’m never satisfied with the choices given
20. I’m satisfied with the choices given
21. I’d be happier in another college as I’ve heard that they have a wide selection to choose from at meal times
22. I feel helpless if I’m not given a choice
23. Offering a wide selection is important
24. Choice is rewarding
25. Choice is desirable
26. I choose what everyone else is eating
Choice and emotion
27. My choices are based on how I’m feeling at the time
28. Being able to choose what I want at meals influences my subsequent mood
29. Knowing I’ll able to choose my meal gives me something to look forward to
30. At the start of the year I thought there were too many choices but now I’m bored with them
31. Having a wide choice doesn’t make any difference to my enjoyment of a meal

Choice and culture
32. My choices are based on my culture
33. Choices I make are based on my assumptions / background / cultural beliefs

Too much choice
34. Too many choices takes me a long time to decide what to have
35. Too much choice makes it hard to decide what to have
36. Too much choice leads me to make simple, snap judgements just to avoid the hassle of wading through other options
37. There are too many choices
38. The more choices I have, the more satisfied I am
39. There is too much choice to make an easy decision
40. Having a wide choice builds expectations that there will always be a wide choice

Choice and others
41. Making choices is hard, so I choose what my friends have
42. The best way to choose is best is to ask staff what they’d recommend
43. The best way to choose is best is to ask friends what they’d recommend
44. I don’t need everything that’s offered
45. My friends influence me to have seconds

Increase in choice
46. More choice may contribute to an increase in food waste
47. More choices would satisfy my own particular wants
48. More choice results in quality improvement
49. More choice results in cost increases
50. More choice means more time’s required to decide what to have
51. More choice means I have to make difficult decisions
52. I expect to have many choices all the time
53. I have more choice than what I need
54. I believe more choice would increase satisfaction

Choice reduction
55. Reducing choice could reduce food waste
56. Reducing choice reduces my food consumption
57. Eliminating choice would make my meal decisions easier
58. Reducing choice would be disappointing
59. Reducing choice could create negative perceptions about the foodservice
60. Reducing choices contributes to environmental sustainability

Choice and Health
61. I feel confident in making the healthier choice with the food provided.
62. I feel the need for the foodservice to offer low energy choices.
63. I tend to eat more at the college than I would at home.
64. I believe that the wide variety of choice available contribute to weight gain.
65. Because of the huge variety of choice available, I tend to take more than what I need.
66. The choices I make depend on the healthiness of the meal

Possible interventions
67. I expect to have a huge selection of salad ingredients even if it is not seasonal.
68. I wouldn’t mind having the vegetarian option once a week
69. I prefer not to have a choice, I’d rather there was just one dish on the menu
70. I choose whatever I like at meal times
71. I like a meal tray because I can take more food
72. I’ll try new dishes when my friends recommend them
73. I’m willing to try different dishes based on vegetable protein instead of meat
74. I enjoy having the choice of toast and fruit throughout the day
## Appendix 8: Final Q-set (42 statements)

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<tr>
<td>Too much choice makes it hard to decide what to have</td>
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<td>The more choices I have, the more satisfied I am</td>
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<td>I prefer not to have a choice, I’d rather there was just one dish on the menu</td>
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Appendix 9: Poster advertisement for Q-sort activity

“THe possibilities of reducing food choice to improve the economical (profits), nutritional/psychological (people) and environmental (planet) performance of university residential college foodservices

Ethics Committee’s reference code: D13/392

I am Joanne Loh, a Master of Dietetics student at the University of Otago. For my study, I am interested in finding out what Carrington College residents think about reducing the choice in food options provided at mealtimes.

To do this, I will be conducting:
- An attitudinal card sorting activity called a Q-sort lasting 30 minutes.
- These will be conducted in the Heriot tutorial room, starting from 28th July 2014.

You will be given a coffee and chocolate voucher for your time.

If you are interested in partaking in this activity and wish to hear more about the study, please email; lohjo451@student.otago.ac.nz

If you have questions or concerns about this project, please feel free to contact either:
- Joanne Loh, Department of Human Nutrition, lohjo451@student.otago.ac.nz
- Dr. Miranda Mirosa, Department of Food Science, miranda.mirosa@otago.ac.nz, Phone: 03 479 7953

This proposal has been reviewed and approved by the Departments of Food Science and Human Nutrition, University of Otago.
Appendix 10: Q-sort activity – information sheet for participants

“The possibilities of reducing food choice to improve the economical (profits), nutritional/psychological (people) and environmental (planet) performance of university residential college foodservices“

INFORMATION SHEET FOR INTERVIEW PARTICIPANTS

Thank you for showing an interest in this project. I am Joanne Loh, a Master of Dietetics student in the Department of Human Nutrition. My research interest is in foodservice.

Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate, I thank you. If you decide not to take part there will be no disadvantage to you and we thank you for considering our request.

What is the Aim of the Project?
The aim of this research is to explore the possibility reducing choice on menus and stakeholder attitudes to choice reduction, in order to identify circumstances under which less choice is acceptable. This project is being undertaken by as part of the requirements for my Master in Dietetics.

What Type of Participants is being sought?
Staff and residents of Carrington College, Dunedin, New Zealand

What will Participants be asked to do?
Should you agree to take part in this project, you will participate in a Q-sort activity with the researcher. This will take approximately 30 minutes of your time. Please be aware that you may decide not to take part in the project without any disadvantage to yourself of any kind. In the activity you will be given a set of 42 cards with each card containing a statement about choice and choice reduction. You will then be asked to rank the statements according to your attitudes about choice reduction according to the pattern shown below.
What Data or Information will be Collected and What Use will be made of it?

After you have sorted the cards according to the pattern above, you will be asked to explain why you sorted the cards as you did. The interview sessions will be audio recorded and the Q Sorts will be photographed to allow the researcher to remember and accurately transcribe what was said during the session. Neither the audio recordings, nor the photographs, will be shared with anyone outside the current research project.

Nothing that you say during the course of the session will be disclosed to any person outside of the group session. After the interview, the audio file will be transcribed and your real name will be removed from the data and replaced with a pseudonym so that outsiders reading the final report cannot identify your real name.

Any personal information that you provide will only be used to assist in explaining the study results. Personal information will be published only as aggregate values. Responses will be collected and transferred onto a USB memory-stick that will be stored in a lockable filing cabinet in an office in the University of Otago Dunedin Centre. The data will only be accessible to Joanne Loh (researcher), Dr Miranda Mirosa and Dr. Heather Spence (academic supervisors), as required by the University's research policy. Any raw data on which the results of the project depend will be retained in secure storage for five years, after which time they will be destroyed.

The results of the project may be published in which case they will be available in the University of Otago Library (Dunedin, New Zealand). Every attempt will be made to preserve your anonymity. You are most welcome to request a summary of the study results.
Can Participants Change their Mind and Withdraw from the Project?
You may withdraw from participation in the project at any time and without any disadvantage to yourself of any kind.

What if Participants have any Questions? If you have any questions about our project, either now or in the future, please feel free to contact either:

Joanne Loh and/or Dr. Miranda Mirosa
Department of Human Nutrition Department of Food Science
Email: lohjo451@student.otago.ac.nz Email: miranda.mirosa@otago.ac.nz

Telephone: 03- 479 7953

This study has been approved by the Department stated above. If you have any concerns about the ethical conduct of the research you may contact the Committee through the Human Ethics Committee Administrator (ph 03 479-8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.
Appendix 11: Q-sort activity protocol

1. Set up recorder.
2. Ask participants to read the information sheet and if they agree to participate in the study, to then sign the consent form.
3. Explain what is Q-methodology
   a. It is a method that provides a foundation for the study of an individual’s viewpoint, option, beliefs and attitudes.
4. Hand out “Participant Instruction Sheet” and “Q set”
5. Turn on the recorder.
6. Ask “Post Q sort interview guide”
7. Take a photo of grid with sorted cards
8. Ask participant to do the survey on “Possible interventions” and to fill up “Participants demographics” via monkey survey
   a. Appreciate that you don’t discuss these interventions to avoid influencing others on their opinion.
   b. These interventions are just suggestions and ideas on what might work.
9. Hand out reimbursement voucher and ask participant to sign that they received this.
Appendix 12: Q-sort activity – consent form for participants

“The possibilities of reducing food choice to improve the economical (profits), nutritional/psychological (people) and environmental (planet) performance of university residential college foodservices “

CONSENT FORM FOR PARTICIPANTS

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any step.

I know that:
1. My participation in the project is entirely voluntary;

2. I am free to withdraw from the project at any time without any disadvantage;

3. The data will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for at least five years;

4. This project involves Q-sorts and open-questioning technique. The general line of questioning includes ‘Why did you sort the cards in the manner you did?’” The precise nature of the questions which will be asked have not been determined in advance, but will depend on the way in which the interview develops and that in the event that the line of questioning develops in such a way that I feel hesitant or uncomfortable I may decline to answer any particular question(s) and/or may withdraw from the project without any disadvantage of any kind.

5. Only once I have completed the session will I be compensated with a coffee and chocolate voucher.

6. The results of the project may be published and available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity.

I agree to take part in this project.

.................................................................................................................................
.................................................................................................................................
(Signature of participant) ................................................................................................................................. (Date)
Appendix 13: Q-sort activity – instruction sheet for participants

Research Question:
What does choice mean to you at the college’s meal times?

Instructions

1. Read the research question above. The 42 item cards all offer a different answer to the research question. The Q-sorting task requires you to rank each of these items using the sorting distribution below. The more you agree with an item, the higher the ranking you are likely to award it. The more you disagree, the lower the ranking.

2. Please note, that the final pattern of item rankings you produce must be the same as the shape of the sorting distribution provided. E.g. looking at the blank sorting distribution, you will see that only TWO items can be given a ranking of +5, THREE can be given a ranking of +4 and so on.

3. This system is being used because it is an effective means of capturing your viewpoint for purposes of our study.

4. To begin, take the pile of 42 cards. You now need to read each card, one at a time, and divide them into 3 ranking categories.
   a. Category 1: responses to the research question with which you AGREE. Put these items in a single pile towards your right hand side
   b. Category 2: responses with which you DISAGREE. Put these on your left.
   c. Category 3: should include items which you feel INDIFFERENT, UNSURE or which otherwise leave you with MIXED FEELINGS.

5. Take the pile of items you AGREE with and spread them out so that you can see them all at once. Your job is now to allocate each of these items a ranking position at the right-hand (or agree) end of the distribution provided. The highest rankings should be given to the items with which you agree most strongly. Keep going until ALL the AGREE items have been allocated. Don’t be concerned if for example positive statements end up in the neutral or negative column. We are looking at the statements in relation to one another.

6. To continue sorting, you now need to follow the same procedure, but this time focusing on the pile of items you DISAGREE with.

7. To complete the Q sort, use the same procedure to sort the pile about which you feel INDIFFERENT/UNSURE.

8. Congratulations! You have finished sorting. At this stage, have one final look at the whole thing and feel free to make any final adjustments you want to make.

9. I will now ask you to explain why you sorted the cards as you did. And I’ll photograph it.
Appendix 14: Example of completed Q-sort
Appendix 15: Post Q-sort interview guide for college staff/residents

1. Explore the meaning of the items placed at the extremes of the distributions.
   About the statements/items ranked by sorter at the extremes: “What do these mean to you?” / Tell me more about why you placed items here
   What do they mean to the participants? Why do they feel so strongly about them?
   E.g. why did you decide to sort these items at +5? Because I think they are more important than the other items.

2. Focus shifts to other items in the distribution that participants or I want to talk about.
   Again, get them to talk about personal meaning and significance of an item

3. Are there any items towards the middle of the distribution that play some sort of pivotal role for them? Does the statements evoke a strong response?
   Look for item placements that are unusual or that do not immediately make sense

4. Ask if there were any they did not understand or if they felt any obvious issues had been omitted from the Q set
Appendix 16: Short demographic survey

Participant: ______

Gender:
  o Male
  o Female

Age:
  o 15-20 years
  o 21-25 years
  o 26-30 years
  o 31 years and older

Ethnicity:
  o NZ European
  o Maori
  o Pacific Island
  o Others: _______________

Discipline of study
  o ______________________
Appendix 17: Statements sorted by shared viewpoints (consensus)

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Factor Array 1</th>
<th>Factor Array 2</th>
<th>Factor Array 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Reducing choices contributes to environmental sustainability</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>I don't need everything that's offered</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Having a wide variety of choice builds expectations that I can control</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>40</td>
<td>I'll try new dishes when my friends recommend them</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>I feel overwhelmed when there's more than one choice</td>
<td>-3</td>
<td>-4</td>
<td>-4</td>
</tr>
<tr>
<td>19</td>
<td>Having a wide choice doesn't make any difference to my experience</td>
<td>-2</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>18</td>
<td>I considered the quality of the meals before choosing them</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>38</td>
<td>My friends influence me to have seconds</td>
<td>-4</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>16</td>
<td>My choices are based on how I'm feeling at the time</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>31</td>
<td>The best way to choose is to ask staff / friends what they prefer</td>
<td>-2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>33</td>
<td>I think Carrington food service should offer low calorie meals</td>
<td>0</td>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>15</td>
<td>I prefer to make my own choices rather than having someone else involved</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26</td>
<td>Reducing choice could create negative perceptions about</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>35</td>
<td>I expect to have a huge selection of salad ingredients</td>
<td>-1</td>
<td>-3</td>
<td>0</td>
</tr>
<tr>
<td>29</td>
<td>Making choices is hard, so I choose what my friends have</td>
<td>-5</td>
<td>-3</td>
<td>-5</td>
</tr>
<tr>
<td>14</td>
<td>Each choice reinforces my perception of control</td>
<td>0</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Choice gives me freedom to choose what I want</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>I sometimes regret the meal choice I made</td>
<td>-1</td>
<td>0</td>
<td>-2</td>
</tr>
<tr>
<td>7</td>
<td>There are too many choices on the menu</td>
<td>-3</td>
<td>-4</td>
<td>-4</td>
</tr>
<tr>
<td>23</td>
<td>Reducing choice reduces my food consumption</td>
<td>1</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>41</td>
<td>I enjoy having the choice of toast and fruit throughout</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>I choose seconds so I don't get hungry</td>
<td>-4</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>37</td>
<td>I prefer not to have a choice, I'd rather there was juice</td>
<td>-3</td>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>25</td>
<td>Reducing choice would make my meal decisions easier</td>
<td>1</td>
<td>0</td>
<td>-3</td>
</tr>
<tr>
<td>20</td>
<td>At the start of the year I thought there were too many choices</td>
<td>-3</td>
<td>-5</td>
<td>-1</td>
</tr>
<tr>
<td>5</td>
<td>The more choices I have, the more satisfied I am</td>
<td>5</td>
<td>-2</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>I'm making the most of the wide variety in menu choices</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Too much choice makes it hard to decide what to have</td>
<td>0</td>
<td>-1</td>
<td>-4</td>
</tr>
<tr>
<td>38</td>
<td>I like a meal tray because I can take more food</td>
<td>-4</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>27</td>
<td>Reducing choice would be disappointing</td>
<td>-1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17</td>
<td>Being able to choose what I want at meals influences my decisions</td>
<td>-1</td>
<td>-2</td>
<td>-3</td>
</tr>
<tr>
<td>32</td>
<td>I feel confident in making the healthier choice with</td>
<td>3</td>
<td>1</td>
<td>-2</td>
</tr>
<tr>
<td>36</td>
<td>I wouldn't mind having the vegetarian option once a week</td>
<td>4</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>Because of the huge variety of choice available, I tend to choose more</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>41</td>
<td>I believe the availability of a wide variety of choices</td>
<td>0</td>
<td>2</td>
<td>-3</td>
</tr>
<tr>
<td>11</td>
<td>I choose seconds every day as I've paid college fees and</td>
<td>-5</td>
<td>-2</td>
<td>-3</td>
</tr>
<tr>
<td>21</td>
<td>Choices I make are based on my assumptions / background</td>
<td>3</td>
<td>-3</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>I don't have a choice when I am living at home so I eat regularly</td>
<td>-2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>Knowing I'll be able to choose my meal gives me something</td>
<td>-1</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>22</td>
<td>Reducing choice could reduce food waste</td>
<td>4</td>
<td>2</td>
<td>-4</td>
</tr>
<tr>
<td>34</td>
<td>The choices I make depend on the healthiness of the meal</td>
<td>5</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>39</td>
<td>I'm willing to try different dishes based on vegetable preferences</td>
<td>4</td>
<td>-4</td>
<td>2</td>
</tr>
</tbody>
</table>
## Appendix 18: Distinguishing statements for factor 1 (Believers)

<table>
<thead>
<tr>
<th>No. Statement</th>
<th>No.</th>
<th>Q-SV</th>
<th>Z-SCR</th>
<th>Q-SV</th>
<th>Z-SCR</th>
<th>Q-SV</th>
<th>Z-SCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>34. The choices I make depend on the healthiness of the meal</td>
<td>5</td>
<td>1.47</td>
<td>-1.59</td>
<td>2</td>
<td>-0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. I wouldn't mind having the vegetarian option once a week</td>
<td>4</td>
<td>1.42</td>
<td>-1.03</td>
<td>1</td>
<td>0.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39. I'm willing to try different dishes based on vegetable p</td>
<td>9</td>
<td>1.39</td>
<td>-1.41</td>
<td>2</td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Reducing choice could reduce food waste</td>
<td>2</td>
<td>1.35</td>
<td>-0.62</td>
<td>2</td>
<td>-0.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Choices I make are based on my assumptions / background</td>
<td>3</td>
<td>1.18</td>
<td>-0.87</td>
<td>0</td>
<td>0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I prefer to make my own choices rather than having someone else</td>
<td>2</td>
<td>0.60</td>
<td>1.19</td>
<td>4</td>
<td>1.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Reducing choice reduces my food consumption</td>
<td>1</td>
<td>0.42</td>
<td>-0.00</td>
<td>1</td>
<td>-0.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Reducing choice could create negative perceptions about</td>
<td>3</td>
<td>0.42</td>
<td>0.02</td>
<td>3</td>
<td>1.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Reducing choice would make my meal decisions easier</td>
<td>1</td>
<td>0.32</td>
<td>0.09</td>
<td>-3</td>
<td>-0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Too much choice makes it hard to decide what to have</td>
<td>1</td>
<td>0.17</td>
<td>-1.48</td>
<td>2</td>
<td>-0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I'm making the most of the wide variety in menu choices</td>
<td>0</td>
<td>0.14</td>
<td>1.39</td>
<td>1</td>
<td>0.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42. I believe that the availability of a wide variety of choices is</td>
<td>0</td>
<td>0.00</td>
<td>0.72</td>
<td>3</td>
<td>-1.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Reducing choice would be disappointing</td>
<td>2</td>
<td>-0.17</td>
<td>3</td>
<td>1.37</td>
<td>4</td>
<td>1.16</td>
<td></td>
</tr>
<tr>
<td>8. I don't have a choice when I'm living at home so I feel</td>
<td>2</td>
<td>-0.59</td>
<td>4</td>
<td>1.44</td>
<td>2</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>5. More choices I have, the more satisfied I am</td>
<td>5</td>
<td>-0.59</td>
<td>1</td>
<td>0.28</td>
<td>1</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>31. The best way to choose is to ask staff / friends what they</td>
<td>5</td>
<td>-0.61</td>
<td>0</td>
<td>0.84</td>
<td>0</td>
<td>-0.95</td>
<td></td>
</tr>
<tr>
<td>7. There are too many choices on the menu</td>
<td>-3</td>
<td>-0.91</td>
<td>-1</td>
<td>-4</td>
<td>-1.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37. I prefer not to have a choice, I'd rather there was ju</td>
<td>-3</td>
<td>-1.14</td>
<td>-2</td>
<td>-2</td>
<td>-1.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38. I like a meal tray because I can take more food</td>
<td>-4</td>
<td>-1.38</td>
<td>1</td>
<td>-0.56</td>
<td>-2</td>
<td>-0.71</td>
<td></td>
</tr>
<tr>
<td>13. I choose seconds so I don't get hungry</td>
<td>-4</td>
<td>-1.47</td>
<td>-2</td>
<td>-0.08</td>
<td>-1</td>
<td>-0.54</td>
<td></td>
</tr>
<tr>
<td>30. My friends influence me to have seconds</td>
<td>-4</td>
<td>-1.53</td>
<td>-3</td>
<td>-1.13</td>
<td>-3</td>
<td>-0.99</td>
<td></td>
</tr>
<tr>
<td>11. I choose seconds every day as I've paid college fees and</td>
<td>-5</td>
<td>-2.24</td>
<td>-2</td>
<td>-6</td>
<td>-3</td>
<td>-0.86</td>
<td></td>
</tr>
</tbody>
</table>

## Appendix 19: Distinguishing statements for factor 2 (Resisters)

<table>
<thead>
<tr>
<th>No. Statement</th>
<th>No.</th>
<th>Q-SV</th>
<th>Z-SCR</th>
<th>Q-SV</th>
<th>Z-SCR</th>
<th>Q-SV</th>
<th>Z-SCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>41. I enjoy having the choice of toast and fruit throughout</td>
<td>3</td>
<td>1.11</td>
<td>5</td>
<td>1.73</td>
<td>2</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>8. I don't have a choice when I am living at home so I real</td>
<td>-2</td>
<td>-0.59</td>
<td>4</td>
<td>1.44</td>
<td>2</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>12. I'm making the most of the wide variety in menu choices</td>
<td>0</td>
<td>0.14</td>
<td>4.30</td>
<td>1</td>
<td>0.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42. I believe that the availability of a wide variety of choices is</td>
<td>0</td>
<td>0.00</td>
<td>0.72</td>
<td>-3</td>
<td>-1.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Reducing choice could reduce food waste</td>
<td>2</td>
<td>1.35</td>
<td>0.62</td>
<td>-2</td>
<td>-0.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I considered the quality of the meals before choosing them</td>
<td>2</td>
<td>0.96</td>
<td>1.52</td>
<td>3</td>
<td>1.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38. I like a meal tray because I can take more food</td>
<td>-4</td>
<td>-1.38</td>
<td>1</td>
<td>0.26</td>
<td>-2</td>
<td>-0.71</td>
<td></td>
</tr>
<tr>
<td>25. Reducing choice would make my meal decisions easier</td>
<td>1</td>
<td>0.32</td>
<td>-0.29</td>
<td>-3</td>
<td>-0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. I wouldn't mind having the vegetarian option once a week</td>
<td>4</td>
<td>1.42</td>
<td>-1.32</td>
<td>2</td>
<td>0.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Too much choice makes it hard to decide what to have</td>
<td>1</td>
<td>0.17</td>
<td>-1.48</td>
<td>-4</td>
<td>-1.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Each choice reinforces my perception of control</td>
<td>0</td>
<td>0.20</td>
<td>-0.49</td>
<td>1</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. I feel confident in making the healthier choice with the vegetable d</td>
<td>3</td>
<td>0.99</td>
<td>-1.59</td>
<td>2</td>
<td>0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Choices I make are based on my assumptions / background</td>
<td>3</td>
<td>1.10</td>
<td>-3.87</td>
<td>0</td>
<td>0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. I expect to have a huge selection of salad ingredients e</td>
<td>-1</td>
<td>-0.55</td>
<td>-3</td>
<td>-0.99</td>
<td>-3</td>
<td>-0.23</td>
<td></td>
</tr>
<tr>
<td>29. Making choices is hard, so I choose what my friends have</td>
<td>-5</td>
<td>-1.93</td>
<td>-3</td>
<td>-1.22</td>
<td>-5</td>
<td>-1.69</td>
<td></td>
</tr>
<tr>
<td>39. I'm willing to try different dishes based on vegetable p</td>
<td>4</td>
<td>1.39</td>
<td>-4.41</td>
<td>2</td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 20: Distinguishing statements for factor 3 (Emotives)

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Q-SV</th>
<th>Z-SCR</th>
<th>Q-SV</th>
<th>Z-SCR</th>
<th>Q-SV</th>
<th>Z-SCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Knowing I'll be able to choose my meal gives me something</td>
<td>-1</td>
<td>-0.85</td>
<td>0</td>
<td>0.10</td>
<td>5</td>
<td>1.87*</td>
</tr>
<tr>
<td>9</td>
<td>Choice gives me freedom to choose what I want</td>
<td>2</td>
<td>0.70</td>
<td>3</td>
<td>0.93</td>
<td>5</td>
<td>1.53*</td>
</tr>
<tr>
<td>17</td>
<td>Being able to choose what I want at meals influences my</td>
<td>-1</td>
<td>-0.56</td>
<td>-2</td>
<td>-0.59</td>
<td>3</td>
<td>0.89*</td>
</tr>
<tr>
<td>8</td>
<td>I don’t have a choice when I am living at home so I really</td>
<td>-2</td>
<td>-0.59</td>
<td>4</td>
<td>1.44</td>
<td>2</td>
<td>0.86*</td>
</tr>
<tr>
<td>39</td>
<td>I’m willing to try different dishes based on vegetable p</td>
<td>4</td>
<td>1.39</td>
<td>-4</td>
<td>-1.41</td>
<td>2</td>
<td>0.76*</td>
</tr>
<tr>
<td>12</td>
<td>I’m making the most of the wide variety in menu choices</td>
<td>0</td>
<td>0.14</td>
<td>4</td>
<td>1.39</td>
<td>1</td>
<td>0.64</td>
</tr>
<tr>
<td>36</td>
<td>I wouldn’t mind having the vegetarian option once a week</td>
<td>4</td>
<td>1.42</td>
<td>-1</td>
<td>-0.32</td>
<td>1</td>
<td>0.36*</td>
</tr>
<tr>
<td>21</td>
<td>Choices I make are based on my assumptions / background</td>
<td>3</td>
<td>1.10</td>
<td>-3</td>
<td>-0.87</td>
<td>0</td>
<td>0.11*</td>
</tr>
<tr>
<td>24</td>
<td>Because of the huge variety of choice available, I tend</td>
<td>5</td>
<td>1.45</td>
<td>5</td>
<td>1.75</td>
<td>0</td>
<td>0.10*</td>
</tr>
<tr>
<td>28</td>
<td>At the start of the year I thought there were too many choices</td>
<td>-3</td>
<td>-1.33</td>
<td>-5</td>
<td>-1.67</td>
<td>-1</td>
<td>-0.50*</td>
</tr>
<tr>
<td>6</td>
<td>I sometimes regret the meal choice I made</td>
<td>-1</td>
<td>-0.82</td>
<td>0</td>
<td>0.17</td>
<td>-2</td>
<td>-0.65*</td>
</tr>
<tr>
<td>38</td>
<td>I like a meal tray because I can take more food</td>
<td>-4</td>
<td>-1.38</td>
<td>1</td>
<td>0.26</td>
<td>-2</td>
<td>-0.71*</td>
</tr>
<tr>
<td>22</td>
<td>Reducing choice could reduce food waste</td>
<td>2</td>
<td>1.35</td>
<td>2</td>
<td>0.62</td>
<td>-2</td>
<td>-0.79*</td>
</tr>
<tr>
<td>25</td>
<td>Reducing choice would make my meal decisions easier</td>
<td>1</td>
<td>0.32</td>
<td>0</td>
<td>-0.29</td>
<td>-3</td>
<td>-0.86*</td>
</tr>
<tr>
<td>42</td>
<td>I believe that the availability of a wide variety of choices</td>
<td>0</td>
<td>0.06</td>
<td>2</td>
<td>0.72</td>
<td>-3</td>
<td>-1.03*</td>
</tr>
<tr>
<td>11</td>
<td>Too much choice makes it hard to decide what to have</td>
<td>0</td>
<td>0.17</td>
<td>-1</td>
<td>-0.48</td>
<td>-4</td>
<td>-1.32*</td>
</tr>
</tbody>
</table>

(P < .05; Asterisk (*) Indicates Significance at P < .01)

Both the Factor Q-Sort Value (Q-SV) and the Z-Score (Z-SCR) are shown.