Consumer green purchasing behaviour: From attitude, perceived controllability and normative influences to purchasing behaviour

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Abstract

Scholars in green marketing predicted that after the year 2000, the market for environmentally friendly products would mature and substantially expand. Today, although many people express their concern about the environment, environmentally friendly products are still not the first choice for most consumers.

Grounded in the Theory of Planned Behaviour, this research investigated the factors that influence consumers' decisions when buying energy-saving light bulbs. Descriptive norm, self-identity and past behaviour were hypothesised to influence consumers' purchasing intentions and behaviour.

Survey data (N=313) were collected online from New Zealand residents between late 2011 and early 2012. Structural equation modelling (SEM) was employed to test the theoretical model. Given the study context and operational definitions of the constructs, all indicators in this study were specified as reflective. Construct validity and measurement model specification issues were examined and discussed. The results suggest that people who have positive attitudinal affections and beliefs, identify themselves as pro-environment and have purchased environmentally friendly products in the past tend to have stronger intentions to purchase environmentally friendly products. The findings also suggested that most people hold a positive purchasing intention and attitude towards energy-saving light bulbs. Practitioners in the field of green marketing could apply the findings when developing marketing strategies. Given the cross-sectional nature of this survey study, further research is needed to explore the causal relationships between the focal variables, as well as the intention–behaviour link. Theoretical contributions, methodological implications, future research directions are discussed.

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Chapter 1 Introduction

In 1962, *Silent Spring* (Carson, 1999) was published. The book describes a possible future when everything is silent during spring time. There are no bees humming nor birds singing in the spring time of the future because environmental pollution has killed them all. This possible but unpleasant future raised people's awareness of the influence that human behaviour has on the natural environment (Bekoff & Nystrom, 2004). Various environmental movements have emerged since then, aiming to save the environment from degradation. Both consumption and marketing have been considered as causes of and solutions to environmental degradation (Fisk, 1974). 'Consumption' means the way people collect and use resources to maintain their preferred lifestyle. 'Marketing' of products aims to help people meet their needs. Marketing that integrates environmental concerns while meeting the needs of consumers is commonly called 'environmental marketing' or 'green marketing' (Charter, 1992; Fisk, 1974; Polonsky, 1995).

These days, many people express a concern for the environment, but the question is whether their actions match their words. This study's review of the definitions of green marketing (see Section 1.1) and also the history of people's environmental awareness (see Section 1.2) indicated a gap between what people say and do. Section 1.3 states the research background and aims, and Section 1.4 provides an overview of the whole research project.

1.1 Green Marketing

Many scholars have tried to define the term 'green marketing'. Peattie (1992, p. 11) considers green marketing is 'a style of marketing which has arisen in response to the increasing concern about the state of the global environment and the life it contains (including human life)'. Coddington (1993, p. 1) defines the term as 'marketing activities that recognise environmental stewardship as a business development responsibility and [a] business growth opportunity'. Grant (2007) sees green marketing as a win–win situation for both businesses and the environment, and suggests that the activities should include a 'cultural' outcome, because being environmentally friendly

can mean a lifestyle change (e.g. from a consumption-oriented lifestyle to a conservation-oriented one). Although the wordings of the definitions are different, they express quite similar concepts. That is, they all consider both the environment and business, aiming to find a balance between conserving the environment and maintaining a quality lifestyle. This is what *green marketing* means in this research: maining a quality lifestyle without compromising the environment.

Consumption itself is not inherently problematic – people need food to survive, clothes to keep warm and a house for shelter. These are all forms of consumption and all consume natural resources. Thus, totally abandoning the consumption lifestyle to solve environmental problems is neither easy nor realistic. However, the speed at which society is consuming natural resources and discarding 'useless' substances back into the environment is causing problems for the environment (Dupré, 2005; World Wildlife Fund, 2008).

Providing products that not only meet consumers' needs but also are less harmful to the environment is thought to be a solution to the consumption problem. More importantly, the success of these products in the market lies in whether the products can be accepted by general consumers, not just those who care strongly for the environment.

1.2 Brief History of Consumers' Environmental Awareness and Emergence of Green Business

Kalafatis, Pollard, East and Tsogas (1999) suggest that consumers' environmental awareness can be roughly categorised into four stages (decades): the *awakening era* (1960s), the *take action era* (1970s), the *accountable era* (1980s), and the *power in the marketplace era* (1990s). 'Green business' was predicted to increase after the year 2000 and into the beginning of the twenty-first century (Menon & Menon, 1997).

The *awakening era* began with Rachel Carson's 1962 book, *Silent Spring*. The book not only aroused public awareness, but also attracted John F. Kennedy's attention (the US president at the time) (Lear, 1999). He ordered his President's Science Advisory Committee to further examine the arguments put forward by Carson.

As more people became aware of human-caused environmental degradation, and two oil crises in the 1970s strengthened the public's impression that natural resources would not last forever, actions to solve the problem were devised. Thus, the 1970s were identified as the *take action era*. Entrepreneurs with strong environmental concerns initiated businesses based on environmentally conscious principles (Darnil & Le Roux, 2008; Quarter, 2000). In addition, scholars began to make a connection between degradation and marketing practices (Fisk, 1974). Marketing thus became part of a possible solution for environmental problems.

During the 1980s, the public's awareness of these issues increased and more *accountability* was demanded from business entities. The term 'sustainable development' was first defined by the United Nations in 1987 as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development, 1987, p. 43), a concept now widely recognised and used in various contexts (Sustainable Business Council, 2012). Since then, the public became aware that every action taken by the current generation is actually connected to and can affect the options available for future generations. If no action was taken to try to solve human-induced environmental problems, there would not be many natural resources left for the future.

In the 1990s, public awareness of the issues reached a tipping point, with the public wanting to give financial support to socially responsible businesses. This meant businesses needed to report on their performance regarding the environment. This period became the *power in the marketplace era*. Consumers became aware of their power to boycott products produced by socially irresponsible companies with no concerns for the environment. SAFECHEM Europe was one such example (Darnil & Le Roux, 2008; The Dow Chemical Company, 1995). This company provided both chlorinated and non-chlorinated solvents for cleaning. Due to the harmful effects of chlorinated solvents, strict regulations were put in place to control their use (Darnil & Le Roux, 2008) and there was public pressure to boycott the use of those products. The company needed to develop a solution to avoid going out of business. Thus, SAFECHEM devised the idea of 'renting' the chlorinated solvents instead of selling the solvents to their customers. SAFECHEM 'rents' the unused products to their clients for cleaning and takes back the used products; thus, the clients do not need to worry about

the disposal of the used products. As a result, the company created more business opportunities.

Besides boycotting environmentally harmful products, consumers have another avenue for affecting change: investing their money in businesses that are environmentally friendly. Investment indices and investment companies, such as Domini Social Investments, emerged to help investors channel their money into socially and environmentally responsible businesses (Darnil & Le Roux, 2008; Domini Social Investments, 1997).

Based on the progress from the 1960s to 1990s, Menon and Menon (1997) forecasted that green businesses and green marketing would be increasingly successful in the next decade, as more and more people in every sector became willing to use and sell products that did not harm the environment. Peattie and Crane (2005) also found that more and more people (and firms) were expressing their concerns about the environment, compared with the previous decades.

However, when we look back over the first decade of the twenty-first century (2000–2010), green marketing did not become as prosperous as predicted. Instead of becoming mainstream, the marketing of environmentally friendly products was usually seen as serving a niche market (consumers with environmental concerns), or an aspiration of business founders with a strong affinity for the environment. While people were aware of the fragility of the ecosystem and the need to do something for the environment (Pickett-Baker & Ozaki, 2008), such awareness has not been fully translated into action.

In 2008, the World Business Council for Sustainable Development [WBCSD] suggested the following six possible reasons for the discrepancy between consumers' stated willingness to help and their inaction when it came to purchasing for the environment (2008):

- availability of the product
- affordability of the product
- product performance
- consumers' conflicting priorities
- consumers' scepticism regarding the product

- force of purchasing habit (p. 6).

The first three reasons are product-centred and the latter three are consumer-centred. Although the first three reasons seem to be product-centred, they can also be perceptions. That is, consumers may perceive that such products are hard to find in the market (even if the product is *in* the market), expensive to buy (even if the product is within their budget), and/or performs poorly (even if their performance is similar to that of the conventional products).

Nevertheless, the reasons offered by the WBCSD do not seem to explain why green marketing did not develop as predicted. On the other hand, not all the reasons are applicable to every country. New Zealand, for example, has had environmentally friendly, affordable consumer products available in the marketplace since early 2000 (Harris, 2007). Further, most New Zealanders are proud of the country's *clean, green image* and are eager to maintain it (Lawton & Lawton, 2003). However, environmentally friendly consumption is not always the first priority for New Zealand consumers (Frame & Newton, 2007). This research, thus embedded in the New Zealand context, focuses on investigating the other factors that influence consumers' purchasing decisions, aiming to explore why people buy (or do not buy) environmentally friendly products.

1.3 Research Background and Aims

According to Pickett-Baker & Ozaki (2008), marketers should develop a practical strategy that includes the influential factors for influencing the target consumers' purchasing behaviour; yet, more factors may need to be added to or dropped from the factors proposed by the WBCSD (2008). For example, Nolan, Schultz, Cialdini, Goldstein and Griskevicius (2008) posited that people buy energy-saving light bulbs not only to save money on electricity bills through reduced energy use, but also to define and reflect their self-identity. No research has explored how *self-identity* interacts and intertwines with the above reasons specifed by WBCSD (e.g. conflicting priorities and force of habit might be related); thus, more research is needed to clarify the relationships in order to design sensible green marketing strategies. Understanding the factors leading to consumers' purchasing intentions is the main purpose of this research project. This knowledge will help practitioners in the field of green marketing to

construct efficient and practical strategies to encourage consumers to translate their pro-environment concerns into actual purchasing behaviour.

This study employs two main investigations, first to identify the factors, and then to examine the relationships between the factors influencing consumers' purchasing behaviour. The first investigation involved a literature review; the second an empirical consumer survey, based on the reviewed literature.

1.4 Thesis Outline

Following this introduction, this thesis contains five further chapters: Literature Review, Methodology, Sample Characteristics and Descriptive Statistics, Data Analysis and Results, and Discussion and Conclusion.

Chapter 2 consists of a literature review on attitudes and behaviour, consumer behaviour and environmentally friendly behaviour, to identify the factors that influence consumers' environmentally friendly purchasing behaviour as well as any knowledge gaps in the literature and/or in practice. The first section focuses on environmentally friendly behaviour and examines what has been researched in the past. The second section proposes a model for consumers' environmentally friendly purchasing behaviour, based on the reviewed literature.

Chapter 3 describes the methodology used for this research. It illustrates how the consumer survey was designed to collect empirical evidence to verify the proposed model. The chapter contains five main sections: common method bias (potential common method variance obtained from data collection, of which the variance may bias data analyses); selection of participants (rationale used to select the target population for this research and determine sample size); instrumentation (questionnaire design); data collection (the way the questionnaire was distributed); and data analysis (approaches and criteria used to analyse the survey data, from the preliminary data preparation to model testing).

Chapter 4 presents the descriptive statistics of the consumer sample and briefly discusses the results. This chapter contains two main sections: demographics (composition of the sample population, including age, gender, education, occupation

and income) and proposed constructs (connecting the data compiled from the survey to the constructs in the proposed model).

Chapter 5 presents the data analysis and results. It focuses on data preparation (explaining how the raw data were handled before testing the proposed model), and model testing. This chapter contains six main sections: missing data; normality; constructs and their indicators; confirmatory factor analysis (CFA); common method variance; and model testing. Missing data and normality cover how the raw data were treated to resolve issues of missing data and non-normal data distributions. The constructs and indicators section illustrates the reliability and validity of the indicators to measure the relevant construct. The CFA section presents the examination of measurement model to confirm the discriminant validity of the constructs. The common method variance section illustrates and discusses whether potential common method variance has biased the results of model testing. The model testing section illustrates the fit of the proposed model and the model's parameter estimates.

Chapter 6 contains the discussion and conclusion. It presents the discussions for the statistical findings of the revised proposed model and connects the findings to the relevant literature. This chapter contains four main sections: major findings; theoretical implications; implications for practices; and study limitations and recommendations for future research. The major findings section summarises the results of data analysis and discusses study contributions and rationale for revising the proposed model. The implications section discusses the theoretical implications for the existing literature. The implications for practices section presents possible practical methods to nudge consumers to purchase environmentally friendly products. The last section, limitations and recommendations, describes the study limitations and suggests directions for future research.

Chapter 2
Literature Review – Understanding Green Consumers

As mentioned in the previous chapter, the aim of the current research is to explore why people buy (or do not buy) environmentally friendly products. From a conventional marketing perspective, understanding consumer behaviour is important because this can assist in developing more effective promotion strategies to sell products. This approach is also applicable to the green marketing context. A marketer who wants to be environmentally friendly should not only act according to these ideals but also understand what motivates (or de-motivates) consumer regarding such behaviours (Rex & Baumann, 2007).

This chapter first focuses on reviewing the theories that serve as the foundations of the current study, with an emphasis on consumer as a social being, thus, purchase behaviour as a social behaviour (see Section 2.1). Section 2.2 discusses the proposed constructs that influence behaviour and their inter-relationships. This section aims to capture the factors that influence consumers when purchasing environmentally friendly products.

2.1 From Environmental Concern to Environmentally Friendly Behaviour: Dual Information Processing

'To say is one thing, to do is another.' – A proverb

In the 1930s, LaPiere (2010) conducted an experiment within in the US hospitality industry to investigate the relationship between what people said and what they did. Racism was common at that time; hotels and restaurants in the US would often state that Asian guests were not welcome on the property. To find out whether the actual practice matched the claim, LaPiere travelled with a Chinese couple to observe

how hotels and restaurants responded. He hypothesised that the couple would be rejected by the hotels and restaurants visited because of the generally negative attitude towards Chinese people at the time. As LaPiere's presence (as a white American) might influence the service, he tried to factor himself out by looking after the car or luggage during the journey, and letting the Chinese couple negotiate accommodation and dining. They visited 67 hotels and 184 restaurants and were rejected by one accommodation provider. After the journey, LaPiere wrote to all 251 service providers and asked them if they would accommodate Chinese guests, giving them three answer options: 'Yes', 'No', and 'Uncertain; depend upon circumstances'. Of the 128 responses received, more than 90% said 'No'. Only one accommodation provider responded with a delighted 'Yes', because of a nice experience she had. The rest replied 'Uncertain; depend upon circumstances'. In other words, the stated attitude of the service providers towards Chinese customers did not match their actual practices.

Like LaPiere, Johnson, Fryer and Raggett (2008) also found that there was a discrepancy between people's environmental concerns and their purchasing decisions. In their research, almost every New Zealander they surveyed agreed that looking after the environment is everyone's responsibility and half of them considered that urgent action was needed to protect the environment. However, when it came to individual actions, only 3% of the respondents said their purchasing actions were influenced by their environmental concerns. What are the factors that influenced the 3% of respondents to put their words into action? What caused the discrepancy between thinking and actions for the rest of the survey respondents?

Human behaviour is complex. Sometimes, it can be an automatic response, but other times, it can be an expression of complex internal beliefs. It is argued that most human behaviour, including consumer behaviour, is performed under an individual's control and that all behaviour is an attempt to achieve the individual's goals (Ajzen, 1985; Cialdini & Trost, 1998). Many factors indeed can influence a consumer's buying decisions, such as what specific product they want to buy, where they shop, how much they can afford to pay for the product, how much time is available for shopping, how convenient it is to make the purchase, etc. (Solomon et al., 2009). Consumers can actively choose the brands they like among products in the same category, and/or passively buy the only products that are available in the market. Many internal factors may affect decision making, for examples: they like one brand better than the others, it

is the most popular brand among friends and family, or it is the only brand they can afford at that particular time, and so on. External reasons can include product availability, and policies and regulations. The current research focuses on the internal factors affecting people's purchasing decisions, attempting to understand what motivates consumers to purchase environmentally friendly products, while controlling the external factors by conducting the study in a single market, i.e. New Zealand.

In the literature, behaviour is argued to be a result of intensive cognitive information processing, while other times a quick response to a situation without going through much internal processing (Goldstein & Cialdini, 2009; Kuhl & Beckmann, 1985; Petty & Cacioppo, 1996). Section 2.1.1 briefly discusses the two schools of thought about the way behaviour is formed. Section 2.1.2 focuses on dual information processing, which illustrates how individuals process information received from the external environment and react to the message, with Elaboration Likelihood Model (Cacioppo, Harkins, & Petty, 1981; Petty & Cacioppo, 1986; Petty & Wegener, 1999) as the focal theory. Section 2.1.3 presents a review of the Theory of Planned Behaviour, which suggests that behaviour is a result of cognition and further proposes a set of factors involved in decision making.

After reviewing the Theory of Planned Behaviour and its application to promote environment-friendly consumer behaviour, the following sections highlight the variables that could prompt automatic purchasing behaviour; that is, what influences consumers when they are not cognitively processing product information. Section 2.1.4 focuses on the descriptive norm, which refers to people's perception of what action or behaviour is done by the majority in a given situation. Previous research has found that people have the tendency to do what they perceive as a norm and behave accordingly (Cialdini, Kallgren, & Reno, 1991; Cialdini, Reno, & Kallgren, 1990). Section 2.1.5 presents a review of self-identity and past behaviour, citing prior studies that also support the theory that these two constructs have positive influences on behaviour (Armitage & Conner, 2001; Berger & Heath, 2007; Foxall, 1997; Rise, Sheeran, & Hukkelberg, 2010; Webb & Sheeran, 2006).

2.1.1 Behaviour: Behaviourism vs. Cognitivism

There are two main schools of thoughts regarding what governs behaviour: behaviourism and cognitivism (McGarty & Haslam, 1997; M. C. J. White, 1982). Behaviourists believe that behaviour is determined by external factors in the environment. Cognitivists advocate that internal cognitive activities determine how one behaves, including responds to the environment.

Behaviourists see individuals' behaviour mainly as a reaction to external stimuli, conditioned through the settings of the external environment, and do not focus on internal thinking processes (Skinner, 1948, 1984; Watson, 1913). If the appropriate conditions are set, the desired behaviour will result. Individuals learn to perform behaviour through conditioning and are very likely to carry out the same behaviour when encounter similar situation in the future. In other words, behaviour can change depending on the conditions in the external environment.

However, this school of thought does not explain how the establishment of a behaviour can contribute to, as well as be influenced by, individuals' internal cognition. Therefore, behaviourism can illustrate and partially explain how and why people are likely to continue their 'established' behaviour of purchasing the same product, but it does not fully explain the purchasing behaviour of consumers when making purchasing decisions about 'new' products when the original external settings remain the same; that is, when there is no trigger for 'new' purchasing behaviour.

Researchers from the other school of thought, cognitivism, argues that behaviour is a result of people's cognitive assessment of the external environment (Briñol & Petty, 2012). That is, when people encounter a specific situation, they go through intensive internal processes (i.e. information processing) to decide how to respond to the given situation. Therefore, the behaviour is seen as an outcome of people's thoughts. This perspective explains how a 'new' behaviour is carried out in an unchanged external setting. However, information processing requires time and effort for individuals to work out a suitable response to a changing environment; as such, it is not possible for an individual to make every decision by assessing each piece of information extensively, every minute of every day (Cialdini & Goldstein, 2004; Cialdini & Trost, 1998; Petty, Cacioppo, & Goldman, 1981). If this is true, what explains behaviour that is not based on cognitive assessment?

The cognitive school of thought does not explain behaviours that do *not* result from intensive cognitive assessment (e.g. an individual picking up a product that they are accustomed to buying, without thinking too much). How can this be explained from the cognitive perspective? How can this perspective predict how people might react to a given situation if they are not able to assess the information and make decision accordingly? The attempt to answer these questions is the focus of the next subsection.

2.1.2 Dual information processing: Elaboration Likelihood Model

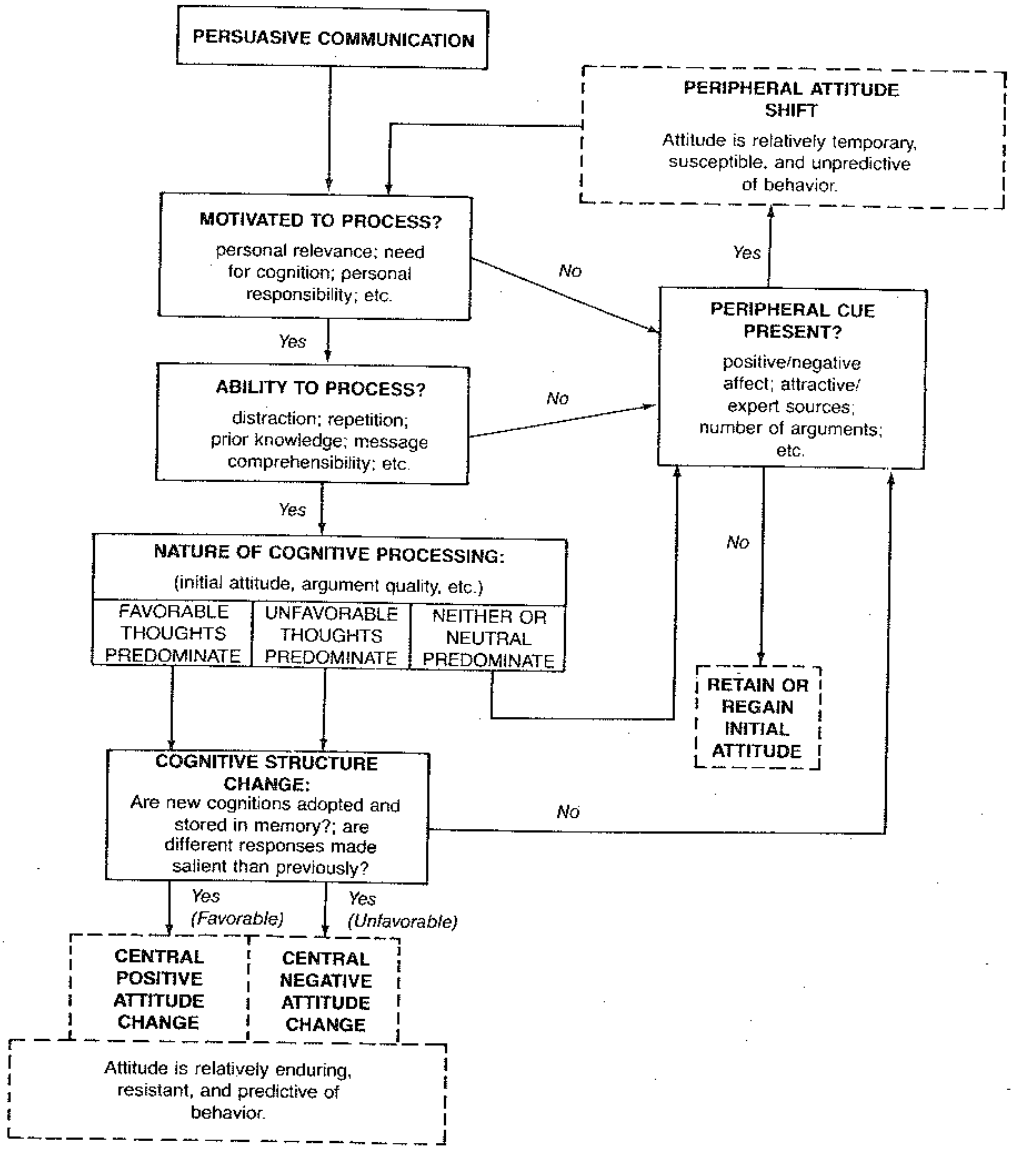
Scholars from the cognitive school of thought proposed several different dual information-processing models (Cacioppo, et al., 1981; Shiffrin & Schneider, 1977), as attempts to explain human behaviour when someone has to react to a given situation without sufficient resources (e.g. time and knowledge) to assess the information received. One of the most commonly cited is the Elaboration Likelihood Model (Cacioppo, et al., 1981; Petty & Cacioppo, 1986; Petty & Wegener, 1999), which describes that attitude changes can go through two possible routes of information processing, which can lead to behaviour change.

The Elaboration Likelihood Model (as illustrated in Figure 2.1) suggests that attitudinal change can be either enduring or temporary. The determinant of whether the attitudinal change is enduring or not lies in level of information processing, via two possible routes, known as ‘central route’ and ‘peripheral route’. Both routes can result in attitude change, but change made via the central route is more enduring than change made via the peripheral route.

The central route leads to attitudinal changes that are based on extensive and effortful information processing (Petty & Wegener, 1999).The peripheral route on the other hand relies on peripheral cues or mental shortcuts for quick and effortless processing of information. Motivation, ability and opportunity are the key factors determining whether the central or peripheral route will be chosen. In general, people are motivated to process the information through the central route when the argument is personally relevant, especially when the decision is important (Petty, Cacioppo, et al., 1981). However, the ability to comprehend an argument is also important. If the message is not comprehensible, or lack of mental framework to link the message to

existing knowledge, elaborated information processing is unlikely to occur, no matter how motivated the person is. When an individual is motivated to think about the message, and the message is comprehensible, then the nature of the argument becomes critical. To achieve positive persuasion (i.e. changing attitude to be in line with the given message), arguments should be strong and compelling. Further, there should be opportunity for the individual to process the information. Time, energy and cognitive efforts are needed to decode, comprehend, and accept (or reject) the argument presented and then change (or reinforce existing) attitude.

Figure 2.1 Elaboration Likelihood Model (Petty & Cacioppo, 1986, p. 126)



Conversely, when there is no motivation, ability or opportunity for an individual to process the information, the message is likely to go through the peripheral route. Through this route, only peripheral cues (e.g. reward, attractive source, contextual stimuli, etc.) are used to develop a response towards the information or situation. In other words, this route can save time, energy and resources by bypassing cognitive processing. This method of attitudinal change, if any, may be temporary: when the cues are gone, the change is usually gone. However, such attitude change can also leave its mark on people. When they encounter similar information or a similar situation in the future, residual memory may 'pop up' in the form of a cue, which could help process the message. This time, they may process the information more fluently than the first time, building on the previous experience, which could increase the level of involvement.

Level of involvement, according to the Elaboration Likelihood Model (Petty, 1994; Petty & Cacioppo, 1996; Petty, Cacioppo, et al., 1981; Petty & Wegener, 1999), is the key to inducing cognitive process the message. Since previous experience enhances an individual's ability to deal with information, providing multiple exposures to the same message means the individual is more likely to recognise and process the message, leading to longer-term attitude change. Even if the message is not processed via the central route, the residues left by the previous experience of dealing with the same message or situation could still work as peripheral cue, saving time and energy, as well as facilitating efficient decision-making.

In summary, the Elaboration Likelihood Model provides a theoretical framework to explain the interactions between attitude, behaviour and processing information from the external environment (e.g. marketing messages). Behaviour can be influenced by attitude, while attitude change (or no change) can be the result of either extensive (via central route) or effortless (via peripheral route) processing of information. In relation to the discussion regarding cognitivism in Section 2.1.1, the Elaboration Likelihood Model provides a mechanism to help answer the question: How do individuals react if they are not able to process the received information? However, further explanation is required for other aspects, such as the relationship between attitude and behaviour, and the cues used in peripheral route information processing.

According to the Elaboration Likelihood Model, attitude change can lead to behaviour change. Attitude refers to individuals' evaluation of people (including

themselves), groups, places, objects and issues (Ajzen, 1991; Briñol & Petty, 2012). A positive correlation between attitude and behaviour is found in and supported by the literature (e.g. Briñol & Petty, 2012). Despite this correlation, the literature suggests that holding an attitude does not always lead to carrying out the relevant behaviour (Fishbein & Ajzen, 1974; Fukukawa & Ennew, 2010; LaPiere, 2010). The finding from LaPiere's travelling experiment with the Chinese couple (as mentioned earlier) illustrates the inconsistency between attitude and behaviour. This leads to the question: What is the relationship between attitude and behaviour,? The Theory of Planned Behaviour (see Section 2.1.3) attempts to answer this question from the cognitive perspective (Ajzen, 1991; Armitage & Conner, 2001).

As mentioned earlier, processing information through the peripheral route saves time and cognitive effort. Reward, an attractive advertising model and/or contextual stimuli are all cues that facilitate processing through the peripheral route. LaPiere's experiment (2010) is an example of this. In his experiment, the generally unfriendly attitude towards Chinese people was replaced in practice by a warmer and more welcoming attitude. The factors influencing this attitudinal change could have been the good quality and condition of the couple's clothing, the appearance of their baggage, their cleanliness and neatness, their good and unaccented English, etc. . However, the effect might have been temporary; while most of the visited hotels and restaurants had actually accommodated the couple, in the follow-up survey, only one said they would accommodate Chinese customers. Those contextual stimuli could have temporarily influenced the service providers' attitude and behaviour. The same stimuli may not be effective if applied to other people in other situations. This raises the next question: What cues can be used to affect attitude and behaviour?

Researchers have found that effective cues include descriptive norm (Cialdini, et al., 1990; Göckeritz et al., 2010), relevant past behaviour (Foxall, 1997) and self-identity (Stryker & Burke, 2000). Descriptive norm describes an individual's perception of what actions are taken by the majority. Relevant past behaviour refers to whether or not individuals have performed the same behaviour previously. Self-identity means the way individuals see themselves. These cues echo behaviourism. In some respects, people are conditioned to behave in a manner that is acceptable to the majority or to important others, to satisfy the need for belonging (Maslow, 1943; Taormina & Gao, 2013). These situational settings act as cues to an individual to carry out a specific

behaviour, which is considered appropriate to the situation. Before moving onto further discussion of descriptive norm, self-identity and past behaviour (Sections 2.1.4 and 2.1.5), the next section review an over-arching cognitive theory, the Theory of Planned Behaviour, the guiding theoretical framework of this research.

2.1.3 Theory of Planned Behaviour

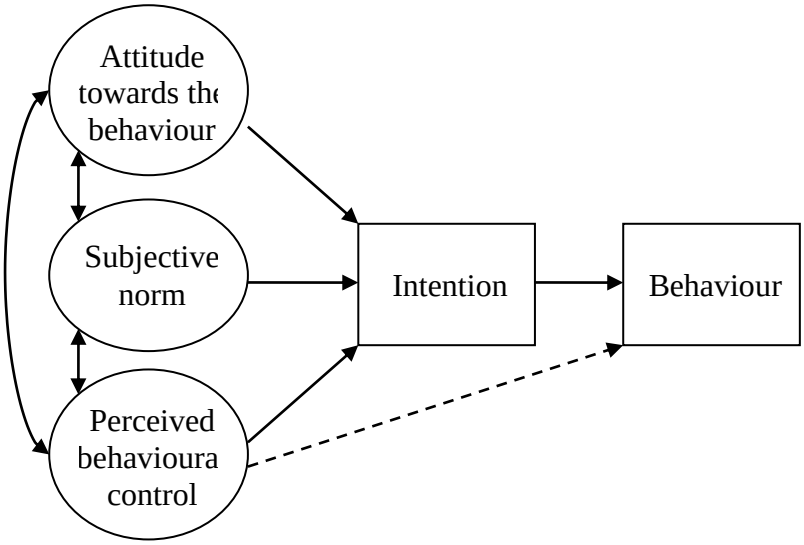
The Theory of Planned Behaviour is widely discussed and applied in various social and behavioural contexts, including green marketing (Ajzen, 1991; Armitage & Conner, 2001; De Cannière, De Pelsmacker, & Geuens, 2009). The theory assumes that behaviour is directly influenced by behavioural intention, a mediator between behaviour and three other factors: attitude, subjective norm, and perceived behavioural control.

The Theory of Planned Behaviour is an extension of Theory of Reasoned Action (Ajzen, 1985, 1991, 2012; Ajzen & Fishbein, 1977; Fishbein & Ajzen, 1975). Fishbein and Ajzen (1975) first proposed the Theory of Reasoned Action to explain the gap between attitude and behaviour. They argue that most human behaviour is cognitively-influenced; the direct predictor of behaviour is behavioural intention, which is a result of both attitude and subjective norms. In other words, attitude does not have a direct influence on behaviour, but instead works through intention. Intention is a collective construct, which indicates an individual's disposition towards related actions.

In 1985, Ajzen (1985, 1991) developed the Theory of Planned Behaviour and argued that using only attitude and personality traits to predict behaviour is insufficient; perceptions of whether an individual can perform the behaviour should also be taken into account. Thus, four constructs (intention, perceived behavioural control, attitude towards the behaviour, and subjective norm) were included as behavioural precursors. In 1985, Ajzen defined intention as an individual's attempt to perform a particular behaviour, and revised the definition of concept to intending to carry out the behaviour in 1991.

The following subsections present discussion relevant to the Theory of Planned Behaviour. Section 2.1.3.1 presents the characteristics of, and the interactions among, the five constructs in the Theory of Planned Behaviour. Section 2.1.3.2 focuses on research that has applied the Theory of Planned Behaviour to examine consumer purchasing behaviour and environmentally friendly behaviour.

Figure 2.2 Theory of Planned Behaviour (Ajzen, 1991, p. 182)



2.1.3.1 Characterisations of each construct and their interactions

This subsection focuses on the constructs behaviour, intention, attitude, subjective norm and perceived behavioural control, providing a definition of each and a description of the way they interact.

Behaviour

As mentioned above, behaviour is assumed to be influenced by intention and perceived behavioural control (as illustrated in Figure 2.2). Most of our daily behaviour is the result of our own choices (Ajzen, 1985). Having a morning coffee at home, buying a coffee from a café on the way to work, making a cup of coffee at work, or even switching to tea for the day, are all choices an individual can make. According to Ajzen (1991), if individuals can make their own decisions about whether to perform a specific behaviour, this specific behaviour is predictable and explainable because behaviour is derived from cognition. Cognition requires individuals to consider their situation then make a decision based on their thoughts and/or beliefs. Ajzen categorised these beliefs into the three constructs attitude, subjective norm and perceived behavioural control. The constructs work together to form an individual's intention to engage in certain behaviour (as illustrated in Figure 2.2). By measuring these constructs, an individual's intention can be predicted. The stronger the intention, the more likely the individual is to turn the intention into action (Ajzen, 1985, 1991).

Beyond intention, an individual's perception of their own capability to carry out the behaviour can also influence the outcome, i.e. the target behaviour (Ajzen, 1985). For example, an individual might be craving a cup of coffee before work (attitude) and receives no disapproval from the people who are close to him/her (subjective norm). He/she intends to conduct a specific behaviour (i.e. consume a coffee before work). However, he/she perceives that he/she does not have time to make a coffee at home, and does not have enough money to purchase it on the way to work. That is to say, he/she does not think that he/she will be able to do the target behaviour. As a result, he/she would not have a cup of coffee before work.

Intention

As mentioned above, Ajzen proposed that intention is the main factor influencing actual behaviour, and intention is influenced by attitude, subjective norm and perceived behavioural control (as illustrated in Figure 2.2). Behavioural intentions are the key to an individual performing a specific action (Ajzen, 1985, 1991), the aggregations of salient beliefs (i.e. beliefs regarding attitudes, subjective norm and perceived behavioural control), and serve as 'indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behaviour' (Ajzen, 1991, p. 182).

Fishbein and Ajzen defined intention as 'a person's location on a subjective probability dimension involving a relation between himself and some action' (1975, p. 288). Ajzen (1991) further refined this definition and suggested that the construct should be directly related to the actual performance, rather than just trying to carry out the behaviour. Therefore, the stronger the intention, the more likely it is that the individual will conduct the target behaviour. However, not all intentions are carried through into actual behaviour (Ajzen, 1985). Intention is a constantly evolving concept; thus hard to pin down and predict. Only the salient intentions to the changing surroundings are able to indicate whether the behaviour of interest will be carried out in the specific contexts.

Attitude

Ajzen (1991) proposed that attitude is an antecedent of intention (as illustrated in Figure 2.2) and is formed by an individual's beliefs about the target behaviour. The conventional definition of attitude is that it is an individual's predisposition towards

people, places, objects and issues (Ajzen, 1985; Briñol & Petty, 2012; Fishbein & Ajzen, 1974). In the Theory of Planned Behaviour, attitude is specified as the attitude towards the behaviour (Ajzen, 1985, 1991). Attitude towards the behaviour is formed through beliefs about the behaviour. These behavioural beliefs are a product of values and thoughts about the outcomes and attributes of the behaviour (Ajzen, 1985; Petty, Ostrom, & Brock, 1981). For example, one may believe that purchasing an organic product (behaviour) means that expenses will go up and the appearance of the organic product will not be as attractive as the conventional ones; however, this could be balanced by knowing that the product does not harm the environment and is good for health, and so on. Positive and negative beliefs can coexist.

An individual's attitude towards the behaviour is determined by the perceived outcomes, attributes associated with the behaviour, and the strength of the association between the behavioural beliefs and the behaviour (Ajzen, 1985, 1991). Individuals process the information relevant to the target behaviour, and then generate attitude (favourable or unfavourable) towards the behaviour, which then influences the intention to perform the behaviour. The more positive the attitude regarding a behaviour, the stronger the intention to perform the action.

Subjective norm

According to the Theory of Planned Behaviour, subjective norm is considered a predictor of behavioural intention (as illustrated in Figure 2.2) and is based on normative beliefs, i.e. beliefs or perception of whether people important to us expect a specific behaviour to be performed. These important others can be specific people or groups whose opinions are valued by us. In more recent research, Ajzen and Fishbein (Ajzen, 2006; Ajzen & Fishbein, 2005) extended the definition of subjective norm to include the behaviour of important others, and the construct to include both injunctive norms (what is expected by others) and descriptive norms (what others are perceived to be doing). The strength of the subjective norm depends not only on normative beliefs, but also the individual's motivation to conform to expectations (Ajzen, 1985). The stronger the motivation to conform, the stronger the subjective norm.

However, Armitage and Conner's meta-analytic review of the Theory of Planned Behaviour (2001), found subjective norm (what is expected by others) to be a weak predictor of intention. Interestingly, they also found that this was due to the

method adopted to measure the subjective norm. When the construct was measured against a single indicator (a measure with low reliability), the correlation between subjective norm and intention was weak. When the subjective norm construct was measured using multiple indicators, there was a significant correlation between subjective norm and intention. This finding implies that subjective norm is a complex construct which is hard to be measured by one simple question item, but should be assessed through several question items that cover the norm from different aspects (see Section 3.3.5 for detail).

Perceived behavioural control

This construct was suggested by Ajzen (1991) as a predictor of both intention and actual behaviour in the Theory of Planned Behaviour (as illustrated in Figure 2.2). Ajzen also suggested that *perceived* control has more impact on the target behaviour than *actual* behavioural control.

Perceived behavioural control is generated from control beliefs; that is, resources and opportunities a person believes to be available to perform the behaviour. The perceived behavioural control construct in the Theory of Planned Behaviour consists of perceived self-efficacy and perceived controllability (Ajzen, 2002a). Perceived self-efficacy refers to beliefs about the ease or difficulty of conducting the target behaviour. An individual is more likely to take action if the target behaviour is perceived as easy and doable within one's capacity. Perceived controllability refers to the extent to which an individual believes they can control the performance of the behaviour. If perceived controllability is high, the likelihood of conducting the target behaviour will also be high. According to the Theory of Planned Behaviour, the perceived behavioural control construct can directly influence actual behaviour and indirectly influence behaviour via intention.

In summary, the Theory of Planned Behaviour suggests that an individual's volitional behaviour can be predicted by measuring behavioural intentions, which is influenced by perceived behavioural control, attitude and subjective norm. The following subsection reviews applications of the Theory of Planned Behaviour to study consumer behaviour with special focus on behaviour friendly to the environment.

2.1.3.2 Application to environmentally friendly behaviour and consumer purchasing behaviour

The Theory of Planned Behaviour is applicable to consumer research because consumer behaviours are usually within volitional control (Ajzen, 2008; Ajzen, Joyce, Sheikh, & Cote, 2011). The Theory of Planned Behaviour is a hierarchical model (as illustrated in Figure 2.2), which suggests that:

1) behaviour is directly influenced by intention and perceived behavioural control

2) intention is affected by attitude, subjective norm and perceived behavioural control.

To illustrate how the theory has been applied to the field, actual behaviour and its predictors (i.e. intention and perceived behavioural control) are discussed first, followed by a focus on intention and its antecedents (i.e. attitude, subjective norm and perceived behavioural control).

Behaviour and its predictors

Ajzen (1991) reviewed 12 studies (e.g. Doll and Ajzen's study in 1990 regarding playing video games, as cited in Ajzen's paper 1991, found that both intention and perceived behavioural control were both able to predict the participants' relevant behaviour. See Ajzen, 1991, review for the full list) that had adopted the Theory of Planned Behaviour and concluded that actual behaviour can be predicted by intention and perceived behavioural control. Armitage and Conner (2001) conducted a meta-analytic review of 161 journal articles (e.g. Ajzen & Driver's paper 1992 in leisure choice, Atsalakis & Sleap 1996 in children in a physical activity program, etc. See Armitage & Conner's review for the full list) and reached the same conclusion. Armitage and Conner noticed that there were two ways to collect actual behavioural data; through survey respondents' self-reporting and through objective observation. Although self-reported behaviour showed a higher correlation with intention than objective observation did, both methods yielded positive results on the intention–behaviour link

Data on actual behaviour is difficult to obtain for analysis, especially when the data collection method is through a self-reported survey. The main concern is that the

information may contain bias (Sherman, 1980). The information provided may have been edited by the respondents, or the respondents may have already forgotten. The literature examples outlined below in this section were carefully screened regarding their data collection methods (i.e. data were self-reported, which is also the method adopted in this research, see Chapter 3 for detail).

Empirical research, based on the Theory of Planned Behaviour, supports intention as a predictor for actual behaviour. However, perceived behavioural control may not always be a reliable predictor of actual behaviour. For example, Terry, Hogg and White (1999) hypothesised that the Theory of Planned Behaviour is applicable to explain recycling behaviour. They collected survey data from 143 residents in a community to obtain information about recycling intention and the antecedent factors. After two weeks, participants were given a second questionnaire, to measure their *actual* recycling behaviour in the previous two weeks. Through this method, the data collected might have been able to reflect the behaviour, which was assumed to have been carried out based on intention reported two weeks earlier, and might still be 'fresh' enough to be remembered and reported correctly. Their results showed that only intention, but not perceived behavioural control, could predict actual recycling behaviour. Other research on recycling behaviour also revealed similar findings (K. M. White & Hyde, 2012).

Tarkiainen and Sundqvist (2005) adopted the Theory of Planned Behaviour to study organic food consumption. They surveyed 200 Finnish consumers regarding their purchases of organic food, but did not measure perceived behavioural control. Instead, the reserachers stationed at the shop to observe consumers' actual purchases of organic food. That data collection decision was derived from Ajzen's argument (1991) that intention can be a sole predictor of actual behaviour when performing easy and effortless behaviour. Since Finnish consumers had easy and effortless access to organic food, the intention construct was hypothesised as the only precursor to actual behaviour. Their findings confirmed the hypothesis.

J. R. Smith et al. (2007) also applied the Theory of Planned Behaviour as the conceptual framework to examine beer-purchasing behaviour. Two questionnaires were distributed to 108 university students. The first questionnaire was designed to collect measures of intention and its antecedents (including perceived behavioural control). The second survey was sent one week later, to obtain data on actual beer purchases

(assuming memory would still be fresh for accurate self-report data). Their findings partially supported the Theory of Planned Behaviour where intention, but not perceived behavioural control, predicted beer purchases.

In 2008, J. R. Smith et al. conducted a similar study on soft-drink purchases (intentions and behaviour) of 112 participants. Self-reported behavioural data were collected one week after a survey. This research also reached the same conclusion regarding predicting behaviour; that is, intention was significant in predicting behaviour, but perceived behavioural control was not. However, Smith et al. suggested that the limited predictive power of perceived behavioural control on behaviour might be due to ceiling effects, which occur when one construct has very high score, leaving little room for estimating the variance in the construct (J. R. Smith, et al., 2008; Theisen, Rapport, Axelrod, & Brines, 1998; Wu & Cheng, 1999). The average scores of the perceived behavioural control in Smith et al.'s study were high (6.5 on a 7-point scale). Thus, the variance of the perceived behavioural control was hard to measure.

Conversely, De Cannière, De Pelsmacker and Geuens' research (2009) showed that both intention and perceived behavioural control could be used to predict behaviour. Their study involved a Belgian retailer and its customers. The retailer ran 71 shops in Belgium at the time of the study (February to July 2004). Data (the sample size for analysis was 634 customers of the retailer) on intention and its antecedents (attitude, subjective norm and perceived behavioural control) were collected by questionnaire in February. Actual shopping data, from February to July, were obtained from the retailer's customer database. The researchers then analysed whether consumers' purchasing intentions (taken from the survey) matched what the retailer actually sold (taken from the customer database). A key point to note here is that the behaviour data was not from the survey respondents, which means that inferring that an individual's intention will lead them to a specific behaviour should be viewed with caution. Their findings supported the Theory of Planned Behaviour; that is, both intention and perceived behavioural control could be used to predict actual purchasing behaviour.

The Theory of Planned Behaviour was also adopted by Gardner and Abraham (2010) to examine intention to drive a private car in comparison to actual behaviour. They surveyed 190 drivers for their intention to drive during the following week. They also collected behaviour data on the frequency of the respondents' car use over the previous week. In this study, past behaviour was treated as actual behaviour; however, it

may be hard to ascertain whether it was the behaviour (i.e. the past behaviour in their study) that influenced drivers' intentions, or whether the intention predicted the behaviour. Their findings supported the Theory of Planned Behaviour; intention was able to predict car-use behaviour. People who intended to drive their own car were more likely to do so. A connection between perceived behavioural control and actual behaviour was also confirmed, though the correlation was negative. People who perceived that they had less control over their transportation options were more likely to drive a private car.

In summary, both the intention and perceived behavioural control constructs have empirical support for their roles in the prediction of actual behaviour. However, there are also cases where intention is a sole predictor of behaviour. In those cases, Ajzen (1991) argues that the construct can help improve the intention construct's predictive power. Further, a ceiling effect was observed; that is, when individuals had high control over the behaviour (i.e. perceived behavioural control is high), then the construct made no measurable difference in predicting behaviour (Armitage & Conner, 2001; J. R. Smith, et al., 2008; Terry, et al., 1999).

Intention and its antecedents

Ajzen (1991) reviewed 16 studies (e.g. Doll & Ajzen 1990 in playing video games, Godin, Vezina & Leclerc 1989 in exercising after giving birth, etc. See Ajzen 1991 for full list) and concluded that the constructs attitude towards the behaviour (or attitude, for short), subjective norm and perceived behavioural control were antecedents to intention. Armitage and Conner's meta-analysis (2001) on 161 journal articles (e.g. Ajzen & Driver's paper 1992 in leisure choice, Atsalakis & Sleap 1996 in children in a physical activity program, etc. See Armitage & Conner's review for the full list) obtained similar conclusions that the constructs attitude, subjective norm and perceived behavioural control are capable of explaining intention. This section examines studies that are grounded in the Theory of Planned Behaviour, to observe the way the studies were planned and the findings from the research.

Kalafatis, Pollard, East and Tsogas (1999) applied the Theory of Planned Behaviour to study consumers' intentions to buy green products in different markets. They chose a market in the UK (London area) and one in Greece (Athens area) to represent developed and developing markets, respectively. Questionnaires were

distributed to consumers interested in buying timber furniture, to capture information about their intentions and the related antecedent variables. Their findings did not fully support Ajzen's model (1991). Specifically:

- Attitude was not able to predict intention to purchase eco-friendly furniture in both markets.
- Subjective norm, defined as perceived expectations from others, was found to be significant in predicting intention but only in the UK market.
- Perceived behavioural control only had a significant impact on intention in the Greek data.

Kalafatis et al. argued that differences were due to the two countries' different levels of public awareness and debate about environmental issues, with the UK market having higher social awareness of the importance of protecting the environment than the Greek market. Thus, the subjective norm (the perceived social pressure) was influential in purchasing intentions in the UK market, but not in the Greek market. In Greece, perceived behavioural control (perceived capability to act) had a significant impact on purchasing intention.

In Terry, Hogg and White's research (1999) on recycling behaviour, only intention (not perceived behavioural control) was found to have predictive power over actual behaviour. Their findings did not fully support Ajzen's (1991) proposal regarding the relationships between intention and its antecedents. Terry et al.'s results showed the following:

- Attitude was able to predict the intention to recycle.
- Injunctive norm (similar to Ajzen's subjective norm) was not significant in predicting intention.
- Descriptive norm (the actions of other people who are important to the respondent), an extension of the subjective norm construct (Ajzen & Fishbein, 2005), had an effect on individuals' intentions.
- Perceived behavioural control was only significant to the people who did not consider themselves part of any recycling-related group.

These findings implied that self-identity played a part in intention formation. People who considered themselves part of a group were more likely to perform a behaviour carried out by the other group members. Perceived behavioural control had more influence on the people who had not categorised themselves as part of a group.

White and Hyde's research (2012) obtained similar results to those from Terry et al.'s study, but found a different relationship between intention and its antecedents. In White and Hyde's study, only attitude and subjective norm (perceived expectations of important others) were found to have predictive power for intention. Perceived behavioural control did not have a significant statistical correlation with intention.

Tarkiainen and Sundqvist (2005) obtained data from 200 Finnish consumers and found organic-food-purchases could be predicted from intentions. In that study, behavioural intentions can be directly derived from attitude towards the purchases, perceived behavioural control and, indirectly, from subjective norm. Based on the argument that social environment influences attitude formation, Tarkiainen and Sundqvist hypothesised that the subjective norm would be more influential on consumers' favourable/unfavourable attitude towards (i.e. evaluation of) the behaviour (i.e., purchases of organic food). They posited that the subjective norm was a precursor to attitude, instead of to intention. In addition, they specified that perceived behavioural control was a consumer's perception about a products' affordability and availability. This specification was in accordance with Ajzen's suggestion (2002a), that perceived behavioural control consists of perceived self-efficacy and perceived controllability. Tarkiainen and Sundqvist's findings included the following:

- Attitude was able to predict purchasing intention.
- Subjective norms (referred to as injunctive norms by Tarkiainen and Sundqvist) were found to be influential on attitude.
- Affordability and availability (i.e. perceived behavioural control) were not able to predict purchasing intention.

Tarkiainen and Sundqvist argued that affordability and availability played an important role in forming consumers' perception of behavioural control. However, when consumers perceived that the product of interest was always available and affordable, perceived control became a non-issue when considering a purchase; thus lacking predictive power in that market/study.

J. R. Smith et al.'s research on beer-purchasing behaviour (2007) also supported the intention–behaviour relationship proposed by the Theory of Planned Behaviour. They assumed that attitude, subjective norm and perceived behavioural control were precursors to intention, and found the following supporting evidence:

- Attitude was able to predict the purchasing intention.
- Subjective norm, which included both injunctive and descriptive norms, was able to predict purchasing intention.
- Perceived behavioural control was also found to have a positive influence on intention.
- Intention could explain 49% of variance while only including attitude, perceived behaviour control and subjective norm (i.e. the original Theory of Planned Behaviour), but the explained variance of intention increased to 71% when past behaviour and self-identity were added to the original Theory of Planned Behaviour for analysis.

However, J. R. Smith et al.'s study (2008) regarding soft-drink purchases did not obtain similar supporting results. Their 2008 data still confirmed that attitude and subjective norm (both injunctive and descriptive norms) influenced people's intentions towards soft-drink purchasing. However, perceived behavioural control was found to have no significant connection with the purchasing intention. According to J. R. Smith et al., such a finding may be due to the ceiling effects (as discussed earlier, in page 23).

Lodorfos and Dennis's organic food study (2008) supported the relationships between intention and its antecedents. De Cannière, De Pelsmacker and Geuens' research (2009) on consumer purchasing behaviour in a Belgium retailer supported the position that intention and perceived behavioural control are predictors of actual behaviour. Their findings also supported the relationship between intention and its three antecedents, as proposed in the Theory of Planned Behaviour.

Gardner and Abraham's research (2010) on environmentally friendly behaviour (i.e. driving a private car versus using public transportation) also supported the position that attitude, subjective norm and perceived behavioural control are influencing factors for intention. The normative influences surveyed in Gardner and Abraham's research included both perceived injunctive and descriptive norms from others of importance.

In theory, attitude towards behaviour, subjective norm (both injunctive and descriptive norms) and perceived behavioural control are considered the antecedents of behavioural intention (Ajzen, 1991). However, this relationship has not been confirmed in every empirical study, even though, according to the meta-analyses conducted by Sutton (1998) and Armitage and Conner (2001), the Theory of Planned Behaviour could explain 50% and 64–71% of the variances in intention. In other words, the Theory of Planned Behaviour is still considered an effective conceptual model that provides a practical and theoretical foundation for examining consumers' purchasing behaviour from the cognitive perspective. Section 3.3 will further elaborate how the constructs were measured in this research project to enhance the constructs' predicting power on intention.

2.1.4 Descriptive norms

Originally, Ajzen (1985, 1991) proposed the subjective norm construct to include social pressure; that is, whether or not an individual is willing to comply with the expectations of others. Social pressure is a type of normative influence and refers to what one 'ought' to do in a given situation. In other words, the influence can be seen as an injunctive norm. In Armitage and Conner's meta-analytic review (2001), they noticed that while the injunctive norms were effective at influencing actual behaviour, so were descriptive norms. Descriptive norm, in their findings, referred to an individual's perception of whether the target behaviour was usually done by important others. Ajzen later acknowledged that descriptive norms also play an important part in influencing an individual's intention (Ajzen, 2006; Ajzen & Fishbein, 2005).

The social norm, or descriptive norm, influences an individual to be more likely to do 'what is commonly done' in a given situation. The individual may not detect this influence (Cialdini, et al., 1990; Griskevicius, Cialdini, & Goldstein, 2008). Many psychological processes are subject to these 'normative social influences' (Deutsch & Gerard, 1955), which are similar to the subjective norm proposed in the Theory of Planned Behaviour, focusing on the individual's perception of social pressures from important others.

However, Cialdini, Reno and Kallgren (1990) suggested that effective normative influences also come from the perceived actions of the majority, as well as those people

who are important to the individual. Further, they noticed that norms can influence people's actual behaviour directly and subconsciously, and may not be detected by the people who are being influenced (Cialdini, 2005; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008). They called these influences *social norms*, being the perception of what most people do (Cialdini, et al., 1991; Goldstein, Cialdini, & Griskevicius, 2008). They argued that the rationale of people following the perceived majority derives from dual information processing. The perceived actions of the majority serves as a peripheral cue, hinting at what manner is acceptable and appropriate in a specific situation. When an individual does not have the time and/or resources to analyse the message in a situation, following the hint speeds up decision-making (as discussed in Section 2.1.2). The following subsections discuss descriptive norms from theoretical and empirical perspectives.

2.1.4.1 Social norm: 'What is commonly done in a given situation'

The theoretical foundation of the social norm is based on the idea that norms are the implicit and explicit rules and standards of a group, guiding and constraining social behaviour without the force of laws (Cialdini & Trost, 1998). Sanctions for the people who deviate from the norms come from social networks. An expression of disapproval from others is sufficiently strong to induce individual compliance (Nelissen & Mulder, 2013). When individuals are familiar with the group they are interacting with, they will know what is expected in a given situation so that sanction for deviation can be avoided. When an individual is not familiar with the situation or has no idea of what is expected, their *perception* of what is commonly done can provide hint(s) to what action is sensible, effective and suitable because most people are doing it (Cialdini, et al., 1990). Further, the perception of what is commonly done serves as situational cue, which allows rapid information processing via the peripheral route (Petty & Cacioppo, 1996), which requires less time and effort to reach decision or take action to avoid social sanction and/or embarrassment. Empirical supports for the power of social norm (i.e. descriptive norm) on consumer behaviour come not only from survey studies but also from experiments including some on environment-friendly behaviour, e.g. recycling, to be discussed in the next section.

2.1.4.2 Application to environmentally friendly behaviour and consumer purchasing behaviour

The recycling study conducted by Terry, Hogg and White (1999) revealed that people had a stronger intention to recycle if their friends and peers were also recycling and intention was found to be strongly predictive of actual recycling behaviour. J. R. Smith et al.'s research (2008) also showed that people's intentions regarding purchasing soft-drink were stronger if important others were also purchasing the product. Gardner and Abraham (2010) found that people intended to drive their own car if people important to them were driving a private car most of the time, although they did not examine whether there was a direct relationship between the descriptive norms and related behaviour. Kim, Lee and Hur's survey data (2012) also indicated that descriptive norms influenced purchase intentions, and people were more likely to have an intention to buy environment-friendly products if the products were popular.

The above findings, which supported the assumption that descriptive norms influence behaviour, though indirectly, were based on data collected from self-reported questionnaires, and may have carried measurement biases (Schwarz, 1999). Data from experiments in which actual behaviour was observed directly in 'controlled' settings can provide further support for the power of the social norm/descriptive norm. Some of these experiments are discussed next.

Goldstein, Cialdini and Griskevicius (2008) examined the direct influence of social norm on pro-environmental behaviour and conducted a hotel towel re-use experiment. Traditionally, hotels would replace towels for guests staying for more than one night. In the experiment, hotel guests who were staying for more than one night were asked to nominate whether they would like to re-use the towels, via a request card placed on the towel racks. Two different re-use messages were designed, to measure the effect of social norms. One was a standard environmental message, focusing only on environmental protection:

> 'HELP SAVE THE ENVIRONMENT. You can show your respect for nature and help save the environment by reusing your towel during your stay' (p. 473).

The other contained the descriptive norm (i.e. social norm):

> ‘JOIN YOUR FELLOW GUESTS IN HELPING TO SAVE THE ENVIRONMENT. Almost 75% of guests who are asked to participate in our new resource savings program do help by using their towels more than once. You can join your fellow guests in this program to help save the environment by reusing your towel during your stay’ (p. 474).

The results revealed that only 35.1% of the participants who received the standard message group reused their towel, whereas 44.1% of the descriptive norm group did so. The difference was statistically significant, illustrating the direct influence of social norms (descriptive norms) on behaviour.

Griskevicius, Cialdini and Goldstein’s research (2008) also found that people tend to do what they perceive others are doing. They carried out a two-condition experiment in a busy New York subway station. In the first condition, which served as the control in the experiment, they counted how many passers-by donated money to a street musician. In the second condition, the researchers arranged for a colleague (confederate) to give money to the musician first, before any passers-by had the chance to make a donation. The number of passers-by who gave money to the musician in the second condition was eight times higher than the number observed in the first. It seemed reasonable to attribute this difference to seeing other people doing it, given all other variables were controlled to similar levels. However, when the passers-by in the second condition were asked their reasons (i.e. a manipulation check) for the donation, they said, ‘*I like the song he was playing*’, ‘*I felt sorry for the guy*’ or ‘*I had some extra change in my pocket*’ (Griskevicius, et al., 2008, p. 7). This implied that these people did not realise that they may have been influenced by another person (the confederate) giving money before them.

In another two studies, Nolan, Schultz, Cialdini, Goldstein and Griskevicius (2008) researched energy-saving behaviour in households. The first study was a self-reported survey, in which 810 households provided information about their households’ intention to conserve power and reasons for doing so, among other things. Respondents had four predefined responses to choose from: (R1) ‘*It saves money*’; (R2) ‘*It protects the environment*’; (R3) ‘*It benefits society*’; and (R4) ‘*A lot of other people are trying to conserve energy*’ (Nolan, et al., 2008, p. 915). They also asked the respondents for their beliefs about energy conservation, again with predefined responses: (B1) ‘*How much do you think conserving energy will benefit society?*’; (B2) ‘*How much do you think*

conserving energy will protect the natural environment?'; (B3) '*How much money do you think you can save by conserving energy in your home?*'; and (B4) '*How often do you think your neighbours try to conserve energy?*' (Nolan, et al., 2008, p. 915). First they analysed respondents' intentions to conserve power and the reasons for doing so, followed by another analysis of the relationship between the intentions and the beliefs. The results suggested that respondents usually accredited their energy-conserving intentions to protecting the environment (i.e. R2), but were less likely to consider that their intentions were a result of descriptive norm (i.e. R4). However, the correlation coefficients of the relationships between the intentions and the beliefs showed that the strongest predictor of the intention to conserve energy conservation was the belief that 'other people are doing so' (i.e. B4).

Nolan et al.'s second study was an experiment (371 households in California). Five reminders to conserve energy were sent to households, containing messages similar to the reasons and beliefs from the first study. Each reminder contained a message referring to a *descriptive norm*, *self-interest*, *environment*, *social responsibility* or *just information* (the latter served as the control). The five types of reminders were randomly assigned to participating households. The electricity meters of the households were read before and during the period in which the reminders were sent out and one month afterwards. At the end of the research period, householders were asked in an interview about their reasons for conserving energy during the period. By comparing the data collected from the interviews and that from the electricity meters, Nolan et al. obtained similar findings to those from the first study. The households reported that they conserved energy for environmental reasons and social responsibility. However, on investigating the relationship between meter readings and reminders; the households that received the *descriptive norm* reminder consumed less energy than the households that received the other four messages.

In summary, social norms/descriptive norms (i.e. what is commonly done by most people) can either explicitly or implicitly provide information about the action considered appropriate and acceptable in a situation (Cialdini & Goldstein, 2004). Individuals may not detect the influence of the norms, but such normative influences can affect intentions and, by extension, actual behaviour. To acknowledge the increasing significance of social norms in the existing literature, the construct will be

included in this study and the proposed conceptual model (to be discussed in Section 2.2).

2.1.5 Self-identity and past behaviour

Besides descriptive norm, two other factors have been commonly integrated into the Theory of Planned Behaviour: self-identity and past behaviour (Armitage & Conner, 2001; Webb & Sheeran, 2006), to be discussed next.

2.1.5.1 Self-identity

Self-identity refers to the roles to which an individual attaches themselves in highly differentiated societies (Berger & Heath, 2007; Nigbur, Lyons, & Uzzell, 2010; Stryker & Burke, 2000). Theoretically, these attachments can foster actions that contribute to individuals' role fulfilment and self-validation. Individuals tend to carry out actions and behaviours expected of their roles (Stryker, 1997). Individuals care about whether they fulfil the roles and it is also important that this role fulfilment is recognised by others in the group. For example, when individuals identify themselves as environmentalists, they may not only act according to the role, but also like to be recognised as an environmentalist by friends and family.

There are empirical supports for the influence of self-identity on behavioural intention. Studies have shown that people who identify themselves as a typical buyer or user of a specific product have stronger purchasing intentions (J. R. Smith, et al., 2007, 2008; Thorbjørnsen, Pedersen, & Nysveen, 2007). Further, J. R. Smith (2007) found that the explained variances of intention increased (from 49% to 69%) when self-identity was integrated into the model. People who identified themselves as advocates of environmentally friendly action also showed stronger intentions to purchase environmentally friendly products (Nigbur, et al., 2010; Terry, et al., 1999; K. M. White & Hyde, 2012). Rise, Sherran and Hukkelberg's meta-analysis (2010) also supported self-identity as a predictor of intention and behaviour. The 40 datasets they analysed showed that self-identity had a significant correlation to intention (sample-weighted average correlation = .47), and intention mediated the relationship between self-identity

and behaviour. In conclusion, they suggested that the self-identity construct should be incorporated into the Theory of Planned Behaviour.

Outside the Theory of Planned Behaviour, self-identity has also been found to influence individuals' behaviour directly. As mentioned above, self-identity influences individuals' behaviour in other ways. Individuals recognise themselves as being connected to a role and being identified in that role. Others can identify individuals as being in a role from the information that the individuals communicate about themselves (Griskevicius, Tybur, & Van den Bergh, 2010), and they can gain reputation in the role through their actions. In Griskevicius et al's (2010) experiments, partiticpants tended to purchase environmentally friendly products if the purchase might be perceived as projecting the desired status. As illustrated by Publilius Syrus's maxim, 'A good reputation is more valuable than money' (cited by Griskevicius , et al., 2010, p. 401), people tend to behave in certain ways that they think will indicate who they are and what they want to be, even if the price of such behaviour is high. Berger and Heath's research (2007) also found that people tended to purchase products that matched the identities they claimed for themselves.

In summary, self-identity is an important construct to be considered when predicting intention and, by extension, actual behaviour, and will be incorporated into the proposed model of this study. Further discussion will follow in Section 2.2.

2.1.5.2 Past behaviour

Past behaviour is usually considered a predictor of future behaviour (Foxall, 1997). In theory, individuals tend to continue to behave in ways that are similar to how they have behaved in the past.

According to the Elaboration Likelihood Model (Petty & Cacioppo, 1996), individuals do not willingly process a message if it is not at high level of involvement, perceived to be under volitional control, or if they have no motivation (desire to react) or ability to understand the message or to respond to it. When there is a situational cue (such as existing preference, expertise on the source, or expected reactions from others), people tend to react according to the cue. Past experiences provide a scheme for people to extract information and evaluate whether they like the message, then they either maintain or change attitude accordingly (Schwarz, 2004). Further, a frequently repeated

behaviour acts as a peripheral cue and influences an individual's intention to perform the same behaviour when encountering the same situation again (Ajzen, 2002b, 2011). As such, past behaviour is, in theory and practical senses, a predictor of individuals' intentions and future behaviour.

Meta-analytic reviews suggest that past behaviour is a good predictor of related future behaviour (Ouellette & Wood, 1998; Sutton, 1998; Webb & Sheeran, 2006). Ouellette and Wood (1998) found that past behaviour had significant correlations with intention (r = .43) and future behaviour (r = .39). Empirical studies, incorporating past behaviour into the Theory of Planned Behaviour, have also found that relevant past behaviour could influence people's environmentally friendly behaviour and their consumption behaviour (Knussen & Yule, 2008; J. R. Smith, et al., 2007, 2008; Terry, et al., 1999; K. M. White & Hyde, 2012). Terry et al. (1999) reported that people who had recycled materials were more likely to have positive attitude towards recycling; and such an attitude could influence these people's current recycling behaviour through their intention. Findings from J. R. Smith et al.'s beer purchase studies (2007, 2008) supported past behaviour (whether the respondents had purchased beer before) as a predictor of both intention and actual purchasing behaviour (whether they intended to and actually did purchase beer in the given time frame). When past behaviour was added to the Theory of Planned Behaviour, the explained variance of intention increased from 49% to 58%. Knussen and Yule's (2008) survey of 252 people from Scotland regarding their recycling habits concluded that past behaviour influenced people's intention to recycle. White and Hyde's household recycling research (2012) suggested that past behaviour could be used to predict individuals' attitudes, subjective norms, perceived behavioural controls, self-identity, intentions and actual behaviour.

Hence, past behaviour is an important predictor to be incorporated into the Theory of Planned Behaviour to predict intentions and actual behaviour and will be discussed further in the next section.

2.2 Proposed Model

The main research question of this study is: What factors would make consumers take their environmental concerns into account when making purchasing

decisions? More specifically, what are the factors that influence consumers in New Zealand to buy environmentally friendly products?

Peattie and Crane (2005) suggested that greater numbers of consumers are now expressing concerns regarding the environment. However, not everyone takes such concerns into account while shopping, according to the New Zealand Household Sustainability Survey 2008 (Johnson, et al., 2008). This survey revealed that only 3% of the New Zealand households surveyed always take environmental concerns into account while shopping; 37% said they sometimes did so; and 23% reported that they hardly ever took such concerns into account. This section describes a model, which is founded on and derived from the literature reviewed, to explain the discrepancy between consumers' environmental concerns and actual purchasing behaviour. Section 2.2.1 presents the rationale for the proposal through a summary of the literature described in the previous sections. Section 2.2.2 explains the reasons for adopting the constructs included in the model and the relationships between the proposed constructs.

2.2.1 Rationale for proposing the hypothesised model

As discussed in the previous section, human behaviour is complex. The two schools of thought explain behaviour from two different perspectives. Behaviourists believe that behaviour can be conditioned by external stimuli, but this perspective cannot explain how consumers make purchasing decisions on new products when the original external settings (of the shopping environment) remain the same. Cognitivists believe that consumers make purchasing decisions based on extensive internal considerations and evaluations; however, not all decisions are made after extensive cognitive processing. Hence, assessment of the influences on consumers' purchasing decisions should address both external and internal aspects.

The Elaboration Likelihood Model provides a comprehensive model to illustrate the way people process information when making decisions and interact with the external environment. Attitudinal change is brought about through internal information processing; that is, assessing the information received from the external environment. The response can be to maintain (or reinforce) the original attitude or to change attitude. Any attitudinal change can be either short term (if information was processed through the peripheral route) or long term (if the information was processed through the central

route). The Elaboration Likelihood Model (Petty & Cacioppo, 1986) provides a framework to explain the interactions between individuals and their external environment, leading to changes (or no change) in attitude. On the other hand, the literature suggests that attitude may not be the only cognitive variable that influences behaviour. Other factors have been found and confirmed to influence attitudes and behaviour, some processed through the peripheral route, also need further investigation and explanation.

The Theory of Planned Behaviour is an over-arching theory to understand decision making and consumer behaviour from a cognitive perspective. The theory incorporates behavioural factors from various aspects (e.g. attitudinal, normative and perceived controllability) and suggests a way to integrate the factors into a conceptual model with many practical applications. The theory suggests that behaviour is an explicit expression of an individual's intentions. Intentions to do something are influenced by relevant attitude, subjective norm (i.e. injunctive norm, or the perceived expectations of others) and perceived behavioural control. The Theory of Planned Behaviour suggests that behaviour can be predicted from the relevant behavioural intention if the behaviour is under an individual's volitional control. In theory, attitude towards the behaviour, subjective norm and perceived behavioural control, can be combined collectively to form/predict behavioural intention which then predict actual behaviour. Although not every empirical study supported every proposed construct in the Theory of Planned Behaviour, the theory has significant theoretical values (as summarised above). Sutton (1998) states that expecting a model to explain 100% of variances in the real world is not realistic. In practice, an effect size equivalent to explain 10% of variance can be meaningful. According to Sutton's meta-analysis, the Theory of Planned Behaviour could explain up to 38% of the variances observed in behaviour, and up to 50% in intention, on average. Another meta-analytic review, by Armitage and Conner (2001), suggested that the Theory of Planned Behaviour explained 27% of variances in behaviour, and 39% in intention, on average, supporting the efficacy of the theory.

Other variables were also found to be influential when incorporated into the original model of the TPB, and applied to study pro-environment behaviour. The descriptive norm (i.e. the perception of the behaviour most people perform in a given situation) can be an effective peripheral cue to influence consumers' purchasing

decisions. Self-identity and past behaviour also help decision-making speed. Although these three variables were not included in Ajzen's original model (1991), several studies have integrated the variables into the Theory of Planned Behaviour and found supporting evidence.

The current study adopts the Theory of Planned Behaviour (proposed by Ajzen) as the theoretical foundation and incorporates descriptive norm (i.e. the social norm), self-identity and past behaviour to examine New Zealand consumers' purchase intentions and behaviour of environment-friendly product.

2.2.2 Proposed model and its constructs

The following subsections present and discuss factors in the proposed model. Hypotheses of the study are listed at the end of this section and illustrated in Figure 2.3.

2.2.2.1 Behaviour

The behaviour construct (BH) in the present study refers to consumers' purchasing behaviour of environmental-friendly products. The behaviour is assumed to be influenced directly by intention, perceived behavioural control, descriptive norm, self-identity and past behaviour. That is, consumers are more likely to purchase such products if they have stronger intentions to purchase, consider they have control in purchase, perceive that many people around them are buying the products, identify themselves as pro-environment, and have purchased the products previously.

2.2.2.2 Intention

In this study, the intention construct (INT) retains Ajzen's original (1991) definition and captures the motivational factors behind the target behaviour. The construct indicates the willingness of individuals to carry out the behaviour and how much effort they will exert to achieve the outcome. The construct is presumed to be a predictor of actual behaviour; that is, consumers' intentions to purchase have a positive influence on their actual behaviour. In addition, attitudes towards behaviour, the injunctive norm (i.e. the subjective norm proposed by Ajzen, 1991), perceived

behavioural controls, descriptive norm, self-identity and past behaviour are assumed to be the antecedents of the intention construct.

A predictor of actual behaviour

According to the meta-analytic reviews of the Theory of Planned Behaviour, intention can influence the actual target behaviour (Armitage & Conner, 2001; Sutton, 1998). Other consumer research studies adopted variant forms of the Theory of Planned Behaviour also generated supporting evidence for the intention–behaviour relationship (Akehurst, Afonso, & Gonçalves, 2012; Chan & Lau, 2000). Chan and Lau saw intention as a verbal commitment towards an actual purchasing behaviour, whereas the actual purchasing behaviour is that commitment in action. In other words, their definition of intention also referred to individuals' willingness to carry out the behaviour. Chan and Lau's research found that intention could predict purchasing behaviour of pro-environment products. Akehurst et al. (2102) defined environment-friendly purchasing intentions as consumers' readiness to act for the benefit of the environment. Consistent with other consumer research, Akehurst et al. also found that consumers' intentions could be used to predict actual purchase of environment-friendly products.

Intention predicted by the proposed antecedents

Intention, according to Ajzen's Theory of Planned Behaviour (1991) is formed by attitude, subjective norm (i.e. injunctive norm in nature) and perceived behavioural control. According to two meta-analyses, up to 39% (Armitage & Conner, 2001) and 50% (Sutton, 1998) of the variance in the intention construct can be explained by the three antecedent constructs Other research, which adopted the Theory of Planned Behaviour, also found that intention could also be influenced by descriptive norm, self-identity and past behaviour. The following subsections (2.2.2.3 through 2.2.2.8) present and describe the characteristics of the proposed antecedents of the intention construct in this current research project. These antecedents are presumed to influence consumers' purchasing behaviour, either directly or mediated through intention.

2.2.2.3 Attitude

The attitude construct in this study adopts the definition suggested by Ajzen (1991) and Petty et al. (Cacioppo, et al., 1981; Petty, Ostrom, et al., 1981). This conceptual construct is defined as consumers' affective predisposition towards environmentally friendly purchasing behaviour. Consumers make these decisions based on related behavioural beliefs about the target action. It is hypothesised that attitude influences consumers' purchasing intentions; that is, consumers will have stronger intentions to purchase environment-friendly products if they have a positive attitude towards the purchasing behaviour.

Derived from the literature, attitude in this study reflects a person's relevant beliefs and is also expressed as a person's affective disposition (Ajzen, 1991, 2006; Ajzen & Sexton, 1999; J. R. Smith, et al., 2007, 2008). In other words, attitude reflects the way an individual thinks and feels. However, thinking and feeling are two different concepts and according to Golden and Johnson (1983), their effects on purchasing intentions can differ. Golden and Johnson found that an advertisement that provoked an individual to think more enhanced the person's purchasing intention, but an advertisement that contained elements that affected emotion did not affect the viewers' purchasing intention as strongly. Researchers who have investigated the relationship between attitude and intention/behaviour have assessed the attitude construct by specifying whether thinking (beliefs) or feeling (affective disposition) was measured.

Kim, Lee and Hur's consumer research (2012) examined attitude towards the purchasing behaviour as it related to consumers' related behavioural beliefs. They called the belief environmental concern, which referred to a general attitude that valued protecting the environment. This attitude was based on the relative importance that individuals placed on themselves, on other people, or on the environment. The results of their online survey supported the position that environmental concern/attitude has a positive influence on purchasing intentions. That is, people who stated they were concerned about the environment had stronger intentions to purchase environment-friendly products.

Ku and Tai (2013) conducted an experiment to investigate consumers' purchasing intentions. The participants were asked to go into an e-store of DVD movies. Before participants logged into the experimental e-store, they were asked to score their

top 10 preferred movies (to collect data about a personal interest construct). After they logged in, five recommended DVDs were provided by the e-store. These recommended DVDs were generated from the participant's preferred movie list. The recommendations were controlled in the experiment (to collect data about an external subjective norm construct). After viewing these five recommendations, participants were asked to fill out a questionnaire about each recommendation. The questionnaire was designed to collect the data about Ku and Tai's remaining proposed constructs: attitude and purchasing intention. The attitude construct in Ku and Tai's research referred to consumers' positive feelings about the recommended movies. From their data, Ku and Tai concluded that attitude was the primary factor that influenced people's purchasing intentions; people who had more favourable attitudes about the purchasing behaviour had stronger purchasing intentions.

For this current study, attitude is measured using two aspects: affective feelings and related beliefs towards environmentally friendly purchasing behaviour. These two aspects are hypothesised to each have their own influence on intention because they interact differently with other constructs (Golden & Johnson, 1983). The proposed relationships between the proposed constructs are illustrated in Figure 2.3, in which the concept affections is called ATD_Affections and the concept beliefs is called ATD_Beliefs. This study hypothesises that the ATD_Affections and ATD_Beliefs constructs will have positive influences on consumers' purchasing intentions.

2.2.2.4 Injunctive norm

This study adopts Ajzen's original definition of the subjective norm (1991) for the injunctive norm construct (IN); that is, perceived expectations of relevant referents. Ajzen (2006) later suggested that the subjective norm should include both injunctive norm (the perception of what others expect or approve of) and the descriptive norm (the perception of what others do). This study treats these two conceptual constructs (i.e. injunctive and descriptive norms) separately, to study their effects separately. The injunctive norm is presumed to have a positive influence on consumers' purchasing intentions of environment-friendly products. That is, individuals will have a stronger intention to purchase such products when they perceive that they are expected by the people who are close to them to buy the products.

Consumer research investigating the relationship between injunctive norm and intention (although not based on the Theory of Planned Behaviour) found support for this relationship (Coleman, Bahnan, Kelkar, & Curry, 2011; Kim, et al., 2012). Coleman et al. conducted a survey to examine consumers' environmental-friendly consumption behaviour. They defined subjective norm as 'what is expected by others' (i.e. the injunctive norm in this study), and extended the concept to also consider the importance those surveyed attached to the expectations of others. They concluded that the subjective norms could influence purchasing intentions. That is, people, who perceive that they are expected to buy such products, and attach significance to these expectations, are likely to have stronger intentions to buy the products. Findings from Kim et al.'s study supported this injunctive norm–intention relationship.

Expectations from others offer a normative influence that affects individuals' intentions and behaviour (Ajzen, 1991, 2006; Cialdini & Goldstein, 2004; Cialdini & Trost, 1998). However, willingness to comply with the perceived expectations can also be an important factor influencing the predictive power of injunctive norms (Coleman, et al., 2011). In this study, the injunctive norm construct is measured in two aspects. One is perceived expectations; that is, whether the individuals think or *perceive* they are expected by others to purchase products friendly to the environment. The second is willingness to comply with such expectations.

2.2.2.5 Perceived behavioural control

The perceived behavioural control construct adopts the same definition by Ajzen (1991, 2002a) and Carrington et al. (2010). Perceived behavioural control refers to:

- *self-efficacy* (the beliefs relating to the ease or difficulty of performing the target behaviour)
- *perceived controllability* (beliefs relating to the extent to which the target behaviour is under the volitional control)
- *situational context* (the actual shopping environment).

Thus, perceived behavioural control is affected not only by beliefs about one's ability to perform the target behaviour, but also by the external (shopping) settings. Perceived behavioural control is hypothesised to have a direct influence on both

intention and actual behaviour. If individuals perceive no barriers to performing the behaviour and the shopping environment facilitates the behaviour, it is more likely to develop intention to purchase. Individuals are also more likely to carry out the target behaviour if they perceive that they have control over such behaviour.

Perceived behavioural control has been found to make a significant difference to both intention and behaviour (Armitage & Conner, 2001). In other words, individuals have stronger intention to carry through the action and are more likely to perform the target behaviour, *if* they perceive that they have sufficient resources and ability to do so. Further, self-efficacy has been found to have a greater correlation to intention and behaviour than perceived controllability (Manstead & Van Eekelen, 1998). Manstead and Van Eekelen argued that the correlation might be a result of the respondents' perceptions of how easy or difficult it was to perform the target behaviour (i.e. self-efficacy) as well as their ability to perform the behaviour (i.e. perceived controllability). Overall, their study supported the influences of these two factors on intention and behaviour. Even though prior studies (e.g. J. R. Smith, et al., 2008) were not able to conclude that perceived behaviour control was a significant predictor of intention and/or behaviour, J. R. Smith et al. argued that this non-significant result could have been due to the ceiling effect, i.e. the construct may still have its effect on intention but the measures were not robust enough to reveal it's true effects. In other words, they suggested that it was worthwhile to keep the variable in the model while measuring intention and/or behaviour.

Carrington et al. (2010) introduced the concept of *situational context* to the perceived behavioural control construct. The concept refers to the 'momentary contingent factors within the shopping environment that may act to block or facilitate the translation of ethical purchasee intentions into ethical buying behaviour' (p. 147). They argued that the influence of perceived behavioural control in the situational context is different from perceived self-efficacy and perceived controllability in general. Their insight explains how situational factors in the shopping environment can affect shoppers' behaviour. For example, a consumer may not usually be able to afford a specific product, but when the product is on sale, it falls within their budget. Their intention to buy the product would increase in this situation. Therefore, for this research, perceived behavioural control is measured through the following two aspects:

1.) *self-efficacy and perceived controllability*, which focuses more on *perceived* internal capability and is called PBC_Perception in the proposed model;

2.) *situational context*, which emphasises *perceived* external resources that allow consumers to undertake the target behaviour and is called PBC_Situational in the proposed model.

Figure 2.3 illustrates the proposed relationships. Conceptually measuring the perceived behavioural control from two aspects provides insights to the influences of perceived behavioural control on consumers' purchasing intention and behaviour: how the perceived self-efficacy and controllability in general influence intention/behaviour, and how such perception in a situational context would affect intention/behaviour.

2.2.2.6 Descriptive norm

Descriptive norm refers to the perception of what is commonly done in a given situation (Cialdini, 2003; Cialdini, et al., 1990). The descriptive norm construct in this current research context refers to consumers' perception of what type of products (i.e. environment-friendly or conventional) most people are buying. Ajzen (2006) included the descriptive norm in his definition of subjective norm in the Theory of Planned Behaviour, and proposed this normative influence affects behaviour, mediated (indirectly) through intentions. However, Cialdini et al. believe that normative influence could influence behaviour directly. In the current study, the descriptive norm is hypothesised to influence consumers' intentions and purchasing behaviour of environment-friendly products. That is, individuals have stronger intentions to purchase environment-friendly products, and are more likely to do so if they perceive that most people are buying such products.

Several researchers in the areas have incorporated descriptive norm into their studies (Fukukawa & Ennew, 2010; Gardner & Abraham, 2010; J. R. Smith, et al., 2007, 2008; Terry, et al., 1999). Their findings supported the descriptive norm–intention relationship, in that the behaviour of the majority has a positive influence on individuals' behavioural intentions. In meta-analyses (e.g. Armitage & Conner, 2001, etc.), descriptive norm has also been found to have predictive and has been recommended for inclusion in the Theory of Planned Behaviour (Armitage & Conner, 2001; Manning, 2009; Rivis & Sheeran, 2003). Armitage and Conner (2001) suggested that including

the construct improved the predictive power of the normative influence. Rivis and Sheeran (2003) found a strong correlation between the descriptive norm and intention. Manning (2009) discovered that the relationship between behaviour and descriptive norm was stronger than the relationship between behaviour and injunctive norm (which was the original definition of the subjective norm in the Ajzen's 1991 Theory of Planned Behaviour).

Similar to injunctive norm, normative influences have the power to make individuals conform to the majority. Therefore, this study examines the effect of descriptive norm from two aspects: perceptions of what types of products (environment-friendly or conventional) most people are purchasing; and willingness to follow the majority. The hypothesis is that consumers' intentions to purchase green products and actual purchases will correlate to perceived descriptive norm, which is a mix of the two assessed aspects (i.e. perception and compliance with the perception). That is, if consumers perceive that the majority of shoppers buy pro-environmental products, they have stronger intention and are more likely to purchase such products.

2.2.2.7 Self-identity

Social identity can be roughly defined by two perspectives: self-identity and group-identity (Berger & Heath, 2007; Rise, et al., 2010). The former refers to me-identification, which includes the meanings, expectations and activities related to the identity; the latter focuses on we-identification, which means acting on behalf of the group (Rise, et al., 2010). The present research focuses on self-identity, which is measured as the identification of the self. Self-identity is related to the way an individual identifies or sees oneself, e.g. pro-environmental or conventional. If consumers identify themselves as pro-environment, they are more likely to take environmental concerns into account when making purchase decisions; and more likely to buy products good for the environmental.

It is hypothesised that self-identity influences intentions and purchases of environmental-friendly products, i.e. individuals with stronger related self-identity have stronger intention and are more likely to buy such products The construct is named ID, as illustrated in Figure 2.3. The detail of the self-identity measurement is described in the next chapter, Methodology.

2.2.2.8 Past behaviour

Past behaviour is obviously about past purchasing behaviour; that is, whether or not the individuals have purchased pro-environment products in the past. As discussed in the literature review, past behaviour has been shown to influence intentions and behaviour (Foxall, 1997). People who have purchased pro-environment products in the past stronger intentions and are more likely to buy such products again. In this research, past behaviour is a measure of consumers' purchasing experiences and is called PB in the proposed model (see Figure 2.3). The Methodology chapter details how this construct is measured.

2.2.2.9 The proposed model and summary of hypotheses

The research aim is to identify and understand the factors that influence consumers' green purchasing behaviour, thus filling the gap identified by Johnson, Fryer and Raggett (2008), i.e. that 55% of surveyed New Zealanders considered that protecting environment was urgent, but only 3% always applied their concern to their shopping decisions. Grounded in the Theory of Planned Behaviour and the Elaboration Likelihood Model , this research sets out to examine the decision making processes when consumers considering purchases of environment-friendly products. Relevant factors are listed in H1 to H6 below and their conceptual relationships are presented in proposed model (Figure 2.3):

(H1) their purchasing intention (INT)

(H2) their perceived controllability and self-efficacy (PBC_Perception)

(H3) their awareness of situational influences while shopping (PBC_Situational)

(H4) their perceived descriptive norms (DN)

(H5) how they identify themselves (ID)

(H6) their past behaviour (PB).

Specifically, it is hypothesised that consumers' intentions (INT) to purchase pro-environment products are positively influenced by:

(H7) affections towards the purchasing behaviour (ATD_Affections)

(H8) beliefs about the purchasing behaviour (ATD_Beliefs)

(H9) perceived injunctive norms (IN)

(H10) perceived controllability of behaviour and self-efficacy (PBC_Perception)

(H11) awareness of situational influences while shopping (PBC_Situational)

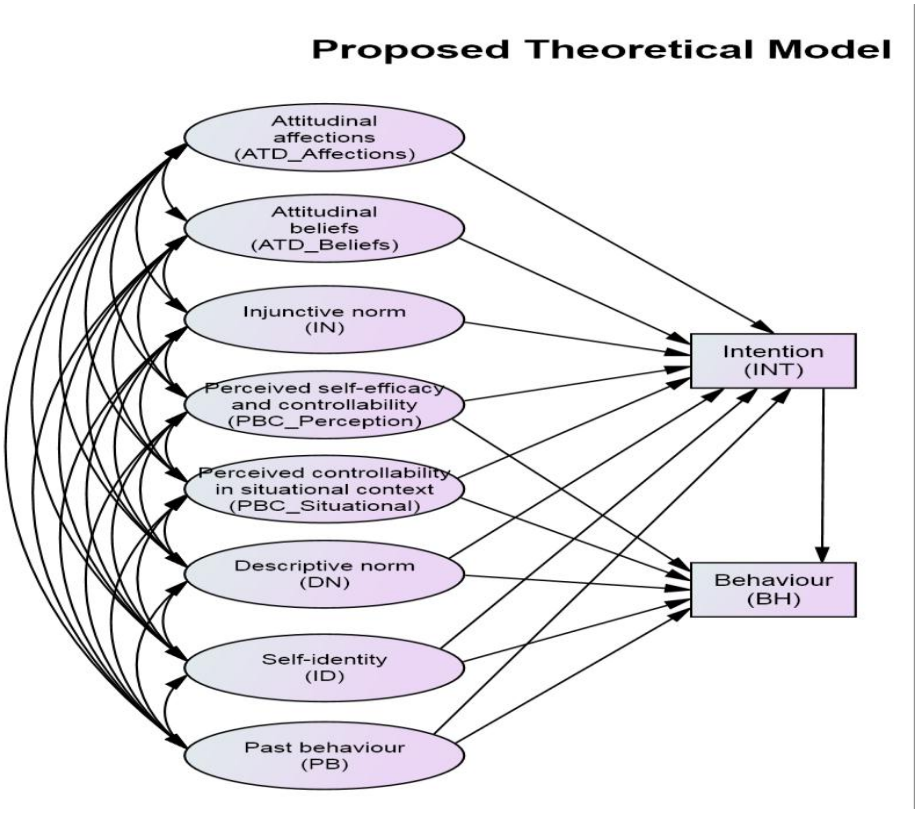
(H12) perceived descriptive norms (DN)

(H13) how they identify themselves (ID)

(H14) past behaviour (PB).

Thus, this research aims to lead to a better understanding of the purchase decision making processes regarding environment-friendly products. This understanding will allow the development of more efficient and practical marketing strategies to encourage consumers to translate their pro-environmental concerns into actual purchasing behaviour.

Figure 2.3 Proposed model (conceptual)



2.3 Summary

The current research aims to understand what influences consumers' decision to buy environmental-friendly products. This study bases its theoretical framework on the Theory of Planned Behaviour, which suggests that *actual behaviour* can be predicted from the relevant *intention*, and states that *intention* is formed by related *attitude*, *injunctive norms* (perceived expectations of others) and *perceived behavioural control*. The proposed model extends beyond the Theory of Planned Behaviour, and incorporates *descriptive norms*, *self-identity* and *past behaviour* as potential factors to predict *intentions* and *behaviour*. In sum, individuals are more likely to purchase environment-friendly products if they:

1) have related and salient intention to purchase such products
2) consider themselves capable of purchasing the products
3) perceive that people around them are also purchasing the products
4) identify themselves as buyers of this type of product or as advocates for the environment
5) have purchased environmentally friendly products in the past.

The proposed model suggests that people's intentions to purchase environmental-friendly products are influenced by their attitude, subjective norms, any perceived behavioural control, descriptive norms, self-identity and past behaviour. The following chapters present the rationale for collecting data in a specific market, New Zealand, and on a specific product, light bulb, and the approaches used to proceed the data, and test and verify the proposed model.

Chapter 3 Methodology

The main purpose of this research is to understand why people buy (or do not buy) environment-friendly products. Based on the literature review, it is hypothesised that consumers' *intentions* and *perceived behavioural control* affect such purchasing behaviour. Furthermore, buying *intention* is hypothesised to be affected by consumers' *attitude* towards the purchasing behaviour, *injunctive norms*, *perceived behavioural control*, *descriptive norms*, *self-identity* and *past behaviour*. To empirically test the hypotheses, data were collected using an online consumer survey. Research design is the main focus of this chapter, with details regarding common method variance (Section 3.1), selection of study participants (Section 3.2), instrumentation (Section 3.3), data collection procedures (Section 3.4) and data analysis strategies (Section 3.5).

3.1 Common Method Variance/Bias

Inevitably, every measuring instrument used for data collection not only obtains the construct's variance but also error variance due to the adopted measuring method(s) (Baumgartner & Weijters, 2012; MacKenzie & Podsakoff, 2012; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In other words, data collected will contain not only features of the constructs as intended, but also variances from the measuring instruments, which do not represent the constructs. The latter is called 'common method variance' (CMV, or common method bias), and can cause bias(es) in data analyses and interpretations. The effects of CMV can be on the items (i.e. reliability and/or validity of the measures in representing the constructs) and/or on co-variation between constructs. Hence, it is necessary to address potential problems to minimise possible contaminations of the data.

Measuring methods, in this context, include both the instruments adopted for data collection and data analysis strategies (MacKenzie & Podsakoff, 2012; Podsakoff, et al., 2003). Design of the instrument is relatively more important than the data analysis approach, as the instrument determines the quality of the data, i.e. capabilities of the data in representing the constructs of interest (Baumgartner & Weijters, 2012). For quantitative behavioural research, Podsakoff et al. (2003) pointed out four potential issues that can increase method bias:

- common rater effects (i.e. when data measuring predictor and criterion variables are collected from the same respondents, people tend to give *consistent* answers, rather than stating their *true* feelings and/or experiences);
- item characteristic effects (e.g. social desirability can affect how respondents answer questions, i.e. whether to state true feelings and/or experiences, or choose answers that make them look good);
- item context effects (i.e. context of the items can provide cues to respondents and affect answers);
- measurement context effects (i.e. as in the first issue above, when measures of predictor and criterion variables are collected from the same respondents at the same time, respondents would try to be *consistent* instead of providing *true* information).

The above four issues can affect respondents' comprehension of the question items, information retrieval for responses, judgement of accuracy of retrieved memories, mapping of judgements onto response categories, and/or reporting of responses. Such errors thus could bias data analyses and lead to incorrect interpretation of results.

There are various remedies for minimising potential common method bias. Podsakoff et al. (2003, pp. 886-887) suggest researchers should (1) avoid collecting measures of predictor and criterion variables from the same sources; (2) provide temporal separation of measurement; (3) protect respondents' anonymity and assure the respondents that there is no right or wrong answer (to reduce evaluation apprehension); (4) counterbalance the question order (to minimise priming effects); and (5) improve scale items (to enhance clarity and comprehension of question items).

Conway and Lance's view (2010) was also in line with Podsakoff et al. (2003), but argued that the data collected from self-reported surveys are appropriate. After reviewing published works (e.g. Chan 2009, and Skinner, 1957, as cited in Conway & Lance's review. See Conway & Lance's review 2010 for detail), they concluded that self-reported surveys could also provide accurate data but constructing a well-designed questionnaire to reduce CMV is necessary. Baumgartner and Weijters (2012) suggested that adopting items from prior research and pre-testing survey can be positive approaches to deal with CMV.

The current study employed a cross-sectional and self-administered online quantitative survey for data collection, so good questionnaire design was crucial, as discussed. In the survey design stage, precautions, similar to those discussed by Podsakoff et al. (2003) and Baumgartner and Weijters (2012), were taken to minimise measurement errors. Most of the items were adopted from prior research and items for counterbalance were included (see Section 3.3). Before launching the survey, the questionnaire was examined by the thesis supervisors, followed by two pre-tests, to ensure the questions were comprehensible to respondents and the survey was not too long to complete (see Section 3.4).

In spite of precautions taken during the questionnaire design stages, CMV is still possible and possibly inevitable (Campbell & Fiske, 1959; MacKenzie & Podsakoff, 2012). Nevertheless, Podsakoff et al. (2003) argue that if CMV is not large enough to bias data analysis, then the variance would not be considered a detrimental problem during data analysis. They recommended several statistical approaches to evaluate the severity of CMV and determine whether it would cause bias in data analysis. Since the data for this research were collected from a single survey and the questionnaire was designed and pre-tested following the recommended quality-check approach, the *controlling for the effects of an unmeasured latent methods factor* technique was deemed appropriate (Podsakoff, et al., 2003, illustrated in Figure 3.1, p.86). Section 3.5.4 describes the rationale of choosing this technique and relevant testing procedures, and results and interpretation are discussed in Section 5.5.

3.2 Selection of Participants

The target population of this research was people over 16 years of age who resided in New Zealand at the time of the survey. Limiting the target population to New Zealand residents allowed data to be drawn from a single consumer market, thus controlling for external (market) variability (e.g. product availability, public awareness, etc.), minimizing measurement errors, and also made choosing a focal product for the survey feasible. The next subsection discusses the characteristics of the selected product and the sample.

3.2.1 Product category and target population

The range of environmental-friendly products is broad. For example, a hybrid car can be considered an eco-friendly product and so can a roll of toilet paper made from recycled material. It is often a quick and easy decision for the consumer to select which toilet paper to buy, but may take much longer to decide whether to buy a hybrid car. Different types of decision processes are involved when buying different type of products and need to be taken into considerations when designing the survey. Further, a specific product category can also enhance respondents' comprehension of environmental-friendly products and reduce ambiguity of the term, and hence, reduce the impact of the potential common method variance (as discussed in Section 3.1). The focal product chosen for this study was energy-saving light bulbs, for the following reasons:

1) Light bulbs are a necessary consumer good in any household.

2) Light bulbs can be roughly categorised into two groups: traditional incandescent bulbs and energy-efficient bulbs. According to the New Zealand Energy Efficiency and Conservation Authority [EECA] (2012c), traditional incandescent bulbs consume more electricity than energy-efficient ones, for a similar level of light output. Both traditional and energy-saving light bulbs are readily available in the market. However, the energy-saving light bulbs are slightly more expensive than the traditional ones.

3) Around the time of data collection, the ENERGYWISE^{TM} programme (EECA, 2009) had run a nationwide advertising campaign to increase public awareness of energy efficiency in households. The campaign included promoting a switch from using traditional light bulbs to energy-efficient ones (EECA, 2012a, 2012d; 2012e). The main benefits given by EECA were savings on electricity bills and that reduced energy consumption is good for the environment (EECA, 2012d).

These above reasons provided an excellent backdrop for this research, as the ENERGYWISE campaign had created an ideal social setting, with enhanced consumer awareness of energy-saving light bulbs. Therefore the target population was people residing in New Zealand, presumably have been exposed to the ENERGYWISE campaign and ready access to both types of light bulbs.

3.2.2 Sample size

Sample size affects the accuracy and power of statistical analysis (Hair, Black, Babin, & Anderson, 2010; Jackson, 2003; Kline, 2011). In general, the larger the sample size, the more reliable the results, but different methods have different requirements for sample size. Given the nature of this research and resources availability, a large-sample technique, known as structural equation modelling (SEM) (Kline, 2011) was the most suitable data analysis strategy for this study (Section 3.4 includes details of the analyses). Within the SEM analysis framework, sample size requirements change as the proposed model becomes more complex, i.e. larger numbers of indicators, constructs and parameters (Kline, 2011; MacCallum, Browne, & Sugawara, 1996; Tabachnick & Fidell, 2013). Ten constructs were proposed in this study (i.e. attitudinal affections, attitudinal beliefs, injunctive norm, perceived self-efficacy and controllability, situational influences on perceived behavioural control, descriptive norm, self-identity, past behaviour, intention and behaviour) with a total of 22 indicators (to be discussed in Chapter 5). Model complexity is represented by the model's degree of freedom (*df*), which is calculated from the model's observed constructs and estimated parameters. According to MacCallum et al. (1996), a minimum sample size of 178 is sufficient if the model's *df* is 100 or above. The estimated *df* of the proposed model in this study was 174 (as illustrated later in Figure 5.14). Therefore, the minimum sample size for this research was 178. This criterion was met because the final adequate sample size of this study was 313 (Section 4.1 provides detailed characteristics of the sample, with information on data preparation in Sections 5.1 and 5.2).

3.3 Instrumentation

The present study employed a survey to collect empirical evidence to verify the proposed model. This section focuses on the indicators used to measure the proposed constructs. Table 3.1 at the end of this section summarises the rationale for adopting each indicator variable. Appendix 8 lists the common abbreviations for the indicators and constructs in this research.

The consumer survey was a self-reported questionnaire. Precautionary remedies for reducing possible common method bias (as discussed in Section 3.1) were taken into

account in the questionnaire design stage. Most of the items were measured on a seven-point Likert scale, apart from five items in the descriptive norm section, one indicator in the perceived behavioural control section, and six indicators in the demographics section (these are discussed in the following subsections). The next section focuses on the measures of the proposed constructs; that is, the measurement models of the constructs. Each subsection provides information about why the items were adopted and explains the theoretical relationships between the items and the constructs they represent. Section 3.2.1 outlines the theoretical differences between the two types of measurement model (i.e. reflective or formative), and these differences were used to define the relationships between the indicators and the constructs they represent. Sections 3.2.2 to 3.2.10 discuss the individual measurement models for each of the proposed constructs in this study.

3.3.1 Measurement model

As mentioned earlier, this study employed SEM to analyse the relationships between the proposed constructs. Diamantopoulos, Riefler and Roth (2008) define constructs as phenomena of theoretical interest, but cannot be observed directly and need to be assessed through observable indicators (e.g. question items in a survey). A model that analyses the relationships between constructs is called a structural model, while a model that examines the relationships between a construct and its respective observed indicators is known as a measurement model. Before examining a structural model (i.e. the relationships between constructs), the measurement models need to be analysed for:

- specification of causality (i.e. *reflective* or *formative* measurement models – further discussion is in the following paragraphs in this section)
- reliability and validity of the observed indicators (i.e. whether they are reliable and valid to assess their respective constructs – further discussion in Section 3.5.2).

More importantly, incorrect specifications of causality can incorrect (or biased) estimates of the measurement and structural model parameters, and erroneous conclusions on the overall model, i.e. erroneous interpretations of the relationships

between study constructs (Jarvis, MacKenzie, & Podsakoff, 2003; MacCallum & Browne, 1993).

There are two types of indicator to observe a phenomenon: *reflective* or *formative*; (Diamantopoulos, et al., 2008; Jarvis, et al., 2003; MacCallum & Browne, 1993)? Reflective indicators are an expression of the phenomena of interest; what is being measured is caused by the underlying latent construct. That is, the indicators demonstrate the effects of the construct. For example, asking people how much they like environment-friendly products is one way to measure their attitude (the latent construct), as in the Theory of Planned Behaviour (Ajzen, 1991). Formative indicators measure the phenomena that form the construct of theoretical interest. For example, how people feel about using an eco-friendly product could affect (or help form) their attitude towards the product, , as in the Elaboration Likelihood Model (Petty & Cacioppo, 1986).

The distinction between reflective and formative indicators can be hard to distinguish; a manifestation of an attitude (e.g. liking a product) can also contribute to forming or changing an attitude (i.e. the feeling the person gets from the product) (Petty & Cacioppo, 1986). Under such circumstances, Fornell and Bookstein (1982a, 1982b) recommended considering the objective of the research to decide how to specify the measurement model. When a study is intended to test a theory and explain observed variance, reflective indicators are more suitable. When trying to explain an abstract or unobserved variance (i.e. attempting to explain the formation of a conceptual phenomenon), defining observed indicators as formative is more appropriate.

According to the criteria recommended by Jarvis et al. (2003), Diamantopoulos et al. (2008) and MacCallum and Browne (1993), some indicators of the constructs in this study (e.g. injunctive norm and descriptive norm) could be considered formative. However, these indicators have been treated as reflective in this study because of the hypothesised nature of their effects, i.e. they measure the respective constructs through respondents' *perceptions* of their own attitudes and intentions, *perceived* expectations, *perceived* purchasing behaviour of the majority, and so on. In a way, these perceptions are the manifestations of the constructs to be measured, and are thus more in line with the definition of a reflective measurement model (Bollen & Hoyle, 2012; Fornell & Bookstein, 1982a; Jarvis, et al., 2003). Hence, the relationships between the observed indicators and the constructs in this study were specified as reflective.

3.3.2 Behaviour measure

In this study, behaviour refers to purchase of energy-saving light bulbs and was measured in the future tense. Five indicators were used to assess the behaviour (listed in Table 3.1 and Appendix 2). These indicators were adopted from similar studies that examined consumers' buying behaviour with the Theory of Planned Behaviour as theoretical framework. All indicators (i.e. question items) were constructed according to Ajzen's suggestions (Ajzen, 2006; Chan & Lau, 2000; Sinnappan & Rahman, 2011). Responses to each indicator were measured on a seven-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*. The relationship between the indicators and the *behaviour* was defined as reflective.

Ajzen (2006) suggested that any indicator intended to measure behaviour must include a target, action, context and time. The following example was given to illustrate these four elements: *Walking* (the action) *on a treadmill* (the target) *in a physical fitness centre* (the context) *for at least 30 minutes each day in the forthcoming month* (the time) (p. 2). The 'behaviour' indicators in this study were constructed following this requirement. For example, '*In future* (the time), *I will buy* (the action) *energy-saving light bulbs* (the target) *because they are environmentally friendly* (the context)', and '*In future* (the time), *I will buy* (the action) *energy-saving light bulbs* (the target) *even if they are more expensive than conventional ones* (the context)'. Since the main focus of the behaviour data was on purchase of energy-saving light bulbs, different contexts were included to assess whether respondents really meant to purchase the product. The completed set of questionnaire items is presented in Appendix 2 (pp. 179).

Sherman claimed (1980) that data on actual behaviour is hard to collect through a self-reported survey because responses may either be edited (internally by the respondents' memory) or require a prediction for the future. However, in later behaviour, people are likely to follow through on the predictions. The indicators of the behaviour construct in the current research, were constructed following the same rationale as in previous studies (e.g. Chan & Lau, (Chan & Lau, 2000) (Chan & Lau, 2000) (Chan & Lau, 2000) (Chan & Lau, 2000) 2000; Sinnappan and Rahman, 2011), in which reliability and validity have been established. The indicators were in the future tense, to eliminate the limitations of obtaining *behaviour* information through a one-time, self-

reported survey. However, using the future tense to ask behavioural questions meant the indicators were similar to those asked about intention, which was a separate construct in the proposed model. Thus, close attention was paid to evaluate discriminant validity between the *intention* and *behaviour* constructs and actions were taken, where necessary, to remedy problems (such as merging the indicators from the *behavioural* segment to the *intention* segment, as discussed in Section 5.3.1).

3.3.3 Intention measure

Intention refers to an individual's willingness to perform the target behaviour (Ajzen, 1991). A common belief (among consumer researchers) a higher intention indicates higher likelihood of the target behaviour. Four indicators were constructed to measure the intention construct (i.e. INT). All indicators were adopted or modified from similar research examining the relationship between purchasing intentions and behaviour. As in Ajzen (2006), Dodds, Monroe and Grewal (1991) and J. R. Smith, et al.'s (2008) studies, two of the four items, i.e. LikelyBuy and IntentBuy, measured the intention construct by asking the respondents if they intended to buy energy-saving light bulbs, with a statement like, '*The likelihood that I will buy energy-saving light bulbs is high*' (LikelyBuy). As in Ajzen (2006), Chan and Lau (2000) and EECA's (2012e) studies, the other two items, i.e. Buy4Envt and Buy4Bill, examined the respondents' purchasing motives (e.g. to protect the environment or reduce electricity bills), with a statement such as, '*I intend to buy energy-saving light bulbs because they are friendly for the environment*' (Buy4Evnt). All four variables were measured on a seven-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*.

3.3.4 Attitude measures

Attitude refers to an individual's evaluation (favourable or unfavourable) of the target behaviour (Ajzen, 1991). The evaluation can be based on relevant beliefs and expressed through emotions (J. R. Smith, et al., 2008). There are two components for attitude: affections and beliefs. In this study, ATD_Affections construct is designed to capture people's emotions and ATD_Beliefs construct is intended to capture relevant

beliefs. These two attitudinal constructs are hypothesised to have separate influences on intention.

Since both attitudinal constructs were derived from the same concept, attitude, it might be conceptually meaningful to specify them as a higher-order measurement model under the overall structural model (Byrne, 2010; Kline, 2011). A higher-order construct suggests that a higher-order latent variable (i.e. attitude in this case) mediates the influences from its sub-constructs (i.e. the latent variables of the attitudinal affections and attitudinal beliefs) to the dependent variable(s) (i.e. intention in this research). However, in the current study, the two attitudinal constructs (i.e. attitudinal affections and attitudinal beliefs) were hypothesised, conceptually, to have direct influences on intention (as mentioned in Hypotheses 7 and 8); thus, specifying these two constructs to a higher-order construct was not considered. Further, according to the results confirmatory factor analysis (see Section 5.4), these two attitudinal constructs were distinct from each other (which indicates that these two constructs are not measuring the same construct). Therefore, these two attitudinal constructs were specified in the same order as the other hypothesised antecedents to intention.

Four indicators (adjectives) were used to measure the ATD_Affections construct, by capturing respondents' emotional attitude towards the target behaviour (Ajzen, 1991, 2006). This set of measures started with a leading statement, '*For me, choosing energy-saving light bulbs would be* ___'; and the predefined adjectives were 'pleasant', 'favourable', 'a positive thing to do' and 'a wise decision'. Eight indicators for the ATD_Beliefs construct were adopted from similar research (Antil, 1984; Whitmarsh & O'Neill, 2010), with examples such as, '*Consumers should be made to pay higher prices for light bulbs that consume more energy*', '*I trust energy-saving claims made by manufacturers*', and '*The higher cost of energy-saving light bulbs encourages people to carry on buying non-energy-saving ones*'. All indicators were measured on a seven-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*.

3.3.5 Injunctive norm measure

Injunctive norm refers to an individual's perception of what he/she is expected to do by others, where the individual may choose to comply with the expectation (Ajzen,

1991), thus measured by two sub-constructs: IN_Perception (perceived expectations) and IN_Comply (and willingness to comply with such expectations).

Four indicators (i.e. INFamily, INFriends, INCoworkers and INImportantOth) of the IN_Perception construct were adopted from Smith et al.'s research (2008), e.g. '*My family thinks I should purchase energy-saving light bulbs*'. Four indicators of IN_Comply (i.e. INBeingSeen, INFamilyInflu, INFriendInflu and INCoworkerInflu) were modified from (Bearden, Netemeyer, & Teel, 1989; Whitmarsh & O'Neill, 2010) studies, e.g. '*If other people can see me using a product, I often purchase the brand they expect me to buy*'. Again, injuctive norm indicators were measured on a seven-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*. The presentation order of this set of items (see Table 3.1) was revised after pilot studies (as discussed in Section 3.4).

After verifying reliability and validity of the indicators of the IN_Perception and IN_Comply constructs (reliability and validity checks are discussed in Section 3.5), a product term was created for the injunctive norm construct, by multiplying IN_Percepion and IN_Comply, as suggested by Ajzen (2006). The product term, IN, was then used in further analysis, i.e. testing the influence of injunctive norm in the proposed model.

3.3.6 Perceived behavioural control measures

Perceived behavioural control (PBC) refers to a person's perception of whether they *can* carry out the target behaviour (Ajzen, 1991), and is derived from perceived self-efficacy and/or the actual shopping environment, defined as 'situational context' in this research. Two measures were used to assess the *perceived behavioural control* construct. PBC_Perception assessed self-efficacy (whether respondents believed the target behaviour was ease or difficulty, i.e. beliefs about their own capacity to carry out the target behaviour) and perceived controllability (whether respondents believed they were had control over their performance of the target behaviour). PBC_Situational assessed control beliefs about the situational context, i.e. external forces.

Four indicators of the PBC_Perception construct were adopted and modified from prior research with established similar measures (Abrahamse & Steg, 2011; Carrington, et al., 2010; Cleveland, Kalamas, & Laroche, 2005; J. R. Smith, et al., 2008); for

examples, '*It is easy for me to find energy-saving light bulbs whenever I need to buy them*', and '*Energy-saving light bulbs are affordable for me in terms of my purchasing budget*'. Five indicators of the PBC_Situational construct were derived according to Carrington et al.'s suggestion. These measures started with a statement: '*While purchasing light bulbs, ___ (the factors below) usually affect my purchasing decision*', followed by five predefined options (e.g. '*affordability*' and '*availability in store*'). All nine indicators were measured on a seven-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*.

One extra item (i.e. PBC_Perception_da) was included for respondents who were willing to pay more for energy-saving light bulbs. EECA (2012b) states that although energy-saving light bulbs are more expensive than conventional equivalents, electricity bills will become lower after the switch over. One study found that consumers were unwilling to pay a premium for environment-friendly products (Michaud & Llerena, 2011). However, another study suggested that consumers would pay more for pro-environment products if the purchases contributed to enhanced reputation (Griskevicius, et al., 2010). Thus, gathering information about how much extra respondents were willing to pay would be helpful to empirically test the two sides of the argument. This item was not rated on a seven-point Likert scale; instead, a sliding scale, ranging from NZ$0.50 to NZ$10.00 (the price range suggested in EECA, 2012b) was used to measure how much respondents were willing to pay for an energy-saving light bulb.

3.3.7 Descriptive norm measures

Descriptive norm refers to an individual's perception of how other people act in a given situation, and tendency to follow such behaviour (Cialdini, et al., 1990). Two sub-constructs assessed the descriptive norm construct: DN_Perception captured perceptions of what others were buying and DN_Comply assessed tendencies to follow what others are doing.

All five indicators of the DN_Perception construct were modified from the study by Cialdini et al. (1990). These five items were measured on a sliding scale of 0–100% so that respondents could show what they perceived people in respective social groups were buying. The respondents were asked to drag a marker along the percentage slide to indicate their perceptions, with a 'don't know' option at the end. This set of items was

preceded by a statement '*Thinking about the following groups, I assume that about __% of them generally purchase energy-saving light bulbs*', then presented with the five predefined groups, i.e. '*My neighbours*', '*My family members*' and '*Other shoppers*').

The three items in the DN_Comply measure were adopted from Lennox and Wolfe's study (1984), in which respondents were not asked directly about purchase willingness, but instead awareness of surroundings was measured. Nolan et al.'s study (2008) illustrated the problem of asking the 'follow the majority' question (as described in Section 2.1.4.2). Three indicators adopted included: '*When I am uncertain which light bulb is better in a store, I look to other people's product choice for clues*', '*If I am uncertain as to how to act in public, I look to the behaviour of others for cues*', and '*It's important to me to fit into the social group I'm with*'. The three items were measured on a seven-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*.

As recommended by Ajzen (2006) and similar to the *injunctive norm*, a product term for measuring descriptive norm was created by multiplying DN_Perception and DN_Comply, after confirming the reliability and validity of the items (to be discussed in Section 3.4). The product term, DN, was used in subsequent analyses, i.e. model testing.

3.3.8 Self-identity measure

As self-identity refers to the roles that individuals attach to themselves in highly differentiated societies, people are likely to behave in congruence with these roles. Six indicators to assess the self-identity construct (i.e. ID). Four indicators were adopted from research exploring the relationship between consumer behaviour and self-identity, through statements such as, '*I consider myself an energy saver*' and '*I see myself as a typical buyer of energy-saving light bulbs*'. Two indicators (i.e. GreenBuyer and EnvtResponb) were borrowed from the *green consumer values* measure developed by Haws, Winterich and Naylor (as cited in Bearden, Netemeyer, & Haws, 2011, p. 173). They were, '*It is important to me that the products I use do not harm the environment*', and '*I would describe myself as environmentally responsible*'. The six indicators were measured on a seven-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*.

3.3.9 Past behaviour measure

As noted in the Literature Review section, past behaviour is predictive of future behaviour, as individuals tend to behave the same way as they have in the past. Three indicators were used for the past behaviour construct, all adopted from similar research (Gardner & Abraham, 2010; Norman, 2011; J. R. Smith, et al., 2008):

- '*When I last purchased a light bulb, I deliberately chose one with energy-saving claims*',
- '*During the past 12 months, I generally purchased energy-saving light bulbs whenever there was this option*', and
- '*During the past 12 months, choosing energy-saving light bulbs is something I have done automatically*'.

The three indicators were measured on a seven-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*.

3.3.10 Demographics

In addition, the survey collected demographic information from respondents including *residency*, *age*, *gender*, *education*, *occupation* and *income*. Since the target population was New Zealand residents, the residency question screened out people who were not in New Zealand, using only two options: '*New Zealand*' and '*Outside New Zealand*'. The age question was designed to eliminate those who were under 16. The rest of the options (i.e. '*16–25*', '*26–35*', '*36–45*', '*46–55*', '*56–65*' and '*over 65*') were used to compare the sample with the target population (all New Zealanders). The rest of the demographic variables (i.e. gender, education, occupation, and income) were collected for the same reason.

3.3.11 In summary

The instrument used to collect data was a self-reported questionnaire, in which most of the items were adopted from prior research. The questionnaire contained 61 questions collecting demographics and information for further model testing (i.e. attitudinal beliefs, attitudinal affections, perceived expectation from others, willingness to follow those expectations, perceived self-efficacy and controllability, perceived

controllability in situational context, perceived majority, tendency to fit in with the perceived majority, self-identity, past behaviour, intention and behaviour). One question assessed how much a consumer would be willing to pay for energy-saving light bulbs. Table 3.1 summarises the rationales used for each adopted indicator/item. The next section discusses data collection procedures and related issues.

Table 3.1 Rationale of item adoption

Construct	Description	Source	Indicators/Items
BH	Measure of an individual's future purchasing behaviour regarding energy-saving light bulbs. Measured on: 7-point Likert scale	Ajzen (2006) – 2 items Chan and Lau (2000) – 1 item Sinnappan and Rahman (2011) – 2 items	Please indicate to what extent you agree or disagree with the following statements. a. In future, I will buy energy-saving light bulbs because they are environmentally friendly. b. In future, I will buy energy-saving light bulbs even if they are more expensive than conventional ones. c. In future, I will buy energy-saving light bulbs to reduce my electricity bills. d. In future, when I buy light bulbs, I will look at product information to see if it saves energy. e. In future, I will switch over to buying energy-saving light bulbs.
INT	Measures of an individual's intention regarding purchasing energy-saving light bulbs. Measured on: 7-point Likert scale	Dodds et al. (1991) – 1 item Ajzen (2006); Chan and Lau (2000) – 1 items Ajzen (2006); Smith et al. (2008) – 1 item Ajzen (2006); EECA (2012c) – 1 item	The following questions are to explore your intention in purchasing energy-saving light bulbs. Please indicate to what extent you agree or disagree with the following statements. a. The likelihood that I will buy energy-saving light bulbs is high. b. I intend to buy energy-saving light bulbs because they are friendly for the environment. c. I intend to buy energy-saving light bulbs to reduce my electricity bills. d. I do NOT intend to buy energy-saving light bulbs even if they are available in the market.

Construct	Description	Source	Indicators/Items
ATD_ Affections	Assesses an individual's favourable or unfavourable appraisal of purchasing energy-saving light bulbs. Measured on: 7-point Likert scale	Ajzen (1991) – 4 items	For me, choosing energy-saving light bulbs would be ____. a. pleasant b. favourable c. a positive thing to do d. a wise decision
ATD_ Beliefs	Measures an individual's belief-based attitude regarding purchasing energy-saving light bulbs. Measured on: 7-point Likert scale	Antil (1984) – 4 items Whitmarsh and O'Neill (2010) – 2 items A. do Paço (personal communication, April 21, 2011) – 2 items	a. Consumers should be made to pay higher prices for light bulbs that consume more energy. b. Commercial advertising should be forced to mention ecological disadvantages of non-energy-saving light bulbs. c. I trust energy-saving claims made by manufacturers. d. It would be wise for the government to devote more money towards supporting a strong energy-saving programme. e. The light bulbs that consume more energy should be heavily taxed by the government. f. Paying more (more than conventional ones) for energy-saving light bulbs is acceptable. g. The higher cost of energy-saving light bulbs encourages people to carry on buying non energy-saving ones. h. I trust an ecolabel issued by an independent third party, e.g. Energy Star.
IN_ Perception	Assesses how an individual perceives the expectations of others regarding purchasing energy-saving light bulbs. Measured on: 7-point Likert scale	Smith et al. (2008) – 3 items Whitmarsh and O'Neill (2010) – 1 item	a. My family thinks I should purchase energy-saving light bulbs. b. My friends think that I should purchase energy-saving light bulbs. c. My co-workers think I should purchase energy-saving

Construct	Description	Source	Indicators/Items
			light bulbs. d. In general, I think the views of people who are important to me are favourable towards my purchasing energy-saving light bulbs.
IN_ Comply	Measures to what degree the individual's purchasing decisions are influenced by the expectation mentioned by IN_Perception. Measured on: 7-point Likert scale	Bearden, Netemeyer, and Teel (1989) – 1 item Withmarsh and O'Neill (2010) – 3 items	e. If other people can see me using a product, I often purchase the brand they expect me to buy. ___ (the groups below) have much influence on my decision to purchase (or not purchase) energy-saving light bulbs. Please indicate to what extent you agree or disagree with the following statements. a. My family b. My friends c. My co-workers
PBC_ Perception	Assesses an individual's perceived self-efficacy and controllability regarding purchasing energy-saving light bulbs. Measured on: 7-point Likert scale	Smith et al. (2008); Terry et al. (1999) – 1 item Abrahamse and Steg (2011) – 1 item Carrington et al (2010) – 1 item Cleveland, Kalamas, and Laroche (2005) – 1 item	a. It is easy for me to find energy-saving light bulbs whenever I need to buy them. b. Energy-saving light bulbs are affordable for me in terms of my purchasing budget. c. High time demands on me made it much harder to purchase energy-saving light bulbs on my last visit to the store. d. I would be willing to spend more (more than conventional ones) to purchase energy-saving light bulbs.
PBC_ Perception_da	Measures how much additional money consumers are willing to pay for energy-saving light	Developed for use in this study	While choosing an energy-saving light bulb over a conventional one, how much extra are you willing to pay? (Please position the button of the slide to indicate how much

Construct	Description	Source	Indicators/Items
	bulbs. Measured on: Sliding scale, ranging from NZ$.50 to NZ$10, indicating the extra amount the individual is willing to pay.		extra you are willing to pay)
PBC_ Situational	Measures an individual's awareness of their reasons for their purchasing decision. Measured on: 7-point Likert scale	Carrington (2010) – 5 items	While purchasing light bulbs, ___ (the factors below) usually affect my purchasing decision. a. Concerns for the environment b. Sufficient product information c. Affordability d. Availability in store e. Product quality
DN_ Perception	Measures the individual's perceptions about the purchasing behaviour of various groups. Measured on: Sliding scale, ranging from 0% to 100%, to indicate level of agreement with the statement.	Developed for use in this study, concept based on Cialdini et al (1990)	Thinking about the following groups, I assume that about ___% of them generally purchase energy-saving light bulbs. (Please position the button of each slide to indicate your estimated percentage.) a. My neighbours b. My family members c. My fiends d. My co-workers e. Other shoppers

Construct	Description	Source	Indicators/Items
DN_ Comply	Measures the influence of descriptive norms on an individual's behaviour, as observed by the individual. Measured on: 7-point Likert scale	Lennox and Wolfe (1984) – 3 items	The following questions are to explore your interaction with others. Please indicate to what extent you agree or disagree with the following statements. a. When I am uncertain which light bulb is better in a store, I look to other people's product choice for clues. b. If I am uncertain as to how to act in public, I look to the behaviour of others for cues. c. It's important to me to fit into the social group I'm with.
ID	Assesses an individual's self-identity. Measured on: 7-point Likert scale	Smith et al. (2007) – 2 items Terry et al. (1999) – 2 items Haws, Winterich and Naylor's green consumer values scale (2010; as cited in Bearden, Netemeyer & Haws, 2011) – 2 items	The following questions are to explore how you see yourself, from the perspective of being eco-friendly, not limited to purchasing energy-saving light bulbs, unless specified. Please indicate to what extent you agree or disagree with the following statements. a. It is important to me that the products I use do not harm the environment. b. I consider myself as an energy saver. c. To conserve energy is an important part of who I am. d. I see myself as a typical buyer of energy-saving light bulbs. e. I am NOT the type of person oriented to purchase energy-saving light bulbs. f. I would describe myself as environmentally responsible.

Construct	Description	Source	Indicators/Items
PB	Measures an individual's past purchasing behaviour regarding energy-saving light bulbs. Measured on: 7-point Likert scale	Gardner and Abraham (2010) – 1 item Smith et al. (2008) – 1 item Norman (2011) – 1 item	The following questions are to explore how you made your light bulb purchasing decision in the past. Please indicate to what extent you agree or disagree with the following statements. a. When I last purchased light bulbs, I deliberately chose one with energy-saving claims. b. During the past 12 months, I generally purchased energy-saving light bulbs, whenever there was this option. c. During the past 12 months, choosing energy-saving light bulbs is something I do automatically.

3.4 Data Collection Procedures

Data collection and related issues are the main focus of this section. A Low Risk Notification was sought and obtained from the Massey University Ethics Committee in September 2011. The proposed method of data collection was confirmed to comply with the Code of Ethical Conduct for Research Involving Human Participants (Massey University, 2010). As mentioned earlier, the instrument for data collection was constructed on the internet. In the next section, the reasons for employing a web-based survey are discussed, followed by a description of the pilot studies, survey distribution, and the method used to recruit the survey participants.

3.4.1 Web-based survey

Accessibility was the main consideration when choosing the internet as the channel for data collection. Web-based surveys can be accessed by the target respondents at times and places that suit them, as long as the respondents have access to the internet (Cheyne & Ritter, 2001; Sax, Gilmartin, & Bryant, 2003). Further, the information provided by the respondents can be saved directly into a database. This auto-saving function of web-based surveys saves respondents time and effort. Other benefits are that respondents do not need to post back the completed questionnaires and data entry errors are reduced.

However, using a web-based survey gives rise to potential bias and threats. According to Sax et al. (2003), people may (1) treat such survey emails as junk mail, (2) be concerned about their privacy and confidentiality (especially when they know there will be a follow-up questionnaire), (3) not check their email often, (4) not have access to the internet, and/or (5) drop out from the survey due to the survey length. These issues were considered when designing the survey and actions for eliminating or reducing these biases were taken. A survey agent was hired to increase the sample size (see Section 3.4.3 for details), as an effort to reduce the impacts from issue 1. To reduce participants' concerns for privacy and confidentiality (issue 2), a statement saying '*Your participation is anonymous*' was placed at the beginning of the questionnaire and there was no follow-up survey (this meant the indicators for collecting the behaviour

construct needed to be adjusted, as discussed earlier in Section 3.3.2). Issues relating to internet usage were not a major concern in this study, as New Zealanders' internet usage is high (see the detail in the next paragraph). Two actions were taken to prevent respondents from dropping out of the survey because of its length: the numbers of items was minimised through running pilot studies (see Section 3.4.2); and the group questions were numbered so that respondents could see how much they had already completed (e.g. '5/18' indicated that the question was 5th out of the total of 18 groups; see Appendices 1 and 2 for details).

P. Smith et al. (2011) reported that New Zealanders' internet usage has been increasing since 2007. They noted that in 2011, 86% of New Zealanders were internet users, compared to 62% in 2007, and only about 20% of New Zealanders considered that the internet was not important in their daily lives in 2011. Further, 98% of internet users checked their emails. Therefore, launching a survey on the internet in New Zealand was considered practical. The web-based version of this questionnaire was constructed using Qualtrics, an online survey tool.

3.4.2 Pilot studies

As discussed in Section 3.1, expert evaluation of the questionnaire and pre-testing the questionnaire before launching the survey are recommended strategies for reducing potential common method variance, which may bias data analyses (Baumgartner & Weijters, 2012; MacKenzie & Podsakoff, 2012; Podsakoff, et al., 2003). The main purposes of the pilot studies were to (1) ascertain whether the items in the questionnaire were comprehensible to the respondents, (2) estimate the completion time required for the questionnaire, and (3) solicit feedback regarding improvement of the study. This section summarises how the pilot studies were conducted, the comments that were received and the changes that were made.

3.4.2.1 Prior to the pilot studies

The questionnaire was evaluated by the thesis supervisors, who raised the following concerns:

1) There were six reversed items in the questionnaire, such as, '*I do NOT intend to buy energy-saving light bulbs even if they are available in the market*', in the *past behaviour*, *intention*, *self-identity* and *descriptive norm* measures. According to Weems, Onwuegbuzie, Schreiber and Eggers (2003), reversed items can confuse respondents. In this current study, the purpose of having the reversed items was to ensure that respondents answered the questions with real responses. Hence, these six items were retained in the questionnaire, but close attention was paid to these items during the pilot studies, to ensure they were comprehensible.

2) To avoid respondents becoming fatigued or dropping out of completing the questionnaire, the original 104 items in the first draft were screened for repetitive and/or similar items, reducing the total number of items for the first pilot study to 74 (including six items under the demographic section).

3) Each construct in the questionnaire should have at least three but no more than five items, to ensure data quality.

3.4.2.2 Pilot study 1

In November 2011, 11 invitations to participate in the pilot study were emailed to friends of the researcher. Eight of them provided feedback regarding the questionnaire. The average survey completion time was 18.4 minutes. Two of the eight respondents said they felt the questionnaire was too long; one needed more time to comprehend the double-negative questions; and two said some questions seemed repetitive.

The following changes were made in accordance with these comments:

1) An introduction sentence was added to each set of items to explain what information the measure expected to collect. To minimise the perception of repetitiveness, items measuring different constructs were put into different sections.

2) The grouped items were re-numbered, changing from '*1, 2, 3 …*' to '*a, b, c …*'.

3) A total of four reversed items (one per scale) were removed from the past purchasing behaviour scale, the self-identity scale, the perceived behavioural control scale and the descriptive norm scale. One item was added to the past purchasing behaviour scale, to ensure there were at least three items in that construct, to ensure data quality.

4) One item was removed from the *behaviour* section due to its similarity to another item under the same construct.

These amendments reduced the number of reversed items (from six to two) and the total number of items (74 to 70 – including the 6 demographic items), and at least three items were retained under each construct.

3.4.2.2 Pilot study 2

A link to the revised questionnaire was emailed out to another 10 friends who had agreed to take part in the pilot studies. Seven of them provided feedback regarding the questionnaire. The average completion time was 16.3 minutes. The main issue raised was repetitiveness; three respondents felt several items seemed to be asking similar things. No one reported an issue with the reversed items, nor did they think the questionnaire was too long.

Actions taken in response to their feedback were as follows:

1) Nine items were removed, due to their similarity to other items: one from the intention scale, two from the descriptive norm scale, two from the self-identity scale, two from the attitude scale, and two from the behaviour scale.

2) The items in the behaviour scale were reworded by adding the phrase 'In future, I will…', as in Ajzen's paper (2006). The aim of this rephrasing was to differentiate the items in the purchasing behaviour scale from the ones in the intention scale. Although the items in these two sections were similar, asking about purchasing behaviour, one section was focused on respondents' intentions to buy and the other on whether they actually buy (or would buy).

3) One item was added to the behaviour scale because the removal of one item meant there were only four items left in the scale and the advice was that having five items under a construct would work better for statistical analysis.

Thus, one further item that was not similar to the existing items under the construct was adopted from relevant published research (Chan & Lau, 2000), bringing the total number of items to measure the *behaviour* construct to five.

These amendments further reduced the number of items in the questionnaire from 70 to 62. Fifty-five items were designed to test the hypotheses, one item was to identify how much more people were willing to pay for energy-saving light bulbs, and six items were to collect demographic information (one of these screened out those not residing in New Zealand). These 62 items (see Appendix 2) were now ready for the data collection phase.

3.4.3 Survey distribution: Social network and research agent

The data collection commenced in December 2011 and continued until February 2012. An ideal valid sample size (i.e. valid for testing the proposed model) for this study was at least 300 participants (as discussed earlier in Section 3.2.2). Therefore, two distribution channels were employed to recruit as many participants as possible: social networks and using a research agent.

3.4.3.1 Social networks

The social networks channel in this study included emails and posts to Facebook pages. According to P. Smith et al. (2011), more than 90% of internet users in New Zealand checked their email at least weekly, 64% of internet users belonged to a social networking site, and 96% of people using social networks used Facebook the most. Others identified using LinkedIn, Twitter, YouTube, Bebo and other sites.

Invitations to take part in the survey were emailed to friends and associates who resided in New Zealand and were suitable respondents, and they were asked to 'snowball' the survey within their own networks (the invitation is shown in Appendix 3). A similar approach was taken on Facebook, with an invitation message posted on Facebook pages that were New Zealand based and allowed the survey invitation message to be posted on their wall. This included both an invitation to complete the

survey and encouragement to spread the survey link by posting the message to personal Facebook walls.

3.4.3.2 Research agent

Research First (a research agent based in Christchurch, New Zealand), was hired to distribute the survey to a wide range of consumer panels nationwide, with a targeted completion rate of 300 to 400 respondents.

Data collection ended in February 2012. During the survey period (December 2011 to February 2012), 401 people who resided in New Zealand completed the survey. All 401 responses were accepted because: (1) it was thought that the non-return rate could increase over time, especially during the last month; (2) the research had a time limit, with a required completion date of 2013; and (3) the research budget was limited.

3.5 Data Analysis Strategies

The research employed structural equation modelling (SEM) to test the fit of the proposed theoretical model. The order of this section follows the flow of steps taken to analyse the data.

First, the dataset was screened for missing data and normality (the rationales for the screening are described in Section 3.5.1). Next, scale reliability, which focuses on the relationships between the sets of items and the constructs they represent (see Section 3.5.2), was checked. Confirmatory factor analysis was then performed to examine the discriminant validity of the proposed scales (see Section 3.5.3). Common method variance/bias would be inspected before testing the model (see Section 3.5.4). Finally, the scales were put together in the proposed model and tested via SEM (see Section 3.5.5).

SPSS 20.0 and AMOS 20.0 were used for the data analysis. SPSS is a statistical analysis and data management programme (Allen & Bennett, 2012). The programme is used to (1) store the data collected from the consumer survey; (2) perform preliminary data analysis (see Section 3.5.1); and (3) review the dimensionality and reliability of the sets of observed variables (see Section 3.5.2). AMOS (analysis of

moment structure) is software designed to undertake analysis using SEM (Arbuckle, 2011). It is a user-friendly programme with a graphical interface (Byrne, 2010; Cunningham & Wang, 2005) and can inspect convergent and discriminant validities (see Sections 3.5.2–3.5.3), common method variance/bias (see Section 3.5.4) and model fit (see Section 3.5.5)

3.5.1 Missing data and data distribution

Missing data and *normality* are discussed in this subsection, with Section 3.5.1.1 addressing issues regarding missing data; Section 3.5.1.2 outlining the criteria of evaluating normality at univariate level; and Section 3.5.1.3 presenting the criteria of assessing normality at the multivariate level. The rationales for the proposed solutions to problems found through the screening are delineated at the end of the respective subsections.

3.5.1.1 Missing data

Missing data is a common problem in self-reported surveys, caused by some survey respondents not responding to all items in the questionnaire. This can severely distort the statistical results (Tabachnick & Fidell, 2013). One common solution is to delete cases that contain missing data; however, this can lead to reduced sample size, which can affect statistical power. Therefore, the removal of cases needs to be minimised to avoid distorting the analysis results.

Tabachnick and Fidell (1996, 2013) pointed out that the seriousness of the problem depends more on the patterns of missing values in a dataset than on the number of missing cases. There are three patterns of missing data: *missing at random* (MAR), *missing completely at random* (MCAR), and *missing not at random* (MNAR). The first two patterns (MAR and MCAR) are not systematic, which means missing values can be imputed from the existing data without distorting the statistical results severely (Little, 1988). Thus, these two types of missing data can be ignored. However, MNAR is systematic, which means that the missing values are related to the variable itself. Removing these variables from the dataset and/or imputing the missing values can distort the analytic results in statistics (Tabachnick & Fidell, 2013). Missing data that

has a pattern of MNAR should not be ignored; that is, a close attention should be paid to find out the reasons of obtaining the missing data.

A total of 401 people participated in the survey (called dataset A). However, 40 of them completed less than 2% of the questionnaire, and they were removed from the dataset, leaving 361 cases (i.e. N=361, dataset B). Out of the 401, 62 had less than a 40% completion rate; there would be 339 cases left if these 62 cases were removed (i.e. N=339, dataset C). Out of the 401, 69 had less than a 60% completion rate; there would be 332 cases remaining if these 69 cases were removed (i.e. N=332, dataset D). The datasets were inspected for missing data patterns.

Tabachnick and Fidell (1996, 2013) suggested two tests for inspecting and identifying missing data to determine whether or not it can be ignored: *t-tests* and *Little's MCAR* test (Little, 1988). Both of these tests were performed in SPSS 20.0.

t-tests

The rationale for applying *t-tests* is to find out whether the missing data in a dataset would have a statistically significant impact, by comparing mean differences between two sub-datasets that are divided from the main dataset (Tabachnick & Fidell, 1996). The test requires one item to be chosen at random from the main dataset (e.g. *income*), then the dataset is split into two sub-datasets, one being cases with data income (Group X) and the other being cases without income data (Group Y). After the division, a *t-test* is performed to compare the mean differences of another randomly chosen variable (e.g. item *PB_a*) between Group X and Group Y. If the result of the comparison suggests that the difference is statistically significant (i.e. the *p*-value of the comparison is less than .05), the implication is that the pattern of the missing data in the dataset is MNAR. If no statistically significant difference between the two sub-datasets is found (i.e. the *p*-value of the comparison is greater than .05), the pattern of the missing data in the dataset could be MAR or MCAR.

Tabachnick and Fidell's suggestion of conducting a *t-test* to assess missing data was made in 1996. The *t-test* can only compare two variables at a time (i.e. the variable for division and the variable for comparison). The results of the pair of variables may be shown as non-significant; but such results may not be applicable to other variable pairs

in the same dataset. However, pairing every variable in the dataset and performing the *t-test* on each would have been an overwhelming task for this study, since there were 61 items (excluding the item that was used for residency screening) in the questionnaire. Therefore, Little's MCAR test was recommended.

Little's MCAR test

Little's MCAR test is performed by the missing values analysis (MVA) function in SPSS. The assumption of Little's MCAR test is that the pattern of the missing data will be *missing completely at random* (Little, 1988). This test aims to inspect the discrepancy between the assumption and the sample population. A desired result is that the discrepancy is not statistically significant (i.e. the *p*-value of the discrepancy is greater than .05), which would indicate that the missing data is MCAR and implies that the missing data can be imputed from existing data (Little, 1988; Tabachnick & Fidell, 2013). However, when the *p*-value of the discrepancy is less than .05, it implies that the pattern of missing data in the sample population is either MAR or MNAR. Another test (e.g. the *t-test*, as above) that is able to tell if the pattern is MNAR, should be carried out to define whether the missing data in the data is not ignorable and cannot be imputed from existing data in the dataset.

The three different datasets for this study (B, C and D) were inspected for their patterns of missing data. According to the results of the Little's MCAR test, the pattern of missing data in dataset D (N=332) was MCAR and therefore, this was the best of the three examined sets to use. The MCAR result suggested that the missing data in the dataset D could be imputed from the other observed variables without causing distortion in the data analyses.

Solution for missing data

This study employed the *expectation maximisation* (EM) method to impute the missing data, using SPSS. The EM method is said to offer a less biased analysis for a dataset with imputed values, when the missing data are either MAR or MCAR (Graham, Hofer, Donaldson, MacKinnon, & Schafer, 1997; Little, 1988; Tabachnick & Fidell, 2013). There are two steps in the EM method for imputing the missing data: *expectation* and *maximisation*. The *expectation* (E) step predicts missing values from the observed data by a series of regression analyses. The *maximisation* (M) step performs the maximum likelihood (ML) estimation, to estimate the likelihood of the predicted scores

from the E step in substituting the missing characteristics in the dataset. These two steps are repeated until convergence is achieved (Kline, 2011; Schafer & Graham, 2002; Tabachnick & Fidell, 2013).

Therefore, the missing data in this study's N=332 dataset were imputed by the EM method first, before moving on to the next step (i.e. checking the normality of the data distribution). Unless specified, the data used for the following data analyses would be N=332, the missing data imputed by the EM method.

3.5.1.2 Univariate normality

Most estimation techniques in SEM assume that the data is normally distributed, especially at multivariate level (Arbuckle, 2011; Byrne, 2010). Before screening for normality at the multivariate level, the *univariate normality* of the data is examined. At the univariate level, outliers and each item's distribution are the main focuses. The outliers are inspected through the *z* scores of the proposed variables/items. Data distribution is examined via the variables' skewness and kurtosis.

Univariate outliers

A univariate outlier refers to a case with an extreme value (Tabachnick & Fidell, 2013). Outliers may distort the interpretation of data. An outlier can be screened out from the *z* scores of the variables. A *z* score refers to a variable's standard deviation above or below the variable's mean. Tabachnick and Fidell suggested that cases with absolute values of *z* scores larger than 3.29 can be considered as potential outliers. The causes of a univariate outlier can be that (1) the case is not from the targeted population (e.g. in this study, the respondent is not a New Zealand resident); (2) the value is a typographical (e.g. data entry) error; or (3) the case is from the targeted population but has an extreme value compared to other cases in the sample.

Determining the cause of the outlier depends on the researcher's knowledge. A common solution for reducing the impact of univariate outliers, if the cause of the outlier is not one of issues mentioned above, is to assign a raw score on the offending variables of the outlying cases to a less extreme value (e.g. from *7-strongly agree* to *6-agree*, or from *1-strongly disagree* to *2-disagree*, on a 7- point Likert scale) (Kline, 2011; Tabachnick & Fidell, 2013). An argument for this action is that it may result in

obtaining a bias conclusion due to the original value being revised. However, Tabachnick and Fidell argued that this action is acceptable in a self-reported Likert scale because the reported strength of an item is artificial, similar to the points predefined in the scale (which are defined by researcher).

Univariate data distribution

Skewness and kurtosis are two common statistical components used to inspect a variable's distribution at the univariate level. Skewness illustrates the symmetry of a variable's distribution and kurtosis reveals the peakedness of the distribution (Kline, 2011; Tabachnick & Fidell, 2013). In a normal distribution, both the values of skewness and kurtosis should be close to zero. Negative skew indicates that the distribution of the variable has a long left tail in its distribution, and positive skew indicates that the variable has a long right tail in its distribution. Positive kurtosis (i.e. leptokurtic) suggests that the variable has a higher peak and heavier tails, and negative kurtosis (i.e. platykurtic) suggests that the variable has a flatter peak and lighter tails. Tabachnick and Fidell (2013) suggested data transformation if the data is not normally distributed, and especially when significant skewness is found.

The significance of a variable's skewness can be inspected through the *z* score of the variable's skewness (Hair, et al., 2010; Tabachnick & Fidell, 2013). The formula for calculating the *z* score of skewness is as follows (where *skewness* refers to the obtained skewness value, and *N* refers to the sample size):

$$Z_{\text{skewness}} = \frac{Skewness - 0}{\sqrt{\frac{6}{N}}}$$

A variable can be considered significantly skewed if its skewness *z* score is greater than ±3.29 (Tabachnick & Fidell, 2013). There is not yet a conclusive clear-cut standard for kurtosis. However, Kline (2011) suggested that an absolute value of kurtosis less than 10.0 is within the acceptable range.

For this current study, the above criteria were applied to inspect the skewness and kurtosis of the variables in the N=332 dataset D. A total of 37 out of the 55 variables (excluding the six demographic variables and the variable that collected information only from the respondents who said they were willing to pay extra money to purchase energy-saving light bulbs) were found to have moderate but significant skewness. The skewness values of these 37 items were negative, indicating that the

distributions of these variables had long left tails. The absolute values of the 55 variables' kurtosis were within the acceptable range (i.e. <10.0).

Solution for skewed data

As suggested by Tabachnick and Fidell (2013), data transformation is needed if significant skewness is found, and it can be helpful for reducing the impacts of outliers and for restoring variables' normality and linearity. Further, the statistical outcomes from a transformed dataset (which was not normally distributed originally) will be more accurate than those from a raw and not-normally distributed dataset (Fink, 2009). Different transformations accommodate different types and degrees of skewed data (Kline, 2011; Tabachnick & Fidell, 2013). The *square root* function suits data that has a moderate positive skewness value (i.e. New X = $\sqrt{X}$). If the data has a moderate negative value, the data should be *reflected* before being *square rooted* (i.e. New X = $\sqrt{k - X}$, where the *k* is a constant and (*k* – X) is a reflected value. *k* is usually one score larger than the largest score of the item; for example, if the largest score of an item is 7 in a 7-point Likert scale, *k* should be 8. A *logarithm* is more suitable for data that has substantial positive skewness. Data with substantial negative skewness should be *reflected* before conducting the *logarithm* calculation. If data has severe positive skewness, an *inverse* transformation is applicable. If data has severe negative skewness, it should be *reflected* before applying the *inverse* transformation.

As mentioned earlier, 37 variables in this study (see Section 5.2.1 for more detail) were found to have significantly moderate and negative skewness values. Thus, *reflecting* then *square-rooting* the variables was the most suitable method for transforming the data. According to Field (2009), data transformation should apply to every variable in the same group (e.g. the same construct), so that the values of the variables will not differ too much between them; the scale reliability can thus be maintained. The items on the eight scales were transformed to restore the variables' univariate normality. After data transformation, the dataset's univariate normality was improved. Therefore, the N=332 data, in which the missing data had been imputed and the non-normally distributed grouped variables had been transformed, was used to examine its multivariate normality.

3.5.1.3 Multivariate normality

As suggested by Tabachnick (2013), after checking and sorting issues regarding the univariate skewness and kurtosis, all the measured variables were grouped to screen for multivariate outliers. The focus of this subsection is inspection of multivariate outliers in the dataset.

Multivariate outliers indicate that a case has an atypical combination of scores on two or more variables. They can be detected through inspecting the Mahalanobis distance, which can be generated by SPSS 20.0. Mahalanobis distance refers to the extent to which a case deviates from the centroid of the remaining cases, the centroid being created at the intersection of the means of all the inspected variables (Tabachnick & Fidell, 2013). The distance of each case can be evaluated by using chi-square test. Tabachnick and Fidell suggested that a case can be estimated as a multivariate outlier when its chi-sqaure value is at the .001 significance level. The *df* of the chi-square value is the same as the number of the measured variables/items. In this study, there were 55 variables designed to measure the proposed constructs, so the *df* of the chi-square values for evaluating the cases' Mahalanobis distance was 55.

The critical value of chi-square for evaluating the cases' Mahalanobis distance is 93.168 at the .001 significance level (Tabachnick & Fidell, 2013). If any case's Mahalanobis distance is greater than 93.168, the case can be considered a multivariate outlier in the examined dataset. In this study, the Mahalanobis distances of 19 cases were greater than 93.168; in other words, they were identified as multivariate outliers.

Solution for multivariate outliers

Data transformation would usually reduce the number of multivariate outliers in a dataset. However, the transformation cannot help to bring a case's Mahalanobis distance closer to the threshold (i.e. below 93.168 in this study) if the case is truly a multivariate outlier. A common solution for reducing the impact of these truly multivariate outliers is to remove them from the sample (Tabachnick & Fidell, 2013). Before being screened for multivariate outliers, the data in this study's dataset had been transformed to restore normality (as mentioned in the previous subsection). Therefore, the 19 detected cases could be argued to be multivariate outliers. These were removed from dataset D, leaving 313 cases in the final sample (N=313).

Unless specified otherwise, the N=313 dataset is the one used for data analysis in the next stage: the relationships between measures and their variables. The N=313 dataset contained no missing data (i.e. any missing data had been imputed), and had been transformed to restore normality.

3.5.2 Relationships between measure and their variables

Fornell and Larcker (1981) pointed out that before testing the structural model, the measurement model should have a satisfactory level of validity and reliability. Thus, after screening and solving the issues relating to missing values and normality in the dataset, the next steps were to assess reliability and then validity. There were 55 variables and 12 proposed constructs in this study. The focus of this subsection is on the rationales and criteria for assessing the relationships between the variables (items) and the constructs. The relationships were inspected from the sets of variables' dimensionality, reliability and convergent validity.

3.5.2.1 Dimensionality

The indicators on the same scales were first examined for their dimensionality. In this study, the items on one scale were designed to measure a theoretical construct. Dimensionality refers to the number of concepts or factors that a set of variables (items) is measuring from a statistical perspective (Hair, et al., 2010). A set of unidimensional items means that these items are measuring one main factor or concept. Conversely, a set of multidimensional items indicates that these items are measuring more than one factor or concept. Therefore, having a set of items that is statistically unidimensional implies that these items are measuring the same construct.

The inspection was performed in SPSS using factor analysis. By examining the scree plots of the sets of items/variables and the component matrix generated by the function, the number of components extracted from the set variables can be presented (Allen & Bennett, 2012). Results showing that there is one component extracted from the set of variables indicate that the set variables are unidimensional.

3.5.2.2 Reliability

Bollen and Lennox (1991) suggested that for valid measurements, items used to assess the same construct must be internally consistent. There are several tests measuring internal consistency (reliability coefficient) among the items within a construct, including test-retest, alternate-forms reliability, inter-rater reliability and Cronbach's *alpha* (Kline, 2011).

Cronbach's *alpha* (i.e. α), or coefficient *alpha*, is the most commonly reported consistency index in the literature. Cronbach's *alpha* is an index of common-factor concentration (Cronbach, 1951, p. 331), which estimates the proportion of systematic variation in a scale. Higher reliability values suggest higher consistency among measured items, which is also desirable for creating an empirical composite. Kline (2011) suggested that a reliability coefficient of around .70 is adequate. In this study, all multi-item scales have reliability values greater than .70.

3.5.2.3 Convergent validity

The indicators in the same scale should demonstrate a moderate or higher correlation to each other. Convergent validity indicates the items' ability to measure their representing latent variable; such validity can be tested via the one-factor congeneric measurement model in the SEM (Kline, 2011). A one-factor congeneric model is a CFA and is used to confirm whether the proposed model (i.e. one-factor congeneric model in this case) fits the data, and whether a set of indicators is able to define the construct in question (Schumacker & Lomax, 2010). Given that the convergent validity is related to whether the observed indicators measure the same latent variable, a convergent validity will be achieved if the factor loadings of the observed indicators towards their latent variable (i.e. the relationships between the observed indicators/items and their latent variable) are significantly different from zero.

As recommended by (Arbuckle, 2011), the inspection of the relationships between the indicators and the constructs (i.e. the latent variables) for this study were conducted in AMOS. Twelve congeneric measurement models for the 12 measures (as mentioned in Section 3.3) were examined. The factor loadings of the items/indicators towards the constructs needed to be reviewed. If they were significantly different from zero, the indicators would be capable of measuring the construct they represented.

3.5.3 Confirmatory factor analysis: Examining measurement model

After inspecting the relationships between the sets of variables and the constructs (i.e. the latent variables), confirmation factor analyses were performed on the proposed latent variables to inspect their discriminant validity. Discriminant validity refers to whether the inspected constructs are distinct from each other (Hair, et al., 2010; Kline, 2011). Kline (2011) suggested that the threshold of the inter-correlations should be .90; that is, if any inter-correlation is greater than .90, the discriminant validity fails.

For this study, the AMOS was used for this inspection. As well as the inter-correlations, the measurement models' goodness-of-fit was also assessed, using CFA. The results suggested that the model fits and the inter-correlations were not as high as .90. The implications of these results were that (1) the measurement models were supported by the research sample and (2) the proposed latent variables were sufficiently distinct from each other to measure different constructs (Byrne, 2010; Kline, 2011). The assessment of a model's goodness-of-fit is described in Section 3.5.5.2.

After the CFA was completed and before examining the proposed model through the SEM, the test of *controlling for effects of an unmeasured latent methods factor* were conducted to determine whether CMV would cause severe bias in model testing.

3.5.4 Common method variance (CMV)

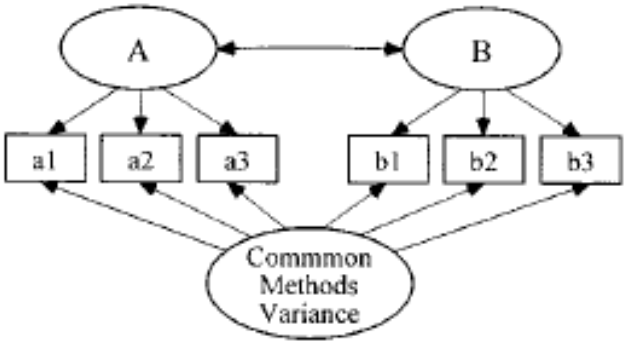
Once the relationships between constructs and their representative items were confirmed, examining the severity of the potential CMV is important. Having CMV in a dataset is inevitable; however, as explained earlier, some variances are acceptable as long as they do not bias analyses and results (Mackenzie & Podsakoff, 2012).

Following Podsakoff et al.'s (2003) recommendation, this study employed the *controlling for the effects of an unmeasured latent methods factor* technique to determine whether the CMV in the data bias the analyses and results. They suggested that the technique is suitable for studies that collected data (1) from the same sources (e.g. same participants, as in the current study), and (2) in the same context (e.g. cross-

sectional, as in the current study); (3) the sources of CMV cannot be identified (e.g. questionnaire design, as discussed in Section 3.3). Conceptually, the *unmeasured* latent variable is not related to the latent variables of interest (e.g. A and B in Figure 3.1), but allegedly have influence on the indicators (e.g. a1 to a3 and b1 to b3 in Figure 3.1) measuring the intended constructs (i.e. A and B).

In order to verify whether existence of CMV in the data could bias analyses and results, Podsakoff et al. (2003) suggest the following steps. Add CMV as a latent factor into the measurement model (as in Figure 3.1) to reflect potential method related variances in the indicators, and generate a *new* set of factor loading estimates based on the data collected from the questionnaire. Then, compare this set of factor loadings (i.e. *with* the presence of the CMV latent factor) with the factor loadings described in Section 3.5.3 (i.e. *without* the CMV latent factor). If the two sets are significantly different, it implies that CMV could have significant influence on the indicators and may lead to biased analyses. If the two sets are not significantly different, then it is likely that the existence of CMV may not bias subsequent analyses and results. After dealing with the CMV issues, the proposed conceptual model can be examined.

Figure 3.1 Example of the *controlling for the effects of an unmeasured latent method factor* technique (Podsakoff, et al., 2003, p. 891)



3.5.5 Model testing

The current study employed SEM in AMOS to test the proposed model: whether consumers' purchasing behaviour was influenced by their intention to buy, attitudinal

affections, attitudinal beliefs, perceived expectations from others, willingness to follow those expectations, perceived self-efficacy and controllability, perceived controllability of situations, perceived majority, tendency to fit in with the perceived majority, self-identity and past purchasing behaviour. Before assessing the relationships between the proposed constructs in this study (i.e. how one construct influences another and to what degree), it was important to confirm that the model was a good fit for the data (Tabachnick & Fidell, 2013).

SEM, also known as covariance structure analysis, path analysis and CFA (Kline, 2011; Tabachnick & Fidell, 2013), allows researchers to investigate the relationships between various independent variables (IVs) and dependent variables (DVs), as well as to assess parameters proposed in a model and evaluate hypotheses. It estimates the measurement errors in psychometric measures and provides fit indices for the model in question (i.e. whether the model is a good fit for the data, or whether the discrepancy between the proposed model and data is significant). SEM has been an important and widely used statistical technique for researchers in consumer research (Fabrigar, Porter, & Norris, 2010; Iacobucci, 2010). However, SEM is generally a large-sample technique, meaning estimations are less stable if the results are generated from small samples. As discussed earlier, the adequate sample size for the current study was around 300.

3.5.5.1 Estimation method and statistical assumptions

The statistical estimation method for the parameters of the proposed model in this study was ML. The main statistical assumption based on the ML estimation method is that the examined data is normally distributed, especially at the multivariate level (Kline, 2011).

ML is the default estimation method in most SEM computer programs and is a widely reported method in studies using SEM for data analysis (Kline, 2011). ML estimates and maximises the likelihood that the observed covariances (i.e. data collected from random samples) are drawn from the whole population. A chi-square value in conjunction with the *p*-value and the *df* are generated by the ML estimation to describe the model's fit. The assessment of the model's goodness-of-fit is discussed in Section 3.5.5.2.

One main assumption of ML estimation is that the data is normally distributed, especially at the multivariate level (Kline, 2011). If the requirement of multivariate normality cannot be met, the *bootstrap* technique can be used as a *post hoc* adjustment to assess model fit (Bollen & Stine, 1992; Byrne, 2010). By bootstrapping the data, a researcher can create various subsamples from an original dataset. Through repetitively estimating the parameter distributions from the subsamples, the bootstrap technique will generate a *p*-value of an adjusted chi-square distribution.

3.5.5.2 Assessment of model fit

The focus of this subsection is on the assessment of model fit. There are two common ways to assess model fit: through chi-square ($\mathcal{X}^2$) goodness-of-fit statistics and through fit indices (Hu & Bentler, 1999; Iacobucci, 2010). The assessments, generated by AMOS, are detailed below.

Chi-square ($\mathcal{X}^2$) and degree of freedom

The $\mathcal{X}^2$ goodness-of-fit statistics include the $\mathcal{X}^2$ value, *df* and *p*-value. The *df* refers to the model's degrees of freedom (df_M), which is the difference between the number of observations ($\frac{v(v+1)}{2}$, where *v* refers to the observed variables in the model) and the number of parameters measured (*q*). Therefore, the df_M is calculated by the following formula: $df_M = \frac{v(v+1)}{2} - q$ (Kline, 2011). The $\mathcal{X}^2$ value assesses the discrepancy between the model and the data, to the specified *df*, and the *p*-value suggests the significance of the discrepancy. A non-significant *p*-value (>.05) is desirable for a model fit, suggesting that the proposed model does not significantly deviate from the sample (Iacobucci, 2010; Kline, 2011; McDonald & Ho, 2002).

However, $\mathcal{X}^2$ is sensitive to sample size and multivariate normality (Tabachnick & Fidell, 2013). When the sample size is large, the $\mathcal{X}^2$ value tends to signal significant discrepancy for trivial differences. When the sample size is small and/or the multivariate distribution is not normal, the probability levels of the computed $\mathcal{X}^2$ will

not be accurate. A corrected chi-square value for sample size (i.e. CMIN/DF, ratio of the chi-square value to the *df*, where CMIN is the chi-square value and DF refers to the degree of freedom) can be used for inspecting the model fit; a value less than five is considered a reasonable fit (Marsh & Hocevar, 1985; West, Taylor, & Wu, 2012).

As well as indices relating to the chi-square, there are other fit indices used for supporting model fit. Commonly reported fit indices include the *standardised root mean square residual* (*SRMR*), the *comparative fit index* (CFI), the *root mean square error of approximation* (*RMSEA*) and *bootstrap p-value* (for indicating the significance level of an adjusted discrepancy between the proposed model and the data, as discussed earlier) (Bollen & Stine, 1992; Hu & Bentler, 1999; Iacobucci, 2010; Tabachnick & Fidell, 2013).

Standardised root mean square residual (SRMR)

SRMR estimates the differences between the sample's and the estimated population's variances and covariances. The SRMR value ranges from zero to one. Smaller SRMR values indicate a good-fitting model. A cut-off point suggested by Hu and Bentler (1999) is .08; i.e. the SRMR values that are less than .08 indicate a model that is a good fit.

Comparative fit index (CFI)

CFI is an incremental fit index, weighing the relative fit of the proposed model over the independence model (Bentler, 1990). An independence model refers to the model that only measures error variances and in which the variables in the model are unrelated to each other (Kline, 2011). The CFI value ranges from zero to one. Values greater than .95 indicate that the model is a good fit for the data (Hu & Bentler, 1999).

Root mean square error of approximation (RMSEA)

RMSEA measures a model's poorness-of-fit by inspecting the error of approximation in the examined population. The greater the value, the larger the error in the examined population (Browne & Cudeck, 1993; Byrne, 2010). Values of .06 or less suggest that the model is a good fit. Values greater than .10 indicate that the model does not fit the data (Byrne, 2010; Hu & Bentler, 1999). This index favours larger models with more observed variables and is less useful for a dataset with a small sample size, as it tends to over-report model rejection (Kline, 2011). AMOS also examines the closeness of fit (*PCLOSE*), which indicates the significance level of the computed error

(Byrne, 2010). A non-significant result of the PCLOSE is desirable (i.e. PCLOSE >.05), suggesting that the error is not significant.

3.6 Summary

This study conducted an online survey to collect quantitative data for model testing. The questionnaire contained a total of 62 questions, of which 55 were designed to collect data to analyse the proposed constructs in the hypothesised model: attitudinal affections, attitudinal beliefs, injunctive norm (the perception of the injunctive norm and the willingness to comply with the perception), perceived self-efficacy and controllability, descriptive norm (the perception of the descriptive norm and the willingness to comply with the perception), self-identity, past behaviour, intention and behaviour.

Preliminary data analyses were conducted first to identify and resolve any issues relating to missing data and the data's normality. Then the relationships between the variables and their related underlying concepts were assessed. The next inspection focused on the relationships between the constructs to assess the discriminant validity of the examined variables. Before testing the proposed model, CMV was inspected to determine the existence of common method bias. The final step was model testing (i.e. testing hypotheses). The results from the analyses are reported in Chapters 4 and 5.

Chapter 4
Sample Characteristics and Descriptive Statistics

This chapter presents the results and descriptive statistics collected from the consumer survey. Section 4.1 describes the demographic information for the participants. Section 4.2 describes the descriptive statistics for the variables in the questionnaire.

4.1 Demographics

The target population for this study was people over 16 years old who resided in New Zealand, and it was necessary to check to what extent the sample population deviated from the target population. This was the main purpose of obtaining demographic information from the survey participants.

A total of 402 respondents clicked the online survey link. One respondent specified that s/he was not residing in New Zealand. Thirty-eight respondents did not answer any questions and two respondents only answered one question in the questionnaire. These 41 cases (responses) were removed from the dataset. As a result, there were 361 cases left in the dataset, a response rate of 89.8% (i.e. the respondents who answered the questions after they clicked into the survey were seen as a response). After the missing value analysis and normality check described earlier in this document, another 48 cases were removed from the dataset, leaving 313 usable cases for data analysis. Analysis of the remaining 313 participants' demographic information (i.e. *age*, *gender*, *education level*, *occupation* and *income*) is presented in Tables 4.1 to 4.5.

Chi-square tests were conducted in Microsoft Excel to compare the significance level of any discrepancies between the sample and the target populations, in terms of the distribution patterns for the demographics (i.e. the percentages) in the two populations (De Vaus, 2002). No severe discrepancies were found when comparing the distribution patterns between the sample and the target populations across the five demographic variables (comparisons are provided below).

4.1.1 Age

Table 4.1 illustrates the information regarding the respondents' age in comparison to the population. The age bands used in the current study were slightly different from those used by Statistics New Zealand. The New Zealand 2006 Census started the age categorisation at 15 years and each category covered 10 years (see Appendix 4). This present study also set each category to 10 years, but starting from 16 years. The starting age of 16 was set as a condition of the study, as discussed in Methodology chapter.

Approximately 97.8% of the 313 respondents provided information regarding their age. The approximate percentages of the 313 respondents in the study's various age bands in 2006 were as follows: under 26 – 6.1%; under 24 – 18.1%; 26–35 – 14.1%; 25–34 – 16.4%; 36–45 – 17.3%; 35–44 – 19.5%; 46–55 – 19.8%; 45–54 – 17.3%; 56–65 – 20%; 55–64 – 13.1%; and over 65 – 20.4% (compared to 15.7% in the target population). A chi-square test was conducted in Excel to determine whether there was a significant difference between the sample and the target population with respect to the percentage in each age group; the missing data was excluded from the test (De Vaus, 2002). The probability value of the test in this study was 0.99617, which implied that the discrepancy was not statistically significant at the .05 critical level. Thus, the ages of people in the sample matched the ages of the target population.

Table 4.1 Descriptive statistics of age

2006 Census*			Survey of the present study		
Age	**Frequency**	**%**	**%**	**Frequency**	**Age**
15–24	571,176	18.07%	6.07%	19	**16–25**
25–34	519,000	16.42%	14.06%	44	**26–35**
35–44	615,252	19.47%	17.25%	54	**36–45**
45–54	546,150	17.28%	19.81%	62	**46–55**
55–64	413,184	13.07%	20.13%	63	**56–65**
65+	495,600	15.68%	20.45%	64	**over 65**
-	-	-	2.24%	7	**Missing**
Total*	3,160,371			313	**Total**
Probability of the chi-square test:** 0.99617					

* Information is from a document downloaded from the Statistics New Zealand website http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/quickstats-about-a-subject/national-highlights.aspx; a note on the file says: 'Individual figures may not add up to totals, and values may vary in different tables'.

**The chi-square test excluded the missing information in the last row.

4.1.2 Gender

Table 4.2 compares information about the gender of the target population of New Zealand (based on the 2006 Census – see Appendix 4; Statistics New Zealand, 2007) to the survey respondents. 95.5% of the 313 respondents indicated their gender to the survey (i.e. 299 respondents). Approximately 42.2% of the 313 respondents were female and 53.4% were male. For the target population in 2006, about 51.9% were female and 48.2% were male. A chi-square test was conducted in Excel to determine whether the distribution patterns of the two populations were statistically significant (De Vaus, 2002). The probability value of the chi-square test was 0.877622, which suggested a non-significant discrepancy between the sample and the target population. Thus, the difference for gender between the sample and the whole population was not significant.

Table 4.2 Descriptive statistics of gender

2006 Census*			Survey of the present study		
Gender	**Frequency**	**%**	**%**	**Frequency**	**Gender**
Female	1,638,777	51.85%	42.17%	132	**Female**
Male	1,521,585	48.15%	53.35%	167	**Male**
-	-	-	4.47%	14	**Missing**
Total*	3,160,371			313	**Total**
Probability of the chi-square test:** 0.87762					

*Information is from a document downloaded from the Statistics New Zealand website http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/quickstats-about-a-subject/national-highlights.aspx; a note in the file says: 'Individual figures may not add up to totals, and values may vary in different tables'.
** The chi-square test excluded the missing information in the last row.

4.1.3 Education

Table 4.3 shows the highest educational level of the survey respondents compared to the target population. There were only four options in the *education* section in the survey for this research: (1) completed or partly completed secondary school; (2) some tertiary-level studies; (3) Bachelor degree or equivalent; and (4) postgraduate diploma or Master's degree or higher. The categories for *highest qualification* specified in the 2006 Census (Statistics New Zealand, 2007; see Appendix 5) were more detailed and included options for *no qualification* and *not elsewhere included*.

Approximately 97.4% of the 313 respondents provided information in this section (i.e. 305 respondents). The approximate percentages for the respondents were as follows: completed or partly completed secondary school education – 31%; completed or partly completed secondary school – 31.4%; tertiary – 35.8% (21.6% in the target population); Bachelor degree – 19.2% (10.0% in the target population); postgraduate or higher – 11.5% (4.2% in the target population). A chi-square test was conducted to investigate the difference between the sample and target population (De Vaus, 2002). The 'unidentifiable', 'no qualification', and 'missing' data categories were excluded from the comparison. The probability value of the comparison was 0.95899, which was not significant at the .05 critical level.

Table 4.3 Descriptive statistics of education

2006 Census*			Survey of the present study		
Education	**Frequency**	**%**	**%**	**Frequency**	**Education**
Secondary	992,568	31.4%	31.0%	97	**Secondary**
Some tertiary	683,583	21.6%	35.8%	112	**Some tertiary**
Bachelor equivalent	315,849	10.0%	19.2%	60	**Bachelor equivalent**
Postgrad or higher	131,931	4.2%	11.5%	36	**Postgrad or higher**
Unidentifiable & no qualification	1,036,446	32.8%	2.6%	8	**Missing**
Total*	3,160,371			313	**Total**
Probability of the chi-square test:** 0.95899					

* Information is from a document downloaded from the Statistics New Zealand website http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/quickstats-about-a-subject/national-highlights.aspx; a note in the file says: 'Individual figures may not add up to totals, and values may vary in different tables'.
**The chi-square test excluded the information in the last row: 'Unidentifiable & no qualification' and 'Missing'.

4.1.4 Occupation

The information on the occupations of the survey participants compared to the target population (Statistics New Zealand, 2007) is presented in Table 4.4. Approximately 97.4% of the 313 respondents provided their occupational information. The approximate percentages for the respondents were as follows: management – 12.8% (17.1% in the target population); professional – 18.8% (18.9% in the target population); technician/trades – 7.7% (12.2% in the target population); community/personal service – 2.9% (7.9% in the target population); administration – 10.2% (12.1% in the target population); salesperson – 6% (9.4% in the target population); labourer – 4.2%; student

– 5.1%; jobs outside the listed categories – 29.7%. The 2006 Census data does not specify the last three categories that were used in the current study. The Census grouped the *unidentifiable responses, responses outside scope,* and *not stated* into the category called, 'Not elsewhere included'. To better compare the two populations, the survey data in the *student* and *others* categories were grouped together with the missing data for the chi-square test. A chi-square test was conducted in Excel to find out whether the discrepancy between the sample and the target population was statistically significant (De Vaus, 2002). The probability value of the test (p=0.96273) was not significant at the .05 critical *alpha* level). Thus, the difference between the two populations was not statistically significant.

Table 4.4 Descriptive statistics of occupation

2006 Census*			Survey of the present study		
Occupation	**Frequency**	**%**	**%**	**Frequency**	**Occupation**
Managers	340,530	17.1%	12.8%	40	**Manager**
Professional	374,328	18.9%	18.8%	59	**Professional**
Technicians and trades	241,857	12.2%	7.7%	24	**Technician or trades**
Community and personal service	156,468	7.9%	2.9%	9	**Community or personal service**
Clerical and administrative	240,813	12.1%	10.2%	32	**Clerical or administrative**
Sales	186,060	9.4%	6.1%	19	**Sales**
Machinery operators, drivers, labourers	333,315	16.8%	4.2%	13	**Machinery operators, labourers or drivers**
Not elsewhere included	112,404	5.7%	37.4%	117	**Others+Missing+Student**
Total*	1,985,778			313	**Total**
Probability of the chi-square test: 0.96273					

* Information is from a document downloaded from the Statistics New Zealand website http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/quickstats-about-a-subject/national-highlights.aspx; a note in the file says: 'Individual figures may not add up to totals, and values may vary in different tables'.

4.1.5 Income

Table 4.5 shows the information for survey participants' and the target population's income. The income data of the target population was based on the New Zealand 2006 Census (Statistics New Zealand, 2007). Approximately 96.8% of the 313 respondents provided income information and 9.9% of respondents clicked *don't know* [for the amount of their income] option. Data from this option may not be equivalent to the *Not stated* option in the 2006 Census (which is 10.2%) (Statistics New Zealand,

2007). The approximate percentages of the respondents in the annual income bands were as follows: less than $5,000 – 3% (12.1% in the target population); $5,001–10,000 – 1.6% (7.2% in the target population); $10,001–20,000 – 10% (19.5% in the target population; $20,001–30,001 – 13.4% (13.8% in the target population); $30,001–40,000 – 11.5% (12.8% in the target population); $40,001–50,000 – 11.8% (8.3% in the target population); more than $50,000 –35.1% (16.2% in the target population).

A chi-square test was conducted to determine the significance level of the differences between the sample and target populations' incomes (but the data for 'Not stated', 'Don't know' and 'Missing' were excluded from the comparison because they were not equivalent to each other) (De Vaus, 2002). The probability value of the chi-square test (p=0.99892) was not significant at the .05 critical *alpha* level. Thus, no severe discrepancy between the incomes of people in the sample and the target population was found.

Table 4.5 Descriptive statistics of income

2006 Census*			Survey of the present study		
Income	**Frequency**	**%**	**%**	**Frequency**	**Income**
$1–$5,000+ Loss + Zero	383,571	12.1%	3.2%	10	**$5,000 or less per year**
$5,001–$10,000	226,800	7.2%	1.6%	5	**$5,001–$10,000**
$10,001–$20,000	615,981	19.5%	10.2%	32	**$10,001–$20,000**
$20,001–$30,000	434,955	13.8%	13.4%	42	**$20,001–$30,000**
$30,001–$40,000	404,070	12.8%	11.5%	36	**$30,001–$40,000**
$40,001–$50,000	262,299	8.3%	11.8%	37	**$40,001–$50,000**
$50,001–$70,000 and more	511,803	16.2%	35.1%	110	**$50,001-$60,000 and more**
Not stated	320,889	10.2%	9.9%	31	**Don't know**
-	-	-	3.2%	10	**Missing**
Total*	3,160,371			313	**Total**
Probability of the chi-square test:** 0.99892					

Information is from a document downloaded from the Statistics New Zealand website http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/quickstats-about-a-subject/national-highlights.aspx; a note given in the file says: 'Individual figures may not add up to totals, and values may vary in different tables'.

**The chi-square test excluded the information in the last two rows: 'Not stated', 'Don't know', and 'Missing'.

In summary, the sample size of the current study was adequate for SEM analysis (N=313>178, as discussed in Section 3.2.2); and, the sample size in this research was representative of the target population.

4.2 Proposed Constructs

In general, New Zealand consumers seem to be environmentally friendly; most survey respondents gave positive responses to the proposed constructs (see Sections 4.2.1–4.2.8). The following subsections present the aggregate results of the proposed constructs in this current study.

4.2.1 Behaviour construct

Five items were adopted to measure the respondents' purchasing behaviour (as discussed in the Methodology chapter, Section 3.3.2). Table 4.6 summarises the descriptive statistics for each item in the *behaviour* construct.

Table 4.6 Descriptive statistics of the behaviour construct

	Disagree		Agree	
	N*	%**	N*	%**
BH				
a. **In future, I will buy energy-saving light bulbs because they are environmentally friendly.**	38	12.1%	218	69.6%
b. **In future, I will buy energy-saving light bulbs even if they are more expensive than conventional ones.**	92	29.4%	165	52.7%
c. **In future, I will buy energy-saving light bulbs to reduce my electricity bills.**	36	11.5%	245	78.3%
d. **In future, when I buy light bulbs, I will look at product information to see if it saves energy.**	34	10.9%	219	70.0%
e. **In future, I will switch over to buying energy-saving light bulbs.**	42	13.4%	183	58.5%

*Number (N) of responses
**Percentage of responses

More than 66% of respondents said that they would buy energy-saving light bulbs because they were environmentally friendly. When considering the *cost of the energy-saving light bulbs*, only 52% were willing to pay a premium for them, but when

considering *a reduction in energy bills*, nearly 80% said they were willing to buy the energy-saving light bulbs. This finding supported the argument that money plays a more important role than that of the environment in affecting respondents' purchasing behaviour. These results supported the results of previous studies, which found that the cost of energy-saving light bulbs can be a barrier for consumers (Mills & Schleich, 2010).

4.2.2 Intention construct

Four items were employed to assess respondents' intentions (as discussed in the Methodology chapter): two collected information on respondents' intentions to buy energy-saving light bulbs and two provided their reasons for the intention (i.e. for the environment or for a reduction in their electricity bills). Table 4.7 illustrates the descriptive statistics for the items in the intention construct.

Table 4.7 Descriptive statistics of the intention construct

	Disagree		Agree	
	N*	%**	N*	%**
INT				
a. **The likelihood that I will buy energy-saving light bulbs is high.**	46	14.7%	228	72.8%
b. **I intend to buy energy-saving light bulbs because they are friendly for the environment.**	42	13.4%	214	68.4%
c. **I intend to buy energy-saving light bulbs to reduce my electricity bills.**	29	9.3%	247	78.9%
d. **I do NOT intend to buy energy-saving light bulbs even if they are available in the market.**	233	74.4%	37	11.8%

*Number (N) of responses
**Percentage of responses

More than 66% of respondents intended to buy energy-saving light bulbs, 79% to reduce their electricity bills and 68% to help save the environment. These findings were consistent with marketing literature, which says that money can be a barrier to (or

incentive for) purchasing products that are friendly to the environment (Dodds, et al., 1991; Eves & Kippes, 2010; Lodorfos & Dennis, 2008; Panzone, 2013; Solomon, et al., 2009). That is, fewer people are willing to pay extra for a premium product, but more people are willing to invest in a product if it will save them money in the future.

4.2.3 Attitude constructs

As discussed in the Methodology chapter, there were 12 items in this study to measure attitude, from two perspectives: four items measured feelings about purchasing energy-saving light bulbs (i.e. items in the ATD_Affections section); and eight items assessed beliefs about issues related to energy saving (i.e. items in the ATD_Beliefs section). Table 4.8 summarises the descriptive statistics for the items.

Participants tended to agree with the items in the ATD_Affections section. They agreed that choosing energy-saving light bulbs is *pleasant* (40.9%), *favourable* (61.3%), *a positive thing to do* (84.0%) and *a wise decision* (79.2%).

In contrast, not all of the eight items in the ATD_Beliefs section received positive replies from the respondents. Three items (a, f and g) assessed thoughts regarding price; approximately 40% of the respondents agreed with people should pay more for energy-saving light bulbs (items a and f). Two items investigated respondents' trust of labelling. A label issued by an independent third party would receive more support (65%) than one issued by the product's manufacturer (54%). One item relating to commercial advertisement was supported by 55% of respondents. One item regarding the efforts government could make was supported by 78% of respondents, but only 35% of respondents agreed with having a higher tax imposed on light bulbs that consume more energy.

Attitude is an aggregate concept that is constructed by various values and beliefs (Ajzen, 1985, 1991; Fazio & Petty, 2008; Petty, Ostrom, et al., 1981). Generally, respondents to this survey had a positive disposition towards purchasing energy-saving light bulbs. For the beliefs about the products, money played a significant role in affecting attitude. The findings regarding trust in an eco-label (which states whether or not the light bulb saves energy) showed that consumers trusted both sources, although the labels issued by an independent third party gained more support than the others.

These results were in line with those in the literature (D'Souza, Taghian, & Lamb, 2006; Harris, 2007; Salzman, 1997).

Table 4.8 Descriptive statistics of the attitude constructs

	Disagree		Agree	
	N*	%**	N*	%**
ATD_Affections For me, choosing energy-saving light bulbs would be				
a. **Pleasant**	29	9.3%	128	40.9%
b. **Favourable**	19	6.1%	192	61.3%
c. **A positive thing to do**	9	2.9%	263	84.0%
d. **A wise decision**	11	3.5%	248	79.2%
ATD_Beliefs				
a. **Consumers should be made to pay higher prices for light bulbs that consume more energy**	123	39.3%	126	40.3%
b. **Commercial advertising should be forced to mention ecological disadvantages of non energy-saving light bulbs.**	58	18.5%	173	55.3%
c. **I trust energy-saving claims made by manufacturers.**	77	24.6%	169	54.0%
d. **It would be wise for the government to devote more money towards supporting a strong energy saving programme.**	26	8.3%	243	77.6%
e. **The light bulbs that consume more energy should be heavily taxed by the government.**	128	40.9%	110	35.1%
f. **Paying more (more than conventional ones) for energy-saving light bulbs is acceptable.**	133	42.5%	124	39.6%
g. **The higher cost of energy-saving light bulbs encourages people to carry on buying non energy-saving ones.**	33	10.5%	244	78.0%
h. **I trust an ecolabel issued by an independent third party, e.g. Energy Star.**	27	8.6%	204	65.2%

*Number (N) of responses
**Percentage of responses

4.2.4 Injunctive norm constructs

As discussed in the Methodology chapter, eight items were adopted to collect information relating to the injunctive norm, on two aspects: four items were to reflect

the injunctive norms perceived by the respondents (i.e. the first four items in the INI section in Table 4.9, named IN_Perception measure); and four items reflected respondents' perceptions of whether they were influenced by other people's expectations (i.e. the last item in the INI section and three items in the INII section in Table 4.9, in the measure named IN_Comply). Table 4.9 summarises the descriptive statistics of the items for the injunctive norm construct.

The approximate percentages for the respondents' level of agreement with the statements were as follows: people significant to them supported their purchases of energy-saving light bulbs (item INI_d) – 35.1% agreed, 23.3% disagreed; their family was in favour of the respondent purchasing energy-saving light bulbs (item INI_a) – 36% agreed, 17.6% disagreed; their friends considered that the respondent should buy energy-saving light bulbs (item INI_b) –27.5% agreed, 17.6% disagreed. Unlike the previous three items, the percentages of agreement and disagreement were very close for the responses to the statement that their co-workers were in favour of their purchases of energy-saving light bulbs (item INI_c): 19% agreed and 19.5% disagreed.

In the responses regarding the IN_Perception measure, more survey respondents considered their decision was not influenced by others, compared to those who agreed with the statements. The approximate percentages for the respondents' level of agreement with the statements were as follows: they would buy the products others expected them to, if those people could see the respondents using the products (item e in INI section) – 11.2%, agreed, 55.9% disagreed; their family had significant influence on their decisions (item a in INII section) – 31.0% agreed, 38.0% disagreed; their friends had significant influence on their purchasing decisions (item INII_b) – 20.4% agreed, 44.4% disagreed; their co-workers influenced their purchasing decisions (item c in INII section) – 12% agreed, 48.2% disagreed.

These results suggested that the respondents tended to be independent when making purchasing decisions about energy-saving light bulbs. That is, they did not usually feel that they were expected to buy environmentally friendly products, nor did they think they were following others' expectations. This finding of independence was in line with the findings of Vaughan and Cattell (1976), who also suggested that New Zealanders are independent when making purchase decisions. Therefore, this study's results of low normative expectations (lower than 40%) were congruent with past findings.

Table 4.9 Descriptive statistics of the injunctive norm constructs

		Disagree		Agree	
		N*	%**	N*	%**
INI					
a.	**My family thinks I should purchase energy-saving light bulbs.**	55	17.6%	114	36.4%
b.	**My friends think that I should purchase energy-saving light bulbs.**	55	17.6%	86	27.5%
c.	**My coworkers think I should purchase energy-saving light bulbs.**	61	19.5%	60	19.2%
d.	**In general, I think the views of people who are important to me are favourable towards my purchasing energy-saving light bulbs.**	73	23.3%	110	35.1%
e.	**If other people can see me using a product, I often purchase the brand they expect me to buy.**	175	55.9%	35	11.2%
INII ____(the groups below) have much influence on my decision to purchase (or not purchase) energy-saving light bulbs. Please indicate to what extent you agree or disagree with the following statements.					
a.	**My family**	119	38.0%	97	31.0%
b.	**My friends**	139	44.4%	64	20.4%
c.	**My co-workers**	151	48.2%	38	12.1%

*Number (N) of responses
**Percentage of responses

4.2.5 Perceived behavioural control constructs

As discussed in the Methodology chapter, nine items were used to measure perceived behavioural control: four items were designed to capture respondents' perceptions of self-efficacy and controllability when purchasing energy-saving light bulbs (i.e. the items in the PBC_Perception section); five items investigated the situational factors that respondents thought would affect their purchasing decision (i.e. the items in the PBC_Situational section). Table 4.10 illustrates the descriptive statistics of the items for the constructs.

Overall, the respondents said that product availability, affordability and quality were the most important issues when making purchasing decisions. Sixty-seven percent

of them considered that purchasing energy-saving light bulbs was not difficult, in terms of availability and affordability, but this level of support dropped to 54% regarding paying a premium for them.

Table 4.10 Descriptive statistics of the perceived behavioural control constructs

	Disagree		Agree	
	N*	%**	N*	%**
PBC_Perception				
a. **It is easy for me to find energy-saving light bulbs whenever I need to buy them.**	17	5.4%	254	81.2%
b. **Energy-saving light bulbs are affordable for me in terms of my purchasing budget.**	62	19.8%	208	66.5%
c. **High time demands on me made it much harder to purchase energy-saving light bulbs on my last visit to the store.**	186	59.4%	41	13.1%
d. **I would be willing to spend more (more than conventional ones) to purchase energy-saving light bulbs.**	77	24.6%	169	54.0%
PBC_Situational While purchasing light bulbs, ___ (the factors below) usually affect my purchasing decision.				
a. **Concerns for the environment**	30	9.6%	221	70.6%
b. **Sufficient product information**	32	10.2%	214	68.4%
c. **Affordability**	15	4.8%	260	83.1%
d. **Availability in store**	12	3.8%	260	83.1%
e. **Product quality**	4	1.3%	275	87.9%

*Number (N) of responses
**Percentage of responses

4.2.6 Descriptive norm constructs

Descriptive norm (eight items) was measured on two aspects: five items measured perceptions of other respondents' purchasing behaviour (DN_Perception construct); 3 items measured willingness to fit in with the majority (DN_Comply construct). The items in the DN_Perception section were measured on a slide ranging from 0% to 100%. Survey respondents were asked to position the slide button of each item to indicate their perception of other people's purchasing behaviour. The items in the DN_Comply section were measured by a seven-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*. Table 4.11 summarises the descriptive statistics of the items for the descriptive norm constructs.

Although items in the DN_Perception construct aimed to capture respondents' perceptions, the respondents tended to state '*Don't know*' when the question focused on groups that were not close to them (i.e. *neighbours*, *co-workers* and *other shoppers*). Of those respondents who did respond with a percentage, approximately 51% thought the general population buys energy-saving light bulbs, implying that they thought nearly 50% of consumers do not buy energy-saving light bulbs.

The results from the DN_Comply construct also suggested that the respondents did not usually look for cues from others if they are uncertain about what to do and buy. The findings from the descriptive norm constructs found that the respondents tended to make independent purchasing decisions.

Table 4.11 Descriptive statistics of the descriptive norm constructs

	0%-20%		21%-40%		41%-60%		61%-80%		81%-100%		Don't know	
	N*	%**	N*	%**	N*	%**	N*	%**	N*	%**	N*	%**
DN_Perception Thinking about the following groups, I assume that ___% of them generally purchasing energy-saving light bulbs. (Please position the button of each slide to indicate your estimated percentage.)												
a. **My Neighbours**	36	11.5 %	33	10.5 %	60	19.2 %	39	12.5 %	17	5.4 %	128	40.9 %
b. **My Family Members**	33	10.5 %	33	10.5 %	61	19.5 %	61	19.5 %	68	21.7 %	57	18.2 %
c. **My Friends**	34	10.9 %	37	11.8 %	66	21.1 %	67	21.4 %	40	12.8 %	69	22.0 %
d. **My Co-workers**	37	11.8 %	30	9.6 %	60	19.2 %	34	10.9 %	12	3.8 %	140	44.7 %
e. **Other Shoppers**	21	6.7 %	34	10.9 %	73	23.3 %	32	10.2 %	10	3.2 %	143	45.7 %

	Disagree		Agree	
	N*	%**	N*	%**
DN_Comply				
a. **When I am uncertain which light bulb is better in a store, I look to other people's product choice for clues.**	187	59.7%	56	17.9%
b. **If I am uncertain as to how to act in public, I look to the behaviour of others for cues.**	178	56.9%	68	21.7%
c. **It's important to me to fit into the social group I'm with.**	150	47.9%	83	26.5%

*Number (N) of responses
**Percentage of responses

4.2.7 Self-identity construct

The self-identity construct aimed to assess whether respondents considered themselves friendly to the environment, such as by buying environmentally friendly products, conserving energy and being environmentally responsible. According to the results from this construct, most of the respondents were pro-environment. The six items that measured self-identity are listed in Table 4.12, along with their summarised descriptive statistics.

The results show that most people (80%) expressed environmental concerns and identified themselves as environmentally responsible. However, only 65% considered conserving energy important and even fewer (60%) saw themselves as typical buyers of energy-saving light bulbs. These results reflected the fact that pro-environment behaviour is complex (Osbaldiston & Schott, 2012); that is, an individual who has concerns for the environment may not conduct every action in a way that is considered beneficial to the environment. These findings also implied that the majority of the respondents cared about the environment but only 60% of them translated their concerns into action.

Table 4.12 Descriptive statistics of the self-identity construct

		Disagree		Agree	
		N*	%**	N*	%**
ID					
a.	**It is important to me that the products I use do not harm the environment.**	13	4.2%	256	81.8%
b.	**I consider myself as an energy saver.**	17	5.4%	252	80.5%
c.	**To conserve energy is an important part of who I am.**	37	11.8%	204	65.2%
d.	**I see myself as a typical buyer of energy-saving light bulbs.**	65	20.8%	186	59.4%
e.	**I am NOT the type of person oriented to purchase energy-saving light bulbs.**	208	66.5%	55	17.6%
f.	**I would describe myself as environmentally responsible.**	10	3.2%	251	80.2%

*Number (N) of responses
**Percentage of responses

4.2.8 Past behaviour construct

The three items for the past behaviour construct were designed to find out whether people had purchased energy-saving light bulbs before. Table 4.13 summarises the descriptive statistics of the items for the past behaviour construct.

The results indicated that more than 59% of respondents had purchased energy-saving light bulbs during the last 12 months. Further, the results also implied that the behaviour was a cognitive one; more than 65% of the respondents acknowledged that they bought and/or deliberately chose energy-saving light bulbs, but this percentage dropped to 59% when respondents were asked if choosing energy-saving light bulbs was something they did automatically.

Table 4.13 Descriptive statistics of the past behaviour construct

		Disagree		Agree	
		N*	%**	N*	%**
PB					
a.	**When I last purchased light bulbs, I deliberately chose one with energy-saving claims.**	75	24.0%	205	65.5%
b.	**During the past 12 months, I generally purchased energy-saving light bulbs, whenever there was this option.**	73	23.3%	204	65.2%
c.	**During the past 12 months, choosing energy-saving light bulbs is something I do automatically.**	82	26.2%	186	59.4%

*Number (N) of responses
**Percentage of responses

4.3 Summary

Section 4.1 summarised the sample's demographic characteristics and showed that the study sample was representative of the target population. The descriptive statistics of the proposed constructs in Section 4.2 have suggested that most of the respondents were pro-environment and were willing to buy environmentally friendly products. The results also indicated that many respondents did not perceive that their purchase decision was bound by social influences.

The next chapter presents the details of the data preparation and analysis, and includes screening for missing data, normality, the reliability of the items, the inter-relationships between the constructs, potential common method variance/bias, and model testing.

Chapter 5
Data Analysis and Results

Chapter 4 presented the raw data collected from the consumer survey, i.e. the descriptive statistics of individual items. This chapter describes the procedures taken to prepare the raw data for model testing using SEM. There are four main sections in this chapter. Section 5.1 examines the issue of missing data. Section 5.2 highlights the issues relating to normality, checking whether the data distribution was normal and how any non-normal distribution was resolved. Section 5.3 presents the relationships between items and the constructs they represented, in terms of the dimensionality, reliability and validity of the items under the constructs. Section 5.4 gives the results of the CFA, which assessed the discriminant validity of the measures of the proposed constructs. Section 5.5 is concerned with checking the CMV and Section 5.5 with model testing, delineating the model fit and parameter estimates.

5.1 Missing Data

As discussed earlier, after removing the 38 responses with 0% completion rates, the two responses with only one question answered, and the one response from a respondent residing outside New Zealand, there were 361 cases left for further analysis. This subsection discusses how the pattern of the missing data was detected and how the issue was resolved.

The purpose of examining the missing data was to:

1) assess the seriousness of the problems in the dataset; that is how many further responses should be removed from the dataset to ensure the results were not influenced by the missing data

2) decide which dataset was most appropriate for further data analysis, while keeping the number of removed responses to a minimum.

There were 61 items in the questionnaire that were suitable for data analysis (the *residency* item was not an effective variable after data screening – all of the respondents in the N=313 dataset were New Zealand residents). The completion rate for a response

refers to how many items were answered in each questionnaire. Table 5.1 summarises the pattern of the completion rate in the N=401 dataset A (the case with the respondent who did not reside in New Zealand had been removed). Kline (2011) recommends a sample size greater than 200 for SEM analysis. However, as even a sample size of 200 can be too small for analysing a complex model, the aim was to retain as many cases as possible. Three different datasets (B, C and D) were examined for patterns of missing data: N=361 (B), N=339 (C) and N=332 (D). Their respective completion rates were 1.60% (only one out of 61 items was answered), 40% (25 items were answered) and 60% (30 items were answered).

Table 5.1 Completion rate summary of the N=401 dataset A

Completion rate	Maximum items answered	Cases with the indicated completion rate	Remaining cases, where the completion rate is higher than the indicated percentage
0%	0	38	363
1.60% or less	1	40	361
10% or less	3	44	357
20% or less	7	56	345
30% or less	7	56	345
40% or less	25	62	339
50% or less	30	69	332
60% or less	37	69	332
70% or less	42	74	327
80% or less	47	75	326
90% or less	54	85	316

As discussed in the Methodology chapter, the pattern of missing data is more important than the amount of missing data, and missing data can be imputed from the existing data if the data is MAR (Tabachnick & Fidell, 1996, 2013). Thus, a dataset where data is randomly missing is preferable for analysis. As discussed in Section 3.5.1.1, the Little's MCAR test was employed to inspect the patterns of missing data in this study's dataset. If the *p*-value of the MCAR test on missing data is found to be not significant (i.e. $p>.05$), the pattern of the missing data is said to be MCAR and the missing data imputation can be carried out using existing data. The process and the results of the MCAR test were as the following.

The three datasets (B, C and D) were examined for their patterns of missing data, using Little's MCAR test. The *p*-value of the dataset B (N=361) was less than .001,

which indicated that the missing data was not MCAR. Therefore, the missing data in the dataset B could not be imputed from the existing data without putting the results at risk of bias (Kline, 2011). The *p*-value of the dataset C (N=339) was .084, which was just above the ideal result of $p > .05$. This statistical result suggested that the missing data in the dataset C could be completely random. The *p*-value of the dataset D (N=332) was .133, which was also satisfactory (i.e. >.05) and better than the value for dataset C. This result indicated that the missing data in the dataset D was MCAR, implying that missing data imputation would not introduce any serious bias (Kline, 2011; Tabachnick & Fidell, 2013).

As discussed in the Methodology chapter, *expectation maximisation* (EM) was adopted as the data imputation method, whereby the values of the missing data are calculated, using the existing data, at the *expectation* step. The calculated *expected* value is then submitted to a *ML* estimation (the *maximisation* step). These two steps are repeated until convergence is achieved (Kline, 2011; Tabachnick & Fidell, 2013). The EM process was performed in SPSS. An imputed dataset, which contained no missing data, was generated by SPSS using EM. The imputed N=332 dataset (dataset E) was then used for the data screening and analysis.

In summary, the three different datasets (i.e. B, C and D) were examined for the impact of their missing data. Based on the results from the Little's MCAR test, it was decided to use the N=332 as the dataset for further analysis. The missing data in the N=332 dataset was also imputed using the EM method before checking it for normality.

5.2 Normality

After resolving the missing data issues, the next step was to check the data's distribution. As discussed in the Methodology chapter, one statistical assumption of SEM is that the analysed data is normally distributed, especially at the multivariate level (Hair, et al., 2010). Therefore, this section discusses the distribution of the data from the imputed N=332 dataset (E), at both the univariate and multivariate levels, and the way problematic distributions were dealt with.

5.2.1 Univariate normality

Two issues were checked at the univariate level: the univariate outliers and the individual item's distribution. The univariate outliers were identified through each item's *z* score. The distribution of an individual item was inspected through the item's skewness and kurtosis. Resolutions undertaken for the issues found are described later in this section.

5.2.1.1 Univariate outliers.

When the absolute value of an item's standardised score (*z* score) is greater than 3.29, this suggests an extreme value (Tabachnick & Fidell, 2013). The standardised scores were generated by SPSS. Extreme values were found in 18 responses (where *z* >3.29) across eight items. As discussed in Section 3.5.1.2, the extreme values were assigned with a less extreme value (Tabachnick & Fidell, 2013). After the action, new *z* scores were generated for the dataset. This time, no univariate outliers were found.

5.2.1.2 Skewness and kurtosis.

The skewness index for 37 out of the 55 items was moderately but significantly skewed at the univariate level. These 37 items were in the attitudinal constructs (ATD_Affections and ATD_Beliefs), perceived behavioural control constructs (PBC_Perception and PBC_Situational), descriptive norm construct (DN_Comply), self-identity construct (ID), intention construct (INT) and behaviour construct (BH). Therefore, the data was transformed to make it a normally distributed dataset.

The data was transformed by *reflecting* and then *square-rooting* the variables (*SQRT(k-x)*, where the *k* is one score larger than the largest score in the transformed item). After the data transformation, most of the 37 skewed items' normality scores dropped back into the acceptable range (i.e. skewness index <3; Kline, 2011), except for 10 items (items a and b in the PB measure; items a, c and d in the INT measure; item a in the PBC_Perception measure, items d, e and g in the ATD_Beliefs measure; and item c in the BH measure).

Restoring normality to significantly skewed items at the univariate level can help reduce the impact of univariate non-normality at the multivariate level (Hair, et al.,

2010). Although the transformation did not restore the univariate normality of every item, the ML estimation method used to analyse the data in this study and the bootstrapping on AMOS helped restore the multivariate normality while processing and analysing the data, if any multivariate non-normality was found.

5.2.2 Multivariate normality

Detecting and dealing with the multivariate outliers are the focuses of this section. As discussed in the Methodology chapter, a multivariate outlier indicates that the combination of a case's scores on two or more items deviate from the centroid.

The *Mahalanobis distance* was used to detect multivariate outliers in the imputed and transformed N=332 dataset (Tabachnick & Fidell, 2013). The items were grouped together to calculate the distances from the centroid. While the data transformation should have helped reduce the number of multivariate outliers in the dataset, there may still have been some responses that remained far from the centroid. As suggested by Tabachnick and Fidell (2013), these responses were removed to reduce their impact on any data analyses. Nineteen responses were identified as outliers in the imputed and transformed N=332 dataset and removed from the dataset. This left a N=313 dataset for data analysis.

In summary, missing data and normality are two important issues to investigate prior to testing a proposed model. In this study, the results from the missing data analysis suggested that the N=332 dataset was appropriate for further use. Therefore, the missing data was imputed and the dataset was then checked for normality. First, the univariate normality of the data was inspected. There were 18 responses with extreme values in some items at the univariate level and these extreme values were adjusted to less extreme scores. The dataset was then checked for skewness and kurtosis at the univariate level, finding a moderate but significant skewness. Therefore, the data was transformed to restore its univariate normality and then the items were grouped together to assess multivariate outliers. Nineteen multivariate outliers were found and removed from the dataset. This left 313 usable responses in the dataset (N=313). This N=313 dataset, with the missing data and the extreme univariate scores imputed, was used to check the relationships between the proposed constructs and their items.

5.3 Constructs and Their Items

This section focuses on the relationships between the items and their related constructs. As discussed earlier in the Methodology chapter, the grouped items (i.e. all items designed to measure the same conceptual construct) have to demonstrate a certain degree of reliability (i.e. a Cronbach's *alpha* value greater than .7) and validity (i.e. convergent validity) before they can be said to measure the related construct.

This section reviews the following issues:

1) Dimensionality of sets of items under the same construct, which indicates whether the items are measuring the same factor: The result is generated by the *factor analysis* function in SPSS. The desired result is unidimensional (Kline, 2011).

2) The coefficient *alpha* (also known as Cronbach's *alpha*) of the grouped items, which suggests internal consistency reliability. The result is generated by the *reliability* analysis function in SPSS. The desired result is a value greater than .70, which suggests that the item's reliability is adequate for further data analysis (Kline, 2011).

3) Convergent validity, by inspecting each construct's congeneric model in AMOS: This step confirms whether the proposed constructs can be measured by the individual items.

Before reviewing each construct's congeneric measurement model, the relationship between the items designed for the behaviour construct and those designed for the intention construct were examined. This approach reflected the concern that was raised in the Methodology chapter (Section 3.3.2), that the self-reported behaviour data may represent intention only, rather than the actual behaviour. Hence, the dimensionality and reliability tests were conducted first on these two sets of items (i.e. behaviour and intention) (see Section 5.3.1). Once the results of these two tests suggested that these two sets of items were measuring the same constructs (i.e. unidimensional and *alpha* >.80), the actions of integrating these two sets of items to form a new intention construct and dropping the behaviour construct from the original proposed model could be made. The convergent validity of this construct was also inspected to determine whether or not this construct was valid for use in the rest of the data analyses.

The indices selected to check the constructs' congeneric model's fit are detailed in Section 3.5.5, and summarised here in Table 5.2.

Table 5.2 List of model fitness indices used in this study and the desired results

Index*	The desired results are:	Sources
***Chi-square* (CMIN), *df* and its *p*-value**	A smaller chi-square value with a *p*-value greater than .05; or the CMIN/DF is less than 3	Byrne, 2010
RMSEA with PCLOSE	RMSEA <.06 indicates good model fit RMSEA =.08 ~ .10 indicates mediocre fit PCLOSE >.05	Byrne, 2010; Hu & Bentler, 1999
The SRMR	A value of less than .08	Hu & Bentler, 1999
The Tucker-Lewis index (TLI)	A value greater than .95	Byrne, 2010
The CFI	A value greater than .95	Byrne, 2010
The bootstrapping *p*-value	A value greater than .05. This result is obtained when the data is not normally distributed at the multivariate level (i.e. the absolute value of the multivariate kurtosis is greater than 4).	Byrne, 2010

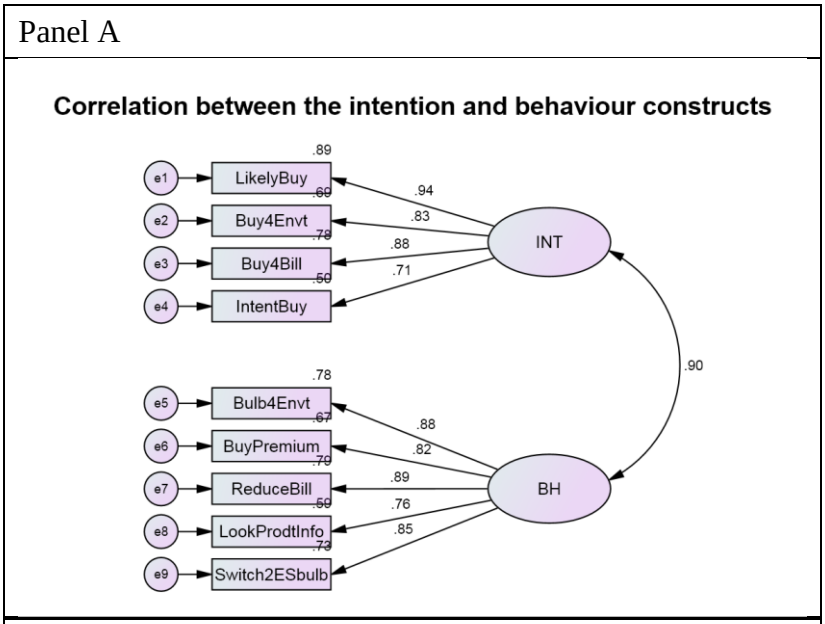
The chi-square and bootstrapping *p*-values are used to confirm whether the items, as a group, can measure the related constructs. SRMR is used to confirm whether the proposed constructs can be measured by the individual items in the construct's congeneric model.

5.3.1 Behaviour and intention constructs

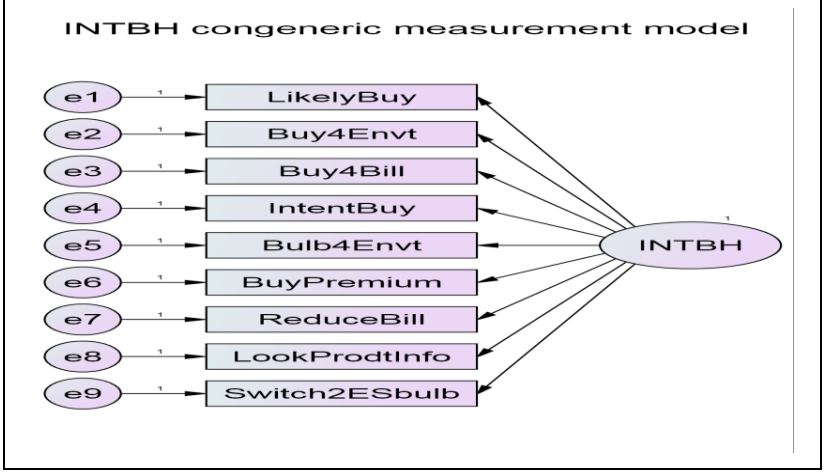
In the survey, there were five items measuring behaviour (i.e. BH, respondents' past purchasing behaviour regarding energy-saving light bulbs), and four items examining intention (i.e. INT, respondents' intentions to purchase energy-saving light bulbs). As discussed in the Methodology chapter, even though the five items had been adopted from prior research in the light of measuring actual behaviour, there was still a possibility of obtaining the information as intention, rather than as actual behaviour.

Figure 5.1 Correlation between the BH and INT constructs

Panel A



Panel B



The correlation between these two constructs was .902 (as indicated in Panel A, Figure 5.1). This high correlation indicated that the two sets of the indicators could be measuring the same construct, rather than two different constructs (Kline, 2011). The resulting dimensionality inspection on the nine items (i.e. 5 for the behaviour and 4 for the intention) indicated that these items were unidimensional, i.e. there was one main factor extracted from these nine items. Further, the Cronbach's *alpha* of these nine items was .947 (the ideal value is greater than .70). The results from the correlations to Cronbach's *alpha* suggested that treating these nine items as indicators of measuring one single construct was more appropriate than treating them as two different sets. Treating these two sets of items as one in measuring intention could also be

theoretically sound, as these nine questions were asking respondents about their future behaviour and/or commitment (Ajzen, 1991). Thus, these nine items were integrated to measure one single construct, intention (as illustrated in Panel B, Figure 5.1). To differentiate between this new intention construct and the original intention construct (as they were measured by different items/indicators), in the revised proposed model the new intention construct was named INTBH, in which the behaviour construct had been removed.

5.3.2 Intention construct

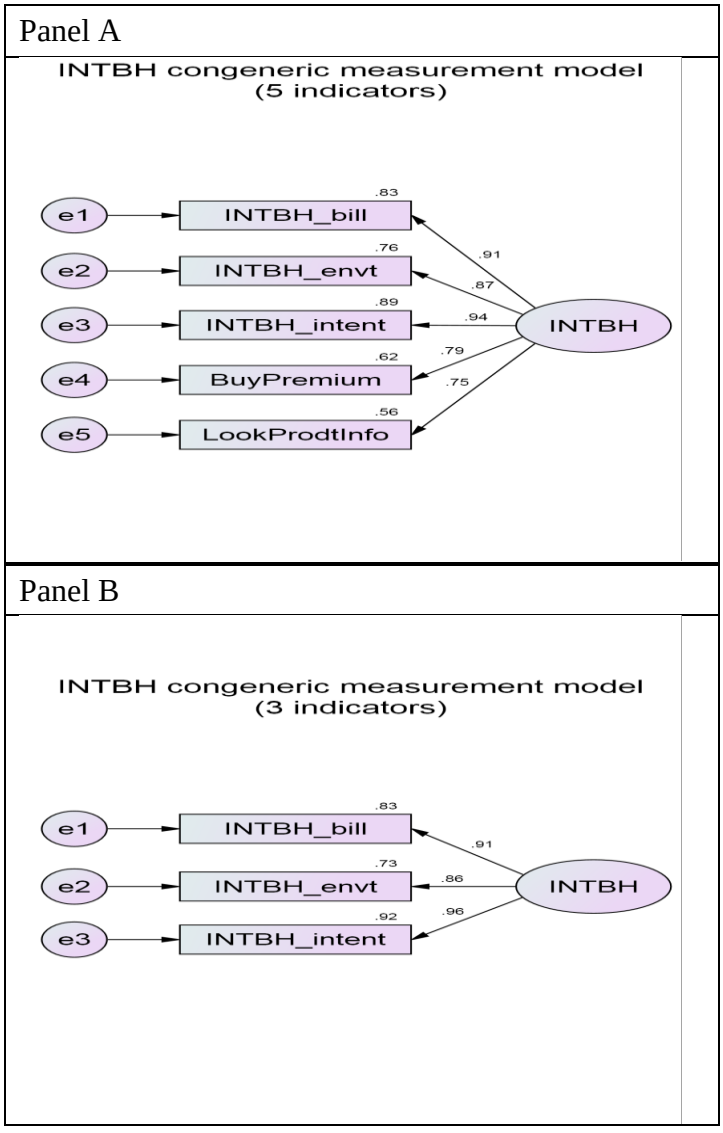
As mentioned in the previous section, there were now nine indicators measuring *intention* (INTBH, as illustrated in Panel B, Figure 5.1). These indicators were unidimensional and their Cronbach's *alpha* was .947.

Closer examination of the nine indicators showed that some of them were repetitive. The repetitive indicators could be categorised into three groups: intent to buy (i.e. LikelyBuy, IntentBuy and Switch2ESbulb), buy for reducing bills (i.e. Buy4Bill and ReduceBill), and buy the bulbs for the environment (i.e. Buy4Envt and Bulb4Envt). Therefore, the indicators under these three groups were parcelled into three composites (i.e. INTBH_intent, INTBH_bill and INTBH_envt), along with the other two indicators, to measure the intention construct (as illustrated in Panel A, Figure 5.2). According to the dimensionality and reliability tests, these five indicators were unidimensional with high Cronbach's *alpha* value ($\alpha = .931$).

The INTBH's congeneric measurement model (see Panel A, Figure 5.2) suggested a poor model fit. The chi-square value of this model was 45.207 (*df* was 5), with the *p*-value less than .001 and its bootstrapping *p*-value less than .001. Even though the model's SRMR (=.0256) and CFI (=.970) indicated a good fit, the model's TLI (=.940), RMSEA (=.161) and PCLOSE (<.001) indicated that the model's fit was poor. According to factor loading estimates and the R-squared values (the percentage the indicator accounts for), the BuyPremium and LookProdtIno had the lowest values among the five (as indicated in Panel A, Figure 5.2). Further, according to the modification indices suggested by the AMOS, the two indicators were the indicators receiving the most recommendations of modification. Closer examination of the responses requested in these two items (i.e. '*In future, I will buy energy-saving light*

bulbs even if they are more expensive than conventional ones' and '*In future, when I buy light bulbs, I will look at the product information to see if they save energy*') showed that they could be poor indicators of respondents' purchasing intentions because (1) the former could indicate that purchasing energy-saving light bulbs is influenced by its selling price and (2) the latter does not fully indicate an attempt to buy the products. Hence, these two indicators were dropped and the revised INTBH's congeneric measure model was as illustrated in Panel B, Figure 5.2.

Figure 5.2 INTBH congeneric measurement model



The revised INTBH congeneric measurement model was a good fit; its chi-square value was 2.828 (*df* was 1) with the *p*-value greater than .05 (*p*=.093), and the bootstrapping *p*-value was 1.000. The SRMR, CFI, TLI, RMSEA and PLCOSE also

suggested a good fit, (.0057, .998, .993, .077 and .217, respectively). The factor loadings of the three indicators were high, as were their R-squared values; these results imply that these three indicators were good in representing the INTBH construct. This revised INTBH construct with its three indicators was used in the later CFA to assess the discriminant validity among the proposed constructs.

5.3.3 Attitude constructs

In this study, there were two attitudinal constructs measuring attitude from two different perspectives: ATD_Affections, which had four reflective items, was designed to collect information about respondents' emotions/feelings towards the purchasing behaviour; ATD_Beliefs, which had eight reflective indicators, was designed to collect data regarding respondents' beliefs/thoughts. Figure 5.3 illustrates the causality links from the two constructs to their representative indicators.

An examination of dimensionality and internal consistency reliability showed that the four items from the first aspect (i.e. ATD_Affections) were unidimensional, which suggested that they were measuring the same factor. The Cronbach's *alpha* for ATD_Affections was .900, which was greater than .70, demonstrating good internal consistency reliability. Even though the Cronbach's *alpha* for the eight items in ATD_Beliefs was high (.809), the eight items were not unidimensional. The factor analysis indicated that there were two factors extracted from the ATD_Beliefs; in other words, the eight items were measuring more than one factor. The component score coefficient matrix of the ATD_Beliefs suggested that the PremiumNeg ('*The higher cost of energy-saving light bulbs encourages people to carry on buying non-energy-saving ones*') was the item causing the problem. PremiumNeg was also the item that least correlated to the other seven items. After removing PremiumNeg, factor analysis showed that there was only one factor measured by the remaining seven items. The Cronbach's *alpha* of the new ATD_Beliefs (with seven items, as illustrated in Panel A, Figure 5.3) was .834, greater than the desired minimum value of .70.

After confirming the items were unidimensional and their Cronbach's *alphas* were greater than .70, the next step was to assess their convergent validity to see if the items could be used individually to represent their related constructs. The results suggested that the four items under the ATD_Affections could not be used individually

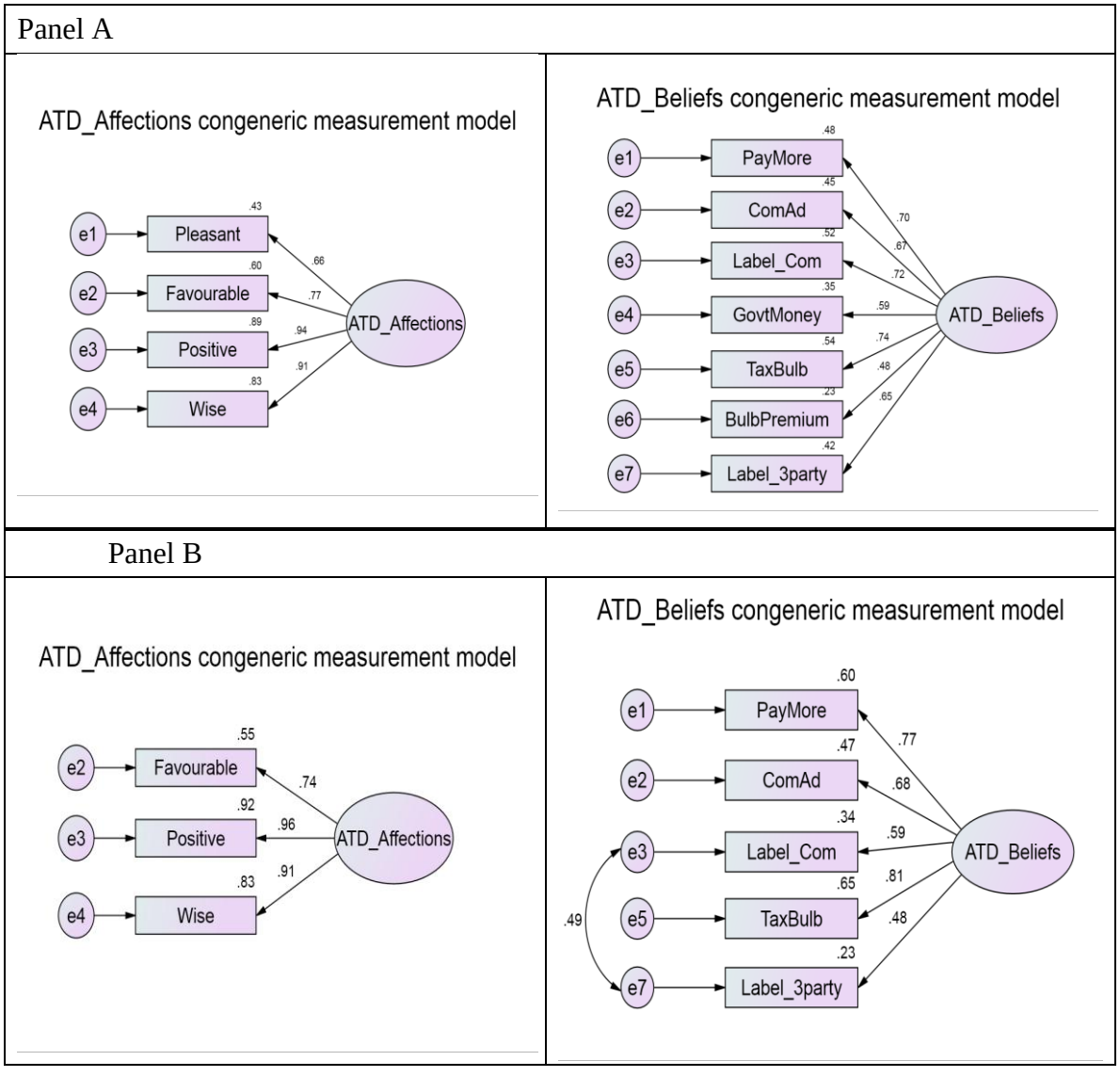
to measure ATD_Affections; nor could the seven items under the ATD_Beliefs be used individually to measure ATD_Beliefs.

According to the assessment of the ATD_Affections' four-item congeneric measurement model (as illustrated in Panel A, Figure 5.3), the fit indices of the ATD_Affections' congeneric model all indicated a poor fit to the data. The chi-square of the ATD_Affections congeneric model was 110.654 (*df* was 2) and the *p*-value was less than .001. Further, the *p*-value of the ATD_Affections' bootstrapping was assessed to a value less than .001. These results indicated that the discrepancy between the proposed congeneric model (i.e. ATD_Affections and its related items) and the data was statistically significant. Other fit indices also indicated the same conclusion. The SRMR of the ATD_Affections' four items was .0811, which was greater than the cut-off point (<.08). The values of the ATD_Affections' CFI and TLI were also below the standard, at .885 and .654, respectively. The values of the ATD_Affections' RMSEA and PCLOSE were .417 and less than .001, respectively, which also suggested that the model was a poor fit for the data (Table 5.2 shows the desired results for fit indices). The decision to drop the Pleasant indicator was made, based on its low factor loading (.66) and R-squared (.43) (Kline, 2011). The fit indices of the revised ATD_Affections' congeneric measurement model (as illustrated in Panel B, Figure 5.3) suggested a good model fit. The revised ATD_Affections' model's chi-square value was .142 (*df* was 1), the *p*-value of the chi-square was .706 and its *p*-value of bootstrapping was 1.000. The other fit indices also aligned with the chi-square values, suggesting a good model fit (SRMR=.0018; CFI=1.000; TLI=1.004; RMSEA<.001; PCLOSE=.797). Therefore, this revised ATD_Affections's measurement model was used in later data analyses.

The results of the ATD_Beliefs' seven-item congeneric model (as illustrated in Panel A, Figure 5.3) showed that the seven remaining items' factor loadings were statistically significant to the ATD_Beliefs variable. The chi-square for the ATD_Beliefs congeneric model was 126.531 (*df* is 14), the *p*-value was less than .001 and the *p*-value of its bootstrapping was also less than .001. The value of the ATD_Beliefs' SRMR was .0687. The values of the construct's CFI and TLI were .854 and .781, respectively. The value of the RMSEA was .141 and the PCLOSE value was less than .001 (Table 5.2 shows the desired results for fit indices). These all indicated that the model was not a good fit for the data. The decision to remove GovtMoney ('*It would be wise for the government to devote more money to supporting a strong energy-*

saving programme') and BulbPremium ('*Paying more for energy-saving light bulbs (than for conventional ones) is acceptable*') was made based on their low estimates on factor loadings (.59 and .48, respectively) and R-squared values (.35 and .23, respectively). Further, based on the modification indices generated by the AMOS, there was a correlation between Label_Com ('*I trust energy-saving claims made by manufacturers*') and Label_3Party ('*I trust an eco-label issued by an independent third party (e.g. Energy Star')*). Hence, a constraint was added to covary these two indicators.

Figure 5.3 ATD congeneric measurement models



The theoretical reasons for dropping these two indicators were: (1) the intensive nationwide advertising campaign (as discussed in Section 3.2.1) could have given the respondents the impression that the government has invested money into related

programmes, and (2) the price difference between an energy-saving light bulb and a non-energy-saving light bulbs may be too small to influence respondents' attitudinal beliefs. This revised ATD_Beliefs measurement model (as illustrated in Panel B, Figure 5.3) had a good model fit, according to its fit indices ($x^2_{(4)}$=6.602, p=.158, bootstrapping p =.871, CFI=.995, TLI=.988, RMSEA=.046, and PCLOSE=.467). Therefore, this revised ATD_Beliefs construct was used in later data analyses.

5.3.4 Injunctive norm construct

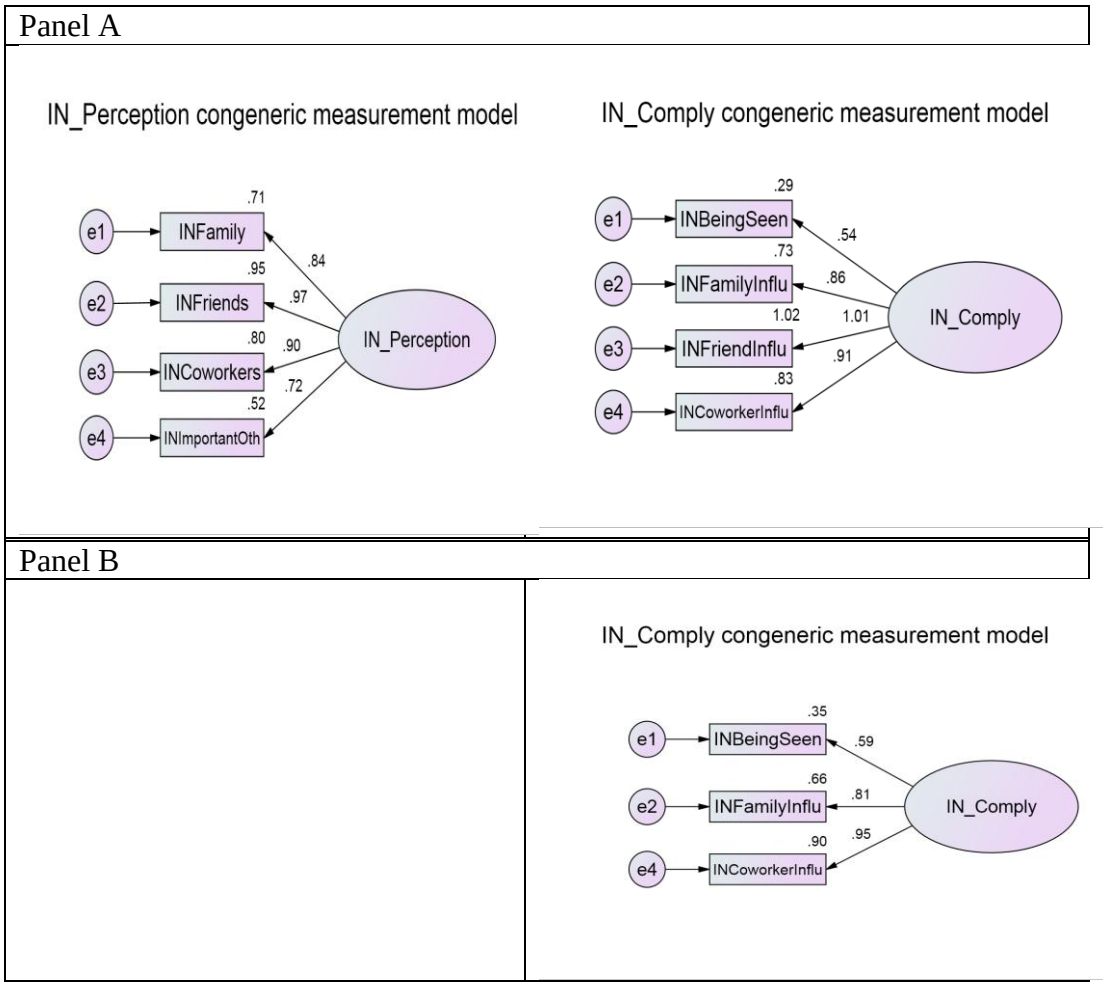
Injunctive norm refers to one's perceived beliefs of what an individual thinks others expect him/her to do. The construct was assessed from two different aspects: the IN_Perception construct, which had four items, was designed to measure the perceived expectations from others (e.g. family, friends, etc.); IN_Comply, which had four items, was designed to identify which people were perceived to influence the respondent's decision making (e.g. family, friends, etc.). Figure 5.4 illustrates the causalities between the two constructs and their indicators. After confirming the capabilities of the indicators measuring the respective sub-constructs (i.e. IN_Perception and IN_Comply) of the injunctive norm construct, a product term was created based on the valid indicators as an index of injunctive norm.

The dimensionality and the internal consistency reliability tests of the four items from IN_Perception showed that the items were unidimensional, which suggested they were measuring the same factor. The Cronbach's *alpha* of IN_Perception was .915, (a result >.70 indicates internal consistency reliability). The factor analysis also indicated that the four items grouped under the IN_Comply were unidimensional; their Cronbach's *alpha* was .899, which was also greater than .70. In the convergent validity assessments, the congeneric measurement models of IN_Perception and IN_Comply indicated that the four items for IN_Perception were capable of measuring IN_Perception individually, but not the items for IN_Comply.

According to the assessment of the IN_Perception's four-item congeneric model (as illustrated in Panel A, Figure 5.4), all four indicators' factor loadings were significant for the IN_Perception construct. The fit indices of the IN_Perception's congeneric model also indicated the model's good fit for the data, showing that the items could measure the construct individually. The chi-square of the IN_Perception

congeneric model was 4.211 and the *p*-value was .122. The *p*-value of the bootstrapping was evaluated because the absolute value of the multivariate kurtosis was greater than four; the *p*-value was .917. These results suggested that the proposed relationship between the four items and the IN_Perception construct fit the sample collected from survey respondents. Other fit indices also led to the same conclusion. The SRMR of the model was .0121 and the values of its CFI and TLI were .989 and .966, respectively. The IN_Perception's RMSEA and PCLOSE values were .060 and .320, which suggested that the discrepancy between the proposed congeneric model and the sample population was minor and not statistically significant. Therefore, these four indicators were used in the later CFA before creating the injunctive norm's product term.

Figure 5.4 IN congeneric measurement models



For the IN_Comply four-item congeneric model (as illustrated in Panel A, Figure 5.4), all four items' factor loadings towards the IN_Comply construct were significant. However, the fit indices of IN_Comply suggested that the proposed

relationship to the variables did not fit the sample population. The chi-square and the *p*-value of the IN_Comply congeneric model were 14.732 (*df* was 2) and .001, respectively, and the *p*-value of the model's bootstrapping was .021. These results indicated that the difference between the congeneric model and the sample population could not be ignored and was statistically significant. The values of the model's RMSEA and PCLOSE also supported this conclusion. The IN_Comply congeneric model's RMSEA and PCLOSE were .143 and .009, respectively. However, the same conclusion was not reached for all the fit indices. The model's SRMR, CFI and TLI values were .0240, .989 and .966, respectively, which suggested the model could fit the sample population (Table 5.2 shows the desired results for fit indices). An examination of the factor loadings and the variances of the indicators showed that INFriendInflu ('*My friends have much influence on my decision to purchase (or not purchase) energy-saving light bulbs*') had the highest factor loading (more than 1.00) and negative variance (-.046, which was inadmissible, as variance cannot be negative). Therefore, the indicator was removed from the scale in measuring the IN_Comply concept (as illustrated in Panel B, Figure 5.4). The revised model was a good fit for the data, as indicated by its fit indices ($x^2_{(1)}$=1.380, *p*=.240, bootstrapping *p* =1.000, CFI=.999, TLI=.997, RMSEA=.035, PCLOSE=.405 and SRMR=.0117). Therefore, these three indicators were used for the later CFA before creating the injunctive norm's product term.

5.3.5 Perceived behavioural control constructs

As discussed in Section 3.3.6, two constructs measured two aspects of perceived behavioural control: PBC_Perception, which had four reflective indicators, measured the respondents' perceived ability to purchase energy-saving light bulbs; PBC_Situational, which had five reflective indicators, assessed the information regarding the respondents' perceived situational influence. Figure 5.5 illustrates the causalities between these two constructs and their corresponding indicators.

The factor analysis performed in SPSS suggested that there was only one main factor extracted from the four items of PBC_Perception. These results indicated that these four items were unidimensional. The Cronbach's *alpha* for PBC_Perception was .706, which was greater than .70, indicating internal consistency reliability. There

was also only one main factor extracted from the five items for PBC_Situational. In other words, these five items were also unidimensional. The Cronbach's *alpha* for the PBC_Situational was .776, which is a desirable result. However, the evaluations of the two grouped items' convergent validity suggested that the items could not be used individually to represent their related constructs in the CFA stage.

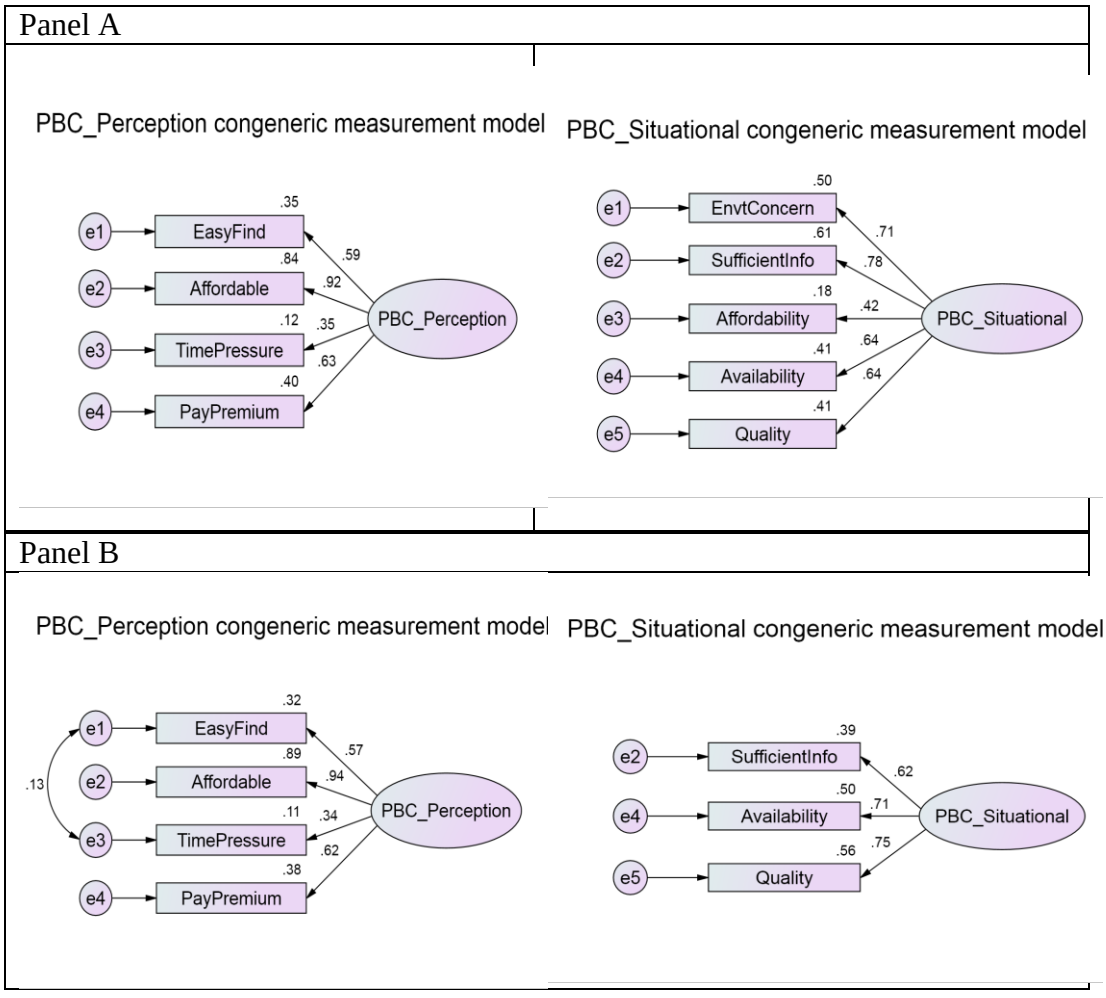
According to PBC_Perception's four-item congeneric measurement model (as illustrated in Panel A, Figure 5.5), all four items' factor loadings were significant for the PBC_Perception construct. However, the results from the PBC_Perception's congeneric measurement model suggested that the proposed relationship did not fit the sample perfectly. The chi-square and the *p*-values of the congeneric models were 7.502 and .023, respectively, which indicated that the discrepancy between the proposed congeneric model and the sample could not be ignored. The bootstrapping *p*-value was not reviewed because PBC_Perception's data distribution was normal at the multivariate level. Other fit indices also suggested that the discrepancy between the model and the sample could not be ignored. The SRMR of the PBC_Perception was .0357, which indicated a good fit. Although the CFI of the PBC_Perception congeneric model was .980, its TLI was .940, which suggested that the model did not fit the sample perfectly. The RMSEA of the PBC_Perception congeneric model was .094 (which indicated mediocre fit), and the PCLOSE value was .133 (which indicated that the discrepancy between the model and the sample may not be statistically significant).

While examining the modification indices suggested by the AMOS, a constraint was suggested to add to covary the indicators EasyFind ('*It is easy for me to find energy-saving light bulbs whenever I need to buy them*') and TimePressure ('*High time demands on me made it much harder to purchase energy-saving light bulbs on my last visit to the store*'). Covarying these two indicators also made sense from theoretical perspective, as time pressure could also affect the impression of whether or not it was easy to find a product. Therefore, a constraint was added as suggested (as illustrated in Panel B, Figure 5.5). According to the fit indices, this revised PBC_Perception model was a good fit for the data ($x^2_{(1)}$=2.806, *p*=.094, bootstrapping *p* =1.000, CFI=.993, TLI=.960, RMSEA=.076, PCLOSE=.219 and SRMR=.0200). Therefore, the PBC_Perception model illustrated in Panel B, Figure 5.5 was used in later data analyses.

For the congeneric measurement model of PBC_Situational (as illustrated in Panel A, Figure 5.5), the results indicated that the proposed relationship (i.e. the five

items and their PBC_Situational construct) did not fit the sample population. The chi-square of the PBC_Situational was 79.306 and the *p*-value was less than .001. The *p*-value of the bootstrapping was inspected because PBC_Situational had a non-normal distribution. The *p*-value of the PBC_Situational's bootstrapping was less than .001. These results indicated that the discrepancy between the PBC_Situational congeneric model and the sample population was major and could not be ignored. The other fit indices also suggested the same conclusion. The PBC_Situational's SRMR was .0819 (>.08 indicates a poor model fit). The CFI and TLI of the PBC_Situational were .838 and .676, respectively, which suggested the model was a poor fit for the sample. The RMSEA and PCLOSE were .218 and less than .001, which also led to the conclusion of poor model fit (Table 5.2 shows the desired results for fit indices).

Figure 5.5 PBC congeneric measurement models



The decision to remove EnvtConcern ('*Concerns for the environment*') and Affordability indicators was made. The reasons for removing EnvtConcern were based

on the suggestion from the modification indices, and also theoretically the indicator should have pre-existed, rather than being prompted in the situation. The reasons for removing Affordability were based on the factor loadings and the suggested modification indices. From theoretical perspective, dropping the Affordability indicator could better reflect reality in New Zealand, as energy-saving light bulbs are not very expensive and consumers may not even consider whether or not they are able to purchase the products, in terms of their budget. The revised PBC_Situational construct was as illustrated in Panel B, Figure 5.5; the model's fit indices suggested that the model was a good fit for the data ($x^2_{(1)}$=.469, p=.493, bootstrapping p =1.000, CFI=1.000, TLI=1.008, RMSEA<.001, PCLOSE=.637 and SRMR=.0087). Therefore, the PBC_Situational model illustrated in Panel B, Figure 5.5 was used in later data analyses.

5.3.6 Descriptive norm construct

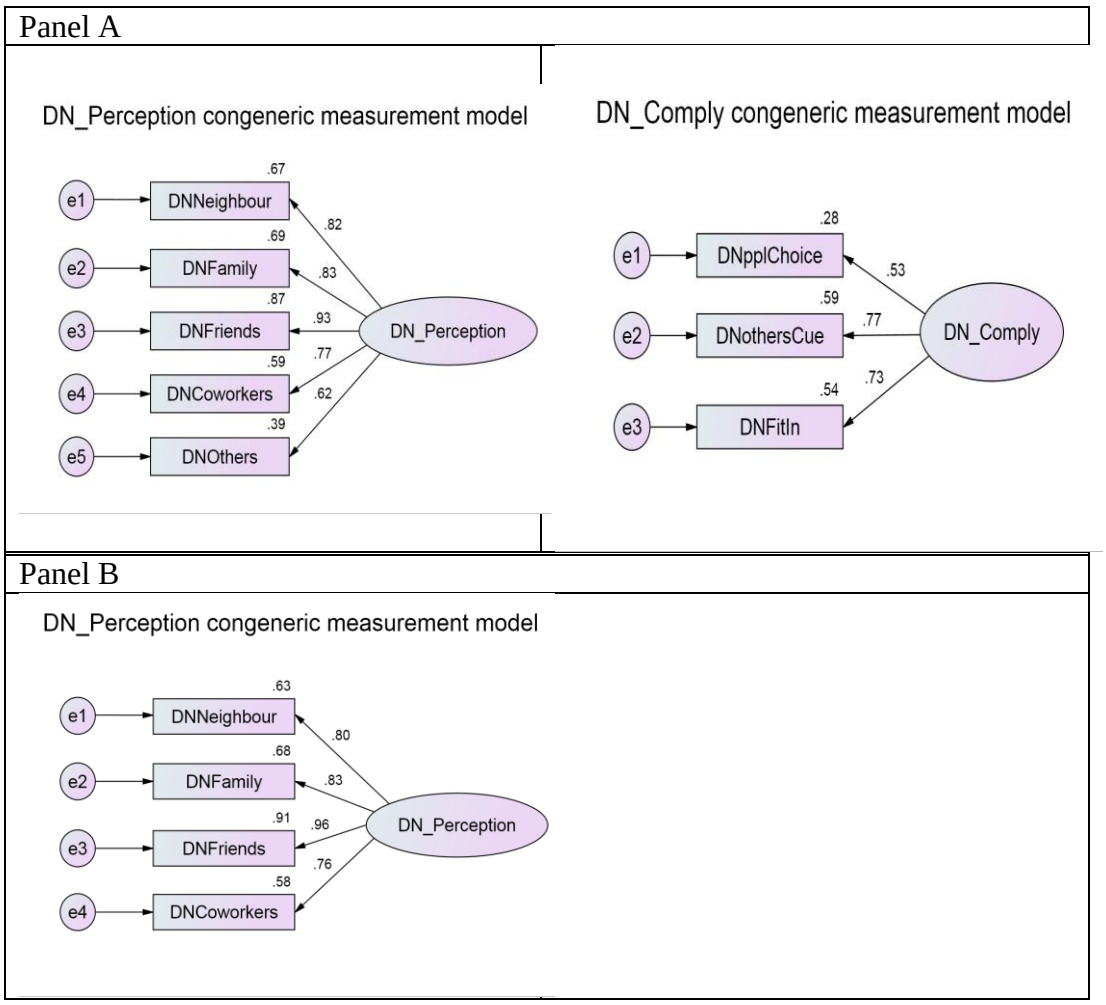
As discussed in Section 3.3.7, two constructs were used to measure two aspects of the descriptive norm. There were five reflective indicators measuring respondents' perceptions about the majority's purchasing behaviour (DN_Perception) and three assessing the respondents' willingness to comply with the majority (DN_Comply). Figure 5.6 illustrates the causalities between the sub-constructs of descriptive norm and their relative indicators. After confirming the valid indicators for measuring these two sub-constructs (as detailed in Section 5.4), a product term was created as the index of descriptive norm.

According to the factor analysis performed in SPSS, the five items for DN_Perception were unidimensional (i.e. only one main factor could be extracted from the five items), as were the three items for DN_Comply. The Cronbach's *alpha* for DN_Perception was .897, demonstrating internal consistency reliability. The coefficient *alpha* of the DN_Comply was .711, which was also a desirable result.

The chi-square of the DN_Perception congeneric model was 60.007 and the *p*-value was less than .001. The *p*-value of bootstrapping was reviewed because the absolute value of the multivariate kurtosis was greater than four (indicating non-normal distribution). The *p*-value of the bootstrapping was less than .001. These results indicated that the discrepancy between the DN_Perception congeneric model and the

sample population could not be ignored. Other fit indices also suggested that the DN_Perception congeneric model was not a good fit for the sample population. While, the SRMR was .0457 (a good result), the CFI and TLI were .945 and .891, respectively. The values of the model's RMSEA and PCLOSE were .188 and less than .001, respectively. On examination of the modification indices, DNOthers was suggested to be the indicator causing the poor fit. Further, the R-square value of DNOthers indicator was very low (.39). Therefore, the decision to drop this indicator was made. The revised DN_Perception model (as illustrated in Panel B, Figure 5.6) was a good fit for the data ($x^2_{(2)}$=.658, p=.720, bootstrapping p =1.000, CFI=1.000, TLI=1.005, RMSEA<.001, PCLOSE=.855 and SRMR=.0048). In other words, the indicators in the revised congeneric model were capable of measuring the DN_Perception. Therefore, these four indicators were used for the later CFA before the descriptive norm's product term

Figure 5.6 DN congeneric measurement models

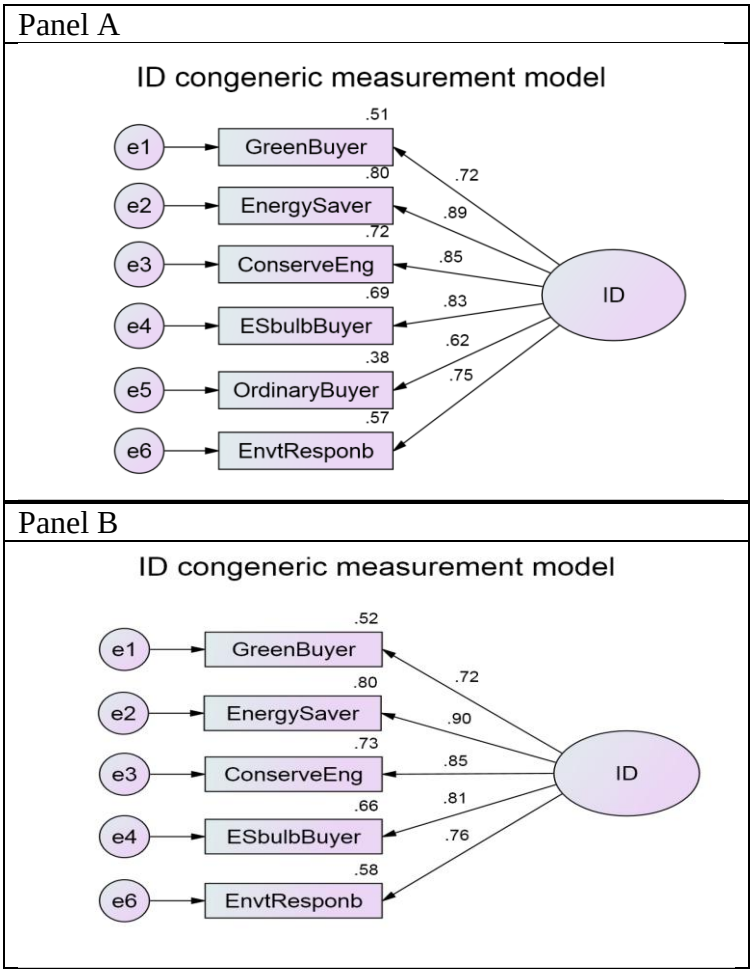


The chi-square of the DN_Comply's congeneric model (as illustrated in Panel A, Figure 5.6) was 4.910 (*df* was 1), the *p*-value was .027 and the *p*-value of the DN_Comply's bootstrapping was .191. These results suggested that the discrepancy between the DN_Comply model and the data could be acceptable. The model's fit indices also aligned with the chi-square results, in which the proposed indicators should be capable in measuring the DN_Comply (CFI=.979, TLI=.938, RMSEA=.112, PCLOSE=.092, SRMR=.0287). Therefore, these three indicators were used for creating the descriptive norm index. This revised congeneric model was used in the later confirmation factory analysis before creating an index for the descriptive norm.

5.3.7 Self-identity construct

There were six reflective indicators in the survey designed to measure self-identity (ID); that is, how the respondents saw themselves. Figure 5.7 illustrates the causality from the construct and its corresponding indicators.

Figure 5.7 ID congeneric measurement model



According to the factor analysis performed in SPSS, there was one main factor extracted from the six items; in other words, they were unidimensional. The Cronbach's *alpha* of ID was .892, which was higher than the cut-off point.

For the ID's six-item congeneric measurement construct (as illustrated in Panel A, Figure 5.7), all the items' factor loadings towards the latent variable were statistically significant. The chi-square of the construct was 44.756 and the *p*-value was less than .001, suggesting that the model was not a good fit for the sample. The construct's bootstrapping *p*-value was .001. These results indicated that the discrepancy between the proposed six-item ID construct and the sample population was major and could not be ignored. Most of the inspected fit indices (i.e. TLI, RMSEA and PCLOSE) supported this discrepancy, but not the SRMR and CFI. The SRMR of the congeneric model was .0371, which was well within acceptable range. The CFI value of the model was .968, which also indicated the model was a good fit (Byrne, 2010). The TLI value of the model was .947, which was slightly less than .95 (the ideal TLI value is >.95). The RMSEA was .112 and the PCLOSE value was .001, which indicated a poor model fit.

An examination of the modification indices showed that OrdinaryBuyer ('*I am NOT the type of person oriented to purchase energy-saving light bulbs*') was the indicator that needed the most modifications. Further, the R-square value of OrdinaryBuyer was low (.38), which also indicated that it was not a good indicator for the self-identity construct. As a result, a decision to drop this indicator was made; the revised self-identity congeneric measurement model was as illustrated in Panel B, Figure 5.7. The revised self-identity model was a good fit for the data ($x^2_{(5)}$=12.879, *p*=.025, bootstrapping *p* =.283, CFI=.992, TLI=.984, RMSEA=.071, PCLOSE=.194 and SRMR=.0218). Therefore, this revised congeneric model was used in later data analyses.

5.3.8 Past behaviour construct

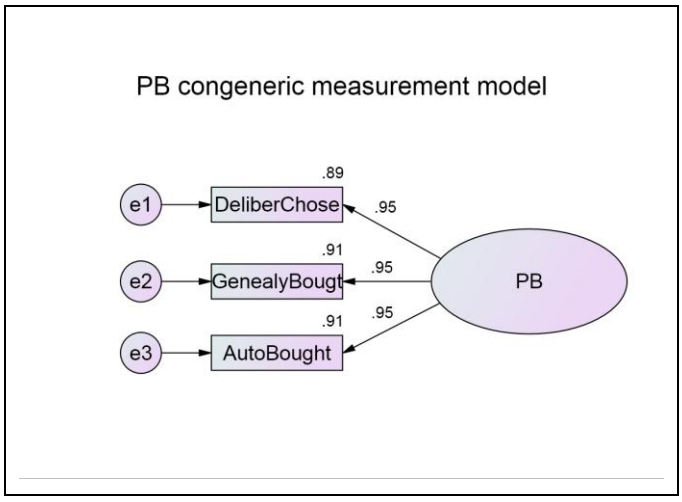
There were three reflective items in the survey measuring past behaviour (PB); that is, the light-bulb-purchasing decisions that respondents had made in the past. Figure 5.8 illustrates the causality between the construct and its three indicators.

The factor analysis performed in SPSS showed that there was one main factor extracted from the three items, meaning they were unidimensional. The Cronbach's *alpha* of PB was .966, higher than .70 (which is a desirable result for internal consistency reliability).

The three-item congeneric measurement model of the PB (as illustrated in Figure 5.8) suggested that the three items' factor loadings towards their PB latent variable were statistically significant. Further, the fit indices of the model also indicated a good model fit. The chi-square of the PB congeneric model was .004, the *p*-value of the chi-square was .950 and the *p*-value of the bootstrapping was 1.000. These results indicated that the discrepancy between PB's three-item congeneric measurement model and the sample population was very minor and could be ignored. Other inspected fit indices also suggested a good model fit. The value of the model's SRMR was .0001. The CFI and TLI values were 1.000 and 1.003, respectively. The model's RMSEA and PCLOSE were .000 and .948, respectively (Table 5.3 shows the desired results for the fit indices).

These three items were not only capable of representing their PB construct as a group (based on the dimensionality and the internal consistency reliability tests), but were also able to measure the construct as individual items (based on the fit indices generated from the three-item congeneric model of the PB construct). Therefore, the PB's three-item congeneric measurement model was used in the subsequent CFA to assess the discriminant validity among the proposed constructs.

Figure 5.8 PB congeneric measurement model



In summary, three features were reported: the dimensionality of the grouped indicators, the grouped indicators' internal consistency reliability, and the indicators' convergent validity towards their latent variables. In brief, all indicators were unidimensional (which suggested that the items were measuring the same factor) to their representing constructs, except ATD_Beliefs. After removing the indicator PremiumNeg, the remaining seven indicators were unidimensional. For the internal consistency reliability, all constructs had a Cronbach's *alpha* greater than .70, which was a desirable result.

Indicators of the *intention* and *behaviour* constructs were examined to verify whether they were measuring two different concepts (i.e. *intention* and *behaviour*) or one single construct. The results suggested that there was only one factor extracted from the two sets of indicators; in other words, the indicators designed for the *intention* and *behaviour* constructs were measuring one single construct, instead of two. Therefore, the indicators were revised to measure the *intention* construct (INTBH), in which the repetitive indicators had been taken care of by parcelling.

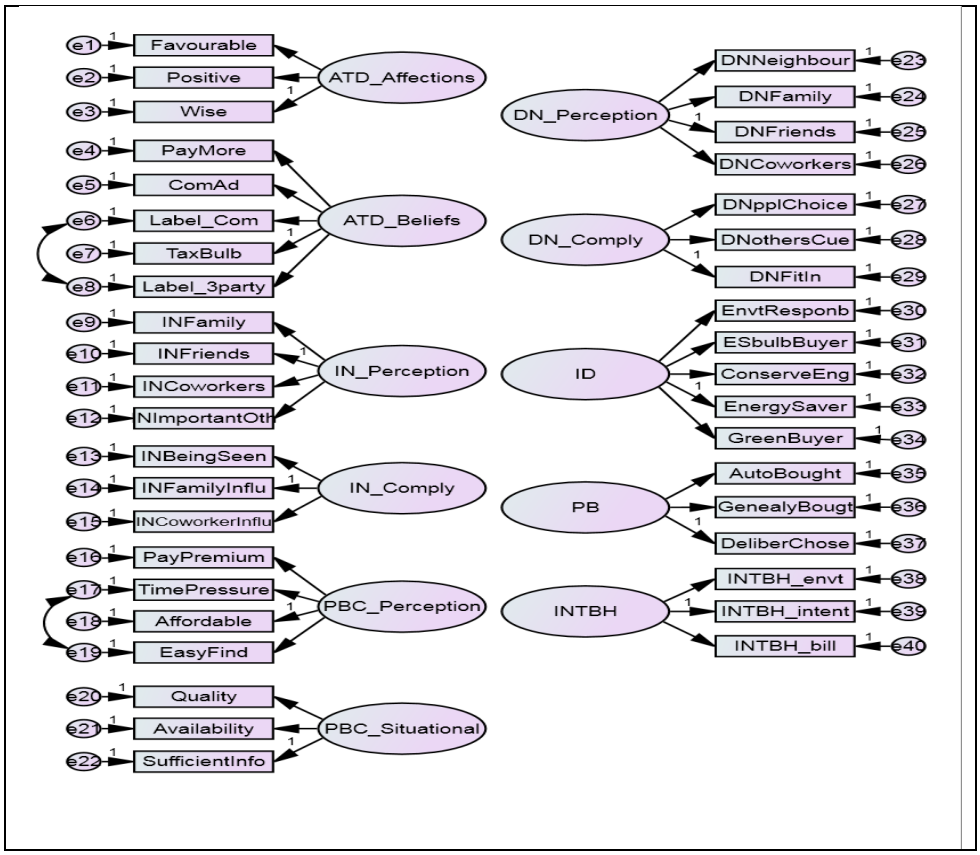
The congeneric measurement model was used to assess whether the proposed constructs' items could measure their related constructs as individual indicators; that is, the indicators' convergent validity. If not, removing poor fit indicator(s) from the congeneric model(s) and/or covarying the potentially correlated indicators were the solutions for improving the models' fit. After verifying and solving issues relating to the indicators' convergent validity, examining the measurement model for the constructs' discriminant validity was the next step.

5.4 Examining Measurement Model: Confirmatory Factor Analysis

Once the validity of the indicators in measuring their representing constructs was verified, the next step was to examine the measurement model through a CFA. This approach aimed to assess the constructs' discriminant validity, which is the degree to which a construct is truly distinct from other constructs, and to verify whether the indicators were measuring their respective construct only (or correlating to other constructs better) (Hair, et al., 2010; Kline, 2011). According to Kline, if the inter-

correlations (*r*) of the constructs are high (greater than .90), the constructs are not distinct from one another. This can be ascertained via CFA, which was conducted in AMOS.

Figure 5.9 Original constructs and indicators for CFA



The 11 constructs (as discussed in Section 5.3 and illustrated in Figure 5.9 as a summary), including two sub-constructs of the injunctive norm and another two for the descriptive norm, are examined in this section. The product terms for the injunctive norm and descriptive norm were created once all the constructs were proven to be distinct from each other.

The following are reported in the CFA (Byrne, 2010; Kline, 2011):

1) the chi-square value, the *df* and the CMIN/DF (i.e. the chi-square value divided by the *df*, with the ideal value less than 3), which illustrate whether the proposed model's CFA fits the sample population

2) fit indices CFI, TLI, RMSEA and PLCOSE (with the ideal cut-off point as described in Table 5.2, p.114), which provide additional support for a model's fit

3) inter-correlations among the constructs, which illustrate whether the proposed constructs are distinct from each other (i.e. r <.90).

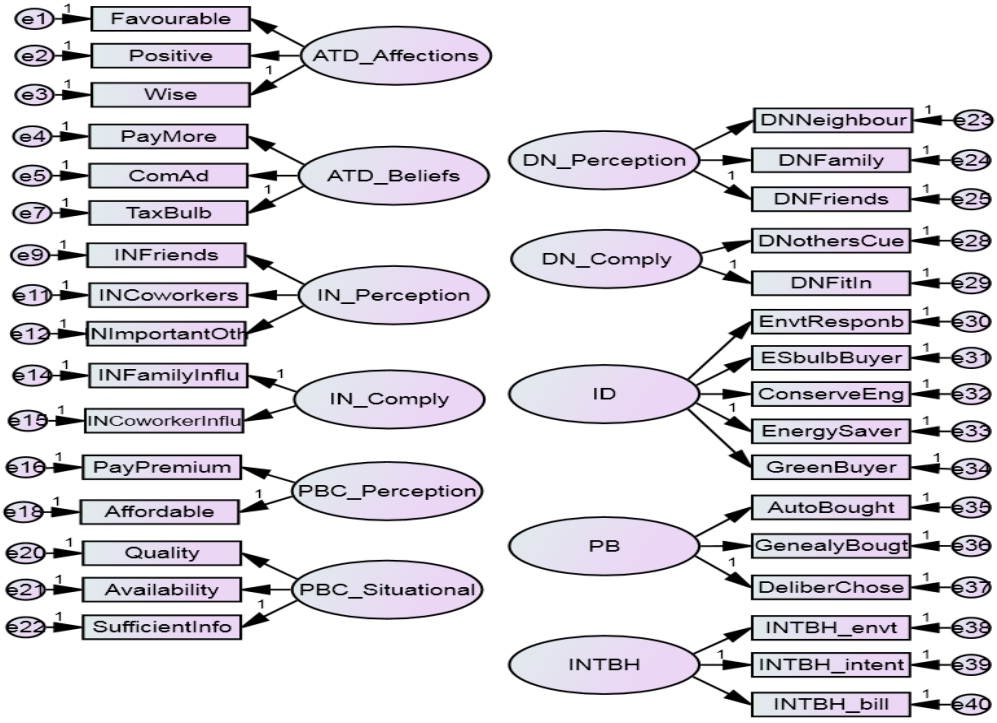
Although retaining most the indicators is ideal, indicator(s) can be dropped if their covariance is high (based on their standardised residual covariance [SRC] values, in which the absolute value less than 2 is ideal, and/or modification indices in AMOS), variance is explained in the model, and/or factor loading is low. Most importantly, the removal decision should be theoretically sound and should not be purely statistically driven.

The fit indices suggested that the CFA of the constructs and their indicators (illustrated in Figure 5.9) were not a good fit for the sample population ($x^2_{(689)}$=7943.279, CMIN/DF=2.820, CFI=.877, TLI=.860, RMSEA=.076, PCLOSE<.001 and SRMR=.0676). The correlations between the constructs were lower than .90; however, some indicators had higher factor loadings on other constructs, or lower loadings on their own construct (see Appendix 9 for detail). Hence, modification was needed for improving the model fit.

Eight indicators were dropped from the measurement model for improving the model fit. Six indicators were found having high SRC values when paired with other indicators (see Appendix 10 for detail), and the modification indices generated by AMOS also suggested that these indicators need modifications: Label_Com ('*I trust energy-saving claims made by manufacturers*'), Label_3Party ('*I trust an eco-label issued by an independent third party (e.g. Energy Star)*), INBeingSeen ('*If other people can see me using a product, I often purchase the brand they expect me to buy*'), TimePressure ('*High time demands on me made it much harder to purchase energy-saving light bulbs on my last visit to the store*'), DNCoworkers ('*Thinking of_my co-workers, I assume that about ___% of them generally purchase energy-saving light bulbs*'; the respondents positioned the button of each slide to indicate their assumption), and DNpplChoice ('*When I am uncertain which light bulb is better in a store, I look to other people's product choice for clues*'). Another two indicators suggested by the modification indices were INFamily ('*My family think I should purchase energy-saving*

light bulbs') and EasyFind ('*It is easy for me to find energy-saving light bulbs whenever I need to buy them*'). Removing these indicators from the model was a possible option for improving the model's fit. From theoretical perspective, these indicators could also be non-significant in influencing respondents' purchasing decisions (see the detailed discussion in Chapter 6, p.145). The revised constructs and their indicators are as illustrated in Figure 5.10.

Figure 5.10 Revised constructs and indicators



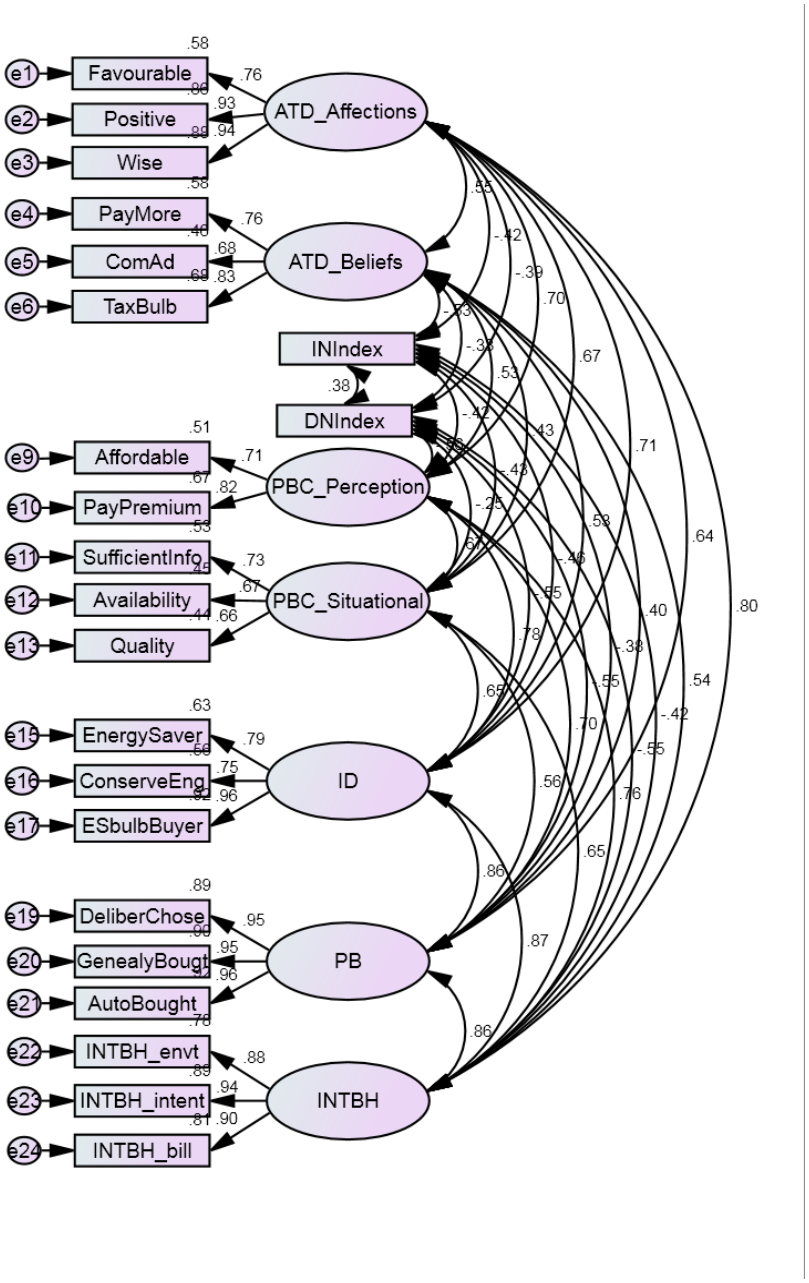
This revised model was a better fit than the one shown in Figure 5.9. The model's chi-square value was 1100.030, with the *df* at 415 (hence, its CMIN/DF was 2.651); values of its CFI and TLI were .918 and .902, respectively; its RMSEA was .073 with PCLOSE less than .001; and the SRMR value was .0503. The correlations between the constructs were lower than .90 and the indicators' factor loading to their theoretical constructs were higher than to other theoretical constructs (see Appendix 11 for detail).

According to the modification indices, actions were needed to the indicators under the normative constructs and self-identity constructs. Many normative indicators were shown to correlate to their corresponding indicators (i.e. indicators under injunctive norm were shown to correlate to other indicators under injunctive norm, and similar findings were made for the indicators under the descriptive norm). These modification actions aligned with the assumptions of this study: as discussed in the chapter on Methodology, injunctive norm (/descriptive norm) includes both perception and willingness to comply. Therefore, 'product' terms for both the injunctive norm and descriptive norm were created. For the self-identity's indicators, GreenBuyer ('*It is important to me that the products I use do not harm the environment*') EnvtResponb ('*I would describe myself as environmentally responsible*') were not a good fit in the model. Their factor loadings were not higher than other indicators of other constructs, nor did they have higher factor loadings on other constructs (see Appendix 11 for detail). As a result, the decision to remove the two self-identity indicators (i.e. GreenBuyer and EnvtResponb) was made (see the detailed discussion in Chapter 6, p.145). There were now three indicators remaining to measure the self-identity construct.

A product term was created by multiplying the scores of the Perception component and the Comply component, and was used as an index of the respective norm. For example, there were three indicators remaining to measure IN_Perception and two for IN_Comply (as illustrated in Figure 5.10). The injunctive norm's product term was created by multiplying IN_Perception and IN_Comply, i.e. INIndex in the model to assess respondents' purchasing intentions. The same procedure applied to creating descriptive norm's product term, DNIndex.

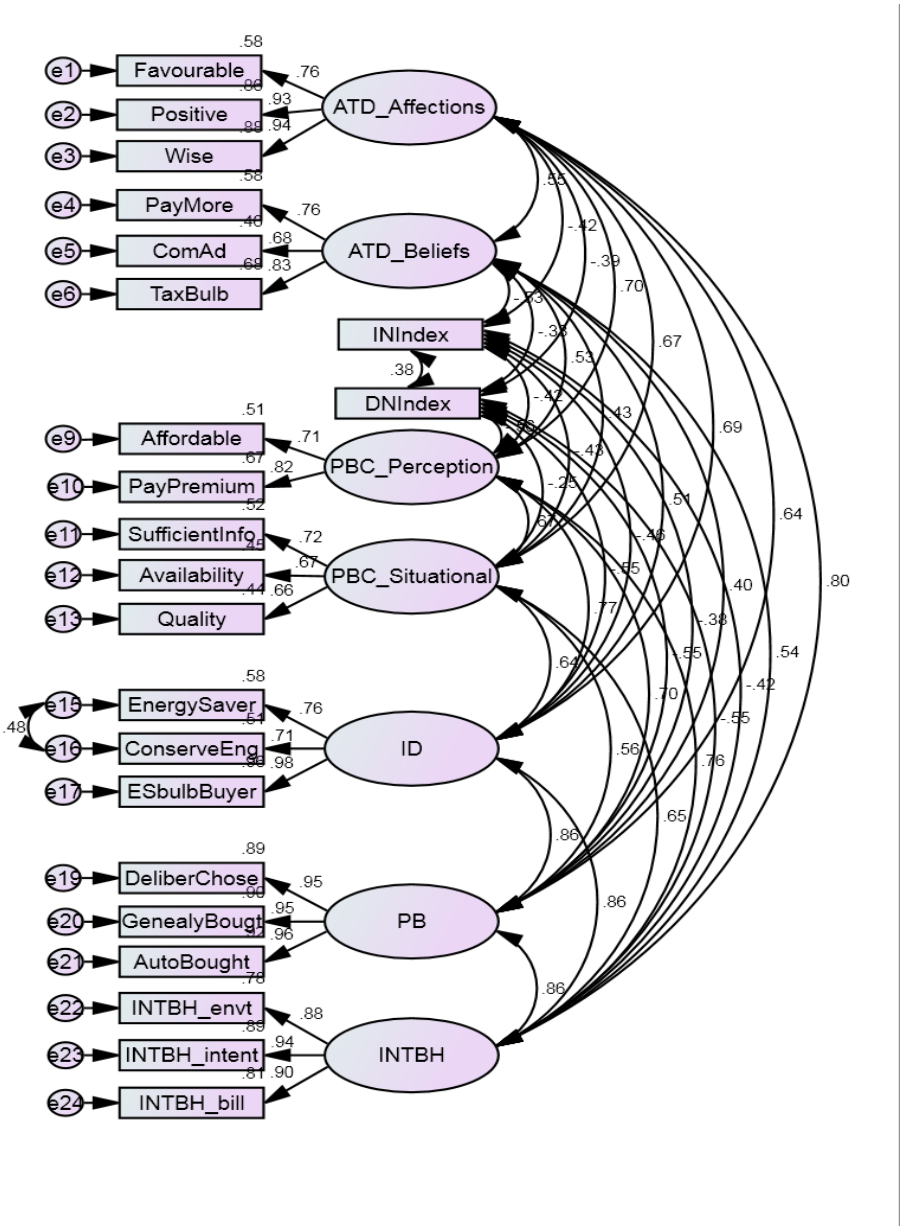
Figure 5.11 illustrates the modified model, in which the two normative indices have been created and the two *self-identity*'s indicators have been removed ($x^2_{(175)}$=469.369, CMIN/DF=2.682, CFI=.949, TLI=.932, RMSEA=.073, PCLOSE<.001 and SRMR=.0417). According to the modification indices by AMOS, a constraint should be added to covary EnergySaver ('*I consider myself an energy saver*') and ConserveEng ('*To conserve energy is an important part of who I am*'); and theoretically, these two indicators can be highly related (as discussed in Section 6.2.2, p.152). Hence, a covariance was added (as illustrated in Figure 5.12).

Figure 5.11 CFA: Normative indices created



The model fit for Figure 5.12 was reasonably acceptable ($x^2_{(174)}$=396.329, CMIN/DF=2.278, CFI=.961, TLI=.949, RMSEA=.064, PCLOSE=.003, and SRMR=.0409). The correlations between the constructs (see Appendix 12) were lower than .90, which indicated good discriminant validities among the proposed constructs. Therefore, the constructs and the indicators illustrated in Figure 5.12 were tested for CMV to determine whether or not the variance could bias the results the results of the model testing.

Figure 5.12 CFA confirmed measurement model



5.5 Common Method Variance

As suggested by Podsakoff et al. (2003), a latent variable (i.e. CMV) was added to Figure 5.12 to test whether or not the potential CMV could bias the results of model testing (as illustrated in Figure 5.13). The latent variable represented the potentially existing CMV. The factor loadings of all indicators in Figure 5.13 were inspected to see if they were statistically different from the factor loadings of the indicators in Figure 5.12. The ideal result would be to have a non-significant discrepancy, because a result

of severe discrepancy would suggest that the existing CMV could bias the results of model testing.

Figure 5.13 Model for testing common method variance

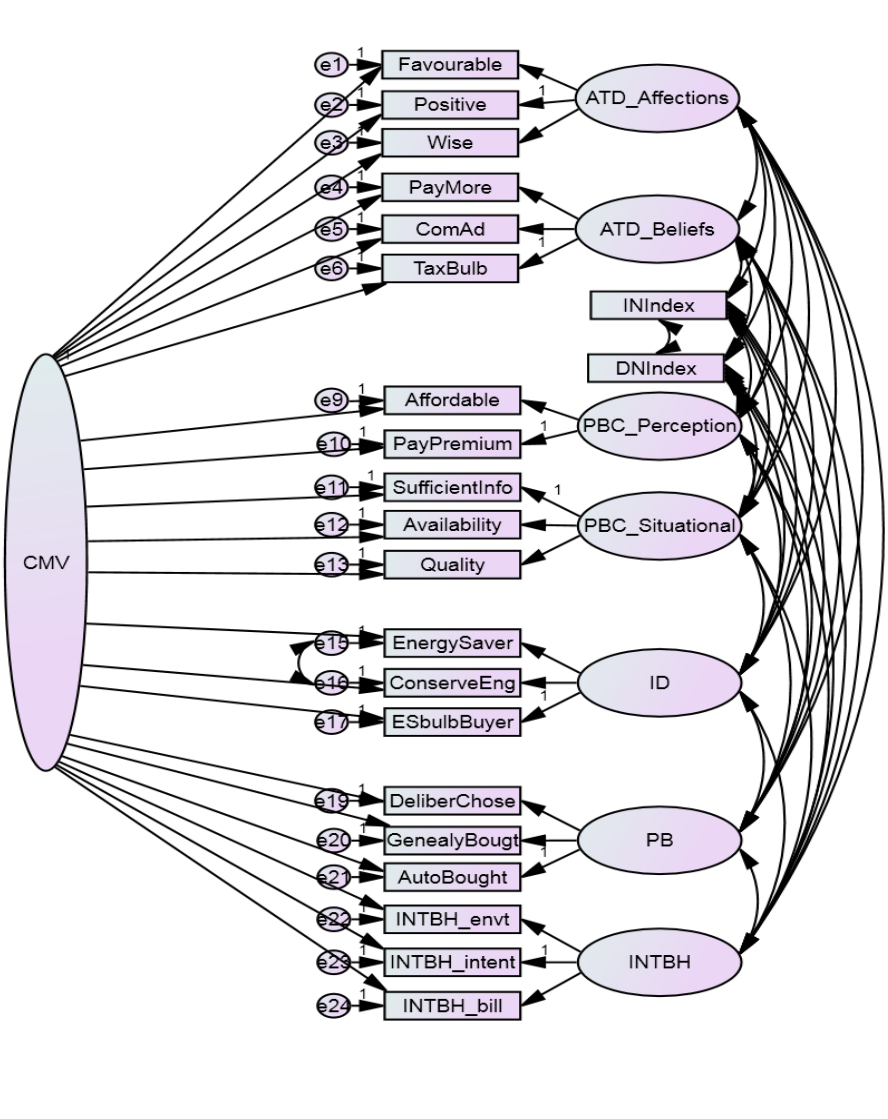


Table 5.3 lists the factor loading estimates of the indicators from the two models (i.e. Figure 5.12 and Figure 5.13). A comparison of the indicators' factor loading to their constructs in Figure 5.13 (which contains the CMV) with Figure 5.12 (which has no CMV latent variable) showed that they did not deviate significantly from the factor loading estimates in Figure 5.12. The probability of chi-square test was sought, with a result of p=1.000, which further confirmed that the discrepancy was not statistically significant. Therefore, proceeding to model testing with the constructs and indicators as shown in Figure 5.12 was acceptable.

Table 5.3 Comparison of factor loadings

			Figure 5.12	Figure 5.13
PayPremium	<---	PBC_Perception	0.82	0.817
Wise	<---	ATD_Affections	0.935	0.937
Positive	<---	ATD_Affections	0.928	0.928
Favourable	<---	ATD_Affections	0.758	0.757
Quality	<---	PBC_Situational	0.665	0.661
SufficientInfo	<---	PBC_Situational	0.724	0.728
EnergySaver	<---	ID	0.761	0.763
ESbulbBuyer	<---	ID	0.979	0.975
AutoBought	<---	PB	0.959	0.949
GenealyBougt	<---	PB	0.949	0.928
DeliberChose	<---	PB	0.945	0.924
INTBH_bill	<---	INTBH	0.901	0.873
TaxBulb	<---	ATD_Beliefs	0.826	0.792
ComAd	<---	ATD_Beliefs	0.677	0.617
PayMore	<---	ATD_Beliefs	0.76	0.733
Affordable	<---	PBC_Perception	0.712	0.717
Availability	<---	PBC_Situational	0.672	0.666
ConserveEng	<---	ID	0.715	0.724
INTBH_envt	<---	INTBH	0.882	0.915
INTBH_intent	<---	INTBH	0.944	0.922
Favourable	<---	CMV	(n/a)	-0.067
Positive	<---	CMV	(n/a)	-0.04
Wise	<---	CMV	(n/a)	0.036
PayMore	<---	CMV	(n/a)	-0.154
ComAd	<---	CMV	(n/a)	-0.335
TaxBulb	<---	CMV	(n/a)	-0.231
Affordable	<---	CMV	(n/a)	0.025
PayPremium	<---	CMV	(n/a)	-0.09
SufficientInfo	<---	CMV	(n/a)	-0.113
Availability	<---	CMV	(n/a)	0.005
Quality	<---	CMV	(n/a)	-0.004
EnergySaver	<---	CMV	(n/a)	0.033
ConserveEng	<---	CMV	(n/a)	-0.225
ESbulbBuyer	<---	CMV	(n/a)	0.025
DeliberChose	<---	CMV	(n/a)	0.202
GenealyBougt	<---	CMV	(n/a)	0.205
AutoBought	<---	CMV	(n/a)	0.145
INTBH_envt	<---	CMV	(n/a)	-0.086
INTBH_intent	<---	CMV	(n/a)	0.251
INTBH_bill	<---	CMV	(n/a)	0.2

5.6 Model Testing

After checking and solving the issues regarding missing data, non-normal distribution, reliability, validity and the common method variance, the data was ready for model testing.

As discussed in Section 2.2, this research originally hypothesised that:

1) consumers' green purchasing behaviour is directly influenced by consumers' purchasing intention, perceived self-efficacy, situational influence, descriptive norm (which was measured from two aspects: the perceived behaviour of the majority and willingness to comply with the majority), self-identity and past behaviour

2) consumers' attitudinal affections, attitudinal beliefs, injunctive norm (measured by two aspects: perceived expectations of others and willingness to follow those expectations), perceived self-efficacy, situational influence), descriptive norm (as mentioned above), self-identity and past behaviour are all independent variables that have a direct impact on consumers' purchasing intention.

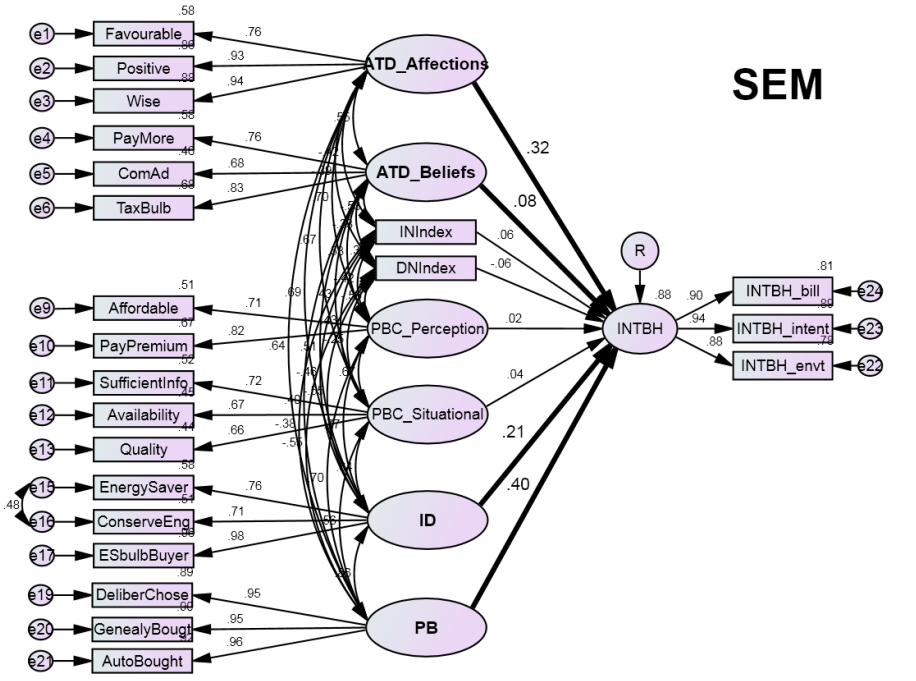
However, the model was modified by dropping the behaviour construct after examining the two constructs' correlation (as detailed in Section 5.3.1). The indicators originally designed for the behaviour construct were shifted to come under the intention construct, measuring the construct along with the indicators originally designed for intention. Intention was still hypothesised to be affected by attitudinal affections, attitudinal beliefs, injunctive norm, perceived self-efficacy, situational influence, descriptive norm, self-identity and past behaviour. These hypothesised relationships were tested by the SEM; the constructs and indicators valid for the test were as indicated in Figure 5.12. Section 5.6.1 focuses on the model testing, providing information on the model's fit to the data. Section 5.6.2 emphasises the parameter estimates of the model.

5.6.1 Assessment of the revised proposed model

Figure 5.14 illustrates the proposed model by using the constructs and indicators verified in Figure 5.12. The sample size (N) of the data used for the testing was 313. The fit indices suggested a reasonable model fit.

The *p*-value for the model's chi-square was less than .001 ($x^2_{(174)}$ = 396.329, CMIN/DF=2.278). The *p*-value for the model's bootstrapping was also less than .001. Although the CMIN/DF value suggested that the discrepancy between the model and the data was acceptable (the ideal value is less than 5, as discussed in Section 3.5.5.2), other fit indices indicated that the model was a marginal fit for the data. The SRMR value of the model was well below the cut-off point of .08 and the value was .0409. The model's CFI suggested a good model fit (.961, which met the cut-off point of ≥.95), while its TLI value was just equal to .95 (the ideal is ≥.95, and the model's TLI=.949). The model's RMSEA (.064; a RMSEA ranging from .060~.100 is considered a fair fit) and PCLOSE (.003, which indicated the significance level of the RMSEA) indicated that the model in Figure 5.14 was a fair fit for the data, at the significance level of .001.

Figure 5.14 SEM by using the constructs and indicators from Figure 5.12



5.6.2 Parameter estimates of the revised proposed model

The parameter estimates of the revised proposed model (illustrated in Figure 5.14) are provided in Table 5.4, and Table 5.5 shows the correlations between the constructs (see Appendix 13 for details that include the correlations between the indicators and the constructs). According to Figure 5.14, the proposed model was able to explain approximately 88% of variance in the intention construct (INTBH). Although every proposed antecedent of intention (i.e. INTBH) influenced intention, only the effect from the attitudinal affections (ATD_Affections), attitudinal beliefs (ATD_Beliefs), self-identity and past behaviour were statistically significant, at the significance level of .05 (see Table 5.4). According to the estimates, the effects from these constructs on intention were positive. In other words, respondents who had positive attitudinal affections and beliefs, identified themselves as pro-environment and who had purchased energy-saving light bulbs in the past were more likely to have a positive intention to purchase energy-saving light bulbs. The normative influences (i.e. the influences from injunctive and descriptive norms) and perceived controllability (i.e. the perceived self-efficacy and the situational influence on the perception of the controllability) were not found to have a statistically significant effect on intention.

According to the parameter estimates, past behaviour had the strongest influence on intention, compared to the other four, followed by attitudinal affections and self-identity. Among the four factors, the construct attitudinal beliefs had the least (but still statistically significant) effect on intention.

Table 5.4 Structural model parameter estimates, model as illustrated in Figure 5.14

Construct		Construct	Regression	Standardised Regression	*p* value
INTBH	<---	ATD_Affections	.392	.315	<.001*
INTBH	<---	ATD_Beliefs	.093	.084	.047*
INTBH	<---	PBC_Situational	.062	.042	.469
INTBH	<---	ID	.178	.207	.005*
INTBH	<---	PB	.285	.401	<.001*
INTBH	<---	PBC_Perception	.019	.017	.814
INTBH	<---	INIndex	0	.055	.104
INTBH	<---	DNIndex	0	-.064	.086

*Statistically significant ($p < .05$).

The correlations between the independent constructs ranged from weak (|.30|) to strong (|.80|), but were still lower than |.90| (the threshold for determining combining the two constructs as one; Kline, 2011), as shown in Table 5.5. Among the pairs, the correlation between *self-identity* (ID) and *past purchasing behaviour* (PB) was the strongest, while *the situational influence on perceived behavioural control* (PBC_Situational) and *descriptive norm* (DNIndex) correlated the least. Further, the correlations between the four constructs that influenced *intention* (i.e. ATD_Affections, ATD_Beliefs, ID and PB) were positive.

Table 5.5 Correlations between independent constructs, model as illustrated in Figure 5.14

Construct		Construct	Estimate
PBC_Perception	<-->	ATD_Beliefs	0.529
ATD_Affections	<-->	ATD_Beliefs	0.555
PBC_Situational	<-->	ATD_Beliefs	0.429
ID	<-->	ATD_Beliefs	0.511
PB	<-->	ATD_Beliefs	0.399
PBC_Perception	<-->	ATD_Affections	0.704
PBC_Perception	<-->	PBC_Situational	0.671
PBC_Perception	<-->	ID	0.768
PBC_Perception	<-->	PB	0.697
ATD_Affections	<-->	PBC_Situational	0.672
ATD_Affections	<-->	ID	0.693
ATD_Affections	<-->	PB	0.641
PBC_Situational	<-->	ID	0.644
PBC_Situational	<-->	PB	0.56
ID	<-->	PB	0.856
ATD_Beliefs	<-->	DNIndex	-0.332
ATD_Beliefs	<-->	INIndex	-0.531
PBC_Perception	<-->	DNIndex	-0.556
PBC_Perception	<-->	INIndex	-0.421
ATD_Affections	<-->	DNIndex	-0.391
ATD_Affections	<-->	INIndex	-0.424
PBC_Situational	<-->	DNIndex	-0.253
PBC_Situational	<-->	INIndex	-0.426
ID	<-->	DNIndex	-0.55
PB	<-->	DNIndex	-0.553
ID	<-->	INIndex	-0.456
PB	<-->	INIndex	-0.378
INIndex	<-->	DNIndex	0.375

5.7 Summary

After the issues related to missing values, normality, items' reliability and constructs' validity had been dealt with, the constructs and their observed variables were ready for model testing. The initial 402 respondents who clicked on the online survey were reduced to 313 because of:

- responses not being from the target audience (41 responses removed)
- patterns of missing data (29 responses removed)
- multivariate outliers (19 responses removed).

Moderate but significant skewness was also found, requiring data transformation to restore the univariate normality of the data.

Indicators were examined with their related constructs for their dimensionality, reliability (i.e. Cronbach's *alpha*) and convergent validity. Indicators were removed from their theoretical construct measurement model if they were found to be inadequate in measuring the construct. Discriminant validity of the proposed constructs and the potential CMV were inspected, using CFA, and the results were satisfactory.

The revised proposed model (see Figure 5.14) was examined using SEM in AMOS. The results suggested that the revised proposed model was a reasonable fit for the sample data. Further investigation of the parameter estimates for the model showed that four constructs (i.e. ATD_Affections, ATD_Beliefs, ID and PB) had a statistically significant effect on the INTBH construct. The next chapter discusses the statistical findings in detail in relation to the literature that was presented in Chapter 2.

Chapter 6
Discussion and Conclusion

This research was grounded in the Theory of Planned Behaviour (Ajzen, 1991) and incorporated the concepts of social norm (called descriptive norm in this study) (Cialdini, et al., 1991; Cialdini, et al., 1990; Cialdini & Trost, 1998; Griskevicius, et al., 2008), self-identity (Nigbur, et al., 2010; Stryker & Burke, 2000) and past behaviour (Foxall, 1997) to examine New Zealand consumers' green purchasing behaviour. Energy-saving light bulbs were chosen as the green product for this study, which rationales were discussed in the Methodology chapter. The original model, which included a behaviour construct, was changed to treat the indicators (originally intended to measure behaviour) as measures of intention, called INTBH. The major findings from the analysis were that the respondents' intentions to purchase energy-saving light bulbs were positively influenced by:

1) their affections towards the purchasing behaviour (H7)

2) their beliefs about the purchasing behaviour (H8)

3) how they identified themselves (H13)

4) their past purchasing behaviour (H14) (see further discussion in Section 6.1).

The revised proposed model, which is discussed in this chapter, was a good fit for the data. Section 6.1 summarises the major findings that can contribute to the body of knowledge on the subject of consumers' green purchasing intentions. Section 6.2 concerns the theoretical implications of the antecedents to intention. Section 6.3 focuses on the practical applications of this research and Section 6.4 details the limitations of the research and recommendations for future research.

6.1 Major Findings

Section 6.1.1 summarises which of the hypotheses were statistically supported under the revised model, as well as the study's findings and its contributions to general theory. Section 6.1.2 presents the discussion regarding the model revision, in terms of the removed construct, behaviour, and its relation to the intention construct in this study.

6.1.1 Hypotheses supported

Four (attitudinal affections, attitudinal beliefs, self-identity, and past behaviour) of the eight proposed theoretical factors were found to influence the respondents' purchasing intentions. Going beyond previous research applying the Theory of Planned Behaviour (Armitage & Conner, 2001; Sutton, 1998), this project put forth the list of influences on consumers' intentions to purchase energy-saving light bulbs should include attitudinal affections, attitudinal beliefs respectively (instead of one aggregated attitude), injunctive norm (which includes expectations from others and willingness to comply with the expectations), perceived self-efficacy and controllability, perceived controllability in situational context (instead of one aggregated perceived controllability), and descriptive norm (which includes perceptions of majority's purchasing behaviour and tendency to comply with the perceptions). Therefore, eight proposed constructs were hypothesised to be antecedents to intention, being respondents' purchasing intentions regarding energy-saving light bulbs (see Hypotheses 7–14 in Section 2.2.2.9, or the model illustrated in Figure 5.14).

The results supported Hypotheses 7, 8, 13 and 14 (Section 6.2 discusses the theoretical implications of the antecedents). That is, the respondents' intentions regarding purchasing energy-saving light bulbs would be influenced by attitudinal affections (H7), attitudinal beliefs (H8), self-identity (H13) and past behaviour (H14). The relationships between these four influential constructs were found to correlate to each other positively (as illustrated in Table 5.5, p.143).

This study has contributed to the body of knowledge regarding consumers' green purchasing behaviour by providing empirical support regarding:

- the influence of attitudinal affections, attitudinal beliefs, self-identity and past behaviour on intention

- the effects of attitudinal affections and attitudinal beliefs on purchasing intention are different.

Additional evidence was also found that:

- the respondents' attitudinal affections were expressed as believing that the purchasing action was favourable, positive and wise
- the respondents' attitudinal beliefs were reflected in their agreement with paying more for non-energy-saving light bulbs, commercial advertising being made to mention the disadvantages of non-energy-saving light bulbs, and non-energy-saving light bulbs being taxed more
- the respondents identified themselves as energy savers and buyers of energy-saving light bulbs
- the respondents would have deliberately and/or usually purchased energy-saving light bulbs in the past.

Sections 6.2 and 6.3 further discuss the implications of these findings.

6.1.2 Model revision

Initially, a *behaviour* construct in the model was proposed for assessing respondents' purchasing behaviour regarding energy-saving light bulbs (as discussed in Section 3.4.1). To differentiate the items in the *behaviour* construct from the ones in the *intention* construct, the items in *behaviour* were expressed in future tense (Ajzen, 2006; as discussed in Sections 3.3.2). However, the statistical results suggested and confirmed that a one-off, self-reported survey could not obtain information about actual behaviour. The *behaviour* and *intention* constructs were found to be alike in terms of their high correlation (r = .90). Further, the reliability (i.e. Cronbach's *alpha*) and dimensionality tests all implied that these the items from the two constructs were measuring one single concept, rather than two distinct constructs (Kline, 2011).

After re-considering the nature of the behaviour questions (e.g. '*In future, I will buy energy-saving light bulbs because they are environmentally friendly*', '*In future, I will buy energy-saving light bulbs to reduce my electricity bills*'), these questions were changed to ask about the respondents' commitment to purchasing energy-saving light

bulbs, the underlying premise of which was similar to the questions regarding intention (e.g. '*I intend to buy energy-saving light bulbs to reduce my electricity bills*'(as discussed in Sections 2.2.2.2 and 5.3.1). Therefore, the behaviour construct was dropped from the model and the five items from the original behaviour construct were grouped with the four items from the original intention construct, to measure the new intention construct, called INTBH (as illustrated in Figure 5.14). Eighty-eight per cent of this revised intention construct's variance could be explained in this revised model, in which respondents' purchasing intentions were measured but not their actual purchasing behaviour. The 88% of explained variance in intention that this research found was high, compared to Armitage and Connor's (2001, up to 39%) average results (up to 39%) and Sutton's (1998, up to 50%) (up to 50%). The next section focuses on the theoretical implications of the major findings in this study.

6.2 Theoretical Implications: Antecedents to Intention

Intention captures an individual's reasons for carrying out a specific behaviour and indicates the strength of an individual's willingness to carry out the behaviour of interest (Ajzen, 1991). In this research, intention referred to a respondent's intention to purchase energy-saving light bulbs.

This current study hypothesised that consumers' purchasing intentions are positively influenced by their relevant attitudinal affections, attitudinal beliefs, perceived expectations from others, willingness to follow those expectations, perceived self-efficacy and controllability, perceived controllability in the situational context, perceived expectations regarding the majority's purchasing behaviour, tendency to fit in with the perception of majority's purchasing behaviour, self-identity and past behaviour. The results suggested that only attitudinal affections and beliefs, self-identity and past behaviour had a significant effect on consumers' purchasing intentions; Hypotheses 7, 8, 13 and 14 were thus supported.

The following five subsections focus on the two attitudinal constructs (i.e. attitudinal affections and attitudinal beliefs), self-identity, and the past behaviour constructs in particular, and other proposed antecedents of intention in general.

6.2.1 Attitudes: Two attitudinal influences

Attitude can be studied from two different perspectives: affections and beliefs (Ajzen, 1991; Ajzen & Sexton, 1999). These two are usually combined and expressed as attitude (Collins, 2003). In Ajzen's Theory of Planned Behaviour, the concept was mainly measured from the affection perspective (Ajzen, 2006). However, prior study has shown that these two have different effects on consumers' purchasing intentions (Golden & Johnson, 1983). To capture their differential effects on *intention*, these two components were treated as two seperate concepts in this study.

According to the CFA (see Section 5.4), the correlation between these two attitudinal constructs confirmed that they were distinctly separate constructs. In other words, what an individual thinks and what one feels can be two totally different things and they affect intentions differently. For example, a person may feel that the action of switching to energy-saving light is a wise decision; hence, the buying decision will be made accordingly. The individual may also believe that the environmental disadvantages of non-energy-saving light bulbs should be mentioned in advertising; however, the influence of this attitudinal belief can be different from the influence of their attitudinal affections. After examining the revised proposed model (as illustrated in Figure 5.14), these two attitude constructs were found to have significantly differential effects on intention. Further, analysis showed that attitudinal affections had a greater effect on intention than attitudinal beliefs did.

In terms of attitudinal influences, the current study hypothesised and found that the influences of affections and beliefs should be considered as separate antecedents to intention; however, exploring and investigating which of these had a stronger effect on intention was not the main focus for this research. Therefore, further investigation on why attitudinal affections have a stronger influence on consumers' purchasing intentions than attitudinal beliefs is needed.

6.2.1.1 Attitudinal affections

In this study, attitudinal affections referred to respondents' feelings regarding purchasing energy-saving light bulbs (e.g. whether they considered the purchasing behaviour was pleasant, favourable, or a positive thing to do, etc.). According to the Theory of Planned Behaviour, affection influences consumers' purchasing intentions;

that is, consumers would have a greater intention to choose energy-saving light bulbs over conventional ones if they had stronger and more positive feelings towards the former (Ajzen, 1991; Ajzen, et al., 2011; Armitage & Conner, 2001; Rise, Thompson, & Verplanken, 2003).

The results of this research supported Hypothesis 7, in which the attitudinal affections construct (i.e. ATD_Affections) had a significant and positive factor loading on the intention construct (i.e. INTBH). In other words, respondents' intentions to purchase energy-saving light bulbs would be stronger if they had positive feelings regarding the purchase.

This particular finding aligns with prior research, which had found that the two aspects of attitude (i.e. thinking and feeling) had different effects on consumers' decision making. Golden and Johnson's research (1983) found that consumers who received a message that contained more 'thinking' elements (i.e. prompting them to think more) than 'feeling elements' (i.e. inducing their emotions) had stronger purchasing intentions. Further, consumers who received 'thinking' advertisements seemed to like the message more than 'feeling' advertisements. Golden and Johnson argued that this finding could have been due to people generating more affective 'likes' after cognitively processing the information; hence, they developed stronger purchasing intentions. This current study has provided further empirical support for Golden and Johnson's argument, in terms of the indicators used for measuring the *attitudinal affections* construct.

In particular, the valid indicators measuring the *attitudinal affection* construct were favourable ('*For me, choosing energy-saving light bulbs would be favourable*'), positive ('*For me, choosing energy-saving light bulbs would be a positive thing to do*') and wise ('*For me, choosing energy-saving light bulbs would be a wise decision*'). A cognitive information-processing phase could be a prerequisite to obtaining these affective feelings (Petty & Cacioppo, 1986). Respondents' experiences of similar purchasing experiences in the past would have allowed them to consider and decide whether the purchasing behaviour was favourable, positive and/or wise.

6.2.1.2 Attitudinal beliefs

Attitudinal beliefs in this study referred to respondents' thoughts regarding purchasing behaviour. In theory, people who have positive beliefs towards a specific behaviour (e.g. purchasing energy-saving light bulbs) will have a stronger intention to carry out the behaviour of interest (i.e. intend to purchase energy-saving light bulbs) (Ajzen, 1991; Ajzen & Sexton, 1999; Armitage & Conner, 2001). This study empirically verified that respondents who had strong and positive beliefs about the behaviour of purchasing energy-saving light bulbs also have stronger intentions to buy the products, thus supporting Hypothesis 8.

Even though the factor loading of this construct to the intention (.08) was less than that for attitudinal affection (.32), attitudinal belief also played an important role in forming respondents purchasing intentions (as implied by the significant factor loading demonstrated in Figure 5.14). Such attitudinal beliefs were reflected by PayMore ('*Consumers should be made to pay higher prices for light bulbs that consume more energy*'), ComAd ('*Commercial advertising should be forced to mention ecological disadvantages of non-energy-saving light bulbs*') and TaxBulb ('*The light bulbs that consume more energy should be heavily taxed by the government*').

The findings reflect and support the survey conducted by Johnson, Fryer and Raggett (2008), in which (1) one-third of their respondents suggested that the New Zealand government should take the responsibility for taking steps to protect environment, (2) more than 80 per cent of their respondents agreed that they were somewhat informed, but (3) three-quarters out of the total respondents reported that they would like to be more informed regarding what they could do to help care for the environment. People who hold positive attitudinal beliefs would have stronger purchasing intentions regarding energy-saving light bulbs; and these people's beliefs related more to being informed about information regarding the energy-saving light bulbs and actions taken by the government.

Two indicators, Label_Com ('*I trust energy-saving claims made by manufacturers*') and Label_3Party ('*I trust an eco-label issued by an independent third party (e.g. Energy Star')*), were found being poor fitted in the CFA (as presented in Section 5.4). The descriptive statistics of these two indicators, at least one-fifth of the respondents neither agreed nor disagreed with the statements. In order to make a

decision of *agree* or *disagree*, one would need to be well informed (Petty & Cacioppo, 1986); but the descriptive statistics of this project imply that more information may be needed for the respondents to make their decision. Such implication also reflect the findings found by Johnson, Fryer and Raggett's (2008): people felt that were somewhat informed but wanted to know more. However, more research is needed to verify this implication about the relationship between the trusts towards the eco-labels and whether the sufficient information is provided through the labels.

6.2.2 Self-identity

In this project, self-identity was defined as whether respondents saw themselves as pro-environment. In theory, individuals are more likely to choose an energy-saving light bulb if they identify themselves as pro-environment (Berger & Heath, 2007; Rise, et al., 2010). The findings confirmed that intentions to purchase energy-saving light bulbs were positively related to how they identified themselves, thus supporting Hypothesis 13. The valid indicators of measuring the self-identity were EnergySaver ('*I consider myself an energy saver*'), ConserveEng ('*To conserve energy is an important part of who I am*'), and ESbulbBuyer ('*I see myself as a typical buyer of energy-saving light bulbs*'). The first two indicators are about conserving energy, and the last is regarding purchase.

Examination of the indicators of self-identity and their relationships with intention showed that respondents who considered themselves energy savers and buyers of energy-saving light bulbs were more likely to have stronger intentions to purchase the products. These findings are consistent with Berger and Heath's study (2007) in the US; their research participants would buy the products that matched the identities they claimed to have.

The finding also echoes with Johnson, Fryer and Raggett's claims about New Zealanders' identifications and intentions regarding energy use (2008). According to their report, 83% of their respondents said they were concerned about energy-saving issues and had taken actions regarding these concerns, and more than 50% were willing to use energy-efficient appliances. In this research, approximately 65% of the respondents reported that conserving energy was an important part of who they were and approximately 81% considered themselves energy savers (as discussed in Section

4.2.7). This research has provided further empirical support for Johnson et al.'s study, in terms of the relationship between people's identifications and their intentions to take action.

6.2.3 Past behaviour

In this study, past behaviour referred to whether the respondents had previously purchased energy-saving light bulbs. The results from this study implied a positive correlation between *past behaviour* and *intention*, supporting Hypothesis 14; the valid indicators of measuring this construct were DeliberChose ('*When I last purchased light bulbs, I deliberately chose one with energy-saving claims*'), GeneralyBougt ('*During the past 12 months, I generally purchased energy-saving light bulbs, whenever there was this option*'), and AutoBought ('*During the past 12 months, choosing energy-saving light bulbs was something I did automatically*'). These findings have provided further empirical support for prior research.

As found in prior research (Kidwell & Jewell, 2008; Ouellette & Wood, 1998; Petty & Cacioppo, 1986; Pickett et al., 2012; Trafimow, 2000; Trafimow & Borrie, 1999; Wang & Ritchie, 2012; Yoon, 2013), a person's previous actions can leave traces that influence future behaviour. A successfully performed behaviour can give a person more confidence that they like the experience, that they can do it, and that the behaviour is accepted by others. This confidence contributes to intention to repeat the behaviour in the future. When we are making conscious decisions, past experiences usually contribute to influence intention, which guides relevant behaviour.

6.2.4 Other proposed antecedents

Among the proposed antecedents of intention, only attitudinal affections, attitudinal beliefs, self-identity and past behaviour were found to significantly influence intention. The effects of the other antecedents (listed below) on intention were weak and did not reach the required level of statistical significance. Antecedents not confirmed in this study were:

- injunctive norms, which were measured in terms of perceived expectations of others and willingness to follow those expectations

- perceived self-efficacy and controllability
- perceived controllability in situations
- descriptive norm, which were measured in terms of perceived expectations of the majority and willingness to fit in with the majority.

Injunctive norms and descriptive norms are two different types of social norm, and in this study, were hypothesised to have positive and significant effects on respondents' intentions to purchase environmentally friendly products (Hypotheses 9 and 12). That is, when a person strongly perceives other people's assumptions that he/she should buy a specific product, he/she is more likely to buy the product. The perceived assumption is addressed as injunctive when it is an explicit expectation (e.g. verbal) from others. When the expectation is implicit (e.g. when the majority are behaving in the specific way), the perceived assumption is descriptive. Past research has found that people tend to comply with the expectations of significant others and/or conform their behaviours to the that of the majority (Ajzen, 1985, 1991, 2006; Cialdini & Goldstein, 2004; Cialdini, et al., 1990). However, the results of this study did not provide enough statistical evidence to support the normative influences on respondents' purchasing intentions.

As discussed in Section 2.2.2.4 and summarised above, injunctive norm was conceptually defined as: whether the person perceived any expectations from others, and whether the person was willing to comply with the expectations. These two aspects were measured separately; once the valid indicators were confirmed, an index was created as a measure to assess the influence of the injunctive norm on the intention. However, not enough empirical evidence support that the injunctive norm influenced the respondents' purchasing intentions. The lack of support for the role of injunctive norm in influencing the intention should not necessarily be interpreted as a failure of the model in the consumer context. In the current research, the respondents did not strongly perceive that they were expected to buy energy-saving light bulbs (i.e. less than 40% of respondents agreed with the items from the injunctive norm IN_Perception construct). They also did not consider others had much influence on their decision making (i.e. less than 31% of the respondents agreed with the items from IN_Comply). Therefore, the influence of the injunctive norm may not be as strong as hypothesised, but further research is needed to explore this notion.

Descriptive norm data were also collected from perception of the majority's purchasing behaviour and compliance to the perception; then an index was created (by multiplying the valid scores from these two aspects) to assess Hypothesis 12; that is, the influence of the descriptive norm on the intention. However, there was not enough evidence for drawing any conclusions. Similar to injunctive norm, the lack of empirical support for the descriptive norm should not be interpreted as a failure of the factor in influencing respondents' purchasing intentions, as there was no clear perceived majority who were purchasing energy-saving light bulbs.

According to the relevant literature, the relationship between intention/behaviour and descriptive norm would be significant if the perceived norm was strong (Goldstein, et al., 2008; Nolan, et al., 2008). In Goldsteins et al.'s hotel towel experiment, the fictitious rate of towel re-use was 75% and this was used to create an influential descriptive norm in their research; their results supported their hypotheses. In Nolan et al.'s survey (2008), the mean of the self-reported energy conservation behaviour of others (i.e. '*How often do you think your neighbours try to conserve energy?*', p. 915) was 2.93 (on a 4-point scale, from 1=*not at all* to 4=*extremely*).

The descriptive statistics of the descriptive norm in this study (as detailed in Section 4.2.6) suggested that only 41% (and less) of the respondents perceived that more than 60% of their friends, family, co-workers or neighbours were purchasing energy-saving light bulbs, while more than 40% of the respondents reported that less than 60% of the people from the listed groups purchased energy-saving light bulbs. Numbers imply that either half of the respondents either perceived that the behaviour of purchasing energy-saving light bulbs was not carried out by the majority, or they did not pay attention to other people's purchasing. In other words, no clear majority was found to fulfil the primary expectation of a descriptive norm (i.e. the perception that there were many people behaving in the same way). Further, less than one-third of the respondents agreed that they would comply with the majority. With no clear majority perceived and low compliance rates, the influence of *descriptive norm* on respondents' purchasing intentions was thus found to be less powerful than expected. However, further research is needed to confirm the level of 'majority' that can be considered large enough to influence consumers' purchasing intentions/behaviour.

Ajzen defines the perceived behavioural control construct as, 'the perception of the ease or difficulty of performing the behaviour of interest' (1991, p. 183). This

definition was adapted to this study as influences on consumers' purchasing intention; namely, perceived self-efficacy and controllability (i.e. the PBC_Perception construct). Hypothesis 10 states that consumers' intentions are positively influenced by their perceived controllability of their behaviour and self-efficacy. The valid indicators for measuring the PBC_Perception construct were Affordable ('*Energy-saving light bulbs are affordable for me in terms of my purchasing budget*') and PayMore ('*I would be willing to spend more to purchase energy-saving light bulbs [than on conventional ones]*'). Carrington et al. (2010) proposed the concept of perceived controllability in the actual shopping environment, arguing that buyers' perception of control in the actual shopping environment was more relevant to, and positively influenced, consumers' purchasing intentions. This research adopted Carrington et al.'s view and defined the construct as perceived controllability in situational context (i.e. the PBC_Situational construct; Hypothesis 11). The valid indicators for measuring this construct were SufficientInfo ('*Sufficient product information*'), Availability ('*Availability in store*') and Quality ('*Product quality*'). (These indicators were under a pre-set question: *While purchasing light bulbs, ___ (the factors below) usually affect my purchasing decision*). The study results failed to support Hypotheses 10 and 11 and these findings should not be interpreted as failures of the perceived efficacy and controllability, and the perceived controllability in situational context in influencing respondents' intentions to purchase energy-saving light bulbs.

The descriptive statistics showed that few people believed that purchasing energy-saving light bulbs was difficult in terms of product availability (only 5.4% of respondents thought the product was difficult to find), affordability (only 19.8% said the product was not affordable on their budget), and time pressure during shopping (only 13.1% said that time pressure influenced their purchasing decisions). These results implied that individuals could ignore the ease or difficulty of purchasing energy-saving light bulbs when it came to forming their intentions, and also resonated with Kalafatis et al.'s findings in the UK and Greek markets. They also found that perceived behavioural control was not a significant factor to the UK consumers, where environmentally friendly products were easy to find, but it was significant for the Greek consumers, as the products were not easy to buy. Fishbein and Ajzen (1975) also pointed out that the effect of the perceived behavioural control on intention could be ignored if the behaviour did not need much effort to be carried out. The findings regarding

affordability and willingness to pay a premium also are in line with other research in New Zealand, which found that more than half of New Zealand consumers were willing to pay a premium for sustainably produced wine (Forbes, Cohen, Cullen, Wratten, & Fountain, 2009). In 2008, Forbes et al. surveyed 109 consumers in Christchurch, which was considered a good representation of the national marketplace, to investigate wine consumers' demand for, and perceptions of, sustainably produced wine. Nearly three-quarters of their respondents claimed they were prepared to pay a higher price for sustainably produced wine; up to 5% more for one-third of their respondents and up to 11% more for another one-third of their respondents.

6.2.5 Summary

The discrepancy between attitude and behaviour has long been discussed in the literature. Intention was proposed to explain the gap, mediating the effect of attitude on actual behaviour (Ajzen & Fishbein, 1977; Fishbein & Ajzen, 1975). Findings from this research have suggested that both attitudinal affections and attitudinal beliefs do indeed influence consumers' green purchasing intentions positively. Influences from self-identity and past behaviour on the intention were supported by empirical evidence, with respondents who identified themselves as energy savers and buyers of energy-saving light bulbs, and who had purchased the bulbs in the past, having stronger intentions to purchase energy-saving light bulbs.

6.3 Implications for Practice

Overall, most respondents in this survey reported strong intentions to purchase energy-saving light bulbs. Only attitudinal affections, attitudinal beliefs, self-identity and past behaviour were found to have positive influences on the respondents' intentions to purchase energy-saving light bulbs (as illustrated in Figure 5.14). According to the Theory of Planned Behaviour (Ajzen, 1991; Armitage & Conner, 2001; J. R. Smith, et al., 2008), intention leads to actual behaviour. The main practical contribution of the current study is in providing a direction on how to enhance consumers' intentions to purchase green products. The findings of this research have suggested several factors that should be focused on when marketing green products.

One avenue of enhancing consumers' intentions is to address attitudinal influences. These include (1) building an emotional connection between consumers and the product by letting them feel that purchasing green products is a favourable, positive and wise decision, and (2) fostering consumers' beliefs relating to such products by increasing taxes and prices of competing products that are harmful to the environment and by advocating to require these harms be mentioned in advertisements.

Another possibility is to help consumers create or strengthen their pro-environment identity, by providing a link between green products and consumers' identity. This approach is supported both by the results of this study and by prior literature (Armitage & Conner, 1999; Fielding, McDonald, & Louis, 2008; Nigbur, et al., 2010; J. R. Smith, et al., 2008; Stryker & Burke, 2000). As the descriptive statistics revealed that more than 60% of the respondents identified themselves as pro-environment, practitioners should therefore focus on binding the products closer to consumers' pro-environment self-identity.

According to the Theory of Planned Behaviour, intention is assumed to be a determinant of consumers' purchasing behaviour, (Ajzen, 1991; Armitage & Conner, 2001; J. R. Smith, et al., 2008). Following this argument, understanding the formation of intention is an important aspect of studying consumers' purchasing behaviour. The results from this study have confirmed that strengthening consumers' attitudinal affections, attitudinal beliefs and self-identity regarding pro-environment products, and enriching their experience of using the products, reinforces consumers' green purchasing intentions.

However, promoting such purchasing behaviour should not only be telling consumers to change their purchase patterns, but also needs to integrate other stakeholders, such as government, business and non-governmental organisations (NGOs) (Bocken & Allwood, 2012; Cronin Jr, Smith, Gleim, Ramirez, & Martinez, 2011; Peattie & Crane, 2005). All these parties can contribute to building consumers' attitudinal affections and beliefs, self-identity, and past behaviour. The government's role can be to set marketplace regulations, such as taxing products that harm the environment or investing in programmes that save the environment, which can help develop consumers' attitudinal beliefs. The role of business can be to manufacture and supply more green products, thus giving consumers the chance to experience such products. NGOs can act as independent third parties and 'whistle blowers', monitoring

the activities of the government and business sectors and making sure they are pro-environment. NGOs can also provide a place for consumers to participate in activities that fulfil their self-identity.

6.4 Limitations and Future Research

This research was originally designed to identify the factors that influence consumer behaviour. However, due to the method used for data collection, information about actual behaviour could not be captured properly. As a result, the behaviour construct was dropped and the theoretical model was revised. Other issues that emerged during the data analysis are discussed here, organised in five subsections: actual purchasing behaviour, normative influences, the intention construct, reflective versus formative indicators, and verification of the findings.

6.4.1 Actual behaviour

As mentioned earlier, the original model was revised (as illustrated in Figure 5.14) because the measure of actual behaviour failed to capture behaviour data. The revised proposed model focused on the formation of consumers' intentions. Even though previous studies (e.g. J. R. Smith, et al., 2008) have suggested and supported a relationship between intention and behaviour, there has also been support for the opposite view (Bowerman & Markowitz, 2012; Rhodes & Dickau, 2012). Without a proper measure of behaviour, this study failed to offer support for either side of the argument.

Due to constraints of time and budget, this research used an online, anonymous and self-reported survey to collect data. Although precautions were taken (e.g. adopting indicators to measure behaviour that had been used in earlier literature), the correlation between the intention and behaviour constructs indicated that these two constructs were measuring the same phenomenon (lacking discriminant validity). Therefore, a decision was made to merge the two sets of items into one. For future research, it is recommended that actual behaviour should be obtained, to clarify the relationships between behaviour and other factors. Possible solutions for collecting behaviour data could adapt Tarkiainen and Sundqvist's approach (2005), in which the researchers

situated themselves in shops (e.g. lighting stores), and asked consumers to fill out a questionnaire. This approach would more directly obtain behaviour data.

6.4.2 Normative influences – further investigation

Injunctive norm and descriptive norm have been found to be powerful factors of affecting people's behaviour and intentions (Cialdini & Goldstein, 2004; Griskevicius, et al., 2008). However, there was not enough evidence in this study to draw the conclusion that respondents' purchasing intentions were influenced by the norms. As discussed in Section 6.3, the respondents did not perceive that they were expected to purchase energy-saving light bulbs, nor did they perceive that many other people were purchasing energy-saving light bulbs. This low perceived norm could be the reason for these inconclusive results. However, further research is needed to confirm whether there were other causes for obtaining the inconclusive findings.

6.4.3 Intention – further investigation

Behavioural intention is assumed to be the main indicator of, and motive for, an individual's behaviour (Ajzen, 1985, 1991; Fishbein & Ajzen, 1975). However, in this study there was insufficient evidence to confirm the relationship between intention and behaviour. Further, not all hypothesised antecedents of intention were supported. The six constructs derived from injunctive norm, descriptive norm and perceived behavioural control were not found to have significant correlations with intention. Are there other influences (beyond the proposed variables) that influence consumers' intentions to buy environmentally friendly products? Some researchers (e.g. Griskevicius, Cantu, & van Vugt, 2012; Griskevicius & Kenrick, 2013; Kenrick, Saad, & Griskevicius, 2013; Tybur & Griskevicius, 2013) have suggested that consumers' purchasing motives may also correlate to evolution. In other words, consumers' environmentally friendly purchasing intentions may be implicitly related to their evolutionary needs, such as leaving behind a better planet to ensure their children can thrive and carry on their genetic legacy. These deep, implicit motivations are difficult to detect and study. Nevertheless, investigating what induces/motivates consumers'

environmentally friendly purchasing intentions is a worthwhile and necessary study in the field of green marketing.

6.4.4 Reflective v.s. formative indicators

This research specified its constructs' measurement model as *reflective*. The specification was based on the hypothesised nature of the effects in this study. The proposed constructs were measured through respondents' perceptions, which is more in line with the criteria recommended by Jarvis et al. (2003), as discussed in Section 3.3.1. However, these indicators can also be argued as being formative when they are interpreted as the factors that form the construct. A worthwhile future research direction would be to find out the potential factors that cause the formation of the construct.

6.4.5 Verification of the findings

The present study employed a self-reported online questionnaire to collect data from New Zealand consumers. The nature of the survey limited the generalisability of the results. To address the limitations of a cross-sectional survey study, further research, such as using experiment and/or longitudinal designs, would be valuable and necessary to understand the phenomena (Andorfer & Liebe, 2012). Furthermore, using different methods for data collection could also help minimise the potential effects of common method variance.

The unstable relationships between intention and its antecedents, as specified in the Theory of Planned Behaviour, could imply that formation of intention is context dependent, as signalled in the UK and Greek studies (Kalafatis, et al., 1999). Thus, replicating the study in a different context (e.g. in another country) or using other green products (e.g. hybrid cars) may be worthwhile (Haig, 2013).

6.4.6 Summary of limitations and recommendations

This research attempted to identify the factors influencing consumers to purchase environmentally friendly products, but it only uncovered partial information about the formation of intention (and not behaviour). Further, the findings were based

on a self-reported survey in New Zealand. Therefore, verifying the findings through experiments or international research could also be useful.

6.5 Conclusion

Consumers' behaviour is complex and often considered a result of complex cognitive processing (Lee et al., 2014; Levine & Craik, 2012; Parker, Wilding, & Bussey, 2002). The relationship between attitude and behaviour has long been discussed in the literature (Briñol & Petty, 2012). People's behaviour is expected to be in line with their attitudes. However, what people favour does not necessarily match what they do in most situations. Therefore, Fishbein and Ajzen proposed the Theory of Reasoned Action and the Theory of Planned Behaviour to model the indirect influences of attitude on behaviour (Ajzen, 1985, 1991, 2012; Fishbein & Ajzen, 1975). Their argument is that human behaviour is not only influenced by attitude but also by perceived social influences and perceived controllability, and behaviour is typically influenced by these three variables jointly. Further, intention mediates the influences of these three variables on behaviour.

This is the theoretical foundation of the current research. The study adopted Fishbein and Ajzen's theory and incorporated descriptive norm (Cialdini, et al., 1990), self-identity (Nigbur, et al., 2010; Stryker & Burke, 2000) and past behaviour (Foxall, 1997) into an extended model to explain consumers' decisions regarding buying energy-saving light bulbs (see Figure 2.3). After extensive deliberation, the model was later revised by dropping the behaviour construct, on both empirical and theoretical grounds.

The revised model is a good fit for the data (see Figure 5.14), supporting most but not all of the hypotheses. Only attitudinal influences (i.e. attitudinal affections and attitudinal beliefs), self-identity and past behaviour were confirmed statistically to have an effect on New Zealand consumers' intentions to purchase energy-saving light bulbs. The findings have provided insights into consumer purchasing behaviour and contributed to the body of knowledge in the field of green marketing. The findings from the survey have also suggested new directions to investigate to understand consumers' environmentally friendly purchasing behaviour.

The current study helps to paint a picture, although incomplete, of a consumer's decision-making processes when buying green products. The findings are applicable for

practice and can be a foundation for future research. The outcomes of this research are in agreement with the existing literature.

The study's findings have confirmed most of the predictive relationships specified in the Theory of Planned Behaviour, but the results have also suggested reconsideration of the operationalisation of attitude, injunctive norm, perceived behavioural control and intention. From a practical perspective, variables that were found to be significant in this study can be incorporated when designing marketing strategies to encourage consumers to buy environmentally friendly products in New Zealand.

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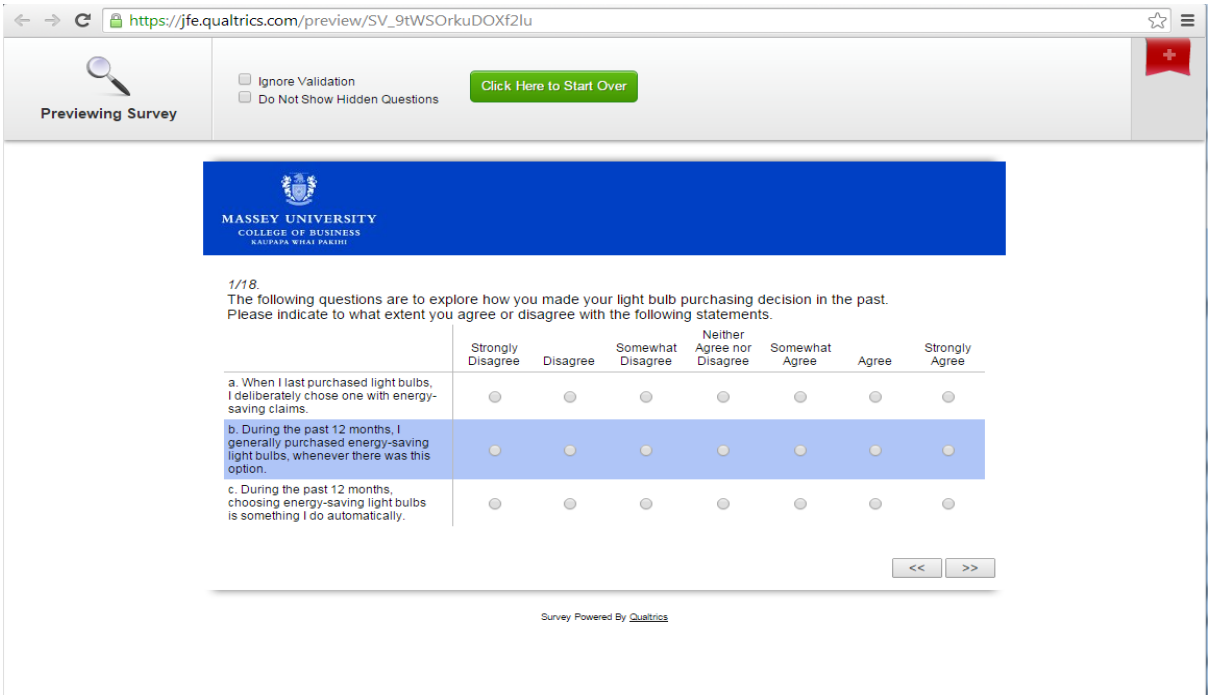
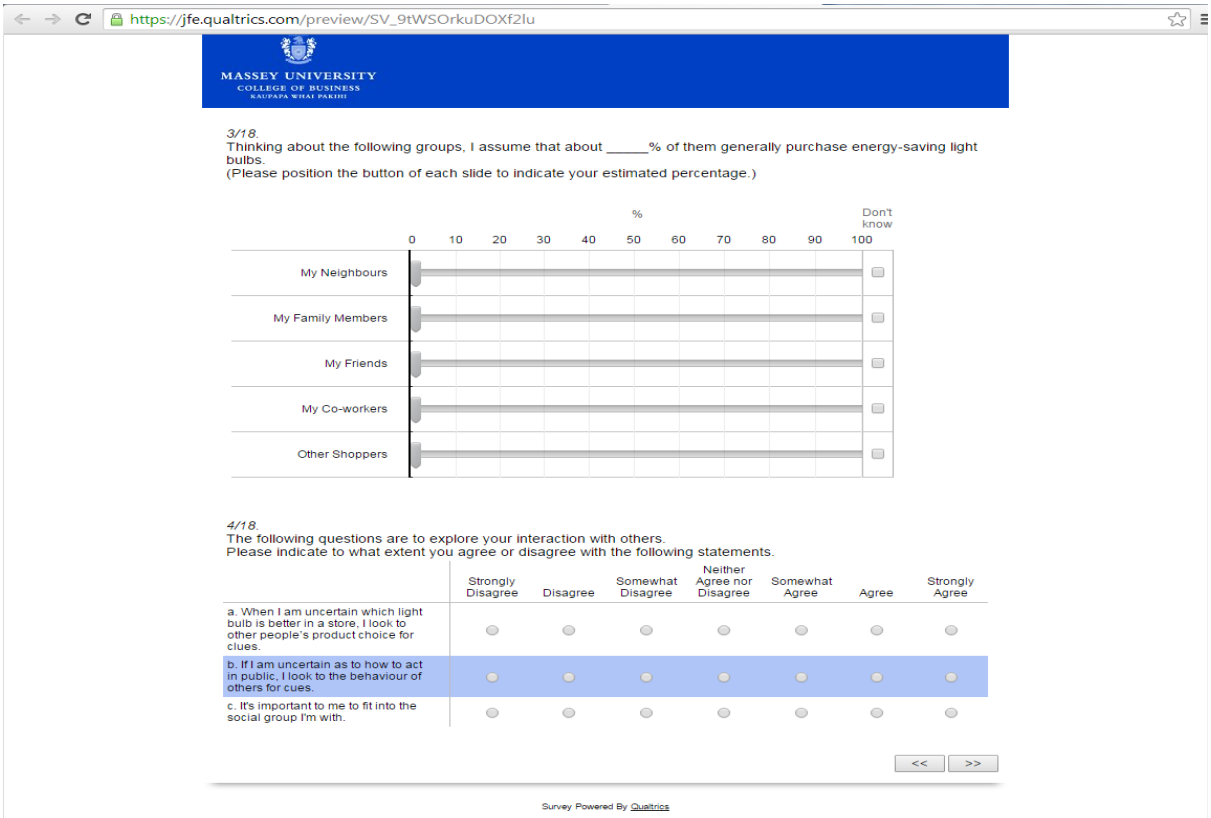
Appendices

Appendix 1 Presentation of the online questionnaire (two constructs' screenshots as example)

(*Past behaviour* construct)



(*Descriptive norm* construct)



Appendix 2 Consumer survey (downloaded version)

Dear friend

You are invited to take part in a study that aims to explore how people go about purchasing eco-friendly "green" products, specifically light bulbs. We are approaching people of 16 years or older who live in New Zealand.

The information you provide will be valuable in creating a better understanding of how people purchase green products. Your participation is of course voluntary and anonymous, but it would be highly appreciated. This survey should not take more than 10 to 15 minutes of your time.

Thank you very much in advance for completing this survey. Please note that completion of this survey indicates your consent to participate.

My name is Paya Hsu and I am undertaking my PhD studies at Massey University Wellington. Please contact me (yun-chin.hsu.2@uni.massey.ac.nz) if you have any queries, or if you would like a copy of the findings of this study when completed.

If you have any concerns or questions about this research that you wish to raise with someone other than myself, please contact my supervisor, Dr Fiona Chan, Senior Lecturer, School of Communication, Journalism and Marketing, Massey University Wellington, telephone: 04 8015799 ext.62420, email: F.Chan@massey.ac.nz

Section A (past behaviour)

1/18.
The following questions are to explore how you made your light bulb purchasing decision in the past. Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
a. When I last purchased light bulbs, I deliberately chose one with energy-saving claims.	○	○	○	○	○	○	○
b. During the past 12 months, I generally purchased energy-saving light bulbs, whenever there was this option.	○	○	○	○	○	○	○
c. During the past 12 months, choosing energy-saving light bulbs is something I do automatically.	○	○	○	○	○	○	○

Section B (Intention)

2/18.
The following questions are to explore your intention in purchasing energy-saving light bulbs. Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
a. The likelihood that I will buy energy-saving light bulbs is high.							
b. I intend to buy energy-saving light bulbs because they are friendly for the environment.							
c. I intend to buy energy-saving light bulbs to reduce my electricity bills.							
d. I do NOT intend to buy energy-saving light bulbs even if they are available in the market.							

Section C (SocialNorm)

3/18.
Thinking about the following groups, I assume that about _____% of them generally purchase energy-saving light bulbs.
(Please position the button of each slide to indicate your estimated percentage.)

	0 10 20 30 40 % 50 60 70 80 90 100	Don't know
My Neighbours		
My Family Members		
My Friends		
My Co-workers		
Other Shoppers		

4/18.
The following questions are to explore your interaction with others.
Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
a. When I am uncertain which light bulb is better in a store, I look to other people's product choice for clues.							
b. If I am uncertain as to how to act in public, I look to the behaviour of others for cues.							
c. It's important to me to fit into							

the social group I'm with.							

Section D (Identity)

5/18.
The following questions are to explore how you see yourself, from the perspective of being eco-friendly, not limited to purchasing energy-saving light bulbs, unless specified.
Please indicate to what extent you agree or disagree with the following statements.

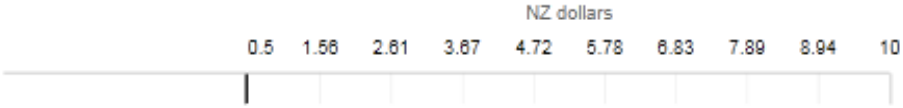
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
a. It is important to me that the products I use do not harm the environment.							
b. I consider myself as an energy saver.							
c. To conserve energy is an important part of who I am.							
d. I see myself as a typical buyer of energy-saving light bulbs							
e. I am NOT the type of person oriented to purchase energy-saving light bulbs.							
f. I would describe myself as environmentally responsible.							

Section E (PBC)

6/18.
The following questions are to explore how you think the action of getting energy-saving light bulbs.
Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
a. It is easy for me to find energy-saving light bulbs whenever I need to buy them.							
b. Energy-saving light bulbs are affordable for me in terms of my purchasing budget.							
c. High time demands on me made it much harder to purchase energy-saving light bulbs on my last visit to the store.							
d. I would be willing to spend more (more than conventional ones) to purchase energy-saving light bulbs.							

6a/18.
While choosing an energy-saving light bulb over a conventional one, how much extra are you willing to pay? (Please position the button of the slide to indicate how much extra you are willing to pay)



7/18.
While purchasing light bulbs, ___ (the factors below) usually affect my purchasing decision.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Concerns for the environment							
Sufficient product information							
Affordability							
Availability in store							
Product quality							

Section F (Attitude)

8/18. For me, choosing energy-saving light bulbs would be _____.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Pleasant							
Favourable							
A positive thing to do							
A wise decision							

9/18.
The following questions are to explore your attitude towards energy-saving light bulbs and related issues. Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
a. Consumers should be made to pay higher prices for light bulbs that consume more energy.							
b. Commercial advertising should be forced to mention ecological disadvantages of non energy-saving light bulbs.							
c. I trust energy-saving claims made by manufacturers.							

d. It would be wise for the government to devote more money towards supporting a strong energy saving programme.							
e. The light bulbs that consume more energy should be heavily taxed by the government.							
f. Paying more (more than conventional ones) for energy-saving light bulbs is acceptable.							
g. The higher cost of energy-saving light bulbs encourages people to carry on buying non energy-saving ones.							
h. I trust an ecolabel issued by an independent third party, e.g. Energy Star.							

Section G (SubjectiveNorm)

10/18.
The following questions are to explore other people's expectations towards you, and your reaction towards the expectations.
Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
a. My family thinks I should purchase energy-saving light bulbs.							
b. My friends think that I should purchase energy-saving light bulbs.							
c. My coworkers think I should purchase energy-saving light bulbs.							
d. In general, I think the views of people who are important to me are favourable towards my purchasing energy-saving light bulbs.							
e. If other people can see me using a product, I often purchase the brand they expect me to buy.							

11/18. ____(the groups below) have much influence on my decision to purchase (or not purchase) energy-saving light bulbs.
Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
My family							
My friends							
My co-workers							

Behaviour

12/18.
Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
a. In future, I will buy energy-saving light bulbs because they are environmentally friendly.	○	○	○	○	○	○	○
b. In future, I will buy energy-saving light bulbs even if they are more expensive than conventional ones.	○	○	○	○	○	○	○
c. In future, I will buy energy-saving light bulbs to reduce my electricity bills.	○	○	○	○	○	○	○
d. In future, when I buy light bulbs, I will look at product information to see if it saves energy.	○	○	○	○	○	○	○
e. In future, I will switch over to buying energy-saving light bulbs.	○	○	○	○	○	○	○

Screening

13/18. Which country do you live in?

- ○ New Zealand
- ○ Outside New Zealand

14/18. What is your age?

- ○ under 16
- ○ 16-25
- ○ 26-35
- ○ 36-45
- ○ 46-55
- ○ 56-65
- ○ over 65

Demographic Information

15/18. What is your gender?

- Female
- Male

16/18. What is the highest level of education you have completed?

- Completed or partly completed secondary school
- Some tertiary level studies
- Bachelor Degree or equivalent
- Postgraduate Diploma or Masters Degree, or higher

17/18. Which of the following best describes your occupational status?

- Manager
- Professional
- Technician or trades
- Community or personal service
- Clerical or administrative
- Sales
- Machinery operator, labourer or driver
- Student
- Other

18/18. What is your total income?

- $5,000 or less per year
- $5,001-$10,000
- $10,001-$20,000
- $20,001-$30,000
- $30,001-$40,000
- $40,001-$50,000
- $50,001-$60,000
- More than $60,000
- Don't know

Appendix 3 Email invitation (*Social networks* channel)

PhD research - Green marketing

From:**Paya Hsu** (payahsu@gmail.com)
Sent:Tuesday, December 13, 2011 1:33:58 AM
To: ychsu@hotmail.com

Hi, dear friend,

My name is Paya Hsu, a PhD student at the Massey University Wellington. I'm interested in the field of how to work together with each other towards a cleaner future; this is why I conduct this research at the first place.

My research is about green marketing, which aims to explore how people go about purchasing environmentally friendly products. Based on the above information, I shall be able to be a step closer to my initial and ultimate attempt.

I thus need your input in providing your thoughts and purchasing behaviour, specifically of light bulbs. It will be appreciated if you can help me by completing this online survey, which takes about 15 minutes. The following is the link to the online questionnaire:
http://masseybusiness.eu.qualtrics.com/SE/?SID=SV_6feom3zusQUkLnS
(By clicking the link, you will be led to the survey website)

Your participation is voluntary and anonymous. If you have any enquiries, no matter it is about the survey itself, or about my overall research, please feel free to contact me via the email.

Thank you very much in advance for your help. And please feel free to forward this email to your friends and family.

Best regards,

-- Paya Hsu
School of Communication, Journalism and Marketing
Massey University Wellington
Rm 5D05
P.O. Box 756
Wellington
Tel: (0)4 801 5799 ext 62363
Email: payahsu@gmail.com

Appendix 4 New Zealand 1996-2006 censuses: Age and gender (Statistics New Zealand, 2007)

1996–2006 Censuses

Age Group	Census Year								
	1996			2001			2006		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4 Years	144,111	135,489	279,603	138,693	132,108	270,801	140,382	134,697	275,079
5-9 Years	147,720	140,574	288,291	147,363	138,837	286,203	146,532	139,956	286,488
10-14 Years	135,663	128,523	264,186	148,632	142,107	290,739	157,113	148,896	306,009
15-19 Years	133,572	129,405	262,977	134,949	130,332	265,281	152,439	147,762	300,198
20-24 Years	134,832	136,926	271,758	118,791	120,993	239,784	135,087	135,894	270,978
25-29 Years	132,453	140,850	273,303	118,008	128,892	246,903	117,216	125,223	242,439
30-34 Years	142,452	151,032	293,484	132,198	147,081	279,276	130,884	145,677	276,561
35-39 Years	139,293	145,923	285,216	142,680	154,785	297,462	143,001	158,550	301,554
40-44 Years	125,436	129,600	255,036	138,501	147,120	285,618	150,900	162,798	313,698
45-49 Years	120,249	120,939	241,191	123,528	128,256	251,787	143,052	150,369	293,421
50-54 Years	93,351	93,366	186,717	116,955	119,217	236,169	124,308	128,421	252,729
55-59 Years	78,783	79,821	158,604	90,180	92,082	182,262	115,224	118,347	233,571
60-64 Years	67,422	67,845	135,264	75,840	78,729	154,569	88,335	91,278	179,613
65-69 Years	65,184	67,788	132,972	62,478	65,433	127,914	72,114	76,434	148,548
70-74 Years	51,759	61,902	113,661	56,145	62,112	118,257	55,878	61,056	116,934
75-79 Years	33,561	48,726	82,290	40,740	53,766	94,506	46,356	54,855	101,214
80-84 Years	20,409	34,869	55,281	22,803	38,310	61,110	29,124	43,113	72,237
85 Years and Over	11,196	27,264	38,460	14,517	34,122	48,639	17,667	39,000	56,667
Total	1,777,461	1,840,839	3,618,303	1,823,007	1,914,273	3,737,277	1,965,621	2,062,326	4,027,947
Median Age	32.2	33.6	33.0	34.0	35.6	34.8	35.1	36.7	**35.9**

Note: This data has been randomly rounded to protect confidentiality. Individual figures may not add up to totals, and values may vary in different tables.

Appendix 5 New Zealand 1996-2006 censuses: Highest qualification (Statistics New Zealand, 2007)

Highest Qualification[1][2]

1996–2006 Censuses

Highest qualification	Census year		
	1996	2001	2006
No qualification	897,699	686,226	708,432
Level 1 certificate gained at school	310,212	389,259	386,073
Level 2 certificate gained at school	236,859	283,482	263,850
Level 3 or 4 certificate gained at school	131,550	156,981	170,055
Overseas secondary school qualification	59,169	163,695	172,590
Level 1, 2 or 3 certificate gained post-school	86,829	106,188	128,622
Level 4 certificate gained post-school	169,845	137,628	286,599
Level 5 diploma	36,612	54,891	110,496
Level 6 diploma	200,295	209,181	157,866
Bachelor degree and level 7 qualifications	149,898	199,932	315,849
Higher degree	74,343	92,154	131,931
Not elsewhere included[3]	432,909	409,917	328,014
Total	2,786,220	2,889,534	3,160,371

(1) All figures are for the census usually resident population aged 15 years and over.

(2) In 2006 data for highest qualifications is output in two ways. This table shows categories that distinguish between qualifications gained at school and post-school. This allows comparison with output from previous censuses.

The other way is with categories that are consistent with the new qualifications framework.

For further information on the qualifications framework, refer to the Statistical Standard for Qualifications,

available from Statistics New Zealand's website.

(3) In 1996, this includes Post-school qualification not applicable, Post-school qualification unidentifiable,

Post-school qualification not specified, School qualification not applicable, School qualification unidentifiable, School qualification not specified and Not specified. In 2001, this includes Other NZ secondary school qualification,

Highest qualification unidentifiable and Not stated. In 2006, this includes Response unidentifiable and Not stated.

Note: This data has been randomly rounded to protect confidentiality.

Individual figures may not add up to totals, and values for the same data may

vary in different tables.

Appendix 6 New Zealand 2006 censuses: Occupation (Statistics New Zealand, 2007)

Occupation (ANZSCO V1.0)[1] of Employed People in New Zealand[2]

2006 Census

Occupation (ANZSCO V1.0)	Total
Managers	340,530
Professionals	374,328
Technicians and Trades Workers	241,857
Community and Personal Service Workers	156,468
Clerical and Administrative Workers	240,813
Sales Workers	186,060
Machinery Operators and Drivers	114,324
Labourers	218,991
Not Elsewhere Included[3]	112,404
Total	1,985,778

(1) Australian and New Zealand Standard Classification of Occupations (ANZSCO V1.0).

(2) All figures are for the employed census usually resident population aged 15 years and over.

(3) Includes Response Unidentifiable, Response Outside Scope and Not Stated.

Note: This data has been randomly rounded to protect confidentiality.

Individual figures may not add up to totals, and values for the same data may vary in different tables.

Appendix 7 New Zealand 2006 census: Income (Statistics New Zealand, 2007)

Total Personal Income[(1)(2)]

2006 Census

Total personal income	Total
Loss	17,355
Zero income	145,050
$1–$5,000	221,166
$5,001–$10,000	226,800
$10,001–$15,000	355,899
$15,001–$20,000	260,082
$20,001–$25,000	219,654
$25,001–$30,000	215,301
$30,001–$35,000	201,300
$35,001–$40,000	202,770
$40,001–$50,000	262,299
$50,001–$70,000	281,160
$70,001–$100,000	125,118
$100,001 or more	105,525
Not stated	320,889
Total	3,160,371
Median income	$24,400

(1) Total personal income relates to the 12 months ending 31 March 2006.

(2) All figures are for the census usually resident population aged 15 years and over.

Note: This data has been randomly rounded to protect confidentiality.
Individual figures may not add up to totals, and values for the same data may vary in different tables.

Appendix 8 Common abbreviations (constructs/scales)

Abbreviation	Construct	Further Explanation
BH	Behaviour	This abbreviation is used to represent the *behaviour* construct in the present study.
INT	Intention	This abbreviation is used to represent the *intention* construct in the present study.
ATD_Affections	Attitudinal affections	This abbreviation is used to represent the *attitude affections* construct, which attempts to capture respondents' related appraisal in the present study.
ATD_Beliefs	Attitudinal beliefs	This abbreviation is used to represent the *attitude beliefs* construct, which attempts to capture information about beliefs that form the *attitude* in the present study.
IN_Perception	Perceived expectations from others	This abbreviation is used for representing the *perceived expectation from others* construct, which attempts to capture how respondents perceive the expectations of others in the present study.
IN_Comply	Willingness to follow expectations	This abbreviation is used to represent the *willingness to follow expectations* construct, which attempts to capture respondents' awareness of being influenced by the expectations in the present study.
PBC_Perception	Perceived controllability and self-efficacy	This abbreviation is used to represent the *perceived controllability and self-efficacy* construct, which attempts to capture respondents' perceived controllability and self-efficacy towards the purchase in the present study.
PBC_Situational	Perceived controllability in situational context	This abbreviation is used to represent the *perceived controllability of situations* construct, which attempts to capture respondents' perceived influence from situational context in the present study.
DN_Perception	Perception of majority's purchasing behaviour	This abbreviation is used to represent the *perceived majority* construct, which attempts to capture respondents' perceived majority's purchasing behaviour in the present study.
DN_FitInMajor	Tendency to fit in with the perceived majority	This abbreviation is used to represent the *tendency to fit in* construct, which attempts to capture how willing respondents are to follow the majority in the present study.
ID	Self-identity	This abbreviation is used to represent the *self-identity* construct in the present

Abbreviation	Construct	Further Explanation
		study.
PB	Past behaviour	This abbreviation is used to represent the *past behaviour* construct in the present study
INTBH	Intention	This abbreviation is used to represent the *intention* construct which incorporates the original *intention* and *behaviour* constructs

Appendix 9 Correlations of all variables in Figure 5.9

	INTBH	PB	ID	DN_ Comply	DN_ Perception	PBC_ Situational	IN_ Comply	IN_ Perception	ATD_ Affections	PBC_ Perception	ATD_ Beliefs
INTBH	1										
PB	0.864	1									
ID	0.824	0.782	1								
DN_ Comply	-0.269	-0.211	-0.219	1							
DN_ Perception	-0.628	-0.63	-0.586	0.272	1						
PBC_ Situational	0.651	0.557	0.672	-0.181	-0.298	1					
IN_ Comply	-0.38	-0.348	-0.408	0.541	0.267	-0.352	1				
IN_ Perception	-0.546	-0.482	-0.535	0.429	0.38	-0.466	0.685	1			
ATD_ Affections	0.802	0.636	0.693	-0.204	-0.458	0.672	-0.364	-0.507	1		
PBC_ Perception	0.813	0.744	0.801	-0.258	-0.585	0.654	-0.371	-0.517	0.708	1	
ATD_ Beliefs	0.656	0.493	0.621	-0.429	-0.365	0.537	-0.532	-0.637	0.661	0.605	1
INTBH_envt	0.884	0.764	0.729	-0.238	-0.556	0.575	-0.336	-0.483	0.709	0.719	0.58
INTBH_intent	0.939	0.811	0.773	-0.252	-0.59	0.611	-0.357	-0.512	0.753	0.763	0.616
INTBH_bill	0.906	0.783	0.747	-0.244	-0.57	0.59	-0.345	-0.495	0.727	0.737	0.595
DeliberChose	0.818	0.946	0.74	-0.2	-0.596	0.528	-0.329	-0.456	0.602	0.704	0.466
GenealyBougt	0.822	0.951	0.744	-0.201	-0.599	0.53	-0.331	-0.458	0.605	0.708	0.468
AutoBought	0.826	0.956	0.748	-0.202	-0.602	0.533	-0.333	-0.461	0.608	0.711	0.471
EnvtResponb	0.592	0.562	0.718	-0.157	-0.421	0.482	-0.293	-0.385	0.497	0.575	0.446

	INTBH	PB	ID	DN_ Comply	DN_ Perception	PBC_ Situational	IN_ Comply	IN_ Perception	ATD_ Affections	PBC_ Perception	ATD_ Beliefs
ESbulbBuyer	0.736	0.698	0.893	-0.196	-0.523	0.6	-0.364	-0.478	0.618	0.715	0.554
GreenBuyer	0.581	0.551	0.705	-0.154	-0.413	0.473	-0.287	-0.377	0.488	0.565	0.438
EnergySaver	0.712	0.676	0.864	-0.189	-0.506	0.58	-0.352	-0.463	0.598	0.692	0.536
ConserveEng	0.673	0.639	0.817	-0.179	-0.479	0.549	-0.333	-0.438	0.566	0.655	0.507
DNFitIn	-0.196	-0.154	-0.159	0.728	0.198	-0.132	0.394	0.313	-0.148	-0.188	-0.313
DNothersCue	-0.201	-0.157	-0.163	0.746	0.203	-0.135	0.404	0.32	-0.152	-0.192	-0.32
DNpplChoice	-0.151	-0.118	-0.123	0.561	0.153	-0.102	0.304	0.241	-0.114	-0.145	-0.241
DNCoworkers	-0.472	-0.473	-0.441	0.204	0.752	-0.224	0.201	0.286	-0.344	-0.44	-0.274
DNFriends	-0.6	-0.601	-0.56	0.26	0.954	-0.284	0.255	0.363	-0.437	-0.558	-0.348
DNFamily	-0.525	-0.526	-0.489	0.227	0.835	-0.248	0.223	0.318	-0.382	-0.488	-0.304
DNNeighbour	-0.5	-0.501	-0.466	0.216	0.796	-0.237	0.213	0.303	-0.364	-0.465	-0.29
Quality	0.442	0.379	0.457	-0.123	-0.202	0.68	-0.24	-0.317	0.457	0.444	0.365
Availability	0.433	0.371	0.447	-0.12	-0.198	0.666	-0.235	-0.31	0.447	0.435	0.358
SufficientInfo	0.468	0.401	0.483	-0.13	-0.214	0.719	-0.253	-0.335	0.483	0.47	0.386
INBeingSeen	-0.235	-0.215	-0.251	0.334	0.165	-0.217	0.617	0.422	-0.225	-0.229	-0.328
INFamilyInflu	-0.313	-0.286	-0.335	0.445	0.22	-0.29	0.822	0.563	-0.299	-0.305	-0.438
INCoworkerInflu	-0.347	-0.317	-0.372	0.494	0.244	-0.321	0.912	0.624	-0.332	-0.338	-0.485
INFamily	-0.468	-0.413	-0.459	0.368	0.326	-0.4	0.587	0.858	-0.435	-0.443	-0.546
INFriends	-0.519	-0.458	-0.509	0.408	0.362	-0.443	0.651	0.951	-0.482	-0.492	-0.606
INCoworkers	-0.493	-0.435	-0.484	0.388	0.344	-0.421	0.619	0.904	-0.458	-0.467	-0.576
INImportantOth	-0.404	-0.357	-0.396	0.318	0.282	-0.345	0.507	0.74	-0.375	-0.383	-0.472
Favourable	0.611	0.484	0.527	-0.155	-0.348	0.511	-0.277	-0.386	0.761	0.539	0.503
Positive	0.751	0.596	0.649	-0.191	-0.429	0.629	-0.341	-0.474	0.936	0.663	0.619
Wise	0.741	0.588	0.64	-0.188	-0.423	0.621	-0.337	-0.468	0.924	0.655	0.611
PayPremium	0.612	0.559	0.603	-0.194	-0.44	0.492	-0.279	-0.389	0.533	0.752	0.455

	INTBH	PB	ID	DN_ Comply	DN_ Perception	PBC_ Situational	IN_ Comply	IN_ Perception	ATD_ Affections	PBC_ Perception	ATD_ Beliefs
TimePressure	0.233	0.213	0.229	-0.074	-0.167	0.187	-0.106	-0.148	0.203	0.286	0.173
Affordable	0.613	0.56	0.604	-0.194	-0.441	0.493	-0.28	-0.389	0.534	0.753	0.455
EasyFind	0.511	0.467	0.503	-0.162	-0.367	0.411	-0.233	-0.325	0.445	0.628	0.38
Label_3party	0.393	0.295	0.372	-0.257	-0.218	0.322	-0.319	-0.381	0.396	0.362	0.599
TaxBulb	0.495	0.372	0.469	-0.324	-0.275	0.406	-0.402	-0.481	0.499	0.457	0.755
PayMore	0.47	0.353	0.445	-0.308	-0.261	0.385	-0.381	-0.456	0.474	0.433	0.716
ComAd	0.445	0.334	0.421	-0.291	-0.247	0.364	-0.361	-0.431	0.448	0.41	0.677
Label_Com	0.45	0.338	0.426	-0.295	-0.25	0.369	-0.365	-0.437	0.454	0.415	0.686

Appendix 10 Standardised residual variances of Figure 5.9

	INTBH_envt	INTBH_intent	INTBH_bill	DeliberChose	GenealyBougt	AutoBought	EnvtResponb	ESbulbBuyer	GreenBuyer
INTBH_envt	0								
INTBH_intent	0.043	0.236							
INTBH_bill	-0.613	0.199	-0.354						
DeliberChose	-0.044	0.189	-0.145	0.023					
GenealyBougt	-0.109	0.231	-0.171	0.017	-0.021				
AutoBought	0.043	0.151	-0.459	-0.018	0.003	0			
EnvtResponb	-0.252	-1.73	-1.881	-1.861	-1.541	-1.442	0		
ESbulbBuyer	1.773	1.539	1.073	1.779	1.733	2.369	-0.893	0	
GreenBuyer	0.966	-0.848	-0.817	-1.479	-1.623	-1.196	1.765	-0.956	0
EnergySaver	-0.292	-0.611	-0.062	-0.637	-0.592	-0.164	0.788	-0.385	0.474
ConserveEng	0.057	-1.589	-1.224	-1.374	-1.625	-0.93	1.028	-0.375	0.489
DNFitIn	-0.306	0.627	-0.375	-0.295	0.717	0.824	1.379	-0.573	0.066
DNothersCue	0.35	1.076	0.097	0.316	0.6	0.732	2.292	-0.017	0.258
DNpplChoice	-1.376	-1.022	-2.229	-2.069	-2.409	-1.633	0.169	-2.963	-1.736
DNCoworkers	1.758	1.134	1.612	0.329	1.048	1.124	1.131	0.496	2.845
DNFriends	-0.45	-0.225	0.214	-0.199	0.368	0.22	0.666	-1.245	1.155
DNFamily	-0.409	-1.205	-0.254	-1.903	-1.002	-1.167	-0.23	-1.849	1.439
DNNeighbour	-0.116	0.202	1.692	-0.271	0.93	0.201	1.126	-0.772	1.367
Quality	-0.557	-1.442	-0.814	-0.985	-0.847	-1.026	-0.875	-0.76	1.678
Availability	0.623	0.492	0.599	-0.531	0.239	-0.55	-1.238	0.116	1.151
SufficientInfo	1.487	0.279	-0.141	0.588	1.233	1.217	2.073	1.318	3.18
INBeingSeen	-2.333	-0.222	-1.203	-1.226	-0.639	-1.194	0.537	-1.463	-0.502
INFamilyInflu	-0.667	0.184	-1.233	-0.356	0.35	0.117	0.984	-0.408	0.36
INCoworkerInflu	-0.66	1.014	0.243	0.145	0.588	-0.211	1.212	-0.555	0.04
INFamily	-2.019	-1.099	-1.952	-1.569	-1.272	-1.675	-0.462	-2.546	-1.33
INFriends	-0.405	0.891	-0.111	0.3	0.367	0.313	0.859	-0.87	0.492
INCoworkers	-0.218	1.336	0.454	0.157	0.482	0.243	1.185	-0.342	0.33
INImportantOth	-1.71	-0.267	-0.96	-0.259	0.187	0.252	0.779	-0.736	-1.032
Favourable	1.392	0.125	0.398	0.957	0.775	0.633	-0.011	1.796	1.07

(Appendix 10 *cont.*)

	GreenBuyer [Repeated]	EnergySaver	ConserveEng	DNFitIn	DNothersCue	DNpplChoice	DNCoworkers	DNFriends	DNFamily
INTBH_envt									
INTBH_intent									
INTBH_bill									
DeliberChose									
GenealyBougt									
AutoBought									
EnvtResponb									
ESbulbBuyer									
GreenBuyer	0								
EnergySaver	0.474	0							
ConserveEng	0.489	0.827	0						
DNFitIn	0.066	1.115	0.024	-0.304					
DNothersCue	0.258	0.928	0.993	0.257	0.287				
DNpplChoice	-1.736	-1.391	-2.341	-1.281	0.624	0			
DNCoworkers	2.845	2.208	0.979	0.379	0.107	0.442	0		
DNFriends	1.155	-0.021	0.084	-0.749	0.066	1.686	0.079	0	
DNFamily	1.439	0.139	0.505	-1.009	-0.858	2.317	0.169	-0.079	0
DNNeighbour	1.367	1.243	1.03	0.092	-0.713	-0.016	0.111	0.049	-0.233
Quality	1.678	-1.124	-2.036	0.933	1.036	0.281	1.001	-0.05	0.046
Availability	1.151	-1.662	-1.245	-2.047	-1.505	-0.557	0.187	0.605	-0.577
SufficientInfo	3.18	0.331	0.732	1.111	1.114	-1.894	-0.331	-0.948	-0.106
INBeingSeen	-0.502	-0.739	-2.074	0.671	0.324	2.875	0.041	1.412	0.331
INFamilyInflu	0.36	0.918	0.622	0.902	0.673	1.238	0.922	0.176	0.457
INCoworkerInflu	0.04	0.504	-0.332	-0.72	-1.123	0.849	1.865	-0.102	-1.034
INFamily	-1.33	-0.729	-0.763	0.722	-0.973	1.172	0.268	0.368	2.371
INFriends	0.492	1.198	0.431	-0.026	-0.887	0.614	0.108	-0.006	0.598
INCoworkers	0.33	1.015	0.675	0.333	-0.612	1.271	0.46	-0.495	-0.162
INImportantOth	-1.032	0.809	-0.225	1.832	0.032	1.419	1.331	1.132	0.881
Favourable	1.07	0.612	0.12	-0.592	-0.21	-1.376	1.828	-0.058	-0.671

(Appendix 10 *cont.*)

	DNFamily [Repeated]	DNNeighbour	Quality	Availability	SufficientInfo	INBeingSeen	INFamilyInflu	INCoworkerInflu	INFamily	INFriends
INTBH_envt										
INTBH_intent										
INTBH_bill										
DeliberChose										
GenealyBougt										
AutoBought										
EnvtResponb										
ESbulbBuyer										
GreenBuyer										
EnergySaver										
ConserveEng										
DNFitIn										
DNOthersCue										
DNpplChoice										
DNCoworkers										
DNFriends										
DNFamily	0									
DNNeighbour	-0.233	0								
Quality	0.046	0.979	-0.216							
Availability	-0.577	1.622	1.206	0.224						
SufficientInfo	-0.106	0.52	-0.202	-0.793	0					
INBeingSeen	0.331	1.342	1.068	-0.32	-0.818	0				
INFamilyInflu	0.457	-2.509	0.757	-1.145	-0.439	-0.726	0.464			
INCoworkerInflu	-1.034	-1.112	1.582	-0.317	-0.723	-0.031	0.299	-0.241		
INFamily	2.371	-0.54	-0.443	-0.941	-1.455	0.794	1.9	-0.575	0	
INFriends	0.598	-1.334	1.044	0.276	-0.112	0.731	-0.148	-1.044	0.054	0
INCoworkers	-0.162	-1.925	0.975	0.306	-0.668	1.859	-0.125	0.6	-0.446	0.193
INImportantOth	0.881	-0.766	0.576	-1.389	-1.581	2.827	2.817	0.957	0.1	-0.149
Favourable	-0.671	-0.157	0.315	1.189	0.883	-1.236	-1.583	-1.317	-1.871	-1.717

(Appendix 10 *cont.*)

	INFriends [Repeated]	INCoworkers	INImportantOth	Favourable	Positive	Wise	PayPremium	TimePressure	Affordable	EasyFind
INTBH_envt										
INTBH_intent										
INTBH_bill										
DeliberChose										
GenealyBougt										
AutoBought										
EnvtResponb										
ESbulbBuyer										
GreenBuyer										
EnergySaver										
ConserveEng										
DNFitIn										
DNothersCue										
DNpplChoice										
DNCoworkers										
DNFriends										
DNFamily										
DNNeighbour										
Quality										
Availability										
SufficientInfo										
INBeingSeen										
INFamilyInflu										
INCoworkerInflu										
INFamily										
INFriends	0									
INCoworkers	0.193	0								
INImportantOth	-0.149	-0.345	0							
Favourable	-1.717	-1.395	-2.2	0						

(Appendix 10 *cont.*)

	EasyFind [Repeated]	Label_3party	TaxBulb	PayMore	ComAd	Label_Com
INTBH_envt						
INTBH_intent						
INTBH_bill						
DeliberChose						
GenealyBougt						
AutoBought						
EnvtResponb						
ESbulbBuyer						
GreenBuyer						
EnergySaver						
ConserveEng						
DNFitIn						
DNothersCue						
DNpplChoice						
DNCoworkers						
DNFriends						
DNFamily						
DNNeighbour						
Quality						
Availability						
SufficientInfo						
INBeingSeen						
INFamilyInflu						
INCoworkerInflu						
INFamily						
INFriends						
INCoworkers						
INImportantOth						
Favourable						

(Appendix 10 *cont.*)

	INTBH_envt	INTBH_intent	INTBH_bill	DeliberChose	GenealyBougt	AutoBought	EnvtResponb	ESbulbBuyer	GreenBuyer
Favourable [Repeated]	1.392	0.125	0.398	0.957	0.775	0.633	-0.011	1.796	1.07
Positive	-0.039	-0.874	-0.86	-0.92	-0.693	-1.08	-1.369	-0.094	-0.48
Wise	0.972	0.75	0.326	0.822	0.96	0.848	-0.205	1.423	-0.072
PayPremium	0.504	-0.153	-0.495	-0.074	-0.367	-0.164	-0.16	0.905	-0.326
TimePressure	-0.033	0.87	-0.604	-0.179	0.348	0.275	-0.39	-0.401	-1.46
Affordable	0.199	-0.645	-0.657	-0.213	-0.412	-0.26	-0.976	0.332	-0.336
EasyFind	0.471	1.219	0.916	0.882	0.915	0.817	0.455	1.16	0.25
Label_3party	3.086	3.366	3.357	2.132	2.236	1.965	0.496	2.018	1.505
TaxBulb	0.899	-0.862	-1.005	-0.305	-0.38	0.204	-0.564	0.054	-0.072
PayMore	-0.402	-1.631	-1.288	-1.377	-0.981	-1.105	-1.592	-0.816	-0.544
ComAd	1.125	-1.519	-1.487	-2.173	-1.386	-1.489	-0.552	-0.368	1.196
Label_Com	2.11	1.491	2.255	2.622	2.752	2.685	1.256	2.888	2.65

(Appendix 10 *cont.*)

	GreenBuyer [Repeated]	EnergySaver	ConserveEng	DNFitIn	DNothersCue	DNpplChoice	DNCoworkers	DNFriends	DNFamily
Favourable [Repeated]	1.07	0.612	0.12	-0.592	-0.21	-1.376	1.828	-0.058	-0.671
Positive	-0.48	-0.974	-0.908	0.405	0.449	-1.073	0.766	0.269	0.428
Wise	-0.072	0.042	0.408	0.446	0.426	-1.637	0.333	-0.824	-1.227
PayPremium	-0.326	-0.426	0.104	-1.312	-0.406	-1.149	0.084	-0.585	-0.778
TimePressure	-1.46	-0.456	-2.003	2.43	3.493	4.686	0.025	-0.015	-0.298
Affordable	-0.336	-0.664	-0.766	0.35	0.483	-0.918	1.392	0.541	0.628
EasyFind	0.25	0.832	-1.148	1.204	0.641	-0.239	1.213	0.348	-0.342
Label_3party	1.505	0.787	-0.392	-0.378	-0.734	-0.963	-2.036	-3.608	-2.477
TaxBulb	-0.072	-1.12	0.717	0.771	0.607	-0.317	1.598	0.709	0.408
PayMore	-0.544	-2.038	-1.022	-0.801	0.41	-0.666	1.523	0.945	0.759
ComAd	1.196	-1.051	0.091	0.51	0.819	-1.109	0.293	0.245	1.187
Label_Com	2.65	1.102	1.201	-1.046	1.081	-2.548	-2.631	-1.795	-1.858

(Appendix 10 *cont.*)

	DNFamily [Repeated]	DNNeighbour	Quality	Availability	SufficientInfo	INBeingSeen	INFamilyInflu	INCoworkerInflu	INFamily	INFriends
Favourable [Repeated]	-0.671	-0.157	0.315	1.189	0.883	-1.236	-1.583	-1.317	-1.871	-1.717
Positive	0.428	1.249	-0.76	0.954	-0.593	0.559	-0.078	0.099	-0.644	0.577
Wise	-1.227	0.899	-0.823	0.449	0.326	0.335	0.072	0.351	-1.223	0.291
PayPremium	-0.778	-1.276	-0.229	0.572	1.25	-0.999	0.336	0.205	-1.675	0.11
TimePressure	-0.298	-1.336	-0.263	0.067	-0.333	3.789	2.549	3.172	1.603	2.687
Affordable	0.628	-0.489	-0.722	-0.51	0.893	-1.148	-1.118	-0.191	-1.306	0.44
EasyFind	-0.342	-0.224	-0.986	-0.853	-0.827	-0.448	0.297	0.305	-1.146	0.225
Label_3party	-2.477	-1.12	1.341	1.934	1.419	0.278	-0.883	0.454	-1.73	-0.922
TaxBulb	0.408	1.302	-2.036	-0.27	-0.31	-1.227	-0.234	0.49	-0.638	0.302
PayMore	0.759	1.073	-2.502	-0.701	-0.704	0.158	-0.416	0.813	-0.602	0.748
ComAd	1.187	1.176	-1.182	1.065	1.035	-1.195	0.477	-0.742	0.545	0.76
Label_Com	-1.858	-0.954	1.501	1.894	2.467	-0.898	-0.296	-0.062	-1.926	-0.642

(Appendix 10 *cont.*)

	INFriends [Repeated]	INCoworkers	INImportantOth	Favourable	Positive	Wise	PayPremium	TimePressure	Affordable	EasyFind
Favourable [Repeated]	-1.717	-1.395	-2.2	0						
Positive	0.577	0.836	-0.648	-0.233	-0.508					
Wise	0.291	0.678	-0.724	-0.075	0.137	0.602				
PayPremium	0.11	0.093	-0.966	2.018	0.178	1.513	0			
TimePressure	2.687	1.635	2.315	0.357	-0.105	0.637	-1.147	0		
Affordable	0.44	0.344	-0.909	-0.055	-1.61	-0.661	0.268	1.86	0	
EasyFind	0.225	0.318	0.386	0.465	-0.578	1.078	-1.578	0	0.961	0
Label_3party	-0.922	-0.807	-3.069	3.076	2.197	2.821	3.377	1.799	2.28	2.108
TaxBulb	0.302	0.704	-1.411	0.423	-0.84	-0.511	0.54	-2.599	-0.994	-2.127
PayMore	0.748	0.998	-0.725	0.188	-1.211	-1.305	0.221	-1.344	-0.538	-1.875
ComAd	0.76	0.864	-0.832	0.552	-0.294	-1.172	-0.089	-1.725	-1.931	-1.906
Label_Com	-0.642	-0.636	-1.897	3.174	1.246	2.077	3.32	-1.264	1.093	2.216

(Appendix 10 *cont.*)

	EasyFind [Repeated]	Label_3party	TaxBulb	PayMore	ComAd	Label_Com
Favourable [Repeated]						
Positive						
Wise						
PayPremium						
TimePressure						
Affordable						
EasyFind	0					
Label_3party	2.108	0				
TaxBulb	-2.127	-1.243	0			
PayMore	-1.875	-0.781	1.527	0		
ComAd	-1.906	-1.021	0.615	0.275	0	
Label_Com	2.216	0	-1.202	-0.647	-0.059	0

Appendix 11 Correlations of all variables in Figure 5.10

	INTBH	PB	ID	DN_ Comply	DN_ Perception	PBC_ Situational	IN_ Comply	IN_ Perception	ATD_ Affections	PBC_ Perception	ATD_ Beliefs
INTBH	1										
PB	0.864	1									
ID	0.824	0.782	1								
DN_Comply	-0.235	-0.167	-0.172	1							
DN_Perception	-0.644	-0.642	-0.601	0.23	1						
PBC_Situational	0.651	0.559	0.673	-0.156	-0.3	1					
IN_Comply	-0.369	-0.337	-0.395	0.496	0.241	-0.35	1				
IN_Perception	-0.52	-0.46	-0.512	0.406	0.367	-0.449	0.669	1			
ATD_Affections	0.802	0.637	0.693	-0.172	-0.464	0.672	-0.364	-0.49	1		
PBC_Perception	0.765	0.698	0.772	-0.284	-0.595	0.671	-0.359	-0.49	0.701	1	
ATD_Beliefs	0.546	0.399	0.532	-0.357	-0.28	0.426	-0.482	-0.555	0.557	0.529	1
INTBH_envt	0.884	0.765	0.729	-0.208	-0.569	0.576	-0.326	-0.46	0.71	0.677	0.483
INTBH_intent	0.939	0.811	0.774	-0.221	-0.604	0.611	-0.346	-0.488	0.753	0.718	0.513
INTBH_bill	0.906	0.783	0.747	-0.213	-0.583	0.59	-0.334	-0.471	0.727	0.693	0.495
DeliberChose	0.818	0.946	0.74	-0.158	-0.608	0.529	-0.319	-0.436	0.602	0.661	0.377
GenealyBougt	0.822	0.951	0.744	-0.159	-0.611	0.531	-0.321	-0.438	0.605	0.664	0.379
AutoBought	0.827	0.956	0.748	-0.16	-0.614	0.534	-0.322	-0.44	0.609	0.668	0.381
EnvtResponb	0.591	0.561	0.717	-0.124	-0.431	0.483	-0.284	-0.367	0.497	0.554	0.381
ESbulbBuyer	0.736	0.699	0.893	-0.154	-0.536	0.601	-0.353	-0.457	0.619	0.689	0.475
GreenBuyer	0.58	0.551	0.704	-0.121	-0.423	0.474	-0.278	-0.36	0.488	0.543	0.374
EnergySaver	0.711	0.675	0.863	-0.149	-0.518	0.581	-0.341	-0.442	0.598	0.666	0.459
ConserveEng	0.675	0.641	0.819	-0.141	-0.492	0.551	-0.324	-0.419	0.567	0.632	0.435
DNFitIn	-0.177	-0.126	-0.13	0.754	0.173	-0.118	0.374	0.306	-0.13	-0.214	-0.269
DNothersCue	-0.175	-0.124	-0.128	0.744	0.171	-0.116	0.369	0.302	-0.128	-0.211	-0.266

	INTBH	PB	ID	DN_ Comply	DN_ Perception	PBC_ Situational	IN_ Comply	IN_ Perception	ATD_ Affections	PBC_ Perception	ATD_ Beliefs
DNFriends	-0.609	-0.607	-0.568	0.217	0.946	-0.284	0.228	0.347	-0.439	-0.563	-0.265
DNFamily	-0.539	-0.538	-0.503	0.192	0.838	-0.252	0.202	0.307	-0.389	-0.498	-0.235
DNNeighbour	-0.514	-0.513	-0.479	0.183	0.798	-0.24	0.192	0.293	-0.371	-0.475	-0.224
Quality	0.441	0.378	0.456	-0.106	-0.203	0.677	-0.237	-0.304	0.455	0.454	0.289
Availability	0.432	0.37	0.446	-0.103	-0.199	0.663	-0.232	-0.298	0.445	0.445	0.283
SufficientInfo	0.471	0.404	0.487	-0.113	-0.217	0.723	-0.253	-0.325	0.486	0.485	0.308
INFamilyInflu	-0.305	-0.279	-0.327	0.41	0.199	-0.29	0.828	0.554	-0.302	-0.297	-0.399
INCoworkerInflu	-0.338	-0.309	-0.362	0.454	0.221	-0.321	0.917	0.613	-0.334	-0.329	-0.442
INFriends	-0.492	-0.435	-0.484	0.384	0.346	-0.424	0.632	0.944	-0.462	-0.463	-0.524
INCoworkers	-0.478	-0.423	-0.471	0.373	0.337	-0.413	0.615	0.919	-0.45	-0.45	-0.51
INImportantOth	-0.383	-0.339	-0.377	0.299	0.27	-0.331	0.492	0.736	-0.36	-0.361	-0.408
Favourable	0.611	0.484	0.527	-0.131	-0.353	0.511	-0.277	-0.373	0.761	0.533	0.424
Positive	0.751	0.596	0.649	-0.161	-0.435	0.629	-0.341	-0.458	0.936	0.656	0.522
Wise	0.742	0.588	0.641	-0.159	-0.429	0.621	-0.337	-0.453	0.925	0.648	0.515
PayPremium	0.625	0.57	0.631	-0.232	-0.486	0.548	-0.293	-0.4	0.572	0.817	0.432
Affordable	0.547	0.499	0.552	-0.203	-0.425	0.48	-0.257	-0.35	0.501	0.715	0.378
TaxBulb	0.452	0.33	0.44	-0.296	-0.232	0.353	-0.399	-0.459	0.462	0.438	0.828
PayMore	0.413	0.302	0.402	-0.27	-0.212	0.323	-0.365	-0.42	0.422	0.4	0.757
ComAd	0.37	0.27	0.361	-0.242	-0.19	0.289	-0.327	-0.376	0.378	0.358	0.678

Appendix 12 Correlations of all variables in Figure 5.12

	INIndex	DNIndex	ATD_ Beliefs	INTBH	PB	ID	PBC_ Situational	ATD_ Affections	PBC_ Perception
INIndex	1								
DNIndex	0.375	1							
ATD_Beliefs	-0.531	-0.332	1						
INTBH	-0.418	-0.55	0.543	1					
PB	-0.378	-0.553	0.399	0.864	1				
ID	-0.456	-0.55	0.511	0.862	0.856	1			
PBC_Situational	-0.426	-0.253	0.429	0.651	0.56	0.644	1		
ATD_Affections	-0.424	-0.391	0.555	0.804	0.641	0.693	0.672	1	
PBC_Perception	-0.421	-0.556	0.529	0.762	0.697	0.768	0.671	0.704	1
INTBH_bill	-0.377	-0.496	0.49	0.901	0.778	0.776	0.587	0.724	0.687
INTBH_intent	-0.395	-0.519	0.513	0.944	0.815	0.813	0.615	0.759	0.719
INTBH_envt	-0.369	-0.485	0.48	0.882	0.762	0.76	0.575	0.71	0.672
Affordable	-0.3	-0.396	0.376	0.543	0.496	0.547	0.478	0.501	0.712
DeliberChose	-0.358	-0.522	0.377	0.816	0.945	0.809	0.529	0.606	0.659
GenealyBougt	-0.359	-0.525	0.379	0.82	0.949	0.813	0.531	0.609	0.661
AutoBought	-0.363	-0.53	0.382	0.828	0.959	0.821	0.537	0.615	0.668
ESbulbBuyer	-0.446	-0.539	0.501	0.844	0.838	0.979	0.631	0.679	0.752
EnergySaver	-0.347	-0.419	0.389	0.656	0.652	0.761	0.49	0.528	0.585
ConserveEng	-0.326	-0.393	0.365	0.616	0.612	0.715	0.46	0.495	0.549
SufficientInfo	-0.309	-0.183	0.31	0.472	0.405	0.466	0.724	0.486	0.486
Availability	-0.286	-0.17	0.288	0.438	0.376	0.433	0.672	0.451	0.451
Quality	-0.283	-0.168	0.285	0.433	0.372	0.428	0.665	0.447	0.446
Favourable	-0.322	-0.297	0.421	0.61	0.486	0.526	0.509	0.758	0.534
Positive	-0.393	-0.363	0.515	0.746	0.595	0.643	0.623	0.928	0.653

	INIndex	DNIndex	ATD_ Beliefs	INTBH	PB	ID	PBC_ Situational	ATD_ Affections	PBC_ Perception
Wise	-0.397	-0.366	0.519	0.752	0.6	0.648	0.628	0.935	0.658
PayPremium	-0.345	-0.456	0.433	0.625	0.571	0.629	0.55	0.577	0.82
TaxBulb	-0.438	-0.274	0.826	0.449	0.329	0.422	0.354	0.458	0.437
PayMore	-0.403	-0.252	0.76	0.413	0.303	0.388	0.326	0.422	0.402
ComAd	-0.359	-0.225	0.677	0.368	0.27	0.346	0.29	0.376	0.358

Appendix 13 Correlations of variables in Figure 5.14

	DNIndex	INIndex	ATD_ Beliefs	PB	ID	PBC_ Situational	ATD_ Affections	PBC_ Perception	INTBH
DNIndex	1								
INIndex	0.375	1							
ATD_Beliefs	-0.332	-0.531	1						
PB	-0.553	-0.378	0.399	1					
ID	-0.55	-0.456	0.511	0.856	1				
PBC_Situational	-0.253	-0.426	0.429	0.56	0.644	1			
ATD_Affections	-0.391	-0.424	0.555	0.641	0.693	0.672	1		
PBC_Perception	-0.556	-0.421	0.529	0.697	0.768	0.671	0.704	1	
INTBH	-0.55	-0.418	0.543	0.864	0.862	0.651	0.804	0.762	1
INTBH_bill	-0.496	-0.377	0.49	0.778	0.776	0.587	0.724	0.687	0.901
INTBH_intent	-0.519	-0.395	0.513	0.815	0.813	0.615	0.759	0.719	0.944
INTBH_envt	-0.485	-0.369	0.48	0.762	0.76	0.575	0.71	0.672	0.882
Affordable	-0.396	-0.3	0.376	0.496	0.547	0.478	0.501	0.712	0.543
DeliberChose	-0.522	-0.358	0.377	0.945	0.809	0.529	0.606	0.659	0.816
GenealyBougt	-0.525	-0.359	0.379	0.949	0.813	0.531	0.609	0.661	0.82
AutoBought	-0.53	-0.363	0.382	0.959	0.821	0.537	0.615	0.668	0.828
ESbulbBuyer	-0.539	-0.446	0.501	0.838	0.979	0.631	0.679	0.752	0.844
EnergySaver	-0.419	-0.347	0.389	0.652	0.761	0.49	0.528	0.585	0.656
ConserveEng	-0.393	-0.326	0.365	0.612	0.715	0.46	0.495	0.549	0.616
SufficientInfo	-0.183	-0.309	0.31	0.405	0.466	0.724	0.486	0.486	0.472
Availability	-0.17	-0.286	0.288	0.376	0.433	0.672	0.451	0.451	0.438
Quality	-0.168	-0.283	0.285	0.372	0.428	0.665	0.447	0.446	0.433
Favourable	-0.297	-0.322	0.421	0.486	0.526	0.509	0.758	0.534	0.61
Positive	-0.363	-0.393	0.515	0.595	0.643	0.623	0.928	0.653	0.746

	DNIndex	INIndex	ATD_ Beliefs	PB	ID	PBC_ Situational	ATD_ Affections	PBC_ Perception	INTBH
Wise	-0.366	-0.397	0.519	0.6	0.648	0.628	0.935	0.658	0.752
PayPremium	-0.456	-0.345	0.433	0.571	0.629	0.55	0.577	0.82	0.625
TaxBulb	-0.274	-0.438	0.826	0.329	0.422	0.354	0.458	0.437	0.449
PayMore	-0.252	-0.403	0.76	0.303	0.388	0.326	0.422	0.402	0.413
ComAd	-0.225	-0.359	0.677	0.27	0.346	0.29	0.376	0.358	0.368