Of Morals and Scents: How Consumers' Physical Sensation of Cleanliness Affects Their Evaluations of Green Products

Jen-Hsien Hsu

Submitted in accordance with the requirements for the degree of Doctor of Philosophy

The University of Leeds
Leeds University Business School

September, 2015

The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

Acknowledgement

I would like to express my deepest gratitude to all the wonderful people I have met, both in the UK and Taiwan, over the past few years. Every kindness shown to me during my journey and all the support I received along the way will be embedded in my heart forever, and I would like to use these acknowledgements to demonstrate my heartfelt thanks to all those concerned.

My foremost thanks must be extended to my academic supervisors, Professor Joško Brakus and Dr Caterina Presi, for their support and guidance throughout the PhD process and their great efforts to foster my independence as a researcher. I also deeply appreciate the feedback and support from my VIVA examiners, Dr Aristeidis Theotokis and Dr Manto Gotsi, which helped me to improve my research beyond recognition. I have many life and career tutors to thank as well, beginning with Professor Mei-Yen Chen for mentoring me throughout my postgraduate studies in Taiwan, Dr Desmond Thwaites for leading me to the Business School, Professor Matthew Robson for acknowledging my statistical skills and teaching abilities, Dr Charalampos (Babis) Saridakis for the terrific support and mentoring, Miss Angela Tattam for her heroic support during the toughest moment in the first year of my PhD, and last, but not least, Miss Julia Bell for all the wonderfully inspiring talks.

I would also like to express my sincere thanks to many people in my PhD community; to Danat Valizade for being my life referee with his great Russian coaching style, Alessandro Brialigia for many insightful suggestions, Abena Animwaa Yeboah for being a fantastic work partner, João Luzio for his amazing support, and Maximilian Gerrath, Vita Kadile, Zainah Qasem, Athina Zeriti, Nick Jephson, and many others who contributed to easing my academic burden over the past few years..

There are so many great friends I want to say thank you to here, starting with Angy Chen and Yi-Fan Chou for the “revolutionary partnership” throughout this PhD journey, Aleksandrs Lavrinenko for his great company and support, Dr Jacobo Ellies for his inspirational energy and bright ideas, Chaoran Wang for being my “Miss Wisdom”, Martin Lima for his unfailing company at the most crucial stage in my writing-up period, Dr Kieran J D Lee for the critical advice, Dr Dian Li for the terrific support, Margaret Combey for being my linguistic doctor, and all my Taiwanese friends (Dr Yu-Sheng Lin, Dr Chen-An Yu, Dr Tai-Wei Chu, Dr Jason Kao, Gail Chen, Yu-Chia Tsai, James Lin, Dr Shuang Liang, Hui Yu Kuo, Yu-Ping Gu, Hui-Fang

Liu and many others), as well as all my beloved colleagues at the Language Zone (Carolin Schneider, Dr Sabina Grahek, Shazard Shirazi), my great volleyball friends (Dr Patrick Booms, Ronald Adalla, Mohammad Basha, Dave Speers, Richard Harrison, Dave Potter, and many other kind people), my research “fans” (i.e., Lorraine Wild, Thomas Miles, Paul Wrighton), Mr James Haighes for lots of great business meetings, my “British family” (Leslie Webb, Kathleen Webb), as well as many others who have given me their support during these years of studying abroad.

I would also like to say thank you to my lifelong friends from my home town in Taiwan (Ming-Che Wu, Zani Chen, Joanne Liao, Johnny Peng). Thanks to my mentors in my undergraduate life for their invaluable guidance, Prof Kuo-Jen Tsang, Chieh-Ming Chu, Yu-Kang Fan, Hsin-Lun Yu, Lin-Hui Wu, and many others. Thank you to my postgraduate programme buddies (Wei-Chun Chen, Chia-Hsuan Liao, Chun-Chi Liu, Wan-Chuan Chang, Yen-Chun Lin, Tung-Kuan Lin), as well as my previous supervisors and colleagues at TDOC and CTOC for making me a better person.

Last, but never least, I would like to thank my dad, Hsin-Hui Hsu, my mom, Meng-Hua Lin, my sister, Yin-Hui Hsu, and my brother-in-law Eric Chu, for their unconditional love and support that has sustained me from the beginning to the end of this remarkable journey.

Abstract

In this research, the researcher examines the capability of consumers' physical sensation of cleanliness in influencing their subsequent green product evaluation in line with the embodied cognition paradigm. According to the literature, there are two possible cognitive effects that can be elicited by consumers' physical sensation of cleanliness: to perceive the sensory information that indicates cleaning effectiveness and to inflate their sense of moral superiority. Yet, it has not been studied whether these effects can simultaneously be elicited and can both influence consumers' subsequent evaluations of green products.

Furthermore, it has been indicated in the green marketing literature that consumers tend to express different levels of product attractiveness on the same green product due to the perspective difference (how attractive this green product is to me and how attractive I perceive this green product is to other consumers). This evaluation difference implies that consumers might set different priorities, to go for cleaning effectiveness or to go green, in the way they make different aspects of green product evaluation. There is also a need of further studies to examine this underlying mechanism. To conclude, this research is designed to contribute both consumer decision making and green marketing literature regarding (1) the co-existence of the two possible cognitive effects that consumers' physical sensation of cleanliness can have on their subsequent product evaluations and (2) further insight with respect to the nature of consumers green product evaluations.

Three experiments were conducted to test the hypotheses. The results indicated that consumers' physical sensation of cleanliness can simultaneously make them perceive the sensory information that indicates product effectiveness and inflate their sense of moral superiority. The perceived sensory information that indicate cleaning effectiveness had a negative and significant impact on how participants rated the attractiveness of the green product to themselves compared to its non-green counterpart. The inflated sense of moral superiority had a negative and significant impact on how they perceived the green product would be relatively attractive to other consumers compared to its non-green counterpart. With respect to the evaluation gap between how the green product was attractive to me compared to how it would be to other consumers, an interaction effect was found between the perceived sensory information that indicates cleaning

effectiveness and the inflated sense of moral superiority. Specifically, the inflated sense of moral superiority positively significantly influenced this evaluation gap under the condition of low levels of the perceived sensory information that indicates cleaning effectiveness.

This thesis is an attempt to advance both the green marketing and consumer decision making literature by demonstrating two possible cognitive effects that consumers' physical sensation of cleanliness can have in their thinking process, by examining how these two effects can influence consumers' subsequent green product evaluation and by providing further insights regarding the nature of consumers' green product evaluations. Theoretical and practical implications of the findings are discussed and recommendations for future research are suggested.

Table of Contents

List of Tables

List of Figures

Chapter 1 Introduction

1.1 Motivation for Research

The aim of this study is to determine whether consumers' physical sensation of cleanliness can influence their subsequent evaluation of green products, and if so, how? In the following, the author addresses how this sensation can be an influential source in consumers' green products evaluation.

Consumers generally face a trade-off between sustainability and efficiency when choosing green products (Cleveland, Kalamas, & Laroche, 2012; Mostafa, 2007; van Doorn & Verhoef, 2011; Wu, Wu, Lee, & Lee, 2015; Young, Hwang, McDonald, & Oates, 2010). Both of these factors play an important role in consumers' evaluation process. On the one hand, the concern for sustainability enhances the attractiveness of green products because consumers feel that they are pro-environmental and pro-social (Kates, 2001; Koller, Floh, & Zauner, 2011; Mostafa, 2007; Tanner & Kast, 2003; Wu, et al., 2015); on the other, the concern for efficiency makes green products less attractive because they are perceived to be mild and ineffective (Lin & Chang, 2012; Luchs, Naylor, Irwin, & Raghunathan, 2010). When seeking ways to overcome the trade-off between these two concerns in consumers' evaluation of green products, green market researchers have found that consumers are more likely to be influenced to "go green" by moral concerns at the decision making point because cueing moral concerns can heighten the importance of the concern for sustainability in the evaluation process (Goldstein, Cialdini, & Griskevicius, 2008; Kidwell, Farmer, & Hardesty, 2013; Kronrod, Grinstein, & Wathieu, 2011; Peloza, White, & Shang, 2013; White & Peloza, 2009; White & Simpson, 2013).

In line with the literature of embodied cognition, it is argued that there are two possible cognitive effects that consumers' physical sensation of cleanliness can have on their thinking process. On the one hand, this sensation can inflate consumers' sense of moral superiority (thereafter, priming moral superiority), implicitly making them feel that they are more moral than others, thus affecting their morally-based evaluation (Schnall, 2011; Zhong, Strejcek, & Sivanathan, 2010). This implicit sense of moral superiority may influence consumers' green evaluation, since prior literature indicates that the evaluation of green products can be based on morality

(Catlin & Wang, 2013; Mazar & Zhong, 2010). On the other, consumers will thus perceive the sensory information that indicate cleaning effectiveness (thereafter cueing cleaning effectiveness), from the scents of the cleaning detergent that creates them a physical sensation of cleanliness, in line with the embodied cognition literature (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, Barbey, & Wilson, 2003). This perceived sensory information that indicates cleaning effectiveness may have a negative impact on consumers' evaluation of green products, which are generally perceived to be mild and ineffective (Lin & Chang, 2012; Luchs, et al., 2010). These two cognitive effects compete with each other in the process of evaluating green products.

Therefore, in this research, the researcher examines the ability of consumers' physical sensation of cleanliness in influencing their subsequent evaluations of green products due to the aforementioned two possible elicited cognitive effects. Moreover, it is also to be tested that the coexistence of these two possible cognitive effects as well as whether they both can influence consumers' green product evaluations. Theoretical issues behind the focus question on human cognition literature and green consumer literature are addressed below.

1.1.1 Priming? Cueing? Can They Coexist?

It is necessary to firstly briefly introduce the embodied view of human cognition, the priming effect and the cueing effect so as to explain why consumers' physical sensation of cleanliness can have two types of cognitive effects on people's thinking process as well as whether they can be co-activated at the same time.

According to the traditional view of human cognition (also referred to as the disembodied view of human cognition), human cognition theorists posit that people use conceptual notions when they are engaged in conceptual cognitive activities, such as making an evaluation (Dennett, 1969; Fodor, 1975; Haugeland, 1985). Based on this view, sensory information in the marketing environment does not have a direct impact on the way in which people make an evaluation; rather, it influences their feelings and affection, thereby indirectly affecting their evaluation process (Chebat & Michon, 2003; Hirsch, 1995; Mitchell, Kahn, & Knasko, 1995; Spangenberg, Crowley, & Henderson, 1996).

With the development of embodied cognition, theorists from the fields of cognitive science, linguistics, and social psychology, provided empirical evidence and argued that sensory information can also influence people's evaluation by making certain information more accessible in their thinking process (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Lakoff, 2008; Lakoff & Johnson, 1999; Landau, Meier, & Keefer, 2010; Meier, Schnall, Schwarz, & Bargh, 2012; Reimann, et al., 2012). As a result, a new stream of researchers in consumer behaviour literature began to focus on the impact of a sensory stimulus from the marketing environment on consumers' choices. For instance, Hong and Sun (2012) found that a sensation of coldness in the marketing environment could activate a psychological need for warmth so that people demonstrated a greater preference for romantic movies. Zhang and Li (2012) found that a physical experience of heaviness could prime a concept of importance; therefore, people who were carrying a heavy bag rated the type of consumption to be more important than those who were not. In short, these consumer behaviour researchers indicate a sensory stimulus can also have a cognitive impact on consumers' evaluation by implicitly making certain information more accessible in the thinking process apart from awareness.

The type of cognitive effect captured by these researchers is regarded as priming effects in social psychology literature. Priming effects refer to unrelated sensory stimulation that can activate certain information in the brain, making it more accessible in the thinking process; as a result, people use this readily available information in their subsequent evaluation (Bargh, 1990, 2002; Bargh & Chartrand, 2000), and this phenomenon is defined as knowledge activation in priming literature (Förster & Liberman, 2007; Fiedler, 2003; Higgins, 1996). Priming effects are regarded as empirical evidences from embodied cognition theorists of why sensory information can also influence people's cognitive thinking process (Barsalou, Niedenthal, Barbey, & Ruppert, 2003; Meier, et al., 2012; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; Reimann, et al., 2012). In short, the development of embodied cognition has engendered a new stream of consumer behaviour research, which attempts to examine how sensory stimulation in the marketing environment can prime consumers with certain information to influence their subsequent evaluation.

However, a sensory stimulus can also cue people certain information according to the literature. Similar to the aforementioned priming effect, cueing also makes certain information more accessible in the thinking

process so that it is readily available for use in the subsequent evaluation. The difference between these two effects is that people are aware of cued information because it is directly related to the subsequent evaluation (Costley & Brucks, 1992; Kantowitz & Sanders, 1972; Sudevan & Taylor, 1987); for instance, the sensory information of wet air cues people that rain is on the way, while the shape of a flat stone cues them that it is suitable for sitting on and resting. The fact that sensory stimulation can cue people with information that is directly related to their subsequent reaction toward the environment is addressed in the field of environmental psychology (Brakus, 2008; Gibson, 1977; Jones, 2003).

Can a single stimulus simultaneously prime and cue different aspects of information to people? To the best of the author's knowledge, no empirical studies have examined these two possible effects in the case of consumers' physical sensation of cleanliness. One of the theoretical contributions of this research is to verify whether consumers' physical sensation of cleanliness can influence their subsequent green product evaluations through the effects of priming and cueing concurrently.

1.1.2 Level of Intensity of Physical Cleanliness Sensation and Evaluation

The second contribution is the determination of whether the level of intensity of the experimental manipulation influences the way it primes moral superiority. The first factor has been seriously understudied. Past researchers have only indicated that people, who were primed with the physical sensation of cleanliness, reported a higher level of moral superiority than those who were not (Zhong, et al., 2010). The relationship between the level of intensity and the priming effect needs to be empirically tested.

1.1.3 Effect of Priming Moral Superiority versus Cueing Moral Concerns in Green Evaluation

Can priming moral superiority also encourage people to engage in green consumption? Are there significant differences between the effect of priming moral superiority and cueing moral concerns on consumers' green evaluation? To the best of the author's knowledge, these two questions have not yet been answered by previous studies.

In green marketing literature, prior researchers found that cueing moral concerns by using moral appeals in the decision-making context can encourage people to opt for green products. For example, Peloza and his colleagues (2013) found that the participants in their study, who were elicited by means of an implicit sense of guilt, demonstrated a greater preference for ethical products (including green products) than those in the control group. Since moral concerns were highlighted in their study, the participants were more inclined to opt for ethical and green products to illustrate their sense of morality.

The effect of priming moral superiority on consumers' green evaluation is examined in this study. According to the literature, priming and cueing effects have some similarities and differences (Sudevan & Taylor, 1987). They are similar in the fact that both of these techniques can make the brain more active in processing morally-related information during the thinking process. However, although the concept of moral superiority is implicitly activated in the priming technique, people may not necessarily associate this concept with their green evaluation. On the other hand, cueing moral concerns explicitly turns people's focus to moral issues in their green evaluation. As a result, prior studies revealed that cueing moral concerns can encourage people to opt for green products.

Therefore, the findings of this study are expected to contribute to green consumer literature in two dimensions, the first of which relates to the question, can priming moral superiority persuade people to purchase green products? Secondly, what are the differences between the effect of cueing moral concerns and priming moral superiority in consumers' green evaluation?

1.1.4 Attractive to Whom? To Me versus Other Consumers? The Issue of Sustainability Liability

Different perspectives are also an important issue when measuring people's green evaluation. In their paper entitled *The Sustainability Liability*, Luchs and his colleagues (2010) found that people attributed their negative association with green products to a lack of efficiency in an indirect way. When they were asked "how attractive do you find this product?" their responses did not reveal lack of efficiency as a negative influence; however, when they were asked "how attractive do you think the product is to other consumers?", they felt that the green product would be significantly less attractive than it was to themselves. This finding suggests that people tend to evaluate green products differently because of their different perspectives;

moreover, it implies that people generally set different standards due to the context of the evaluation (Epley, Keysar, Van Boven, & Gilovich, 2004; Fisher, 1993; Kruger & Gilovich, 2004).

The findings of this research are expected to further correspond with the issue of sustainability liability in several aspects, the first of which relates to whether activated information, perceived cleaning effectiveness or moral superiority, is more relevant to people's evaluation in terms of how attractive they find green products. The second relates to which of the activated information is more relevant to people's evaluation of the attractiveness of green products to other consumers, while the third relates to, which of the activated information influences the evaluation gap between two perspectives.

1.2 Research Questions

1.2.1 RQ1: Does the intensity level of people's physical sensation of cleanliness influence the way it primes moral superiority?

The first research question is designed to determine if a more intense of a sensory stimulus that creates people a physical sensation of cleanliness can result in a greater priming effect of moral superiority?

1.2.2 RQ2: Does the intensity level of a physical cleanliness sensation influence the way it cues cleaning effectiveness?

The second research question is designed to ascertain if people perceive a higher level of sensory information that indicates cleaning effectiveness when they encounter a more intense of a sensory stimulus that creates people a physical sensation of cleanliness. The answers to these two questions will help to clarify how the participants in the study are actually cued and primed. Will a highly consumers' physical sensation of cleanliness can prime a higher level of moral superiority and a higher level of perceived cleaning effectiveness than a mildly intensive stimulus, or will there be no significant difference between the effects of the highly and mildly consumers' physical sensation of cleanliness on inflating consumers' sense of moral

superiority. In short, the answers to the first two research questions will clarify how the research participants are actually cued and primed in order to study how the different levels of sensation influence the way in which consumer evaluate green products.

1.2.3 RQ3: How could consumers' physical sensation of cleanliness influence their subsequent green product evaluation?

The researcher attempts to extend the prior literature by investigating whether consumers' whether consumers' subsequent green product evaluation can be influenced by their prior physical sensation of cleanliness. In the literature, past researchers found that people's moral related behaviours can be influenced by their prior physicals sensation of cleanliness that inflates their sense of moral superiority (Holland, Hendriks, & Aarts, 2005; Liljenquist, Zhong, & Galinsky, 2010; Zhong, et al., 2010). There is a need to investigate whether consumers' green product evaluation, which can also be positioned as a moral question to consumers, can also be influenced (Catlin & Wang, 2013; Mazar & Zhong, 2010)?

Secondly, it is also expected that consumers' physical sensation can cue cleaning effectiveness in the thinking process. How would these two elicited effects influence consumers' green product evaluation is also worthy of study.

Furthermore, in the context of green product evaluation, it is found that consumers tend to evaluate green products differently according to how attractive this green product is to them and how they perceive the same green product will be attractive to other consumers (Luchs, et al., 2010). The prior literature suggests that the gap between the two types of evaluation due to ego-centric issues (Epley, et al., 2004; Fisher, 1993; Kruger & Gilovich, 2004). In this research, the researcher attempts to further explore whether the ego-centric issues also influence the way they prioritise the product attributes, such as to go green or to go for cleaning effectiveness.

As a result, another aim of this research is to determine which aspects of consumers' green product evaluation can be influenced by the elicited potential priming and cueing effects from their physical sensation of cleanliness to provide further implication regarding the nature of consumers' different facets of green product evaluations.

1.2.4 RQ4: What is the difference between the influence of priming moral superiority and cueing moral concerns on consumers' green evaluation?

The effect of priming moral superiority on consumers' green evaluation is examined in this study. This approach is different from previous empirical green marketing studies demonstrating that cueing moral concerns at the decision-making point can promote green choices (Goldstein, Cialdini, & Griskevicius, 2008; Kronrod, Grinstein, & Wathieu, 2011; Peloza, White, & Shang, 2013; White, MacDonnell, & Ellard, 2012; White & Simpson, 2013).. Through this research, the author attempts to examine the effect of priming moral superiority on consumers' green evaluations as well as to compare the differences between the effect of priming moral superiority and cueing moral concerns on consumers' evaluations of green products.

1.2.5 RQ5: Can a single stimulus simultaneously cue and prime different aspects of information to consumers?

It is anticipated in this research can provide empirical evidence regarding whether consumers' physical sensation of cleanliness can simultaneously have a priming effect and a cueing effect so as to influence their subsequent product evaluation process. To the best of the author's knowledge, this is one of the earliest empirical studies to examine multiple cognitive effects from the same priming source. It is expected that the research findings can provide initial answers to this question.

1.3 Potential Research Contributions

1.3.1 Implications for Human Cognition Literature

1.3.1.1 The co-existence of a priming effect and a cueing effect from the same people's physical sensation.

Further implications for human cognition literature are expected to be provided by this research in terms of the influence of people's physical sensation of cleanliness on their subsequent thinking process in multiple facets. With the development of embodied cognition, prior researchers mainly studied how external sensory information influenced people's

subsequent evaluation by priming certain information in their thinking process (Hong & Sun, 2012; Hung & Labroo, 2011; Jostmann, Lakens, & Schubert, 2009; Luchs, et al., 2010). To the best of the author's knowledge, no empirical studies have yet sought to determine that, in some cases, a single source of people's sensation can influence the thinking process in different ways. If the proposition of the co-existence of the two possible cognitive effects elicited from people' physical sensation of cleanliness is supported, it is expected to provide initial answers to this understudied issue and to contribute to the human cognition literature.

1.3.1.2 People's Physical Sensation of Cleanliness and the Inflated Sense of Moral Superiority

The findings of this research are also expected to contribute to physical cleanliness literature in several ways, the first of which relates to the applicability of the priming effect of inflating people's sense of moral superiority in influencing consumers green product evaluations. In prior literature, it was only found that people's physical sensation of cleanliness can inflate their sense of moral superiority and can influence their subsequent moral related decisions (Holland, et al., 2005; Liljenquist, et al., 2010; Zhong, et al., 2010). There is a need of further study to determine whether people's physical sensation of cleanliness can influence the way they evaluate green products or cleaning products which are also related to moral domains (Catlin & Wang, 2013; Mazar & Zhong, 2010).

Secondly, whether the degree of the priming effect of inflating people's sense of moral superiority from people's physical sensation of cleanliness can be determined by the level of intensity of this sensation is still understudied. In prior literature, past researchers only compared the difference between people's level of moral superiority with and without the intervention of manipulating people's physical sensation of cleanliness. There is also a need of further empirical studies to examine this.

1.3.2 Implications for Green Consumer Behaviour Literature

This research is expected to contribute to green consumer literature in three aspects, as described below.

1.3.2.1 The Nature of Consumers' Green Prodcut Evaluation

The findings are expected to provide a more extensive picture of the way in which consumers evaluate green products. It is anticipated that they will demonstrate the key factors that influence people's green evaluation based on their own perspective and that of other consumers, as well as helping to identify the factors that cause the evaluation gap between the two perspectives.

1.3.2.2 Differences between Priming Moral Superiority and Cueing Moral Concerns in Promoting Green Behaviour

The effect of priming moral superiority on consumers' green evaluation is examined in this study and the findings are expected to indicate if there are any key differences in the ability of the two techniques to influence consumers' green behaviour, and if so, what are they?

1.4 Overview of the Research

The thesis is divided into seven chapters, of which this is the first. The second chapter contains an extensive review of existing literature and the relevant theories and findings related to consumers' green behaviour, embodied cognition, and the two possible cognitive effects elicited by consumers' physical sensation of cleanliness. The hypothesis chapter is addressed in chapter three in which a combination of these reviews can explain how and why this sensation can make consumers perceive the information regarding cleaning effectiveness and inflate consumers' sense of moral superiority, as well as why these two effects can influence consumers' green product evaluations.

The findings from the three empirical studies are presented in Chapters 4 to 6. The purpose of the first empirical study is to test whether the priming effect of consumers' physical sensation of cleanliness on inflating consumers' sense of moral superiority can be influenced by different levels of intensity of experimental manipulations. The second empirical study is designed to test the validity of the construct cleaning effectiveness, which is later applied to assess the cueing effect of experimental manipulation. The

aim of the third empirical study is to examine whether consumers' physical sensation of cleanliness can influence their subsequent green product evaluation concurrently through the effects of cueing and priming.

The empirical findings are summarised in Chapter 7. The research questions are revisited in this chapter and some theoretical implications are provided. The research is concluded with a discussion of its limitations and the provision of some recommendations for future study in this field based on those limitations.

Chapter 2 Literature Review

2.0 Chapter Summary

The existing theories and findings related to green consumer behaviour, embodied cognition, and the co-activation of knowledge are extensively reviewed in this chapter to determine how and why consumers' physical sensation of cleanliness can simultaneously prime and cue two different aspects of information in the human cognition process. The way in which these two aspects of information can influence different aspects of consumers' green evaluation is also examined in this chapter.

2.1 Green Consumer Behaviour

Three issues are covered in this section. The first of which relates in the definition of a green product and the rationales that green cleaning products are selected in this research. The second issue is about tradeoffs on consumers' green product choices. The third section addresses what prior marketing researchers found in promoting consumers to go green. Finally, the dimension issues of

2.1.1 Green Household Cleaning Products

Due to the research design, the household cleaning product category is established as the focus of this study because it is a unique product category in that the hypothesised cognitive effects elicited from consumers' prior physical sensation of cleanliness could be an influential source of their subsequent evaluation of green products. The relevant literature regarding the two types of cognitive effects that consumers' physical sensation of cleanliness can have on their process of product evaluation will be discussed in section 2.3 of this paper. As for this part of the discussion, it will contain a briefly outline of green household cleaning products, as well as their chemical structure.

Green household cleaning products are those that meet the standards of the regulation authorities, such as the European Union and Green Seals, in terms of their manufacturing process, packaging materials, and labelling information (European Union, 2004; Green Seal, 2011). Among

all the required standards, the issue of biodegradability, the capacity of the waste from the manufacturing and rinsing process to decompose readily by means of a biological process, is one of the key issues that determine whether certain household cleaning products can reach the requirements. To this end, green detergent manufacturers generally avoid using contaminating or hazardous chemicals and also reduce the concentration level of chemical synthetics and additives in the formula (Chemat & Vian, 2014; Dahlstrom, 2011; Goldsmith & Sheldon, 2008; Iannuzzi, 2012; Kaushik, 2015; Muniglia, Claisse, Baudelet, & Ricochon, 2014; Ottman, Stafford, & Hartman, 2006).

Therefore, green household cleaning products have two distinctive features. Firstly, they generally have milder product scents than those of their regular counterparts due to the use of a less concentrated level of chemical synthetics and additives, such as soap and bleach, in the manufacturing process. This factor also determines consumers' general experience of green household cleaning products: they have slightly milder scents and fewer bubbles are generally generated in the cleaning process compared to their experience when using regular counterparts.

Secondly, the same factor simultaneously provides consumers with two competing images, namely, that green cleaning products help to protect the environment, but they are not as effective as their regular counterparts. The way in which these two product associations influence consumers' evaluation of green products is discussed in the remainder of this paper.

2.1.2 Nature of Consumers' Green Evaluation: A Trade-off between Sustainability and Cleaning Effectiveness

Green marketing researchers found that consumers' behaviour in terms of purchasing green products is influenced by both positive and negative factors. The positive factors are mainly related to the products' benefit of sustainability; for example, consumers may be motivated to buy green products because they want to conserve the environment, because of the social value derived from the benefit of sustainability, or because buying green products makes them feel morally and socially responsible (Kates, 2001; Koller, et al., 2011; Leonidou, Leonidou, & Kvasova, 2010; Mostafa, 2007; Peattie, 2010; Tanner & Kast, 2003; Wu, et al., 2015). On the other hand, there are some negative factors that discourage the purchase of green

products, such as extra cost, less accessibility, and less cleaning effectiveness (Cleveland, et al., 2012; Englis & Phillips, 2013; Irwin & Spira, 1997; Lin & Chang, 2012; Luchs, et al., 2010; E. Olson, 2013; Wu, et al., 2015). Green marketing researchers suggest that, since consumers generally face a trade-off in their green choices, they are not always attracted to green products. As to this research, the researcher focuses on the trade-off between sustainability and cleaning effectiveness; the reason why these two factors are important are addressed in the following discussion.

2.1.2.1 Cleaning Effectiveness and Green Product Evaluation

In the green marketing literature, it is found that cleaning effectiveness is an important factor that negatively influences consumers' green product evaluations. For example, Lin and Chang (2012) found that green products are generally perceived to be inefficient when they conducted a field study of university students. The results indicated that the students used more of the same hand sanitiser during the days when there was a green label on the top of the bottle compared to the other days that there were not. Luchs and his colleagues also found that green detergents were less popular with consumers because they were perceived to be less efficient than their non-green counterparts. It was only when efficiency was guaranteed in their mock advertisements that the participants expressed a similar level of preference for green and non-green products (Luchs, et al., 2010). In summary, consumers generally perceive that green products are efficiency deficient and this has a negative influence on their evaluation of them.

2.1.2.2 Sustainability and Green Product Evaluation

According to green marketing literature, consumers' evaluation of green products can be enhanced by several reasons that are related to sustainability. In some cases, consumers are motivated to go for green products due to their intrinsic values such as ecological concerns and green ethics (Bohlen, Schlegelmilch, & Diamantopoulos, 1993; Haws, Winterich, & Naylor, 2014; Zimmer, Stafford, & Stafford, 1994). In some cases, consumers are motivated to go for green products due to their extrinsic reasons because they feel that buying green products or adopting green behaviour makes them socially or morally responsible (Cleveland, et al., 2012; Hartmann & Apaolaza-Ibáñez, 2012; Kates, 2001; Leonidou, et al.,

2010; Moisander, 2007; Mostafa, 2007; Peattie, 2010; Thøgersen, Jørgensen, & Sandager, 2012; van Doorn & Verhoef, 2011; White & Peloza, 2009; Young, et al., 2010). Therefore, it can be inferred that consumers' green behaviours are related to moral concerns due to intrinsic or extrinsic reasons.

To sum up, the researcher focuses on the trade-off between sustainability and cleaning effectiveness due to their potential influences on consumers' evaluations of green household cleaning products. The concern of sustainability is found to be a positive factor that encourages consumers to go for green options; while the concern of cleaning effectiveness is found to be a negative factor that discourages consumers to go green. Furthermore, it can be inferred that moral issues are related to consumers' concerns of sustainability. In the following discussion, the researcher reviews the relevant literature to delineate how moral issues are related to consumers' concerns of sustainability so as to influence their green product evaluation.

2.1.3 Moral Issues and Green Product Evaluations

In this section, the researcher reviews the relevant literature to delineate how moral issues are related to consumers' green product evaluation due to the product attribute of sustainability. To address this relationship, the researcher first reviews empirical studies that found that moral issues are related to consumers' green behaviours, such as buying green products or doing environmental friendly behaviours. Second, the researcher reviews relevant literature to provide explanations regarding why moral issues are related to consumers' green product or green behaviours evaluations. Lastly, the researcher further addresses an automatic implicit relationship between consumers' green behaviours and their subsequent perception about their morality.

2.1.3.1 Moral Appeals and Consumers' Green Behaviours

Green marketing researchers have found that it is likely to encourage consumers to engage in green behaviours by using proper moral or normative appeals at the point of decision-making. For example, White and Simpson (2013) found that their participants were more motivated to become engaged in environmental-friendly behaviour when they were exposed to normative appeals that highlighted either what others thought they should do

or what others were doing. These findings suggest that green behaviour is more likely to be promoted by making consumers feel that they should follow others and ‘go green’ than by exposing them to the benefits of a green lifestyle.

Kidwell and his colleagues (2013) found that political ideology and normative appeals have a congruent effect on sustainable behaviour. Their study was based on the manipulation of two kinds of normative appeals, namely, “You can make a difference (individual claim)”, and “Join the fight with like-minded people (binding claim)”, and the results indicated that the participants with a more liberal political ideology were more likely to be persuaded by individual normative appeals, while those who were politically conservative were more likely to be persuaded by binding normative appeals. Meanwhile, in their study, Kronod and her colleagues (2011) found that assertive normative appeals, such as “you must use water sparingly”, helped to encourage participants to engage in environmentally-friendly behaviour when they felt it was important to them. Lastly, Goldstein and his colleagues (2008) conducted a field study and found that hotel clients positively responded to a normative appeal that previous customers who had stayed in the same room had reused their towels rather than demanding clean ones every day, and were thus encouraged to make more economic use of the towels during their stay.

Moral-based influences at the point of decision-making have also been examined as a useful tool to stimulate consumers’ environmentally-friendly behaviour. For instance, in their study, Peloza and his colleagues (2013) found that evoking an implicit sense of guilt, conceptualised as self-accountability, and manipulating the presence of others made it more likely for the participants in the experiment to choose ethical products. Cueing a sense of justice is also found to be an effective way to promote ethical choices. Dickerson and her colleagues conducted social experiments and found that participants became more engaged in water conservation campaigns if they were made aware that they were not saving enough water and were asked to make a public commitment to do so (Dickerson, Thibodeau, Aronson, & Miller, 1992).

In summary, these studies suggest that consumers are more likely to be encouraged to adopt green behaviour if they are provided with moral-related information prior to making a decision to purchase. From a psychological perspective, this approach can be defined as cueing moral concerns, indicating that moral or normative appeals make moral concerns

more salient in the evaluation process (Costley & Brucks, 1992; Kantowitz & Sanders, 1972; Sudevan & Taylor, 1987). These studies also imply that a green evaluation can be made by posing moral-based questions to consumers; therefore, the relevant literature that addresses the relationship between moral concerns and consumers' green evaluation is reviewed in the next section.

2.1.3.2 Moral Issues and the Appreciation of the Product Attribute of Sustainability

The researcher reviews the relevant literature and identifies that there are two types of moral based concerns that make consumers appreciate the product attribute of sustainability of green products: pure altruism and instrumental altruism.

With regard to pure altruism, it has been tested in the marketing literature that consumers' green behaviours can be driven by their sense of environmental awareness and green values. In other words, green products can be attractive consumers because they fulfil consumers intrinsic motivation to protect the environment and achieve sustainability (Dahlstrand & Biel, 1997; Geller, 1995; Kates, 2001; Roberts, 1996; Schlegelmilch, Bohlen, & Diamantopoulos, 1996; Tanner & Kast, 2003).

Green marketing researchers also indicate that green products can also make consumers feel morally well off so that they can be attractive to consumers under the accounts of model of moral norm activation and the costly signal theory. With regard to the model of moral norm activation, Schwartz (1970, 1977) argues that people's altruistic behaviours, such as buying green products to protect the environment, can be motivated under the condition that they feel a sense of moral tension and they find an altruistic behaviour that does not cause them too much extra cost (i.e. a donation of 2 GBP that does not make the donor too much financial cost) to release them from the moral tension. In this sense, buying green products, can be a kind of manageable altruistic behaviour to consumers that makes them morally feel good. This perspective fits to explain the reason why the participants in the experiments in the aforementioned empirical studies were more likely to opt for green behaviours because their moral obligation was aroused by moral appeals and doing the green behaviours in the study was a good way for them to reduce the elicited moral tensions in these studies (Goldstein, et al., 2008; Kidwell, et al., 2013; Kronrod, et al., 2011; Osterhus, 1997; Peloza, et al., 2013; White & Peloza, 2009; White & Simpson, 2013).

In some circumstances, consumers' green behaviours can be conspicuous, exhibiting their altruistic behaviours in front of others. This kind of extrinsic motivation can be explained by the costly signal theory (Zahavi, 1975, 1977; Zahavi & Zahavi, 1997), in which Zahavi argues that people can be motivated to engage in pro-social behaviours, even causing them a big inconvenience, due to their perception that their good deeds can be seen and appreciated by others, which may be of benefit to them in the future. The costly signal theory provides a reasonable account of how and why people collaborate with each other in an altruistic way. It is based on the fact that potential benefits drive people to engage in altruistic behaviour, even to the point of self-sacrifice, contrary to the widely-accepted assumption that people simply seek to maximise their own benefits and rarely engage in altruistic and pro-social behaviour. The costly signal theory has been applied to study the selection of allies and partners, and the findings have indicated its ability to explain humans' collaborative behaviour (Gintis, Smith, & Bowles, 2001; McAndrew, 2002; Miller, 2000, 2007, 2009).

Furthermore, the costly signal theory has been applied to study consumers' green behaviours and the findings have indicated that in some circumstances consumers' green behaviours are conspicuous in nature. For example, Griskevicius and his colleagues (2010) applied the costly signal theory to study consumers' green choices and found that the participants only expressed a greater preference for green products when they were primed with a status motivation, imagining themselves to be hard-working and useful members of the community. Moreover, this greater preference was only expressed for green products that were expensive and observable to others rather than basic everyday ones. The conspicuous view of green consumptions is also supported by the findings from green consumption studies by (Griskevicius, Cantu, & van Vugt, 2012; Hartmann & Apaolaza-Ibáñez, 2012; Herbes & Ramme, 2014; Sexton & Sexton, 2014; Zabkar & Hosta, 2013).

To sum up, the aforementioned discussion provides reasonable accounts regarding why moral issues are related to consumers' green consumptions because buying green products or doing green behaviours is a kind of altruistic behaviour. By doing so, consumers can morally feel well off because it might fulfil their intrinsic values, might help them to reduce their moral tensions, or might help them demonstrate their altruism in front of others. In the next section, the researcher provides reversed evidences, how

consumers feel morally after doing green behaviours, so as to justify how moral issues are related to consumers' green behaviours.

2.1.3.3 Consumers' Green Behaviours and Moral Issues

Researchers in the field of social psychology tested this relationship by using an indirect approach to assess the way in which green behaviour influences people's perception of morality and how they behave in trust games. They hypothesised that people would be more honest (or dishonest) in trust games if their perception of their own morality was influenced by their green actions, and their findings supported this hypothesis. Mazar and Zhong (2010) found that participants who were instructed to buy green products online were less honest in the trust game than those who were induced to buy non-green products. Similarly, Caltin and Wang (2013) found that participants who were instructed to recycle paper prior to the trust game were less honest during the game than those who had not recycled the paper beforehand.

These studies provide indirect evidence that people unconsciously consider themselves to be more moral after engaging in pro-environmental behaviours, and since they feel that they are licensed by their previous green acts, they tend to be less honest in the subsequent trust game. These findings echo those of other empirical studies of the moral licensing effect, namely, if people believe that they have derived moral credentials from their previous acts, they subsequently give themselves license to act in a less moral or socially-desirable manner, such as being less honest or more prejudiced (Cascio & Plant, 2015; Conway & Peetz, 2012; Effron, 2014; Effron, Miller, & Monin, 2012; Effron & Monin, 2010; Effron, Monin, & Miller, 2013; Khan & Dhar, 2006; Kouchaki, 2011; Merritt, et al., 2012; Polman, Pettit, & Wiesenfeld, 2013; Zhong, Liljenquist, & Cain, 2009).

2.1.4 Attractive to Whom? Prospective Issues of Green Evaluation

Previous researchers in the literature also indicate that people tend to make different responses when they evaluate moral or socially-desirable issues; for instance, they tend to present themselves as being more honest than they actually are and they genuinely believe that they are more honest than others. Past researchers explain that this phenomenon is due to ego-centricity or impression management whereby people tend to inflate their

evaluation of moral or socially-desirable issues (Epley, et al., 2004; Fisher, 1993; Kruger & Gilovich, 2004). As a result, social psychology researchers sometimes use an indirect approach to assess people's true opinions by asking them to evaluate an issue from the perspective of an average citizen. They perceive indirect measures to be a useful tool to elicit relatively less ego-centric responses from people (Fisher, 1993; Mason, 1950; Robertson & Joselyn, 1974).

In the context of green evaluation, consumers are also found to evaluate green products differently due to different perspectives. In their study of sustainability liability, Luchs et al. (2010) found that there was a gap in people's evaluation of the attractiveness of green products to them and to other consumers. Their findings suggest that consumers generally express a negative view of green products based on how attractive these products are to other consumers due to the issue of efficiency deficiency,

Both perspectives are applied to measure consumers' green evaluation in this study for two reasons, the first of which is that they will help to capture different facets of consumers' green evaluation. Secondly, it is also implied by previous studies that consumers may adopt a different standard or focus in their green evaluation, and this may influence their concept of which issue, efficiency or morality, is more important in the evaluation process.

2.1.5 Summary

In summary, it is evident that consumers encounter a trade-off between efficiency and sustainability (moral and social values) when evaluating green products and green marketing researchers have found that cueing moral concerns at the point of decision-making can encourage consumers to engage in green behaviour because, to some extent, green evaluation has a moral facet. Lastly, the issue of perspective in consumers' green evaluation is identified from the fact that consumers tend to make a different evaluation of a green product's attractiveness to them and to other consumers. Therefore, these two perspectives of green evaluation are adopted in this study to determine how people' s physical sensation of cleanliness influences consumers' evaluation of green products.

2.2 Embodied Cognition

The essence of embodied cognition is briefly addressed in this section, beginning with a short introduction to the traditional view (also referred to as the disembodied view in the following text) of human cognition, including the key differences between the disembodied and embodied view of human conceptual cognitive activities. This followed by a brief description of the main theories in the domain of embodied cognition in three specific fields, namely, the grounded theory in cognitive science, the metaphorical reasoning thesis in linguistics, and priming studies and the conceptual metaphor thesis in the field of social psychology.

2.2.1 Traditional View of Human Cognition

Theorists in human cognition literature (i.e., Epstein, 1994; Evans, 1984; Evans & Stanovich, 2013; Stanovich & West, 2000) propose that there are two types of processing styles, the first of which is fast, experiential and perceptual, and functions largely below the level of consciousness, while the other is slow, deliberate, and conceptual-based cognition (also referred to as higher order cognitive process). These theorists have introduced several models to capture the characteristics of the two kinds of processing. For example, in the elaboration likelihood model (ELM), the first processing style is conceptualised as the peripheral route in which perceptual information, such as feelings and insights, is processed, while the second processing style is positioned as the central route, in which abstract and conceptual activities take place. Similar descriptions can also be found in Chaiken's heuristic systematic model, as well as in Kahneman's intuition and reasoning processing (Chaiken, 1980; Kahneman, 2003). In brief, the first system refers to perceptual, cognitive activities from body-based modalities, such as the five sensual perceptions, motor actions, biological reactions, and emotional states (hereinafter referred to as body-based modalities) (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003). The second system refers to people's higher order cognitive activities, such as memory, knowledge, language and thoughts as, well as other complex cognition- based activities.

The key debate between the traditional and the embodied view of human cognition lies in how the two systems function and interact within the human cognition process. From the traditional perspective, theorists argue

that the two systems generally function independently. They have their own representation systems and process their own perceptual/ conceptual symbols to deal with perceptual/ conceptual-based cognitive activities (i.e., Dennett, 1969; Fodor, 1975; Haugeland, 1985). Therefore, theorists who hold the disembodied view of human cognition posit that humans' higher order cognitive process is driven by abstract conceptual symbols, and body modalities and perceptual symbols are generally not involved in this process.

However, embodied cognition theorists have a different perspective of the human cognitive process. They believe that the disembodied view of the mind is neither well supported in empirical studies nor able to provide a reasonable explanation of why there are ample body-conceptual effects in the field of social psychology[1]. For example, embodied cognition theorists argue that there is a lack of empirical evidence to support the existence of conceptual symbols (Barsalou, 1999, 2008a; Clark, 1998; Damasio, 1994). They explain that, according to the traditional view, only one specific cortex in the human brain is activated when people are engaged in a conceptual-based thinking process, such as language and logic, since only conceptual symbols are involved in higher order cognitive activities, as presumed by the disembodied view of human cognition. However, the empirical findings from functional magnetic resonance imaging (fMRI) provide different evidence, namely, that in general multiple cortices, different aspects of information processes are simultaneously co-activated during a specific conceptual activity. For instance, cognitive scientists have found empirical evidence of why people generally feel that social exclusion is painful in brain activities. Using fMRI, these researchers found that the anterior cingulate cortex, which is in charge of physical pain, and the right ventral prefrontal cortex, which manages emotion processing, were simultaneously co-activated when participants were either in physical pain or a situation in which they were socially excluded (Eisenberger, Jarcho, Lieberman, & Naliboff, 2006; Eisenberger, Lieberman, & Williams, 2003; Panksepp, 2003).

Moreover, embodied cognition theorists also perceive that the disembodied view of human cognition is incapable of explaining why

---

1 The body-conceptual effect refers to as various kinds of effects found in the field of social psychology. Social psychologists conducted experiments and found that even irrelevant motor actions can influence people's higher order cognitive processes (Briñol and Petty, 2008, Niedenthal et al., 2005, Glenberg et al., 2003, Förster, 2004). Relevant effects and findings will be introduced in Chapter 2.2.4.

people's conceptual performance can be affected by various types of body-based factors influences. Another example is the Stroop effect, whereby researchers in the field of psychology found that it generally took people a substantially longer time to identify a word (vocabulary) when it was printed in different colours (i.e., blue and green) rather than one colour (Jensen & Rohwer Jr, 1966; MacLeod, 1991; Stroop, 1935). They suggested that, if perceptual symbols, colours, are generally not involved in the higher order cognitive process (identifying words), they should not have added an extra cognitive load; therefore, the participants in these studies should have taken a similar amount of time to recognise the words, whether they were printed in the right or wrong colours (Barsalou, Niedenthal, et al., 2003; Niedenthal, Winkielman, Mondillon, & Vermeulen, 2009). Apart from the Stroop effect, embodied theorists in the field of social psychology have also discovered various body-cognitive effects in their social experiments, such as the motor-conceptual compatibility effect, which demonstrates that there are certain connections between humans' perceptual and conceptual cognitive activities (Bargh, Schwader, Hailey, Dyer, & Boothby, 2012; Barsalou, Niedenthal, et al., 2003; Briñol & Petty, 2008; Meier, et al., 2012; Niedenthal, et al., 2005).

Therefore, embodied cognition theorists share the belief that perceptual symbols and perceptual information process are generally involved in the higher order cognitive processes. Embodied cognition theorists from different disciplines provide different kinds of evidence to support this general notion, such as in the field of cognitive science (Anderson, 2003, 2010; Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Damasio, 1989), cognitive linguistics (Johnson, 1993; Lakoff & Johnson, 1980, 1999), and social psychology (Bargh, 2006; Bargh, et al., 2012; Meier, et al., 2012; Williams, Huang, & Bargh, 2009). The theories and studies in the field of cognitive science, cognitive linguistics, and social psychology are reviewed in the next section to illustrate how perceptual and conceptual cognitive activities are integrated in the first place so that they can be co-activated to respond to external stimuli.

2.2.2 Grounded Cognition Theory

In the field of cognitive science, Barsalou and his colleagues propose the grounded cognition theory to explain how and why humans' higher order cognition, such as abstract concepts, is largely grounded in information from the body, such as sensory modalities (vision, audition, haptics, olfaction, and gustation), motor actions (e.g., movement and proprioception), and

introspection (e.g., mental state, emotions and affect) (Barsalou, 1999, 2003a, 2003b, 2008a, 2008b; Barsalou, Kyle, et al., 2003). The essence of the grounded cognition theory is summarised in two points below.

Firstly, Barsalou and his colleagues argue that the nature of an abstract concept is the ability to integrate all related information from multiple domains, both perceptual and conceptual-based. For instance, an abstract concept of a dog, from an embodied perspective, contains multiple kinds of information, such as linguistics (the word ‘dog’), visual (the shape of a dog), auditory (the bark of a dog), introspection (related feelings, such as lovely or scary), as well as many other elements. Another example is the concept of anger, which is also learned with body-based information, such as physiological reactions of hyper-tension, a tensed muscle state, and the loud volume of voices, along with other conceptual-based information, such as harsh language. Grounded cognition theorists conceptualise this process as enactment, indicating that multiple domains of information are integrated to formulate a conceptual notion that is stored in the long-term memory. Since enactment is ongoing in humans’ learning process, they can integrate unlimited aspects of information in a single conceptual notion (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003).

Secondly, in terms of how people respond to new environmental stimulation, for example, a dog’s bark, the human brain will first identify the sound as belonging to the bark of a dog from the long-term memory. Then, the multiple cortices that are in charge of all the relevant information about the conceptual notion of a dog in the pre-existing knowledge of dogs will be activated, such as the cortices that manage the visual aspect (to identify the type of dog), introspection (feeling lovely/ scared), and motor (ready to play/ run away) so that people can quickly respond to these environmental stimuli. This process is conceptualised as the re-enactment process, which captures the simultaneous co-activation of multiple brain cortices in reaction to an external single domain of stimulation (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003).

It can be seen that grounded cognition theorists take the view that there is a shared common representation system in the human brain that copes with a wide range of cognitive activities, from perceptual (sensory perceptions, motor control, mood states, etc.) to conceptual (logic, decision-making, etc.) based activities. Perceptual information is generally included within an abstract conceptual notion so that the processing of perceptual

information is generally involved, even when people are performing a purely conceptual cognitive activity, such as word recognition.

With regard to empirical evidence, cognitive scientists used fMRI to capture the human brain's activities in order to demonstrate how multiple cortices are co-activated in these activities. For example, they found that the visual activity of seeing a picture of food co-activates the cortex that manages salivation and the conceptual activity of recognising activation-based words also co-activates the particular cortex that manages this action (Kan, Barsalou, Solomon, Minor, & Thompson-Schill, 2003; Pecher, Zeelenberg, & Barsalou, 2003; Simmons, Hamann, Harenski, Hu, & Barsalou, 2008; Simmons, Martin, & Barsalou, 2005). These findings support their arguments of the enactment and re-enactment processes of the functioning of the human brain.

The grounded cognition theory is also supported by other cognitive science theorists. For example, Damasio and his colleagues proposed the somatic marker theory, in which they propose that physiological-based information is generally embedded within abstract concepts, so that they also contend that human conceptual concepts are embodied (Damasio, 1989; Damasio, Everitt, & Bishop, 1996; Damasio, Tranel, & Damasio, 1991). In addition, in terms of language, linguists also find a similar pattern that humans' concrete physical experiences are generally embedded within abstract conceptual notions. Some relevant theories and studies are reviewed in the next section.

2.2.3 The Metaphorical Reasoning Thesis: Abstract Concepts and Physical Experiences

When analysing how metaphors are conceived, linguists also found that people generally use concrete physical experience to express abstract ideas. For example, they generally refer to affection (abstract domain) as warmth (physical), the flow of time (abstract domain) as a movement (physical domain), happiness (abstract domain) as an upward feeling (physical domain), and many others (Gibbs, 1994; Lakoff & Johnson, 1980, 1999). Therefore, linguists are anxious to know: (1) what makes people use concrete physical experiences to express abstract ideas? (2) why only certain experience(s) from the physical domain is (are) suitable for expressing the corresponding abstract idea? and (3) why metaphors are shared by the majority within a cultural system, or even a universal one?

Cognitive linguists found that traditional linguistic theories only answered their first question regarding the benefits of metaphors, namely that physical experiences are more expressive, compact, and vivid to express abstract ideas (Gibbs, 1994). However, there is still a need to find an appropriate explanation for the other two questions. Lakoff and Johnson (1980, 1999) proposed the metaphorical reasoning thesis as one of the early attempts to answer these questions. They integrated linguistic theories with the findings from cognitive science to argue that humans' abstract knowledge (higher order cognition) is embodied and that people tend to use accompanying or co-occurring physical experiences to express corresponding abstract concepts.

Using their typical example that "affection is warmth", Lakoff and Johnson (1999, p. 49) explain that people learn and experience the idea of affection (mental warmth) through the bodily experience of physical warmth since infancy. When they cried in the infant stage, they simultaneously experienced both physical and mental warmth because of the affection in the action of being held and caressed by their parents. Therefore, the two concepts were bridged and conflated during the infancy stage. As people become more developed cognitively, they are able to distinguish the experience of physical warmth from that of mental warmth; however, the experience of physical warmth becomes a linguistic tool with which to vividly express affection.

With regard to the issue of why metaphors can be shared and understood by the majority of people, Lakoff and Johnson argue that this is due to the fact that the accompanying or co-occurring physical experiences are universal, so that the majority of people can correlate a particular physical experience with a targeted abstract concept. Back to their example of "Affection is warmth", they explain that this is a physical phenomenon in that physical intimacy conveys bodily warmth; therefore this metaphor can be understood and shared universally. As previously mentioned, they also provide numerous metaphorical examples, such as "Happy is up", "Sad is down", and "Time is motion" to explain why abstract concepts are embodied (Lakoff & Johnson, 1980, 1999).

In short, metaphors can be regarded as inferential evidence to support the argument of grounded cognition, namely, that conceptual notions are generally embodied. The metaphorical reasoning thesis corresponds to the cognitive development theory, namely, that the perceptual understanding of what represents "in" and "out" in physical spaces happens prior to humans'

understanding of the abstract concepts of “in” and “out” (Mandler, 1992). Also, the metaphorical reasoning thesis that metaphors manifest how humans’ perceptual and conceptual experiences are integrated in the knowledge structure is generally agreed by other cognitive linguists (Feldman & Narayanan, 2004; Gibbs, 1994, 2006, 2008; Kövecses, 2010).

Moreover, the metaphorical reasoning thesis provides implications for priming researchers in the field of social psychology. On the one hand, further human perceptual and conceptual information processing relationships are explored through metaphors (Bargh, 2006; Meier, et al., 2012; Williams, et al., 2009); on the other, these “metaphorical-themed” priming researches later provided a new perspective to interpret how human perceptual and conceptual information processes were initially linked (Ijzerman & Koole, 2011; Landau, Keefer, & Meier, 2011; Landau, et al., 2010). The priming literature is briefly reviewed in the next section before addressing the implication of the metaphorical reasoning thesis for priming studies.

2.2.4 Priming Literature and Embodied Cognition

Researchers from the field of social psychology have found that people’s perceptual and conceptual information processes are somewhat connected. Priming researchers have used a priming technique, which involves embedding a seemingly irrelevant stimulation prior to the focal task, to explore several body-based effects on people’s cognitive performance. (Bargh, 1990; Bargh & Chartrand, 2000; Chartrand & Bargh, 2002; Förster & Liberman, 2007; Fiedler, 2003; Higgins, 1996).

One of the priming effects explored is the influence of bodily posture on people’s subsequent level of persistence; for example, Riskind and Gotay (1982) found that participants who sat in a slumped position were less able to deal persistently with the tasks in their studies that required a cognitive effort than those who sat in an upright position. Hung and Labroo (2011) similarly found that people were more willing to follow instructions and engage in “less pleasant, but much healthier” consumption, such as choosing fruit rather than a chocolate bar at the end of the study, when they were in a firm muscle state when they received the instructions. Several studies have verified the effect of bodily posture on people’s level of persistence (Petty, Wells, Heesacker, Brock, & Cacioppo, 1983; Riskind, 1984), demonstrating that people’s cognitive activities can be influenced by passive and unintentional body-based actions or stimulation.

The topics briefly addressed in the following sections include the types of priming effects identified in the priming literature that demonstrate the relationship between humans' processing of perceptual and conceptual information, the way in which priming researchers explain the causes of priming effects, whether or not these explanations support the embodied view of human cognition, and finally, as emphasised in the previous section, the implications of the metaphorical reasoning thesis on priming studies.

2.2.4.1 Types of Priming Effects in the Priming Literature

This section contains a brief description of three types of priming effects from priming studies that explain how humans' conceptual performance can be influenced by seemingly unrelated perceptual stimulation and vice versa (Bargh, et al., 2012; Briñol & Petty, 2008; Meier, et al., 2012).

2.2.4.1.1 Facilitation or Inhibition Conceptual Performance

Priming researchers have found that passive or unintentional bodily actions can either facilitate or inhibit people's conceptual cognitive process; for instance, head movement is a kind of body-based action that affects the way in which positive and negative conceptual information is processed. Wells and Petty (1980) conducted a series of studies in which participants were asked to put on headphones and either nod their head vertically or shake it horizontally while listening to the messages. The results indicated that the head-nodding group of participants agreed more with the messages than those in the head-shaking group throughout the experiments. Other priming researchers have tested the effect of head movements on the way in which people process positive or negative conceptual-based information and their findings indicated that the participants felt it was easier to deal with positive-related cognitive activities, such as memorising positive messages, generating more positive names, etc., when they were nodding their head (Briñol & Petty, 2003; Förster & Strack, 1996; Tom, Pettersen, Lau, Burton, & Cook, 1991; Wells & Petty, 1980).

Arm flexion and arm extension are also found to influence people's positive or negative information processing. For example, Förster and Strack (1997, 1998) found it was more likely for people to generate positive names when they were flexing their arms (simulating approach tendencies) than when they were extending them (simulating avoidance tendencies); at the same time, it was more likely for arm extenders to generate negative names. They also found that it was much easier for the arm flexors to process

positive-related conceptual information than the arm extenders. This is what social psychologists call the conceptual-motor compatibility effect, namely, that humans' conceptual cognitive performance can be facilitated or inhibited by their current or prior motor actions (Briñol & Petty, 2008; Dru & Cretenet, 2008; Förster & Stepper, 2000; Neumann, Förster, & Strack, 2003; Wells & Petty, 1980).

2.2.4.1.2 Facilitation or Inhibition of the Activation of Affect

Researchers have also found that body-based stimulation can influence the activation of affect, which, in turn, can influence the subsequent affect-based evaluation. For example, face muscle manipulation is found to influence people's affect-based judgement of a third object. Laird (1974) conducted a series of studies in which participants were instructed to either smile or frown passively. According to the results, the participants who smiled reported that they felt happier and rated a cartoon they were shown to be funnier than those who frowned. Strack and his colleagues (1988) also had similar results. They asked participants to exercise their smile or frown facial muscles passively by holding a pen in their mouth horizontally (simulating a smile) or vertically (simulating a frown). They also found that the participants who were smiling felt that the cartoon was funnier than those who were frowning. A reverse pattern was also found by Olson and Roese (1995), whose participants rated the joke less funny when they were frowning .

Lastly, the actions of extending and flexing the arm are also found to affect people's affective judgement of a third object. Förster (2004) found the participants who were asked to passively flex their arm rated an unknown orange juice to be tastier, while Labroo and Nielsen (2010) found that this effect can also apply to negative advertisements. In their studies, the participants who were asked to rate a disgusting advertisement while flexing their arm rated it to be less disgusting. In short, these studies demonstrate that even unintentional muscle actions can influence the activation of affect, which may, in turn, influence affective-based judgment.

2.2.4.1.3 Conceptual-Based Manipulation and Bodily Responses

Social psychology researchers have also found that people's behavioural responses can be influenced by prior conceptual stimuli. For instance, Bargh, Chen, and Burrows (1996) divided their participants into two groups, one of which were primed with neutral words and one primed

with elderly conceptual stimuli, such as bright colours and an image of the state of Florida. The findings revealed that those primed with elderly stimuli walked significantly slower than those who were primed with neutral words. Similar findings were found in other priming studies; for example, social psychology researchers found that people who were primed with the names of slow-moving animals, such as a snail, and were primed to do senile-based lexical decision tasks moved or behaved much slower afterwards (Aarts & Dijksterhuis, 2002; Dijksterhuis, Spears, & Lépinasse, 2001).

In short, researchers in the field of social psychology have also found that people's perceptual and conceptual cognitive activities are somewhat connected, such as the Stroop effect and the aforementioned empirical studies. This empirical evidence suggests that even seemingly unrelated perceptual stimuli can influence people's subsequent conceptual activities and vice versa. Therefore, the authors of priming studies also perceive that humans' conceptual cognitive activities are embodied.

2.2.4.2 Latent Mechanism- Knowledge Activation

In terms of the underlying mechanism, priming researchers explain that experimental stimulation can make certain concepts more accessible (also explained as more ready to process information) in the brain activity. If there is an overlap between more accessible information and the subsequent evaluation in the knowledge structure, people naturally tend to use this activated information in their subsequent evaluation. This effect is defined as priming in the literature (Bargh, 1990; Bargh & Chartrand, 2000; Bargh & Ferguson, 2000; Chartrand & Bargh, 2002; Dijksterhuis & Bargh, 2001; Musch & Klauer, 2003) and the cognitive effect that certain concepts become more accessible due to experimental manipulation in the brain activity is defined as knowledge activation in priming literature (Förster & Liberman, 2007; Fiedler, 2003; Higgins, 1996).

The view of knowledge activation is similar to the arguments of the enactment and re-enactment processes in the grounded cognition theory. Grounded cognition theorists believe that, in the re-enactment process, multiple cortices that manage the information related to a conceptual concept, identified through external stimulation, can become partially activated in order to be ready to make a prompt response to the external stimulation (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003). Just as priming researchers used priming techniques to capture

knowledge activation in the brain activity, a higher level of accessibility and readiness for the human brain to process the primed concept, cognitive scientists used fMRI and found that multiple cortices become partially activated when the human brain responds to external stimulation. This state of partial activation explains why the primed concepts are more accessible or more ready to be processed in the brain activity.

When combining the literature from priming studies and the grounded cognition theory, it can be seen that researchers from both fields contend that perceptual information is generally processed in the conceptual thinking process, and humans' conceptual activities are largely embodied in other words (Barsalou, Niedenthal, et al., 2003; Briñol & Petty, 2008; Meier, et al., 2012; Niedenthal, et al., 2005). Researchers from both fields argue that, since perceptual stimulation can make certain concepts more accessible in the brain activity, it can influence humans' conceptual activities.

It can be seen that early priming researchers tested the computational relationship between perceptual stimulation and the concept of priming (Landau, et al., 2011; Landau, et al., 2010). For example, in early priming studies, researchers found that bodily manipulation, such as head nodding or arm flexing can influence the way in which people process positive facts in the conceptual domain (Briñol & Petty, 2003; Förster & Strack, 1996; Tom, et al., 1991; Wells & Petty, 1980). It is very likely that this priming relationship is established because people tend to nod their head to indicate their agreement, thereby bringing the things with which they agree closer to them; as a result, the action of head nodding or arm flexing constitutes a conceptual concept of positive. Therefore, it can be seen that early priming researchers tested the ability of perceptual stimulation, which constitutes an abstract concept, to prime that conceptual concept in the brain activity. The relationship between the priming source and the primed concept is computational, which also echoes the enactment process in the grounded cognition theory.

Does the relationship between the priming source and the primed concept have to be computational? "Metaphorical-themed" priming studies are reviewed in the next section to further discuss this issue.

2.2.4.3 "Metaphorically-Themed" Priming Studies

With the development of the metaphorical thesis, priming researchers began to focus on whether metaphors also denote a relationship between

dyadic perceptual and conceptual information processes. The relationship between physical and mental warmth in humans' cognitive activities is one of the topics that aroused the interest of priming researchers.

Firstly, priming researchers found that manipulating people's sensation of physical warmth can influence the way in which they make mental warmth-based judgments. For instance, Williams and Bargh (2008) found that people would attribute an unknown person to have a warmer personality when they received a warm drink rather than a cold drink from this unknown person. Kang and her colleagues similarly found that participants who touched a warm pack when playing trust games behaved more honestly than those who did not (Kang, Williams, Clark, Gray, & Bargh, 2011). This relationship has also been applied to studies of consumer behaviour; for example, Hong and Sun (2012) found that their participants were more willing to watch romantic movies when they had a sensation of physical coldness. In terms of consumers' actual patterns, they found that romantic comedies released in the winter season received significantly higher box office revenue in the opening week than those released in the summer season using actual US box office revenue data between 1995 and 2010.

On the other hand, manipulating people's feeling of mental warmth can also influence the way in which they make physical warmth-related judgments. For instance, Zhong and Leonardelli (2008) found that their participants expressed a higher level of preference for warm food than cold when they were induced in a situation of social exclusion in their experiment. Bargh and Shalev (2012) similarly found that people who expressed a higher level of chronic loneliness reported a higher level of preference for warm baths or showers in their experiment. In short, these studies demonstrate that the way in which people evaluate mental warmth-related judgements can be influenced by a sensory manipulation of physical warmth, and vice versa.

There are also other metaphorically-themed priming studies, such as spatial orientation and the time question (the metaphor of time is movement), smells fishy means suspicious, physical weight and psychological importance, physical cleanliness and moral purity, and many others (Boroditsky & Ramscar, 2002; Lee & Schwarz, 2012; Meier, Hauser, Robinson, Friesen, & Schjeldahl, 2007; Meier & Robinson, 2004, 2006; Schubert, 2005; Zhong & Liljenquist, 2006; Zhong, et al., 2010). These studies demonstrate that there is a metaphorical relationship when the

human brain processes cognitive activities from these dyadic cross perceptual-conceptual domains. However, these metaphorically-themed priming studies raise a new issue related to the way in which perceptual and dyadic conceptual information processes were originally paired; for example, did they co-occur at the moment these dyadic conceptual concepts were experienced?

According to the grounded cognition theory and early priming studies, cross-domain information processes were initially integrated due to the fact that certain perceptual information co-occurs as soon as conceptual information is experienced or acquired (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Briñol & Petty, 2008). This perspective is able to explain some metaphorical relationships, such as the case of physical warmth and affection whereby the sensory experience of physical warmth co-occurs the moment the conceptual experience of affection is experienced (Lakoff & Johnson, 1980, 1999). While it fits some metaphors, such as smells fishy means suspicious, it seems less convincing to argue that the sensory experience of smelling fish co-occurs the moment people feel suspicious. If so, how were these two domains of information processes paired in the first place?

Landau and his colleagues proposed the conceptual metaphor thesis to provide a reasonable account and explain these metaphorical cases (Landau, et al., 2011; Landau, et al., 2010). They positioned their conceptual metaphor thesis as a parallel account of the way in which perceptual and conceptual cross domain information processes were integrated in the first place. They argued that people can also conceptually integrate these two domains of information because the perceptual information is equivalent to the target conceptual information, making an abstract idea easier to understand. They conceptualise this integration process as “metaphor-enriched social cognition” to capture this kind of top-down integration process.

In summary, these metaphorically-themed priming studies suggest that a metaphor denotes that there is a relationship between processing dyadic perceptual and conceptual information in the brain activity; moreover, they shed a new light on how these two domains of information were integrated in the first place. The fact that people can conceptually integrate these two domains of information is known as the conceptual metaphor thesis, which provides a parallel account to the grounded cognition theory

that perceptual and conceptual information processes were bridged because to their computational relationship.

2.2.5 Summary

The relevant literature that defines embodied cognition and its role in explaining humans' cognitive activities has been reviewed this section. In order to explain how and why humans' conceptual cognitive activities are embodied, the relevant literature regarding the grounded cognition theory, the metaphorical reasoning thesis, priming studies, and the conceptual metaphor thesis was reviewed to explain how and why human perceptual and conceptual cognitive processes are firstly integrated and then influence each other.

The embodied cognition literature provides a theoretical basis for this current research to hypothesise how and why people' s physical sensation of cleanliness can influence consumers' evaluation of green products through a cognitive approach. The aspects of information that can be cued and primed by a sensation of physical cleanliness are addressed in the next section.

2.3 Consumers' Physical Sensation of Cleanliness, the Perceived Sensory information of Cleaning Effectiveness, and the inflated Perception of Moral Superiority

In this section, the researcher reviews the relevant literature to argue two possible cognitive effects that consumers' physical sensation of cleanliness can have in their subsequent thinking process. Furthermore, the researcher argues the co-existence of these two cognitive effects under the account of embodied cognition. In this section, the researcher first addresses the first cognitive effect that consumers' physical sensation of cleanliness can make them perceive the sensory information that indicates cleaning effectiveness. Then, the second cognitive effect that consumers' physical sensation can inflate their perception of moral superiority is addressed in section 2.3.2. Lastly, the researcher reviews the relevant literature to justify the co-existence of these two effects in section 2.3.3.

2.3.1 Consumers' Physical Sensation of Cleanliness and the Perceived Sensory Information that indicates Cleaning Effectiveness

It is argued in this paper that, when consumers experience a physical sensation of cleanliness, which, according to previous empirical studies (Holland, et al., 2005; Liljenquist, et al., 2010; Zhong, et al., 2010) can be manipulated either by cleaning their hands with a hand wipe or smelling the scent of cleaning products, it is expected that people also perceive the product scent of that cleaning product. This perceived scent contains bleach and perfume due to the fact that these two chemicals are commonly used in the manufacture of cleaning detergents (Chemat & Vian, 2014; Dahlstrom, 2011; Goldsmith & Sheldon, 2008; Iannuzzi, 2012; Kaushik, 2015; Muniglia, et al., 2014; Ottman, et al., 2006). Based on the embodied cognition literature, it can be argued that the smell of bleach and that of perfume are integrated in people's knowledge structure of cleaning effectiveness because they accompany the physical experience when they learn the concept of effective cleaning (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Lakoff & Johnson, 1999; Meier, et al., 2012).

Furthermore, it is expected that, when people detect that the scent of bleach and perfume from the cleaning product that creates a physical sensation of cleanliness is related to the concept of cleaning effectiveness, the human brain can more readily process or focus on information related to cleaning effectiveness. The reason for this cognitive effect is the activation and reuse of neurons: the cortices that manage cleaning effectiveness information become active due to the perceived scent of bleach and perfume, and are thus ready to process cleaning effectiveness-related information (Anderson, 2010; Barsalou, 1999, 2003a, 2003b; Barsalou, Kyle, et al., 2003; Förster & Liberman, 2007; Fiedler, 2003; Higgins, 1996).

In summary, the first possible cognitive effect that consumers' physical sensation of cleanliness can have on their subsequent thinking process is identified: consumers can perceive the sensory information that indicates cleaning effectiveness from their physical sensation of cleanliness, which makes them ready to process information related to cleaning effectiveness

2.3.2 Consumers' Physical Sensation of Cleanliness and Inflated Sense of Moral Superiority

"A *little water clears us of this deed: How easy it is then!*"

■ *Macbeth*, Act II, Scene II

In prior literature, embodied cognition theorists found that consumers' physical sensation of cleanliness can also inflate their sense of moral superiority because people tend to attribute their current level of physical cleanliness to their current level of moral superiority. Linguistic explanations and behavioural evidence are firstly provided in this section to explain the metaphorical linkage between these two domains of experience. This is followed by the provision of empirical evidence that supports the argument that consumers' physical sensation of cleanliness can inflate their sense of moral superiority.

Linguists have found that people generally use physical cleanliness to describe the level of morality of a particular person or object in everyday conversation. For example, an immoral person is generally described as "corrupt" or "disgusting" and the terms "my conscience is clear" and "my intentions were pure" are also commonly used in everyday conversation when people are trying to explain that they are moral. Linguists explain that people generally use physical cleanliness to express their level of moral purity because people' s physical sensation of cleanliness serves as an analogue to understand the abstract idea of moral domain purity, which is a top-down conceptual integration process, so that they are linked within their knowledge structure. In terms of why there is an analogous relationship between physical cleanliness and moral purity, Lakoff and Johnson explain that the idea of purity indicates that there is no mixture of any other substance within a physical substance. Secondly, dirt is one of the common sources that cause a physical substance to be impure, as well as making it less clean. As a consequence, physical cleanliness becomes an analogue to facilitate the understanding of moral purity so that these two elements are linked in their knowledge structure (Johnson, 1993; Lakoff & Johnson, 1980, 1999).

Priming studies from social psychology also support the connection between physical cleanliness and moral purity. Priming researchers have found that manipulating people's physical experience of cleanliness can influence their judgement in the moral domain. For example, Zhong and

Liljenquist (2006) conducted several studies and found that, when people were placed in a situation in which their morality was threatened, such as recalling something they had done that was not very moral, they were more likely to think of cleaning-related words (study 1), to have a stronger psychological desire for physical cleansing (study 2), and to have a stronger desire to clean their hands (study 4). Lee and Schwarz (2010a) also produced similar results from their experiments, in which they firstly asked participants to either leave some bad messages by typing (writing condition), leave some bad messages by recording (speaking condition), or take no action (control condition). They then asked the participants to evaluate two products, a hand sanitiser and a mouth wash, and it was found that those in the first two conditions felt that the cleaning products were more attractive. Moreover, this link was found to be modal-specific. The participants in the writing condition expressed a significantly higher level of attraction to the hand sanitiser than those in the other two conditions, while those in the speaking condition expressed a significantly higher level of attraction to the mouth wash than those in the other two conditions. Lastly, Gollwitzer and Melzer (2012) similarly found that playing violent video games can activate people's motivation to clean their hands. In brief, these studies support the argument that the physical sensation of cleanliness is connected to people's mental concept of morality in their knowledge structure, so that they tend to express their moral purity through physical cleanliness in everyday language, and there are empirical studies that support the metaphorical relationship between the two.

With regard to the issue of how people behave if their physical sensation of cleanliness is manipulated, previous empirical studies reveal that people's subsequent morally-related judgment is unintentionally influenced by their prior physical sensation of cleanliness. For instance, Zhong, Strejcek and Sivanathan (2010) found that people made harsher moral judgements when they were asked to clean their hands before making them. They further indicated the effect that a cleaner physical self renders a more severe moral judgement mediated by an inflated perception of moral superiority caused by this physical sensation, measured by the extent to which they feel that they are morally better than their friends and peers. In other words, Zhong et al. (2010) argue that the reason why people's prior physical sensation of cleanliness leads them make harsher moral judgment lies in the fact their sense of moral superiority has been inflated. Other researchers have also found that people's physical sensation of cleanliness can influence their subsequent moral behaviour; for example, Holland and

his colleagues (2005) found that participants who entered a study room imbued with the scent of a cleaning detergent were more likely to clear the cookie crumbs from the table than those who entered a room that was not imbued with this scent. Similarly, Liljenquist, Zhong and Galinsky (2010) found that participants who entered a clean-scented room were more honest in the trust game and more willing to devote themselves to their studies than those who entered the same room that was not clean-scented.

In summary, it can be argued there is a metaphorical connection in people's knowledge structure between the way they process information related to physical cleanliness and the way they process moral purity-related information. As a result, embodied cognition researchers have found that peoples' moral behaviour can be influenced by their prior physical sensation of cleanliness: they may subsequently either criticise others' wrongdoing more severely or behave more morally themselves (Holland, et al., 2005; Liljenquist, et al., 2010; Zhong, et al., 2010). A possible explanation for these effects is that people associate a higher level of perception of physical cleanliness with a higher level of perception of moral superiority (Zhong, et al., 2010); it is argued in this paper that this is the second possible cognitive effect that consumers' prior physical sensation of cleanliness can have on their subsequent thinking process.

2.3.3 The Co-existence of the Two Possible Cognitive Effects of Consumers' Physical Sensation of Cleanliness

It is further argued that these two cognitive effects co-exist, based on the embodied cognition literature, and to the best of the researcher's knowledge, this is one of the first empirical studies that investigates this co-existence, although there is inferential evidence to support the proposition that these effects can be co-activated.

Firstly, embodied cognition theorists argue and empirically prove that there is generally an overlap between the process of an abstract conceptual concept (i.e., to think of an abstract idea positively) and the process of perceptual information (i.e., a motor action of arm flexion that reflects the tendency to approach) (Förster, Higgins, & Idson, 1998; Förster & Strack, 1997, 1998; Neumann & Strack, 2000; Stepper & Strack, 1993; Strack, et al., 1988; Tom, et al., 1991). The reason for this cognitive effect is that people firstly integrate all the related perceptual or conceptual information into an abstract concept in their knowledge structure. Then, when the brain detects

and identifies an external stimulus, all the cortices that manage the information related to this identified concept become activated in order to process it to enable a prompt reaction to the environment (Anderson, 2010; Barsalou, 1999, 2003a, 2003b; Barsalou, Kyle, et al., 2003; Förster & Liberman, 2007; Fiedler, 2003; Higgins, 1996).

As for the case of consumers' physical sensation of cleanliness and its subsequent cognitive effects on their thinking process, it is identified in the literature that this sensation can be either computationally linked to the abstract concept of cleaning effectiveness or metaphorically linked with the concept of moral purity (Anderson, 2010; Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Damasio, 1994; Lakoff & Johnson, 1999; Landau, et al., 2010; Meier, et al., 2012). Due to the lack of empirical studies that propose and examine the co-existence of these two elicited cognitive effects from people's physical sensation of cleanliness, this will be investigated in this study to contribute to both embodied cognition and consumer decision-making literature. If the proposition that the two elicited cognitive effects co-exist is supported, it is expected that consumers' subsequent product evaluation can be thus influenced.

2.3.4 Gender Effects

Prior literature gender differences may influence the way how people detect, respond, and process olfactory stimuli as well as how consumers express their preference on green products stated as follows. Firstly, past researchers indicated that females generally outperform males in terms of scent detections, discriminations, and recognitions (Bem, 1981; Bone & Ellen, 1999; Doty, 1991a, 1991b; Koelega, 1994; Morrin & Ratneshwar, 2003).

For instance, Koch and her colleagues (2007) studied whether negative olfactory stimuli, inducing negative emotions, influenced people's working memory performance. Their findings suggest that both males and females' working memory performance were significantly impaired due to the negative olfactory stimuli. However, through the fMRI data, they found there were different cerebral mechanisms that caused the negative influences between male and female participants at the neuron stage. For male participants, their prefrontal and superior parietal regions were more activated due to the induction of the negative olfactory stimuli that influenced their thinking process; as for female participants, they had stronger reactions in the amygdala and the orbitofrontal cortex (OFC) due to the induction of e negative olfactory stimuli. As a result, gender effects can be a potential

factor to be considered that would influence how consumers detect and process the sensory information while they experience a physical sensation of cleanliness.

Secondly, prior literature also indicates that gender difference may influence how consumers evaluate green products (Blocker & Eckberg, 1997; Bord & O'Connor, 1997; Diamantopoulos, et al., 2003; Schahn & Holzer, 1990; Shrum, McCarty, & Lowrey, 1995). For example, Diamantopoulos et al. (2003) found that females generally express a higher level of positive attitude towards green products than males and senior consumers generally express higher level of positive attitude towards green products than young consumers. Therefore, the researcher will also examine how gender and age influence consumers' green product evaluations. As a result, the direct of gender in influencing consumers' green product evaluation will be considered in this study.

2.4 Chapter Summary

In summary, the nature of consumers' green behaviour, the literature of embodied cognition, the proposition that consumers' physical sensation of cleanliness can have two simultaneous cognitive effects on their thinking process, to perceive the sensory information of cleaning effectiveness and to inflate the sense of moral superiority, are introduced in this chapter.

Firstly, the issues of cleaning effectiveness and moral concerns are identified as the key concerns that have a substantial impact on consumers' green evaluation during the evaluation process. Secondly, based on the embodied cognition literature, a sensation of physical cleanliness is expected to have a cognitive effect on people's evaluation process. Priming information of moral superiority and cueing information of perceived cleaning effectiveness make these two types of information more accessible to people during the evaluation process. As a result, information related to moral superiority and perceived cleaning effectiveness is expected to influence consumers' green evaluation because these two aspects are central to their consideration when making a green evaluation.

Lastly, the way in which these two types of information influence different facets of consumers' green evaluation was examined in order to assess which domain(s) of information is more important to this particular type of green evaluation.

Chapter 3 Hypotheses Development and Methodology

3.0 Chapter overview

The discussion from the literature review has been integrated in this chapter to formulate five research hypotheses, listed in sections 3.1 to 3.5. The first two hypotheses are based on the prediction that two possible cognitive effects, namely, the conveyance of sensory information of cleaning effectiveness to people and the inflation of people's sense of moral superiority, which are sensory stimuli of cleanliness, can influence consumers' thinking process. The third hypothesis is based on the belief in the co-existence of the aforementioned two cognitive effects. As for the last two hypotheses, these are based on a prediction that these two effects can both influence consumers' subsequent evaluation of the attractiveness of the green product they see in the study. An overview of the empirical studies examined in this research is presented in section 3.6. Lastly, in section 3.7, the author addresses the methodological issues in this research, including the reason for choosing an experimental design to complete the research and the key to improving its internal validity.

3.1 Consumers' Physical Sensation of Cleanliness and their Inflated Sense of Moral Superiority

It is argued in this paper that people's physical sensation of cleanliness can inflate their sense of moral superiority on the basis of embodied cognition literature. Embodied cognition theorists argue that people tend to attribute the level of their perception of physical cleanliness to the level of their perception of moral purity due to a conceptual blending process based on a metaphorical relationship between the perception of the former and the perception of the latter (Johnson, 1993; Lakoff & Johnson, 1980, 1999; Landau, et al., 2010; Meier, et al., 2012). As for empirical evidence, Zhong, Strejcek, and Sivanathan (2010) found that their participants who were asked to clean their hands with a cleaning wipe more severely criticised others' moral behaviour than those who were not asked to do so due to the reason that an even higher level of their perception of

physical cleanliness inflated their perception of the level of their moral superiority.

Not only are the findings of Zhong et al. (2010) replicated in this study, but whether an even higher level of physical sensation of cleanliness can make people respond with an even higher level of moral superiority, which has not been empirically studied to date, is also investigated. The research hypotheses are listed below.

Hypothesis 1: Consumers' physical sensation of cleanliness can inflate their sense of moral superiority.

Hypothesis 1.1: Research participants who experience a physical sensation of cleanliness (i.e., cleaning their hands with a hand wipe) will report a higher level of sense of moral superiority than those who do not.

Hypothesis 1.2: There is a positive significant linear relationship between the perceived intensity level of research participants' physical sensation of cleanliness and the reported level of moral superiority.

3.2 Consumers' Physical Sensation of Cleanliness and the Perceived Sensory Information that Indicates Cleaning Effectiveness

It is predicted that people perceive the sensory information of cleaning effectiveness from their physical sensation of cleanliness because they also perceive the scent from the stimulus that indicates the level of effectiveness of cleaning. The reasons for this prediction are explained below.

Firstly, it is argued that the research participants will also perceive the scent of that the experimental stimulus gives them a physical sensation of cleanliness (operationalised by smelling the scent of a cleaning product or cleaning their hands with a hand wipe); this scent contains soap and perfume, as well as other chemicals that are used in the manufacturing process of cleaning products.

Secondly, the capability of a cleaning product's effectiveness is determined by the level of concentration of these chemicals used during the manufacturing process. As a result, a powerful cleaning product is made by a relatively high concentration of these chemicals, which also disseminates a highly intense level of scent (Chemat & Vian, 2014; Dahlstrom, 2011;

Goldsmith & Sheldon, 2008; Iannuzzi, 2012; Kaushik, 2015; Muniglia, et al., 2014; Ottman, et al., 2006).

Thirdly, on the basis of embodied cognition literature, it can be argued that people's conceptual knowledge of cleaning effectiveness contains multiple sources, such as their sensory experience of "this is what clean clothes smell like". Such information is also integrated in their conceptual knowledge of cleaning effectiveness (Barsalou, 1999, 2003b, 2008b; Damasio, 1994; Förster & Liberman, 2007; Higgins, 1996; Lakoff & Johnson, 1999; Landau, et al., 2010; Meier, et al., 2012). In other words, the scent disseminated by the cleaning wipe can also signal the information of cleaning effectiveness. As a result, it is hypothesised that the research participants will perceive sensory information of cleaning effectiveness when experiencing a physical sensation of cleanliness. This leads to the formation of the second research hypothesis, which is discussed below.

Hypothesis 2: Consumers can perceive the sensory information that indicates cleaning effectiveness when they experience a physical sensation of cleanliness. The higher the intensity level of their sensation, the higher the level of the sensory information that indicates cleaning effectiveness perceived by them.

3.3 The Co-existence of the Aforementioned Two Cognitive Effects from Consumers' Physical Sensation of Cleanliness

It is further hypothesised that the two aforementioned psychological effects from people's physical sensation of cleanliness can be elicited simultaneously because these effects reflect different approaches related to how people's perceptual sensation can influence the way they think on the basis of embodied cognition.

Embodied cognition theorists argue that there are two approaches to how the human brain integrates perceptual information (i.e. sensations and motor actions) into an abstract concept: a computational and a metaphorical approach. The computational approach refers to an unconscious integration of all the accompanying information while people are learning or experiencing an abstract concept (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Damasio, 1994; Lakoff & Johnson, 1999). For

instance, they will integrate all dog-related information, be it perceptual or conceptual, into their concept of a dog, such as its name, what it looks like, and how it barks. In other cases, people also intentionally use their physical experience to express the corresponding abstract concept due to the metaphorical relationship between the two, such as when people generally use an actual physical movement to refer to time. These two types of perceptual-conceptual relationship regarding the way in which the human brain integrates different domains of information into an abstract concept are both acknowledged by embodied cognition theorists (Landau, et al., 2011; Landau, et al., 2010; Meier, et al., 2012).

As for this study, the two possible psychological effects that form the research hypotheses are based on the aforementioned two types of perceptual-conceptual relationship. On the one hand, the hypothesis that the participants will perceive the sensory information of cleaning effectiveness when they have a physical sensation of cleanliness is based on the computational relationship between the cleaning scent from the experimental stimuli and the concept of cleaning effectiveness. On the other hand, the hypothesis that participants' physical sensation of cleanliness can inflate their sense of moral superiority is based on the metaphorical relationship between the two domains. Therefore, it is predicted that the perceived sensory information of cleaning effectiveness and the perceived sense of moral superiority are independent contracts that are simultaneously elicited by the participants' physical sensation of cleanliness.

Hypothesis 3.1: There is no significant leaner relationship between participants' perception of the level of the sensory information of cleaning effectiveness and the level of their reported moral superiority.

Hypothesis 3.2: Both cognitive effects, perceiving the sensory information that indicates cleaning effectiveness and inflating the sense of moral superiority, elicited by research participants' physical sensation of cleanliness can influence their subsequent green product evaluation.

3.4 The Perceived the Sensory Information that Indicates Cleaning Effectiveness and Consumers' Subsequent Evaluation of the Attractiveness Regarding the Green Product they See in the Study

It is expected that the perceived sensory information of cleaning effectiveness induced by the participants' physical sensation of cleanliness

can influence the way they evaluate the attractiveness of the green product they see in the study. Firstly, based on the embodied cognition literature, it is expected that the perceived sensory information of cleaning effectiveness can heighten participants' attention to the issue of cleaning effectiveness in their evaluation process, according to the accounts of "knowledge activation" and "re-enactment process" in the literature (Barsalou, 1999, 2003a, 2003b; Barsalou, Kyle, et al., 2003; Förster & Liberman, 2007; Higgins, 1996)

Green marketing researchers have found that the concern of product effectiveness has a negative impact on how consumers rate the level of attractiveness of green products because these products are generally perceived as being milder and less effective than their regular counterparts (Lin & Chang, 2012; Luchs, et al., 2010; E. Olson, 2013; Wu, et al., 2015). Therefore, it is predicted that the perceived level of sensory information of cleaning effectiveness from the sensory stimulus can have a negative impact on the research participants' rating of the level of attractiveness of the green product they see in the study, even though the sensory stimulus is different.

In addition, green marketing researchers also indicate that consumers generally express different levels of attractiveness of the same green product due to different perspective; for example, how I perceive the attractiveness of a green product versus how I perceive the same green product will be attractive to other consumers will provide further information regarding how consumers make their product evaluation (Luchs, et al., 2010). To this end, three types of product evaluations are conceptualised to capture the way in which the research participants evaluate the attractiveness of the green product they see compared to the other regular product in the study. The first type of evaluation conceptualised is the self-based green preference (SGP), which captures the extent to which the research participants feel that the green product is more attractive to them than the non-green product. The second type is the projective green preference (PGP), which captures the extent to which the research participants perceive the green product is more attractive than the non-green product to other participants. The last factor measured is how attractive the research participants feel that the green product is to them and how popular they perceive the same green product will be with other consumers, conceptualised as the dissociative green preference (DGP). To conclude, the fourth research hypothesis is discussed below.

Hypothesis 4 The perceived the sensory information about cleaning effectiveness from a sensory stimulus of cleanliness negatively influences consumers' subsequent evaluation of product attractiveness regarding the green product they see in the study:

H 4.1: The perceived the sensory information that indicates cleaning effectiveness negatively influences self-based green preference (SGP)

H 4.2: The perceived the sensory information that indicates cleaning effectiveness negatively influences projective green preference (PGP)

H 4.3: The perceived the sensory information that indicates cleaning effectiveness negatively influences dissociative green preference (DGP)

3.5 The Inflated Sense of Moral Superiority and Consumers' Subsequent Evaluation of the Attractiveness Regarding the Green Product they See in the Study

Green marketing researchers also indicate that green choices (i.e. buying green products and engaging in environmentally-friendly behaviour) can be promoted via moral-based appeals at the point of making a decision. On the one hand, some green marketing researchers have found that the social values, namely, pro-environmental and pro-social, of green products can drive consumers' motivation to buy them (Cleveland, et al., 2012; Hartmann & Apaolaza-Ibáñez, 2012; Kates, 2001; Leonidou, et al., 2010; Moisander, 2007; Mostafa, 2007; Peattie, 2010; Thøgersen, et al., 2012; van Doorn & Verhoef, 2011; White & Peloza, 2009; Young, et al., 2010). On the other hand, some have also indicated that the likelihood of choosing green products can be increased if marketers subconsciously make consumers feel that buying green products helps to demonstrate their pro-social image to others (Griskevicius, et al., 2012; Griskevicius, et al., 2010; Hartmann & Apaolaza-Ibáñez, 2012; Herbes & Ramme, 2014; Sexton & Sexton, 2014; Zabkar & Hosta, 2013).

Therefore, it is predicted that the participants' inflated sense of moral superiority, induced by their prior sensation of physical cleanliness, can have a positive effect on their subsequent evaluation of the attractiveness of the green product because green products can be a means to demonstrate their pro-social image so that they can be more attractive to others. Similar to the previous section, the investigation relates to how the participants' inflated

sense of moral superiority can influence the three types of evaluation regarding the attractiveness of the green product they see in the study; the fifth research hypothesis is discussed below.

Hypothesis 5 Consumers' inflated sense of moral superiority induced by their prior sensation of cleanliness positively influences consumers' subsequent evaluation of product attractiveness regarding the green product they see in the study:

H 5.1: Consumers' inflated sense of moral superiority positively influences self-based green preference (SGP)

H 5.2: Consumers' inflated sense of moral superiority positively influences projective green preference (PGP)

H 5.3: Consumers' inflated sense of moral superiority positively influences dissociative green preference (DGP)

3.6 An Overview of the Three Empirical Studies

Three empirical studies are designed to investigate the research hypotheses. The first empirical study is designed to determine the capability of people's physical sensation of cleanliness in inflating people's sense of moral superiority. Particularly, the research investigates (1) whether participants in the strong and mild sensation conditions report a higher level of moral superiority than those who are in the control condition, (2) whether participants in the strong sensation condition report an even higher level of moral superiority than those in the mild sensation condition, and (3) whether there is a linear relationship between the intensity level of participants' physical sensation of cleanliness and their perceived level of moral superiority.

The second empirical study is designed to determine whether participants' physical sensation of cleanliness also conveys the sensory information that indicates cleaning effectiveness. Particularly, the research investigates there is a linear relationship between the intensity level of participants' physical sensation of cleanliness and the level of perceived sensory information that indicates cleaning effectiveness.

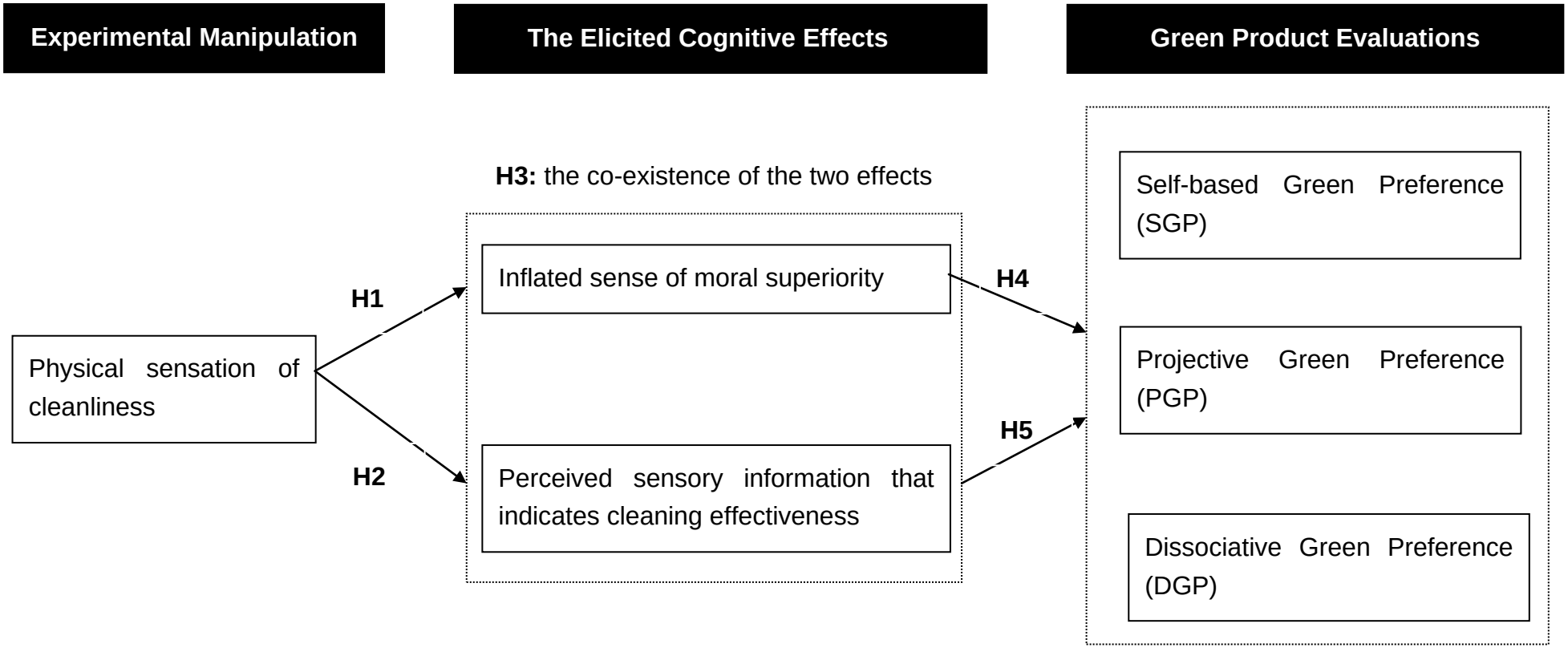
The third empirical study is designed to investigates the last three hypotheses, including (1) the coexistence of the two hypothesised cognitive effects from participants' physical sensation of cleanliness, and (2) to determine whether the two hypothesised cognitive effects from participants'

physical sensation of cleanliness influence their subsequent three types of green product evaluations. An overview of the three empirical studies is provided in Table 3-1 and the supermodel of this study is illustrated as

Table 3-1 Overview of the Three Empirical Studies

	Objectives of the studies
Study 1	● To determine the capability of people's physical sensation of cleanliness in inflating people's sense of moral superiority (H1)
Study 2	● To determine whether participants' physical sensation of cleanliness also conveys the sensory information that indicates cleaning effectiveness (H2)
Study 3	● To retest the two hypothesised cognitive effects regarding the capability of people's physical sensation of cleanliness in conveying the sensory information that indicates cleaning effectiveness and in inflating people's sense of moral superiority (H1 & H2) ● To determine the co-existence of the two hypothesised cognitive effects from people's physical sensation of cleanliness (H3) ● To determine whether the inflated the sense of moral superiority influences participants' subsequent three types of green product evaluations (H4). ● To determine whether the perceived the sensory information that indicates cleaning effectiveness influence participants' subsequent three types of green product evaluations (H5).

Figure 3-1 The Research Model



3.7 Methodological Issues

Two methodological issues are briefly addressed in this chapter, the first of which is the reason for choosing an experimental design to complete the research, while the second concerns the key to improving its internal validity

3.7.1 Experimental Design

An experimental design was adopted to examine the hypotheses in this study for several reasons, as explained below.

Firstly, the method of experimental design is regarded as being the most suitable approach to explore the causal relationship because it helps to control the influence of non-experimental variables other potential factors in a non-laboratory setting in order to identify a causal relationship (Abdi, Edelman, Valentin, & Dowling, 2009; Ryan, 2007; Shadish, Cook, & Campbell, 2002).

Secondly, an experimental design is also regarded as being the most suitable approach because of the nature of the priming effect, which the research aims to capture. According to the literature, a priming effect is a temporary activation state in the mental process. This type of effect is implicit and fades within a short period of time; moreover, noise from the ambient environment can cause a distraction and break this state of temporary activation (Bargh & Chartrand, 2000; Förster & Liberman, 2007; Fiedler, 2003; Higgins, 1996). Therefore, there is a need to conduct an experiment in order to eliminate the possibility that noise from the ambient environment can potentially undermine the priming effect of a sensation of physical cleanliness.

Lastly, the research requires the presence of the participants due to the need of experiment manipulation implementation that participants were asked to smell a scent from a cleaning wipe and to clean their hands with it. Due to the reasons above, an experimental design was adopted in this research.

3.7.2 Internal Validity

Four issues are considered with regard to improving the internal validity as explained below.

3.7.2.1 Randomisation

The participants in this study were allocated to different experimental conditions by means of a simple random assignment (Shadish, et al., 2002). This randomisation facilitated the creation of homogeneous treatment groups in the experiments, as well as minimising the risk of the findings being influenced by other extraneous factors (Abdi, et al., 2009; Ryan, 2007; Shadish, et al., 2002).

3.7.2.2 Manipulation Checks

Manipulation check questions are usually included in an experimental design to ensure that the experimental manipulations have the intended effect on the participants (Cozby, 2009; Shadish, et al., 2002). Questions to check both the experimental and product manipulations were included in the design of this research in order to ensure the validity of these two types of manipulation.

3.7.2.3 Suspicion Check

The participants' awareness of the research hypotheses can be a factor that influences the internal validity of the results. This effect is conceptualised as demand characteristics in psychology literature, which infers that the participants form an interpretation of the experiment's purpose and subconsciously change their behaviour accordingly (Orne, 1962). Suspicion check questions are included in the research design to eliminate the possibility of this type of influence by assessing the participants' level of awareness of the research hypotheses. In practice, if particular participants can guess the research hypotheses, their responses will be excluded from the analyses (Abdi, et al., 2009; Ryan, 2007; Shadish, et al., 2002).

3.7.2.4 Control Variables

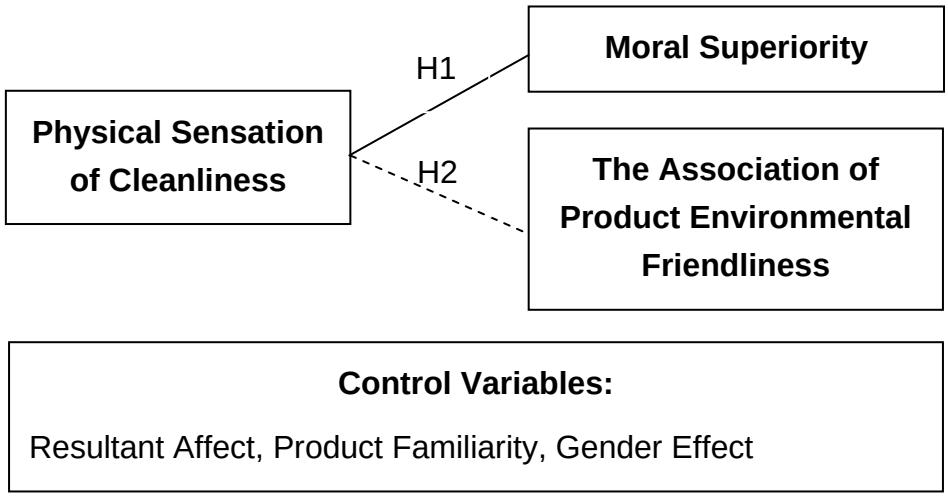
Lastly, control variables are included in the design of the studies in order to exclude the possibility that confounding variables will influence the research findings (Cozby, 2009; Ryan, 2007). For example, gender, green consumer value, price sensitivity, and contamination sensitivity are established as control variables in the third empirical study. Their effect on consumers' green evaluation will be tested or controlled in the statistical analyses (Ryan, 2007).

Chapter 4 Empirical Study 1

4.1 Purpose

The first empirical study is designed to examine the first research hypothesis regarding whether consumers' physical sensation of cleanliness inflates their sense of moral superiority (priming moral superiority) as well as whether this priming effect can be determined by the intensity level of consumers' physical sensation of cleanliness. In addition, a spillover effect is also examined in this study, testing whether consumers' physical sensation of cleanliness influences participants' associations of product environmental friendliness. However, the researcher predicts that consumers' physical sensation of cleanliness would not influence participants' product association due to the reason that there is no metaphorical relationship between the two types of information processes in the brain activities (Johnson, 1993; Lakoff & Johnson, 1980, 1999; Zhong & Liljenquist, 2006; Zhong, et al., 2010). The design of the experiment is reported in the following. The research model is illustrated as Figure 4-1.

Figure 4-1 The Research Model of First Empirical Study



4.2 Design of the Experiment

The study is a single factor between-subject design with three experimental conditions. 75 students from the University of Leeds were recruited with free chocolates as rewards (M_{age}= 24.53, 60% female). Participants came to the study room one at a time and were randomly assigned to either of the experimental conditions. Experimental manipulations and experimental procedures are explained as below.

4.2.1Manipulation of Physical Cleanliness Sensations

Consumers' physical sensation of cleanliness are manipulated through smelling a cleaning scent on a tester, adopted from the prior empirical studies (Holland, et al., 2005; Liljenquist, et al., 2010). Two types of cleaning related products were selected in this study to prime moral superiority: a kitchen cleaner (citrus scented) and an air spray (linen scented). The scent of water was treated as the control condition in this study. The researcher applies this priming technique in manipulating participants' physical sensation of cleanliness and examines how this would influence their subsequent moral and product evaluations.

4.2.2 Procedures

Participants are informed that there are different tasks in this study. The first task is a scent smelling activity where they will be asked to smell the scent on a tester for 10 seconds scented with either a spray of water, citrus cleaner, or air freshener. Right after the smelling task, participants are asked to rate their characters, where the key construct of moral superiority is embedded.

The second task is a product association task. Participants in all experimental conditions will be given an image of a fictitious product, "KitchenShine oven-and-hob cleaner. The researcher informs the participants to rate this product according how they feel based on product design. Several features will be rated by the research participants, including their association of product environmental friendliness.

In the third activity, participants will be given a new tester with the same scent on top. They were asked to smell this tester for another 10 seconds and rated the features of this scent, including the intensity level of this cleaning scent. After these activities, participants were asked to provide background information, including gender, age, and product knowledge of household cleaning product. Meanwhile, a suspicion check question of

participants' awareness about research hypotheses was also included in the questionnaire.

At the very end of the study, participants were debriefed and were asked their consent for the second time regarding whether they still wish to participate in this researcher. None of the participants dropped out from the study.

4.3 Measurements

There were four sections in this questionnaire, the researcher addresses them according to the chronological order in the following discussions.

4.3.1 Moral Superiority

Moral superiority is measured according to the studies from Zhong et al. (2010). They measured this concept by asking participants to rate themselves in comparisons to other undergraduates in the same university on eight different dimensions, including moral character. Their participants were asked to indicate the percentile that described their position relative to others, from 0= *worse than all others* to 100= *better than all others*. In this study, the researcher adopts the same technique but shortened the questionnaire into the three dimensions, which are athleticism, moral character, and sense of humour.

4.3.2 Product Environmental Friendliness

Participants' association of product environmental friendliness is the second dependent variable in the study. It is measured by the following two items conceptualised by the researcher: "This product is environmental friendly" and " I feel this product causes little harm to the environment" The items are measured on a seven-point Likert-type anchored from 1= *Not at all* to 7= *Very much so*. The two items are proved to have a good result in terms of internal consistency (α=.81).

4.3.3 The Intensity Level of the Sensory Stimulus

The researcher also aims to measure the intensity level of sensory stimulus that creates the research participants a physical sensation of cleanliness. This construct is measured by the following two questions conceptualised by the researcher: "This scent eliminates bad odour" and "This scent purifies the air efficiently". They are also measured on a seven-

point Likert-type from 1= *Not at all* to 7= *Very much so*. The two items are proved to have a good result in terms of internal consistency (α=.74)

4.3.4 Control Measures and Background Information

To rule out possible confounding factors that may influence the internal validity of this study, the researcher includes the following measurements in the study so as to investigate their influences on participants' responses.

4.3.4.1 Resultant Affect

Following the relevant empirical studies, the researcher rules out the possibility that participants' resultant affect, potentially can be influenced by their physical sensation of cleanliness, can affect the way they make their evaluations (Liljenquist, et al., 2010; Schnall, Benton, & Harvey, 2008). To this end, the researcher adopted their measurements and asked participants to report their feelings towards the scent they smell in the following two questions: "This scent is disgusting to me" and "I like this scent", measured on a seven-point Likert-type from 1 = *Not at all* to 7 = *Very much so* (α=.74, with the second item reversed).

4.3.4.2 Product Familiarity

To rule out the possibility that participants' familiarity with the brand can influence the way they make product associations, the researcher asked research participants to report "whether they have heard of Ovenshine oven & hob cleaner" and " whether they are familiar with the Ovenshine oven & hob cleaner" on a nominal scale (Yes/ No). Due to the case that the product was a fictitious one, it is expected that none of the participants would recognise this brand.

4.3.4.3 Gender Effect

Gender effect is considered in this study due to the reason that females generally outperformed males in terms of scent detections, discriminations, and recognitions (Bem, 1981; Bone & Ellen, 1999; Doty, 1991a, 1991b; Koelega, 1994; Morrin & Ratneshwar, 2003).

For instance, Koch and her colleagues (2007) studied whether negative olfactory stimuli, inducing negative emotions, influenced people's working memory performance. Their findings suggest that both males and females' working memory performance were significantly impaired due to the negative olfactory stimuli. However, through the fMRI data, they found there were different cerebral mechanisms that caused the negative influences

between male and female participants at the neuron stage. For male participants, their prefrontal and superior parietal regions were more activated due to the induction of the negative olfactory stimuli that influenced their thinking process; as for female participants, they had stronger reactions in the amygdala and the orbitofrontal cortex (OFC) due to the induction of e negative olfactory stimuli.

4.3.4.4 Suspicion Check

To avoid the effect of demanding characteristics that research participants form an interpretation of the experiment's purpose and subconsciously change their behaviour accordingly so as to influence research validity (Orne, 1962), the researcher adopts the technique from (Labroo & Nielsen, 2010) by probing whether research participants can guess the research hypothesis.

To rule out the possibility that gender difference may influence the effect of consumers' physical sensation of cleanliness on their subsequent evaluations, gender effect is considered in this study so as to increase the internal validity of the study. If particular participants can guess the research hypotheses, their responses will be excluded from the analyses (Abdi, et al., 2009; Ryan, 2007; Shadish, et al., 2002). For doing so, the researcher follows the technique from Labroo and Nielsen (2010) by assessing whether researcher participants can guess the purposes of this research.

4.4 Research Hypotheses

In the first empirical study, the research examines how consumers' physical sensation of cleanliness can inflate their sense of moral superiority and can influence their subsequent product association. The two research hypotheses are listed as follows.

4.4.1 H1: Consumers' Physical Sensation of Cleanliness and the Inflated Sense of Moral Superiority

The researcher replicates the prior empirical studies and hypothesises that consumers' physical sensation of cleanliness can inflate their sense of moral superiority, also referred to as priming moral superiority (Zhong, et al., 2010). In addition, the researcher further examines whether

the intensity level of consumers' physical sensation of cleanliness can influence the degree of the effect of priming moral superiority. The researcher makes the following predictions:

1-a: Comparing to the research participants who are not induced to have a physical sensation of cleanliness (smelling the scent of water) will report a lower level of moral superiority than those who are induced (smelling the scent of citrus cleaner or air freshener).

1-b: The intensity level of participants' physical sensation of cleanliness is positively related to the degree the level of moral superiority.

4.4.2 H2: Consumers' Physical Sensation of Cleanliness and Their Subsequent Association of Product Environmental Friendliness

The researcher further examines whether there is a also spill-over effect that participants' subsequent association of product environmental friendliness can be influenced their prior physical sensation of cleanliness. However, the researcher does not expect this spill-over effect due to the reason that there is no metaphorical relationship between the participants' prior physical sensation of cleanliness and their subsequent evaluation of product environmental friendliness. Furthermore, the researcher asks research participants to make this product association based on the image design; as a result, it is expected that research participants will not be influenced by their prior physical sensation of cleanliness (Diamantopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003; Pham, 1996, 1998). The research predictions are listed as follows.

2-a: Participants across the three experimental conditions report similar levels of the association of product environmental friendliness.

2-b: There is no significant relationship between the intensity level of participants' physical sensation of cleanliness and the level of the association of product environmental friendliness.

4.5 Results

4.5.1Preliminary Analysis

In this section, the researcher first performs manipulation check to test whether research participants experienced different intensity levels of physical sensation of cleanliness due to the experimental manipulations. Second, the researcher testes whether moral superiority and the association of product environmental friendliness are independent constructs in the way participants make these two evaluations. Lastly, it is also examined that whether participants' preference towards the scents influenced the way they made their judgments.

4.5.1.1 Manipulation Check

An One Way Analysis of Variance (ANOVA) was conducted to test whether participants perceived different intensity levels of physical sensation of cleanliness due to the experimental manipulations. The results indicated that participants who smelled the scents of the citrus cleaner and the scent of the air freshener reported a significantly higher intensity level of physical sensation of cleanliness ($M_{\text{Water}} = 3.16 < M_{\text{Citrus Cleaner}} = 4.28$, $M_{\text{Air Freshener}} = 4.52$; $F(2, 72) = 10.22$, $p < .05$).

As to examine the gender effect, the results indicated that there were no gender differences in the way they reported the level of purity intensity perceived from each scent ($M_{(\text{Male, Water})} = 3.45$, $M_{(\text{Female, Water})} = 2.92$; $M_{(\text{Male, Citrus Cleaner})} = 4.50$, $M_{(\text{Female, Citrus Cleaner})} = 4.16$; $M_{(\text{Male, Air Freshener})} = 4.60$, $M_{(\text{Female, Air Freshener})} = 4.47$; $p > .10$).

4.5.1.2 The Independence of Moral Superiority and the Association of Product Environmental Friendliness

To examine whether participants' evaluations of moral superiority and the association of product environmental friendliness were independent cognitive outcomes, the researcher conducted Pearson correlation test the relationship. The results indicated that there was no significant relationship between the two constructs ($p=.436$, *n.s*).

4.5.1.3 The Resultant Feelings Caused by Participants' Physical Sensation of Cleanliness and Its Influences on Subsequent Moral and Product Evaluation

The researcher first to examine whether participants reported different levels of feelings towards the scent due to the experimental manipulation. The results indicated that there were no significant differences in the way participants reported their resultant feelings among experimental conditions ($M_{\text{Water}} = 4.48$, $M_{\text{Citrus Cleaner}} = 4.54$, $M_{\text{Air Freshener}} = 5.14$, $p > .10$). Secondly, Pearson correlation tests were conducted to examine the relationship between the resultant feelings and moral superiority as well as the resultant feelings and product associations. The results indicated that neither of the relationships were supported in the analyses ($p > .10$).

4.5.2 Moral Superiority

The researcher first conducted a one-way ANOVA test to investigate whether participants reported different levels of moral superiority due to experimental manipulations. The results indicated that participants from the air freshener and the citrus cleaner conditions reported a significant higher level of moral superiority than those in the water condition ($M_{\text{Air Freshener}} = 79.20$, $M_{\text{Citrus Cleaner}} = 78.56 > M_{\text{Water}} = 67.60$; $F(2, 72) = 5.22$, $p < .05$).

In addition, the results also supports that there is a positive significant linear relationship between the perceived intensity level of participants' physical sensation of cleanliness and the degree of the reported moral superiority (b=.247, p=.005; R^2 =.166). The researcher further examines whether this relationship is supported in all the experimental conditions. To this end, the researcher conducted another regression analysis to test the moderation role of stimulus type on the relationship between the perceived intensity level of the sensation and moral superiority. In this regression model, the researcher included the variables of stimulus types (dummy coded into two categorical levels of citrus cleaner and air freshener; water as the reference level), the perceived intensity level of the sensation (mean centred), and two 2-way interaction product terms. The results indicated one significant and one marginally significant interaction effect of sensory types and efficiency in predicting morality ($\beta_{\text{Citrus Cleaner * Efficiency}} = 6.34$, $p = .01$; $\beta_{\text{Air Freshener * Efficiency}} = 4.45$, $p = .062$). A follow-up analysis was conducted by splitting the data according to sensory types then by regressed moral superiority with purity intensity. The results illustrated that there was a

marginally significant relationships between the intensity level of the sensation and the reported level of moral superiority ($\beta_{\text{Citrus Cleaner}} = 5.66$, $p = .06$; $\beta_{\text{Air Freshener}} = 3.08$, $p = .1$). However, the relationship between the intensity level of the sensation and moral superiority was not supported by the participants' response in the water condition.

The researcher further explores whether gender moderated the effect between the perceived intensity level of the sensation and moral superiority within the citrus cleaner and the air freshener condition. To this end, another regression analysis was conducted by regressing moral superiority with the perceived intensity level of the sensation (mean centred), gender (dummy coded), and the 2-way interaction product term. The results revealed a marginally significant effect of the intensity level of the sensation ($\beta = 3.48$, $p = .09$), and a significant 2-way interaction effect ($\beta = 8.90$, $p < .05$). The whole model explained 22.9 % of variance and the 2-way interaction itself contributed 10.2% of the variance. A follow-up simple slope analysis revealed that the relationship between perceived and moral superiority was supported from the responses of the female participants ($\beta = 6.86$, $p = .001$, $R^2 = .30$) but not from those of the male participants within the citrus cleaner and air freshener conditions.

4.5.3 Physical Sensation of Cleanliness and the Association of Product Environmental Friendliness

Due to the reasons that there is no metaphorical relationship in the brain activities between participants physical sensation of cleanliness and the association of product environmental friendliness and the researcher instructed the research participants to make their product association according to the graphic design, it is expected that participants' association of product environmental friendliness would not be influenced by participants' prior physical sensation of cleanliness. The results supports the predictions. Participants in all experimental conditions expressed similar levels of the association of product environmental friendliness ($M_{\text{Air Freshener}} = 3.40$, $M_{\text{Citrus Cleaner}} = 3.38 > M_{\text{Water}} = 3.18$; $F(2, 72) = .357$, $p > .1$). Moreover, there was no significant relationship between the perceived intensity of the physical sensation of cleanliness and the association of product environmental friendliness ($p > .10$). Therefore, it can be concluded that participants'

association of product environmental friendliness was not influenced by their prior physical sensation of cleanliness in this study.

4.6 Discussion

The researcher summarise the research findings as follows. First, the researcher rules out two confounding factors, resultant mood and product familiarity, that may influence the effect of research participants' physical sensation of cleanliness on their subsequent moral and product evaluation. The resultant mood of the sensation is tested to be an insignificant factor that influenced research participants' moral and product evaluation; none of the participants in the study express that they have heard of or they are familiar with the fictitious product, KitchenShine Oven-and-hob cleaner, in the study. Secondly, the results indicated that research participants' moral evaluation and product evaluation are tested to be independent evaluations. There is no significant linear relationships between the two evaluations.

With regard to whether participants' prior physical sensation of cleanliness inflates their sense of moral superiority (hypothesis 1), the results supports this hypothesis. Participants in the experimental conditions (citrus cleaner and air freshener) condition, reported a higher level of moral superiority than those who were in the control condition (the water condition). Furthermore, the results revealed a positive significant linear relationship between the perceived intensity level of the physical sensation and the degree of the reported moral superiority, indicating that the higher the perceived intensity level of participants' physical sensation of cleanliness, the higher the level of the reported moral superiority.

With regard to the gender effect, the results revealed that the aforementioned linear relationship was moderated by gender: the positive significant relationship between the perceived intensity level of the physical sensation of cleanliness and the reported level of moral superiority only occurred in the female participants.

Lastly, as expected, participants subsequent evaluation of product environmental friendliness were uninfluenced by their prior physical sensation of cleanliness due to the reasons that there is no metaphorical relationship between people's physical sensation of cleanliness and the evaluation of product environmental friendliness and participants were directed to make the evaluation of product environmental friendliness based on the graph design they saw on the mock advertisement.

Chapter 5 Empirical Study 2

5.1 Purposes

The second study is designed to answer the second research hypothesis, which is whether consumers perceive the sensory information that indicates cleaning effectiveness (thereafter perceived cleaning effectiveness) when they are manipulated with a physical sensation of cleanliness. Due to the absence of scales to assess the concept of cleaning effectiveness in the literature, the researcher conceptualises this construct according to chemical properties of the detergents, explained as below.

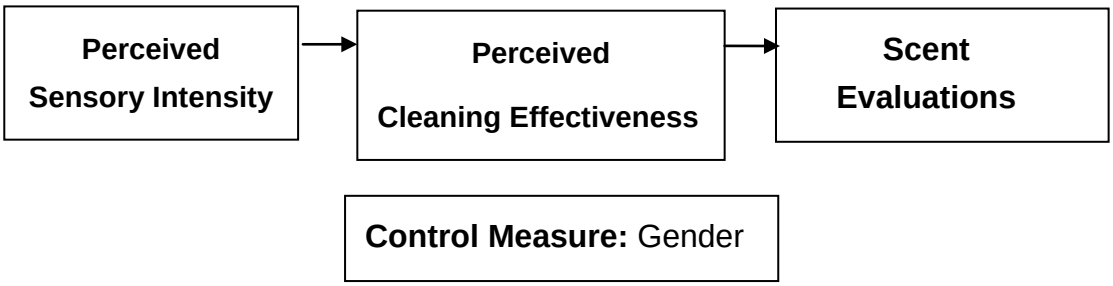
As discussed in the literature review regarding the sensory features of green cleaning products, it is found that green manufacturers use a lower concentration level of chemical synthetics and additional addictives, such as soap, bleaching agents, optical brightness, and perfumes, in the manufacturing process so that their products can be more biodegradable and cause less impact to the environment than regular cleaning products (Chemat & Vian, 2014; Dahlstrom, 2011; Iannuzzi, 2012; Kaushik, 2015; Muniglia, et al., 2014; Ottman, et al., 2006). As a result, green products are milder in terms of sensory features and these sensory features, such as how do cleaning clothes smell like, thus become part of the components that formulate the abstract concept of cleaning effectiveness on the basis of embodied cognition literature (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Williams, et al., 2009).

Due to these facts, the researcher focuses on the following sensory features of a cleaning scent: “how strong it is”, “how artificial it is” and “how chemical it is”. The sensory information of “how strong the scent is” is conceptualised as the construct of perceived sensory intensity which captures participants’ primary responses towards the scent they smell which creates them a physical sensation of cleanliness. The features of “how chemical and how artificial the scent is” are conceptualised as the perceived cleaning effectiveness due to the reason that these two features are part of the information that constitutes a conceptual concept of cleaning effectiveness in consumers’ knowledge structure.

To this end, the researcher conducts this experiment for the following goals: (1) To test the construct dimensionality of perceived cleaning

effectiveness, (2) To test the capability of the constructs of perceived sensory intensity and perceived cleaning effectiveness in capturing people's actual response when they a scent from a cleaning product that creates them a physical sensation of cleanliness, (3) the relationship between perceived sensory intensity and the perceived cleaning effectiveness and (4) the resultant evaluations of the cleaning scents. The research model is illustrated as Figure 5-1.

Figure 5-1 Research Model for Empirical Study 2



5.2 Design and Procedures

5.2.1 Design and Method

It is a single factor within-subject design. 32 students from the University of Leeds were recruited voluntarily for this study (M_{age} = 23.5, female= 56%); they received free chocolate as rewards for their participation. Participants came to the study room one at a time and were informed that this study is to investigate people's reactions and evaluations towards different scents they smell. All the scents they smelled were either from personal cleaning or household cleaning products available in supermarkets. Participants were informed in advanced that this study involved smelling the scents from personal and household cleaning products; they all signed the consent form prior to the study and none of them dropped out of this study.

5.2.2 Materials

The researcher chose six transparent cleaning related products which can manipulate a physical sensation of cleanliness to people. These products were antiseptic wash (for wounds cleaning), foot spray, toner, ironing water, fabric cleaner, and water; water served as baseline in the study. The researcher put all the materials into the same transparent containers, marked with Arabic numbers from 1 to 6 on the bottle. Therefore,

all the cleaning products looked exactly the same to the participants so as to avoid the influences from other external factors on participants' evaluations, such as colour and packaging, etc.

5.2.3 Procedure

Participants were asked to smell the scents of the materials for 10 seconds and reported their evaluations toward the features of the scent respectively. To minimise the contamination from one scent to another, participants were instructed to have a 30 seconds rest, to smell coffee grounds to refresh their scent palettes, and then to smell a piece of paper to recalibrate their scent palettes between each evaluations. This approach is an accepted practice in the fragrance industry to clear the nasal passage and also adopted in prior consumer research (Krishna, Lwin, & Morrin, 2010).

5.2.4 Measurement

5.2.4.1 Perceived Sensory Intensity and Perceived Cleaning Effectiveness

The concept of perceived sensory intensity was measured by the question of "how strong the scent is". The concept of sensory information of cleaning effectiveness was measured by "how artificial the scent is" and "how chemical the scent is", which were conceptualised by the researcher. With regard to participants' evaluations towards the scent, they were asked to rate "this scent is disgusting to me" and "this scent makes me feel good". All the questions were measured in 7-point Likert type scale (from 1= "Not at all" to 7= "Very much so").

5.2.4.2 Scent Evaluations

Participants' evaluations towards each scent were measured by the following two questions: "This scent is disgusting to me" and "This scent makes me feel good" on a 7-point Likert type scale (from 1= "Not at all" to 7= "Very much so").

5.2.4.3 Gender Effects

Gender effect are considered in this study due to the reason that females and males have different level of sensitivity and schema in the way they detect and respond to olfactory stimuli, such as cleaning scents (Bem, 1981; Bone & Ellen, 1999; Doty, 1991a, 1991b; Koelega, 1994; Morrin & Ratneshwar, 2003).

5.3 Results

5.3.1 Dimensionality of the Construct Perceived Cleaning Effectiveness

The researched conducted six exploratory factor analyses (EFA) to test the construct dimensionality of perceived perceived cleaning effectiveness from participants' responses of each scents (Hair, Black, Babin, & Anderson, 2010). The results revealed that the construct of perceived cleaning effectiveness can be subtracted into one factor solution across all experimental conditions. The explained variance were 77.42% and above; the factor loadings were all higher than 0.88. With regard to internal consistency, the researcher conducted six reliability tests and the results revealed that all the Cronbach's alpha values were all higher than 0.8. To sum up, the two measurements for cleaning can be subtracted into single factor dimension construct with satisfactory factor loading values and have satisfactory level of internal consistency. Statistics for exploratory factor analyses and reliability tests are reported as Table 5-1.

Table 5-1 Statistics for EFA and Reliability Tests of the Construct Perceived Cleaning Effectiveness

Item	Antiseptic Water	Foot Spray	Toner	Ironing Water	Leather Cleaner	Water
This scent is artificial (factor loadings)	.797	.916	.875	.801	.847	.774
This scent is chemical (factor loadings)	.797	.916	.875	.801	.847	.774
Eigenvalues	1.60	1.83	1.75	1.60	1.69	1.55
% of variance	79.74	91.55	87.45	80.08	84.65	77.42
KMO	.500	.500	.500	.500	.500	.500
Cronbach's alpha	.744	.895	.846	.727	.817	.696
Mean	5.80	4.13	5.02	4.30	4.41	1.59
SD	1.36	1.62	1.35	1.33	1.33	1.29

5.3.2 Intensity Levels of Cleaning Scent, Perceived Sensory Intensity, Perceived Cleaning Effectiveness and Participants' Resultant Responses

In this section, the researcher examined whether perceived sensory intensity and perceived cleaning effectiveness captured participants' actual responses towards different types of cleaning product scents that creates them a physical sensation of cleanliness. For instance, participants should report the lowest level of perceived sensory intensity and perceived cleaning effectiveness on water because it is odourless and barely contains any chemical synthetics and additional addictives.

The researcher performed repeated measure ANOVA to test whether there were significant differences on the levels of perceived sensory intensity and perceived cleaning effectiveness across different types of cleaning products that creates them a physical sensation of cleanliness. With regard to perceived sensory intensity, the results indicated that participants reported significant different levels of perceived sensory intensity according to the cleaning product scents they smelled in the study ($F(5, 155) = 53.17$, $p < .000$). Participants reported the highest level of perceived sensory intensity on the scent of antiseptic water and the lowest level of perceived sensory intensity on the scent of water. With regard to the levels of perceived sensory intensity from the rest cleaning product scents, there were no significant difference in the way how research participants reported their perceived sensory intensity towards these scents.

With respect to perceived cleaning effectiveness, the results indicated that participants reported significant different levels of perceived cleaning effectiveness towards the six cleaning product scents in the study ($F(5, 155)= 33.27$, $p=.000$). The results were similar to the findings from participants' responses of the perceived level of sensory intensity. They reported the lowest level of perceived cleaning effectiveness on the water scent and the highest level of that on the antiseptic water scent. There were no significant differences among participants' responses of perceived cleaning effectiveness on the rest of cleaning product scents. The mean values are reported as Table 5-2.

Table 5-2 Mean Comparisons for Sensory Intensity and Perceived cleaning effectiveness

Mean	Antiseptic Water	Foot Spray	Toner	Ironing Water	Leather Cleaner	Water
Perceived Sensory Intensity	5.84	3.84	4.88	4.09	3.96	1.06
Perceived Cleaning Effectiveness	5.80	4.13	5.02	4.30	4.41	1.59

Concerning to the gender effect, the results indicated that both male and female participants reported similar levels of perceived sensory intensity and perceived cleaning effectiveness, except a significant difference on the perceived sensory intensity of toner ($M_{Male} = 4.07$, $M_{Female} = 5.50$, $p < .05$), and on the perceived sensory intensity of fabric cleaner ($M_{Male} = 3.29$, $M_{Female} = 4.50$, $p < .05$) as well as a marginally significant difference on the perceived cleaning effectiveness of the antiseptic water ($M_{Male} = 5.32$, $M_{Female} = 6.17$, $p = .08$). The researcher did not observe significant main effect of gender on the rest of tests. The mean values are reported as Table 5-3.

Table 5-3 Gender Difference on Sensory Intensity and Perceived cleaning effectiveness

	Antiseptic Water	Foot Spray	Toner	Ironing Water	Leather Cleaner	Water
Perceived Sensory Intensity	M= 5.57 F= 6.06	M= 3.86 F= 3.83	M= 4.07[a] F= 5.50	M= 4.00 F= 4.17	M= 3.29[a] F= 4.50	M=1.07 F= 1.06
Perceived Cleaning Effectiveness	M= 5.32[b] F= 6.16	M= 3.75 F= 4.42	M= 4.60 F= 5.33	M= 4.32 F= 4.28	M= 4.07 F= 4.67	M= 1.79 F= 1.44

[a] = p<.05; [b] = p<.1

To sum up, the results revealed the constructs of perceived sensory intensity and perceived cleaning effectiveness cue have satisfactory results

to capture people's sensory responses towards different intensity levels of cleaning product scents. Participants reported the lowest level of perceived sensory intensity and perceived cleaning effectiveness on the scent of water as well as the highest level of those on the scent of the antiseptic water. Moreover, male and female participants in general reported similar levels of the two constructs.

5.3.3 Perceived Sensory Intensity and Perceived Cleaning Effectiveness

The following analyses were conducted to examine the relationship between perceived sensory intensity and perceived cleaning effectiveness. The results revealed that there were positive significant relationships between participants' responses of perceived sensory intensity and perceived cleaning effectiveness on each cleaning product scents and water scent: the higher the level of perceived sensory intensity, the higher the level of their responses of perceived cleaning effectiveness. The correlation coefficients are reported as Table 5-4.

Table 5-4 Correlation Coefficients of Sensory Intensity and Perceived cleaning effectiveness

	Antiseptic Water	**Foot Spray**	**Toner**	**Ironing Water**	**Leather Cleaner**	**Water**
Correlation Coefficient	.457** (*p*=.008)	.368* (*p*=.039)	.727** (*p*=.000)	.458** (*p*=.008)	.471** (*p*=.006)	.438** (*p*=.008)

Moreover, participants' responses of perceived sensory intensity and perceived cleaning effectiveness were scent specific in the study. There were no significant relationships between participants' responses of perceived sensory intensity from one scent and the responses of perceived cleaning effectiveness from all the other scents. Therefore, the researcher treated participants' reported sensory intensity and perceived cleaning effectiveness as independent evaluations and got 160 observation values (32 participants * their responses of 5 cleaning products) to generalise the findings.

The researcher regressed perceived cleaning effectiveness with perceived sensory intensity in the model. The results revealed that perceived sensory intensity positively predicted perceived cleaning effectiveness, indicating that participants in the study attributed that strong sensation scents contain a high level of the sensory information of cleaning effectiveness (β = .55, *SE* = .06, *t* = 9.04, *p* < .05, R^2=.341).

With regard to gender effect, the researcher found that there were significant differences between the responses of both perceived sensory intensity (M_{Male} = 4.16, M_{Female} = 4.81, *p* < .05) and perceived cleaning effectiveness (M_{Male} = 4.41, M_{Female} = 4.97, *p* < .05) between male and female participants. Female participants detected a significant higher level of perceived sensory intensity and perceived cleaning effectiveness in this study. Regarding to the moderation effect of gender, the researcher regressed perceived cleaning effectiveness with perceived sensory intensity (mean centred), gender, and the 2-way interaction product term. The results revealed neither gender nor the 2-way interaction product term were significant in the model (*p* > .10). Altogether, it can be seen that even though female participants perceived the same cleaning scent to have a higher level of sensory intensity and cleaning effectiveness, it does not affect the strength of the relationship between perceived sensory intensity and perceived cleaning effectiveness.

5.3.4 Sensory Intensity, Perceived cleaning effectiveness, and Scent Evaluations

In this section, the researcher examined whether perceived sensory intensity and perceived cleaning effectiveness were related to people's evaluations of the scents, which was measured by "This scent is disgusting to me" and "This scent makes me feel good". The researcher reversed coded the first question to formulate the construct of scent evaluations. In the reliability tests, the researcher found that apart from the results in the water condition (α= .273), there was an adequate level of internal consistency regarding participants' evaluations on the five cleaning scents (α= .610 and above). Therefore, the researcher excluded the responses from water condition and conducted the following analyses.

The researcher conducted Pearson correlation tests to examine whether there were significant correlations between perceived sensory intensity and scent evaluations as well as perceived cleaning effectiveness and scent evaluations. The results revealed that perceived sensory intensity did not necessary negatively influence participants' scent evaluation while

participants' scent evaluations of the five cleaning products were negatively significantly influenced by the perceived cleaning effectiveness. All the statistics are reported as Table 5-5.

Table 5-5 Statistics for Perceived Sensory Intensity, Perceived Cleaning Effectiveness and Scent Evaluations

	Antiseptic Water	**Foot Spray**	**Toner**	**Ironing Water**	**Leather Cleaner**
Mean	3.53	5.20	4.58	4.64	5.16
Cronbach's α	1.47	1.11	1.16	1.38	1.06
Correlation I→V	n.s. (*p*=.172)	-.477** (*p*=.006)	-.323 (*p*=.072)	n.s. (*p*=.123)	n.s. (*p*=.522)
Correlation E→V	-.652** (*p*=.000)	-.572** (*p*=.000)	-.471** (*p*=.007)	-.620** (*p*=.000)	-.501** (*p*=.004)

*I→V : the correlation between sensory intensity and scent evaluation

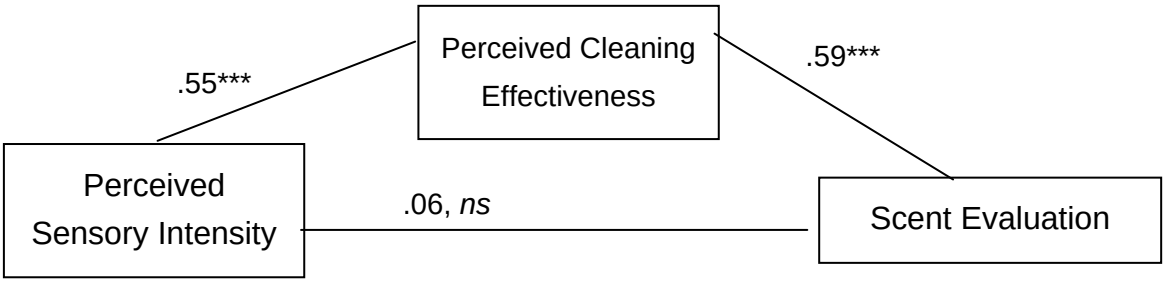
*E→V : the correlation between perceived cleaning effectiveness and scent evaluation

For generalisation, the researcher treated participants' reported perceived sensory intensity, perceived cleaning effectiveness and scent evaluation on the five cleaning scents as independent evaluations and conducted the following analyses (sample size = 160). First, in the Pearson correlation test, the results indicated that both perceived sensory intensity (r = -.427, p < .05) and perceived cleaning effectiveness (r = -.653, p < .05) were significantly correlated to scent evaluation. The researcher regressed scent evaluation with both perceived sensory intensity and perceived cleaning effectiveness and the results indicated that perceived sensory intensity became insignificant in the model (p =.349, n.s.) while perceived cleaning effectiveness was significantly in predicting scent evaluation (β = .55, SE = .067, t = 8.25, p < .05, R^2 = .430). With respect to the gender effect, the results showed that male and female participants reported similar levels of scent evaluations towards the cleaning scents (M_{Male} = 4.70, M_{Female} = 4.56, p > .10). Also in the moderation analyses the results indicated that gender did not moderate the relationship either between perceived sensory intensity and scent evaluation or perceived cleaning effectiveness

and scent evaluation (p > .10). Therefore, it can be seen that participants' scent evaluation was not influenced by gender difference in this study.

Lastly, the researcher conducted mediation analysis to test whether perceived cleaning effectiveness mediated the relationship between perceived sensory intensity and scent evaluation by following the criteria of Baron and Kenny (1986). The results indicated that perceived sensory intensity had a significant effect both on perceived cleaning effectiveness (β = .55, SE = .06, t = 9.04, p < .05) and scent evaluation (β = .36, SE = .06, t = 5.94, p < .05); perceived cleaning effectiveness had a significant effect on scent evaluation (β = .59, SE = .06, t = 10.84, p < .05). The effect of perceived sensory intensity turned insignificant when both perceived sensory intensity and perceived cleaning effectiveness were entered to predict scent evaluation (p =.349, n.s.). The indirect effect was tested to be significant in bootstrapping mediation test (resample size= 5000; β = .304; SE = .050; 95% confidence interval [CI] = .182 to .432) (Preacher & Hayes, 2008; Zhao, Lynch Jr., & Chen, 2010). To conclude, the relationship between perceived sensory intensity and scent evaluation was fully mediated by perceived cleaning effectiveness, indicating that the influence of perceived sensory intensity on scent evaluation was fully explained by the perceived cleaning effectiveness in this study. The path coefficients of the model are reported in Figure 5-2.

Figure 5-2 Mediation Analysis of Sensory Intensity, Perceived cleaning effectiveness, and Scent evaluation



Note: *p < .05; **p < .01; ***p < .001

5.4 Discussion

In this study, the researcher conceptualised the construct of perceived sensory intensity and perceived cleaning effectiveness based on

consumers' actual experiences and the chemical components of cleaning products. The researcher operationalised perceived sensory intensity as "how strong the scent is" and perceived cleaning effectiveness as "how artificial the scent is" and "how chemical the scent is". The researcher chose six different cleaning based products to examine: (1) the dimensionality of the construct perceived cleaning effectiveness, (2) the capability of both perceived sensory intensity and perceived cleaning effectiveness to capture people's actual sensory responses towards different types of cleaning product scents, (3) the relationship between perceived sensory intensity and perceived cleaning effectiveness and (4) the relationships among resultant scent evaluation, perceived sensory intensity and perceived cleaning effectiveness.

The results illustrated that perceived cleaning effectiveness is a single dimension construct with an adequate level of internal consistency from participants' responses on all the cleaning product scents. Moreover, participants reported significant different levels of perceived sensory intensity and perceived cleaning effectiveness according to different intensity level of the cleaning product scents they smelled in the study. Participants reported the lowest level of perceived sensory intensity and perceived cleaning effectiveness on water scent and the highest level of those on antiseptic water.

With respect to the relationships among perceived sensory intensity, perceived cleaning effectiveness, and resultant scent evaluation. The results indicated perceived sensory intensity can predict perceived cleaning effectiveness; both perceived sensory intensity and perceived cleaning effectiveness can predict resultant scent evaluation. There was a gender effect that female participants are more sensitive to olfactory stimuli so that they reported a higher level of perceived sensory intensity and perceived cleaning effectiveness. However, the researcher observed neither a main effect nor a moderating effects of gender in predicting perceived cleaning effectiveness and scent evaluation. Lastly, in the mediation analysis, the results revealed that the effect of perceived sensory intensity on resultant scent evaluation was fully mediated by perceived cleaning effectiveness in the study. In other words, consumers in general prefer to smell a milder cleaning than a strong sensation scent because the former smell less chemical and artificial to consumers due to the fact that they are made by a lower concentration level of chemical synthetics during the manufacturing process.

Chapter 6 Empirical Study 3

6.1 Purpose of the Study

This study was designed to verify the findings from the previous two empirical studies that examines the first two research hypotheses and to investigate whether consumers' physical sensation of cleanliness can influence their subsequent green product evaluation of its product attractiveness, echoing research hypothesis 3, 4, and 5. The design of this study is stated in the following sections.

6.1.1 The Manipulations of Consumers' Physical Sensation of Cleanliness

The researcher uses different techniques in manipulating consumers' physical sensation of cleanliness, asking them to clean their hands with a cleaning wipe. This techniques has been proved to be an effective approach to manipulate this sensation to research participants and it is therefore the researcher adopts this technique to manipulate research participants' physical sensation of cleanliness (Lee & Schwarz, 2010; Preston & Ritter, 2012; Xu, Zwick, & Schwarz, 2012; Zhong, Strejcek, & Sivanathan, 2010).

In addition, the researcher further manipulates different intensity levels of physical sensation of cleanliness to research participants so as to triangulate the findings with regard the possible priming and cueing effect that consumers' physical sensation of cleanliness can have in their subsequent thinking process.

6.1.2 Different Facets of Consumers' Green Product Evaluations

Based on the literature, the researcher examines three types of product attractiveness of a green product, which are Self-based Green Preference (thereafter, SGP), Projective Green Preference (thereafter, PGP) and Dissociative Green Preference (thereafter, DGP) (Epley, et al., 2004; Fisher, 1993; Kruger & Gilovich, 2004; Luchs, et al., 2010).

SGP is conceptualised to capture how the green product, Ecokitchen, is relative attractive than its non-green counterpart, KitchenShine, to participants themselves in this study. PGP is conceptualised to capture how

the green product is perceived to be relatively attractive to other consumers compared to its non-green counterpart. DGP is conceptualised to capture the difference between how attractive green product is to participants themselves and how attractive participants think it would be to other consumers.

6.1.3 Priming Moral Superiority, Cueing Cleaning Effectiveness and Three Types of Green Product Evaluation

There is also a need to investigate how the two possible cognitive effects of consumers' physical sensation of cleanliness can influence their subsequent three types of green product evaluations. In other words, which type of the product evaluation can be influenced by which cognitive effect(s) elicited from consumers' prior physical sensation of cleanliness. The researcher argues this is an important question because the findings can denote the nature of these three types of consumers' green product evaluations. The reasons are as follows.

Firstly, a priming effect or a cueing effect is a kind of psychological effect that certain concept turns ready-to-process in the brain activities due to the prior stimulation. However, this ready-to-process concept can only influence people's subsequent decisions or evaluations under the condition that it is involved in the way how people perform next cognitive task, such as making an evaluation, according to the priming literature (Bargh, 2002; Bargh & Chartrand, 2000; Bargh & Ferguson, 2000; Förster & Liberman, 2007; Higgins, 1996). Psychologists identifies several pre-conditions that determines whether a priming or a cueing effect can influence people's subsequent decision or evaluation; one of them is whether the primed or the cued ready-to-process concept is relevant to people's subsequent decision or evaluation in the brain activities, which is conceptualised as applicability or representativeness in the literature (Avnet, Pham, & Stephen, 2012; Förster & Liberman, 2007; Greifeneder, Bless, & Pham, 2011; Muro & Murray, 2012; Pham, 1996, 1998). If the primed or the cued ready-to-process concept is not relevant to the following decision or evaluation in the brain activities, such ready-to-process information will be ignored in the subsequent evaluation or decision making process.

In this study, the researcher argues that the cued information of cleaning effectiveness or the primed information of moral superiority are both potentially applicable to consumers' three types of green product evaluation due to the reason they are two of the main concerns when consumers

determine how a green product can be attractive to them (Kates, 2001; Koller, et al., 2011; Leonidou, et al., 2010; Mostafa, 2007; Peattie, 2010; Tanner & Kast, 2003; Wu, et al., 2015). However, it is to be determined that which type of the green product evaluation is influenced by the elicited priming or cueing effect from people's physical sensation of cleanliness.

Reversely, if the results suggest a significant relationship between a type of green product evaluation and a type of cognitive effect elicited through people's prior physical sensation of cleanliness (i.e. a significant relationship between SGP and cleaning effectiveness), it implies that consumers' perceived sensory information of cleaning effectiveness from their prior physical sensation of cleanliness is relevant to the their evaluation of how they think the green product is relative attractive to them while the inflated sense of moral superiority is not. In short, the research findings that which type of green product evaluation is influenced by which cognitive effect (perceived cleaning effectiveness, sense of moral superiority, or the interaction of the both) reflects how consumers prioritise the concerns of effectiveness and sustainability in this type of green product evaluation.

To the best of the researcher's knowledge, it is the earliest empirical study that investigates how the two possible cognitive effects from consumers' physical sensation of cleanliness can influence their subsequent three types of green product evaluation of the same green product. It is expected that the findings can further contribute the green marketing literature regarding to the nature of consumers' green product evaluation and the difference between priming moral superiority and cueing moral concerns in influencing consumers' subsequent green product evaluations.

6.1.4 Socio Demographics

The effects of gender and age are considered in this study due to the following reasons.

Gender difference is considered to be a potential factor that influences the way how consumers' physical sensation of cleanliness primes moral superiority and cues cleaning effectiveness due to the empirical findings that females generally outperformed males in terms of scent detections, discriminations, and recognitions (Bem, 1981; Bone & Ellen, 1999; Doty, 1991a, 1991b; Koelega, 1994; Morrin & Ratneshwar, 2003). In this study, the researcher examines whether gender difference influences

the way how consumers' physical sensation of cleanliness prime moral superiority or cues cleaning effectiveness.

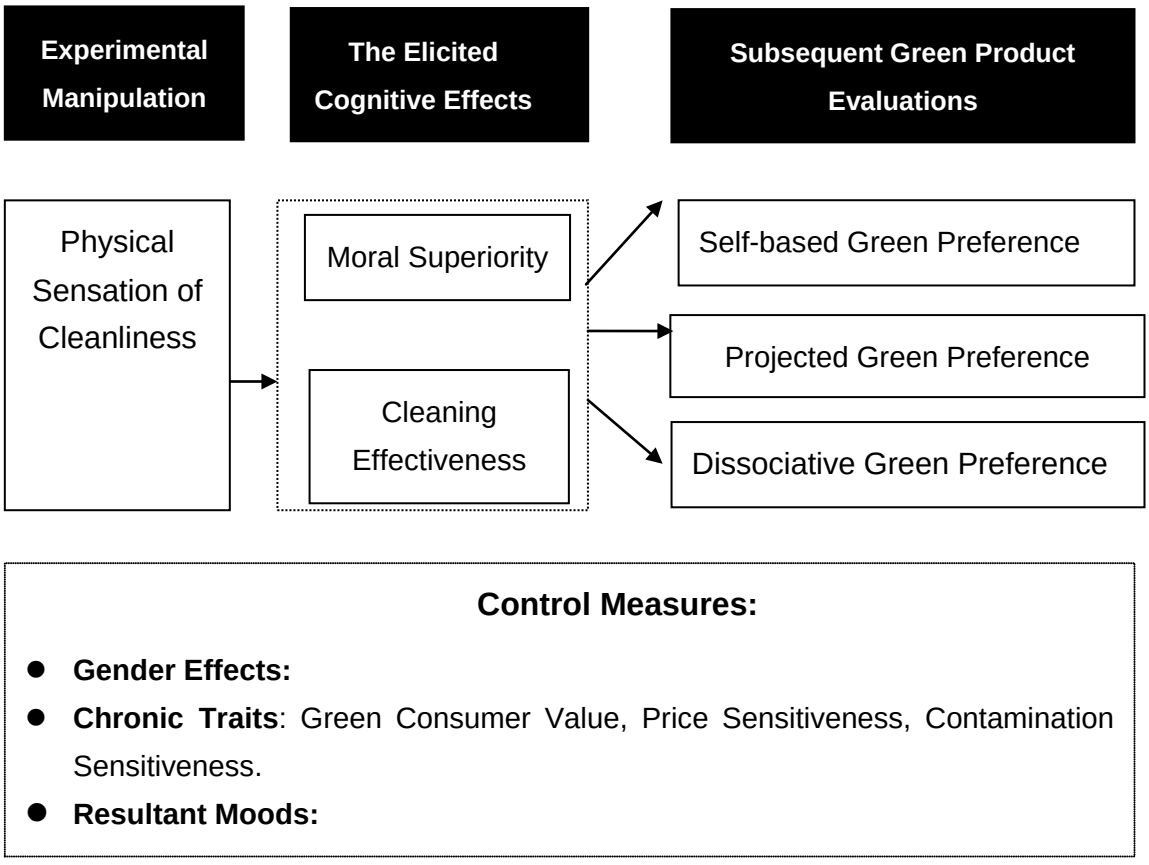
In addition, both gender and age are found to be potential factors that can influence consumers' green behaviours in the prior literature (Blocker & Eckberg, 1997; Bord & O'Connor, 1997; Diamantopoulos, et al., 2003; Schahn & Holzer, 1990; Shrum, McCarty, & Lowrey, 1995). For example, Diamantopoulos et al. (2003) found that females generally express a higher level of positive attitude towards green products than males and senior consumers generally express higher level of positive attitude towards green products than young consumers. Therefore, the researcher will also examine how gender and age influence consumers' green product evaluations.

6.1.5 Other Control Variables

To rule out the possibilities that whether consumers' chronic green consumer value, prices sensitiveness, and sensitiveness to contamination as well as whether their resultant moods induced due to their physical sensation of cleanliness can influence their subsequent three types of green product evaluations, these variables will be statistically controlled in the analyses so as to increase the research validity. Further details about these four variables are introduced form section 6.2.3.2.1 to 6.2.3.2.4.

To conclude, the researcher examines how the two possible cognitive effects from consumers' physical sensation of cleanliness can influence their subsequent green product evaluations under the control of potential confounding variables. The research framework is illustrated as Figure 6-1.

Figure 6-1 Research Framework for Empirical Study 3



6.2 Research Design

6.2.1 Procedures

It is a single factor between-subject design (n=120, M_{age} = 24.3, female= 48%). Research participants were recruited from the University of Leeds, including students and staff, with monetary reward of £5. They were randomly allocated into one of the three experimental conditions: the control condition, the mild sensation condition, and the strong sensation condition. The researcher provided guideline information for all the participants and got their consent prior to the study.

For participants in the strong and mild sensation conditions, they were asked to evaluate a hand wipe at the very beginning of the study. They first smelt the scent from the wipe for 10 seconds; then reported the level of perceived sensory intensity and perceived cleaning effectiveness they perceived from the wipe. Following that, they were asked to clean their hands again with the same wipe (a new one). Participants then were asked to report how clean they feel their hands are (as filter questions) and to report their level moral superiority. Participants in the control condition neither smelled the scent from the cleaning wipe nor cleaned their hands with the wipe; they were only asked to report the level of their moral superiority at the beginning.

After these tasks, participants in all conditions saw the same two oven-and-hob cleaning products, EcoKitchen and KitchenShine, from a mock advertisement. After reading the information, they started to evaluate self-based and projective product attractiveness of these two products as well as other related questions which are used for product manipulation checks.

Then. the researcher assessed all the control measure questions and back ground information questions, including green consumer value, price sensitiveness, contamination sensitiveness, mood assessments, gender, age, and suspicion checks. At the very end, the researcher debriefed to participants and asked their consent to participate the study once again. None of participants guessed the research hypotheses and none of them withdrew from the study.

6.2.2 Experimental Manipulations

6.2.2.1 Manipulation of the Physical Sensation of Cleanliness

The physical sensation of cleanliness is manipulated by asking participants to clean their hands with hand clean wipes. This technique has been tested that it is a reliable tool for manipulating people's physical sensation of cleanliness so that the researcher adopts the same technique in this study (Florack, Kleber, Busch, & Stöhr, 2014; Lee & Schwarz, 2010b; Preston & Ritter, 2012; Schnall, et al., 2008; Zhong & Liljenquist, 2006; Zhong, et al., 2010). Apart from the reasons above, this manipulation technique helps to exclude the possibility that research participants may treat the scent they smell from the hand wipe as the product scent they see from the advertisement, due to the reason that typical hand wipe scents are different from typical oven-and-hob cleaner scents, so as to improve the internal validity of this study.

Second, the researcher attempts to extend prior literature by manipulating different intensity levels of physical cleanliness sensations and examines whether they lead different levels of priming and cueing effects so as to influence consumers' subsequent green product evaluation. To this end, two types of cleaning wipes are used for this study: Boots pharmaceuticals antiseptic wipes and Nieva aloe fragranced face wipes. The two targeted wipes are both used for personal cleaning. Antiseptic wipes contain 5% of alcohol and are designed to cleanse wounds; facial wipes are designed to remove make-up and labelled to be very gentle for facial skins.

A pilot study was conducted to test whether these two wipes elicit different levels of perceived sensory intensity and perceived cleaning effectiveness to the participants. The researcher recruited 40 students from the University of Leeds to participate the study with free chocolates as rewards (M_{age} = 23.38, female = 53%). It was a simple factor between-subject design. Participants were randomly assigned to smell the scent either from the antiseptic wipe or from the aloe wipe, defined as strong and mild sensation conditions. Then, they were asked to report the following three questions: to what extent they feel that "this scent is strong", "this scent is artificial", and "this scent contains a lot chemical" on a 7-point Likert type scale as the assessment for perceived sensory intensity and perceived cleaning effectiveness (from 1= *not at all* to 7= *Very much so*).

The findings were as follows. First, with regard to the dimensionality of the construct perceived cleaning effectiveness, the researcher conducted two EFA and the results indicated that the two questions can both be subtracted into a single dimension construct both in the strong and mild sensation conditions (the values of explained variance are .84 and .88 respectively; factor loadings of each condition were all higher than .9; KMO values were both .5). In terms of internal consistency, the results in the reliability test indicated a good level of internal consistency (α= .809 and .865 respectively).

Then, the researcher conducted two independent sample t tests to examine participants' responses in perceived sensory intensity and perceived cleaning effectiveness. The results supported the experimental manipulations. Participants reported a significant lower level of perceived sensory intensity in mild sensation than in strong sensation condition ($M_{\text{Mild Sensation}} = 4.00$, $M_{\text{Strong Sensation}} = 5.20$, $p < .05$); they also reported a significant lower level of perceived cleaning effectiveness in mild sensation condition than in the strong sensation condition ($M_{\text{Mild Sensation}} = 3.65$, $M_{\text{Strong Sensation}} = 5.40$, $p < .05$). There were no main effects of gender regarding participants' evaluations of perceived sensory intensity and perceived cleaning effectiveness (p=.660 & .671 individually); the researcher did not observe a significant interaction effect of gender on the relationship between perceived sensory intensity and perceived cleaning effectiveness in both conditions ($p > .10$). Therefore, the researcher used face wipe and antiseptic wipe to manipulate strong and mild intensity of the physical cleanliness sensations.

6.2.2.2 Product Manipulations

The researcher creates two fictitious brand names to signify the green product and the non-green counterpart in this study: EcoKitchen and KitchenShine oven-and-hob cleaner. These two products looksd exactly the same in the image design but the researcher put different benefit claims for the two products. Ecokitchen is positioned as mild and natural while KitchenShine is positioned as powerful and effective. Due to the fact that green products are generally more expensive than regular ones, the researcher includes price difference in the product presentation. To this end, the researcher went to three local supermarkets and took notes for the prices of 15 kitchen-cleaning related products. The researcher found that the prices for oven and hob cleaners range from £1 to £4 in these shops; therefore, the researcher picked up the price of £2.99 and £1.69 for

EcoKitchen and KitchesnShine, which were 33rd and 67th percentile in the note. All the product information is illustrated as Table 6-1.

Another pilot study was conducted to examine product manipulations. 29 students and staff from University of Leeds were recruited with free chocolates as rewards (M_{age}= 30.34, female = 58 %). They were asked to read the two products from the advertisement and reported their perception how environmental friendly they feel the both products are ("I feel EcoKitchen/ KitchenShine is environmentally friendly" and "I feel EcoKitchen/ KitchenShien will cause less damage to the environment") and how effective they feel the products are in cleaning ("I think EcoKitchen/ KitchenShine is a powerful cleaner" and "I feel EcoKitchen/ KitchenShine is effective in cleaning). Lastly, to avoid order effect, the researcher counterbalanced the presentation order: about half participants saw the advertisement in which EcoKitchen is on top of KitchenShine (n=15); the others saw the two products with KitchenShine on top.

Exploratory factor analyses with Varimax rotations were conducted to test the dimensionality of the four manipulation check questions. The results indicated a 2-dimension solution in participants' response on cleaning power and environmental friendliness for both products EcoKitche and KitchenShine. Also, there was good internal consistency in consumers' responses regarding the perceived environmental friendliness and efficiency of the two products (α = .749 and above). The statistics for EFA and reliability test are reported in Table 6-2.

The follow up analyses revealed that participants felt EcoKitchen to be significant more environmentally friendly than KitchenShine (p <.05) and felt EcoKitchen to be less effective than KitchenShine in terms of cleaning power (p <.05). Moreover, the researcher did not observe a significant gender effect and an order effect on participants' evaluations of the two product attributes for EcoKitchen and KitchenShine (p >.10).

Table 6-1 Product Designs

	EcoKitchen	**KitchenShine**
Position	Environmental Friendliness	Cleaning Effectiveness
Claims	● Mild on hands; Mild on the environment. ● Plant-based & Bio-degradable ingredients. ● Green Apple Award winner ● Price: £ 2.99	● Tough on grease and tough on dirt. ● Efficient, state-of-the-art formula. ● Voted product of the year ● Price: £ 1.69

Table 6-2 EFA and Reliability Test for Product Manipulation Pilot Study

Item	**EcoKitchen**		**KitchenShine**	
	Environmental Friendliness	**Efficiency**	**Environmental Friendliness**	**Efficiency**
Is environmental friendly.	.932	-	.921	-
Cause less damage to the environment.	.938	-	.916	-
Is a powerful cleaner.	-	.899	-	.901
Is effective in cleaning	-	.917	-	.894
% of variance	44.23	42.44	42.54	40.61
Croanbach's α	.849	.784	.824	.749
Mean (*SD*)	5.81 (.94)	4.45 (.89)	2.85 (.94)	5.69 (.86)

6.2.3 Measurements

In this section, the researcher addresses how the dependent variables of three types of consumers' green product evaluations, moral superiority, and perceived cleaning effectiveness are measured and then addressed how the control variables of green consumer value, contamination sensitiveness, and moods are measured in the study.

6.2.3.1 Dependent Measures

6.2.3.1.1 Green Product Evaluation: SGP, PGP and DGP

Participants were asked to evaluate to what extent the two products are attractive to them based on self and other consumers' perspectives. For the self-perspective, participants were asked to report the following questions: "EcoKitchen/ KitchenShine is attractive to me" and "The product benefits of EcoKitchen/ KitchenShine are appealing to me", which was adopted from Luchs et al. (2010). The two questions can both be subtracted into one dimension construct and revealed good internal consistency from participants' response of both products (α>.7) in this study.

As a result, the researcher conceptualises three types of green product evaluations. The first of which is Self-based Green Preference (SGP), which captures to what extent consumers feel the green product is more relatively more attractive than the other non-green product they see in the study. The second type of green product evaluation is projective green product (PGP) evaluation that captures to what extent consumers perceive the green product is more relatively more attractive than the other non-green product to other consumers in the study. The third type of green product evaluation is dissociative green preference (DGP) that captures the difference in the way how consumers rate the green product attractiveness between the perspective of self and the perspective of others.

6.2.3.1.2 Moral Superiority

The researcher adopts Zhong et al. (2010)'s techniques in measuring moral superiority: asking people to rate to what extent they have a higher level of moral character than his friends or peers. Furthermore, the researcher includes an extra item, kindness, in the design due to the reason that kindness is also an important moral character in the literature (Aquino & Reed, 2002).

In short, in this study, the construct moral superiority is measured through asking people to rate their level of moral character and kindness

comparing to their friends or peers on a 9-point Likert-type scale (where 1 = *definitely lower than others*, 5 = *same as others*, and 9 = *definitely higher than others*). In this study, these two items can be subtracted into a one dimensional construct in the exploratory factor analysis test (78.8% of variance explained; factor loadings=.89; KMO value= .050). With regard to internal consistency, the results indicated a good level of internal consistency in the reliability test (α =.730).

6.2.3.1.3 Perceived Cleaning Effectiveness

Perceived cleaning effectiveness is measured by “how artificial the scent is” and “how chemical the scent is” on a 7-point Likert-type scale, conceptualised by the researcher. In this study, the results revealed that they can be subtracted into a single dimension construct in EFA (80.71% of variance explained; factor loadings=.898; KMO value= .50). The construct also has a satisfactory level of internal consistency in this study (α =.760).

6.2.3.2 Control Measures

Apart from gender and age, the researcher measures the following constructs which might influence how participants’ evolutions in this study.

6.2.3.2.1 Green Consumer Value

First of all, participants’ green value is measured with green consumer value scales (Bearden, Netmeyer, & Haws, 2011; Haws, et al., 2014). It consists six items forming a single dimension. The construct has been tested to be robust enough in terms of reliability and validity and also to be capable to capture participants’ inclinations toward environmental friendly behaviour. In this study, the construct can be subtracted into a one dimensional construct in the EFA with Varimax rotation (73.3% of variance explained; factor loadings=.075; KMO value= .912) and has a good level of internal consistency (α = .924).

6.2.3.2.2 Price Consciousness

Price consciousness scale is included to capture consumers’ chronic tendency of price sensitiveness so as to control the possibility that it might influence participants’ green product evaluations (Lichtenstein, Ridgway, & Netemeyer, 1993). The construct consists four items forming a single dimension. In this study, these four items can be subtracted into a single dimension construct in the exploratory factor analysis test (62.61% of explained variance; factor loadings are .641 and above, KMO= .734). Also,

they were tested to have an adequate level of internal consistency in the reliability test (α =.783).

6.2.3.2.3 Contamination Sensitiveness

To control the possibility that participants' chronic sensitiveness towards contamination could influence their evaluations in the study, obsessive-compulsive disorder (OCD)- contamination subscale was also included as control measure (Goodman, Price, Rasmussen, Mazure, Delgado, et al., 1989; Goodman, Price, Rasmussen, Mazure, Fleischmann, et al., 1989). Compulsive cleaning is an attempt to remove feelings of contamination that threaten one's physical health or mental health (Rachman, 2004). Therefore, it can be seen that people who have a stronger contamination sensitiveness would focus more on physical cleanliness and more likely to have a regular cleaning pattern in their everyday life.

The researcher argues that contamination sensitiveness could be an influential factor to this study due to the following reasons. First, it is likely for a person with a high level of contamination sensitiveness to have a regular and frequent cleaning pattern in their daily routine. However, it is hard to predict whether the chronic contamination sensitiveness would influence people's need of perceived cleaning effectiveness. This tendency may be irrelevant to the green choices. It might lead people to go for powerful cleaning products because they want their oven and hob to be excessively clean.

Second, it is expected that people with a high level of chronic contamination sensitiveness obtain a good level of physical cleanliness in their everyday life, which can be associate with morality according to the literature in the embodied cognition (Holland, et al., 2005; Johnson, 1993; Lakoff & Johnson, 1980, 1999; Zhong & Liljenquist, 2006; Zhong, et al., 2010). In other words, people with a high level of contamination sensitiveness might attribute themselves as more moral so that it might be more likely for them to choose green products.

Due to these concerns, the researcher includes OCD- contamination subscale as a control variable to study consumers' green choices. This construct was measured by the following questions: "In general, I am very concerned with dirt or germs in my living space", "In general, I am very concerned with household cleanliness" and "In general, I am quite bothered by household sticky substances or residues". They were measured on a 7-point Likert type scale (1 = *not at all* to 7 = *very much so*).

In this study, these three items can be subtracted into a single dimension construct in the exploratory factor analysis with Varimax rotation (73.05% of variance explained; factor loadings are 0.69 and above; KMO value= .613). Also, these items have satisfactory level of internal consistency in this study (α = .814).

6.2.3.2.4 Mood Assessments

To control the possibility that people's physical sensation of cleanliness induces participants' different moods which influences their subsequent evaluations. To this end, participants were asked to report their moods, including happy, sad, and calm (1 = *not at all* to 7 = *very much so*).

6.3 Research Hypotheses

6.3.1 Hypothesis 1: Perceived cleaning effectiveness and Moral Superiority as Distinctive Cognitive Outcomes Elicited by people's physical sensation of cleanliness

Based on the literature, the researcher hypothesised that people's physical sensation of cleanliness can cue perceived cleaning effectiveness and prime moral superiority in the brain activities. The former is linked due to a computational relationship between the sensory features of the experimental manipulations (the scents of the cleaning wipes) and the latter is linked due to a metaphorical relationships between people's physical sensation of cleanliness and moral purity (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Ijzerman & Koole, 2011; Landau, et al., 2011; Landau, et al., 2010). Due to the reason that the two relationships are built through different approaches, the researcher hypothesise that they are distinctive information activated by people's physical sensation of cleanliness.

H1: There is no significant correlation relationship between perceived cleaning effectiveness and moral superiority

6.3.2 Hypothesis 2: Consumers' Physical Cleanliness Sensation Cues Perceived cleaning effectiveness

Based on the literature and the second empirical studies, it is demonstrated that consumers can perceive the sensory information that

indicates cleaning effectiveness from their physical sensation of cleanliness (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Williams, et al., 2009). In the third empirical study, the researcher makes the same hypothesis that consumers can perceive the sensory information that indicates cleaning effectiveness form their physical sensation of cleanliness which is manipulated by cleaning their hands with hand wipes. Following the findings from the second empirical study, the research predicts that the higher the intensity level of their physical sensation of cleanliness, the higher the level of perceived sensory information that indicates cleaning effectiveness.

.

H2: The intensity level of consumers' physical sensation of cleanliness positively predicts the level of the perceived sensory information that indicates cleaning effectiveness.

6.3.3 Hypothesis 3: Consumers' Physical Sensation of Cleanliness Inflates their Sense of Moral Superiority

It is illustrated in the literature and from the first empirical study that consumers' physical sensation of cleanliness can inflate their sense of moral superiority due to a metaphorical relationship between the two domains of information in the brain activities (Doron, Sar-El, & Mikulincer, 2012; Holland, et al., 2005; Johnson, 1993; Lakoff & Johnson, 1980, 1999; Schnall, et al., 2008; Zhong & Liljenquist, 2006; Zhong, et al., 2010). In the third empirical study, the researcher makes the same hypothesis and makes the following predictions.

H3.1: For the research participants in the hands with a hand wipe in the study will report a higher level of moral superiority than those who do not.

H 3.1.1: Participants in the strong sensation condition (cleaning their hands with an antiseptic wipe) report a higher level of moral superiority than those who do not (the control condition).

H 3.1.2: Participants in the mild sensation condition (cleaning their hands with an face wipe) report a higher level of moral superiority than those who do not (the control condition).

H 3.1.3: Participants in the strong sensation condition (cleaning their hands with an antiseptic wipe) reports an even higher level of moral

superiority than those in the mild sensation condition (cleaning their hands with an face wipe).

H3.2: The intensity level of consumers' physical sensation of cleanliness positively predicts the level of moral superiority.

6.3.4 Hypothesis 4: Perceived Cleaning Effectiveness, Inflated Moral Superiority, and Self-based Green Preference (SGP)

Due to the fact that both cleaning effectiveness and sustainability are important factors that influence consumers' green product evaluations, it is expected that the above two cognitive effects elicited from consumers' prior physical sensation of cleanliness can have influence on their subsequent green product evaluation (Kates, 2001; Koller, et al., 2011; Leonidou, et al., 2010; Mostafa, 2007; Peattie, 2010; Tanner & Kast, 2003; Wu, et al., 2015). This argument is made according to the psychology literature that only when the cued or the primed ready-to-process concept is relevant to people's subsequent decision or evaluation process in the brain activities so that human brain might automatically include this primed or cued information in the evaluation process (Avnet, et al., 2012; Förster & Liberman, 2007; Greifeneder, et al., 2011; Muro & Murray, 2012; Pham, 1996, 1998).

Furthermore, it is expected that the perceived cleaning effectiveness and the inflated moral superiority have different directions in the way it influences consumers' subsequent green product evaluations. As to the former, it is expected that the perceived cleaning effectiveness can negatively influences the green product evaluation because green products are perceived as mild and not effective to consumers (Cleveland, et al., 2012; Lin & Chang, 2012; Luchs, et al., 2010). As to the latter, it is expected that the inflated sense of moral superiority can positively influence consumers' green product evaluations because green products are positively valued due to its moral benefits be it due to intrinsic or instrumental reasons (Schwartz, 1970, 1977; Zahavi, 1975, 1977; Zahavi & Zahavi, 1997). Therefore, the researcher makes the following predictions regarding how the two cognitive effects, perceived cleaning effectiveness and inflated moral superiority, elicited from consumers' prior physical sensation of cleanliness can influence the evaluation of self-based green preference.

H4: The perceived cleaning effectiveness and the inflated moral purity, elicited by consumers' prior physical sensation of cleanliness, can influence the evaluation of self-based green preference (SGP).

H 4.1: The perceived cleaning effectiveness negatively influences the evaluation of self-based green preference.

H 4.2: The inflated sense of moral superiority positively influences the evaluation of self-based green preference

6.3.5 Hypothesis 5: Perceived Cleaning Effectiveness, Inflated Moral Superiority, and Projective Green Preference (PGP)

Due to the aforementioned reasons, the researcher makes the following predictions with regard to how the two cognitive effects, perceived cleaning effectiveness and inflated moral superiority, elicited from consumers' prior physical sensation of cleanliness can influence this evaluation.

H5: The perceived cleaning effectiveness and the inflated moral purity, elicited by consumers' prior physical sensation of cleanliness, can influence the evaluation of projective green preference (PGP).

H 5.1: The perceived cleaning effectiveness negatively influences the evaluation of projective green preference.

H 5.2: The inflated sense of moral superiority positively influences the evaluation of projective green preference.

6.3.6 Hypothesis 6: Perceived Cleaning Effectiveness, Inflated Moral Superiority, and Dissociative Green Preference (DGP)

Due to the same reasons, the researcher makes the following predictions with regard to how the two cognitive effects, perceived cleaning effectiveness and inflated moral superiority, elicited from consumers' prior physical sensation of cleanliness can influence this evaluation.

H6: The perceived cleaning effectiveness and the inflated moral purity, elicited by consumers' prior physical sensation of cleanliness, can influence the evaluation of dissociative green preference (DGP).

H 5.1: The perceived cleaning effectiveness negatively influences the evaluation of dissociative green preference.

H 5.2: The inflated sense of moral superiority positively influences the evaluation of dissociative green preference.

6.4 Results

In the result section, the researcher first reports manipulation check regarding experimental manipulations: (1) participants experienced a higher level of perceived sensory intensity in the strong sensation than in the mild sensation group and (2) Participants perceived EcoKitchen as more environmental friendly and KitchenShine as more powerful in cleaning.

Second, the researcher examines the hypothesis 1 to hypothesis 3 regarding (1) whether research participants' sense of moral superiority was inflated due to their prior physical sensation of cleanliness, (2) whether research participants perceived the sensory information of cleaning effectiveness from their prior physical sensation of cleanliness, and (3) whether the construct of inflated sense of moral superiority is independent from that of perceived cleaning effectiveness.

In the last three sections, the researcher examines how participants' green product evaluations, including SGP, PGP, and DGP, were influenced by their prior physical sensation of cleanliness.

6.4.1 Manipulation Check

6.4.1.1 Sensory Manipulation

The researcher conducted independent sample t-test to examine whether participants in the strong sensation (antiseptic wipe) condition detected a higher level of perceived sensory intensity than those in the mild sensation condition (face wipe). The results supported our experimental manipulations. Participants in the strong sensation condition reported a higher level of perceived sensory intensity ($M_{\text{Mild Sensation}} = 4.45$, $M_{\text{Strong Sensation}} = 5.40$, $p < .05$).

6.4.1.2 Product Manipulation

6.4.1.2.1 Product cleaning effectiveness

With respect to participants' evaluation on the two oven-and-hob cleaners, the results indicated that participants in all conditions (control, mild sensation, and strong sensation) reported that they felt KitchenShine has a higher level of cleaning power than EcoKitchen ($M_{EcoKitchen}$ = 4.22, $M_{KitchenShine}$ = 5.87, $p < .05$). Research participants rated the level of perceived product cleaning effectiveness for both EcoKitchen and KitchenShine similarly across the three experimental conditions ($p > .10$).

6.4.1.2.2 Product Environmental Friendliness

Regarding product environmental friendliness, participants in all conditions reported that they felt EcoKitchen is more environmental friendly than KitchenShine ($M_{EcoKitchen}$ = 6.06, $M_{KitchenShine}$ = 2.83, $p < .05$). Lastly, research participants rated the level of perceived product environmental friendiness for both EcoKitchen and KitchenShine similarly across the three experimental condition ($p > .10$). All the statistics are listed as Table 6-3.

Table 6-3 Manipulation Check for Product Manipulations

	Overall	**Control**	**Mild**	**Strong**
EcoKitchen Perceived cleaning effectiveness	4.22 (1.15)	4.15 (.95)	4.24 (1.27)	4.28 (1.23)
KitchenShine Perceived cleaning effectiveness	5.87 (.90)	5.81 (.77)	5.85 (1.03)	5.94 (.90)
EcoKitchen Environmental Friendliness	6.06 (.78)	6.16 (.82)	5.95 (.80)	6.06 (.71)
KitchenShine Environmental Friendliness	2.83 (1.05)	2.88 (1.11)	2.79 (1.00)	2.84 (1.06)

To conclude, the results supports the experimental manipulations that participants in the strong sensation condition reported a higher level of perceived sensory intensity than those in the mild sensation condition. All participants perceived that KitchenShine is more effective in cleaning power

and EcoKitchen is more environmental friendlier than the counterpart in the study.

6.4.2 Hypothesis 1-3: Consumers' Physical Sensation of Cleanliness, Perceived Cleaning Effectiveness and Inflated Moral Superiority

In this section, the researcher conducted series of statistical testing to examine (1) perceived cleaning effectiveness and inflated moral superiority are distinctive cognitive effects elicited by consumers' prior physical sensation of cleanliness, (2) research participants perceived the sensory information of cleaning effectiveness from their prior physical sensation of cleanliness, and (3) research participants' sense of moral superiority was inflated due to their prior physical sensation of cleanliness.

6.4.2.1 H1: The Independent Relationship Between Perceived Cleaning Effectiveness and Inflated Moral Superiority

The researcher first examines whether perceived cleaning effectiveness and inflated moral superiority, elicited through participants' physical sensation of cleanliness are independent constructs so that they can be treated as distinctive cognitive effects. To this end, an exploratory factor analysis (EFA) with Varimax rotation was conducted to check the dimensionality of the four questions that measured the two constructs. The results revealed a two-factor solution about construct dimensionality. The two dimensions explained 43.12% and 41.51% of variance individually; the KMO value of the EFA is 0.515, indicating a indicating mediocre result in terms of sample size appropriateness (Kaiser, 1974). The rotated factor loadings are all higher than 0.9 and the cross-factor loadings are all less than 0.15.

In addition, the researcher also conducted a Pearson correlation test and the results indicated that there was no significant relationship between the two constructs (p =.141, n.s.). To conclude, the results supported the hypothesis that perceived cleaning effectiveness and inflated moral superiority are two distinctive cognitive outcomes elicited by participants' physical sensation of cleanliness.

6.4.2.2 H2: Consumers' Physical Sensation of Cleanliness and Perceived Cleaning Effectiveness

The researcher predicts that (1) research participants who were in the strong sensation condition perceived a higher level of perceived cleaning effectiveness than those in the mild sensation condition and (2) there is a positive significant relationship between the level of perceive cleaning effectiveness and the intensity level of participants' physical sensation of cleanliness.

To test this hypothesis, the researcher conducted independent sample t test to examine whether participants in the strong sensation condition reported a higher level of perceived cleaning effectiveness than those in the mild sensation condition and the results also supports this prediction ($M_{\text{Mild Sensation}} = 4.00$, $M_{\text{Strong Sensation}} = 4.86$, $p < .05$). In addition, the researcher also found a positive significant relationship between the level of perceive cleaning effectiveness and the intensity level of participants' physical sensation of cleanliness (B =.467, p =.000, R^2 =.194), which also supported the researcher's prediction.

With regard to gender differences, the researcher found that there is a marginally significant difference between male and female participants on their responses of perceived cleaning effectiveness (M_{Male}= 4.74, M_{Female} = 4.13, p =.055). The follow-up analysis revealed that male participants reported a significant higher level of perceived cleaning effectiveness than female participants in the strong sensation condition (M_{Male} = 5.34, M_{Female} = 4.14, p <.05); there were no significant differences between their responses in the mild sensation condition (M_{Male} = 5.34, M_{Female} = 4.14, p >.10). In addition, gender did not moderate the relationship between perceived sensory intensity and perceived cleaning effectiveness in the regression analysis (p = .211, *n.s.*). A possible explanation for these findings is that females in general have more developed schema on olfactory cues than males so that they did not feel the scent of antiseptic wipe only conveyed a moderate level of perceived cleaning effectiveness.

6.4.2.3 H3: Consumers' Physical Sensation of Cleanliness and Inflated Moral Superiority

In this section, the researcher examines the following relationships. First, did participants from both strong sensation and mild sensation conditions report a higher level of moral superiority than those in the control

condition? Second, was there a significant relationship between the intensity level of participants' physical sensation of cleanliness and the reported level of moral superiority in research? Third, was there a significant relationship between the level of participants' reported chronic contamination sensitiveness and the level of their reported moral superiority?

First, the researcher conducted a One-way ANOVA to examine whether there were significant differences on participants' report of moral superiority among the three experimental conditions. The results revealed that participants in the control condition reported a significant lower level of moral superiority than those in the strong and mild sensation conditions ($M_{\text{Control}} = 6.02$, $M_{\text{Mild Sensation}} = 6.48$, $M_{\text{Strong Sensation}} = 6.68$, $p < .05$). A post hoc analysis revealed that participants in the strong sensation condition reported significant higher level of moral superiority than those in the control condition ($p < .05$); participants in the mild sensation condition reported marginally significant higher level of moral superiority than those in the control condition ($p = .091$). There were no significant difference in participants' responses of moral superiority between the strong and mild sensation conditions ($p > .10$).

With respect to the relationship between the perceived intensity level of participants' physical sensation of cleanliness (thereafter, perceived sensory intensity) and the level of reported moral superiority, the results indicated a positive significant relationship between the two variables (B=.282, p=.002, R^2=.113). Thirdly, the results also indicated that there was a positive significant relationship between the level of participants' chronic contamination sensitiveness and the level of their reported moral superiority (B=.280, p=.012, R^2=.078). Therefore, the researcher conducted another regression analysis in which both perceived sensory intensity and contamination sensitiveness were entered in the model. The results revealed that both variables are significant in the model, indicating that both perceived sensory intensity and contamination sensitiveness can predict morality ($B_{\text{Perceived sensory intensity}} = .272$, $B_{\text{Contamination Awareness}} = .279$, R^2=.184). With regard to the gender effect, the results revealed that both male and female participants reported a similar level of moral superiority ($M_{\text{Male}} = 6.28$, $M_{\text{Female}} = 6.53$, $p > .10$). Gender neither moderated the relationship between perceived sensory intensity and morality nor between contamination sensitiveness and morality ($p > .10$).

To sum up, it can be seen that participants' sense of moral superiority can be positively influenced by both their incidental physical sensation of cleanliness and their chronic contamination sensitiveness. These findings

support the literature and empirical studies regarding the metaphorical relationship between the physical domain of cleanliness and the moral domain of purity (Doron, et al., 2012; Holland, et al., 2005; Johnson, 1993; Lakoff & Johnson, 1980, 1999; Schnall, et al., 2008; Zhong & Liljenquist, 2006; Zhong, et al., 2010).

6.4.3 Control Variable Testing

In this section, the researcher examines the following relationships. First, was green consumer value influenced by participants' physical sensation of cleanliness in this study? Second, did participants' chronic price sensitiveness and contamination sensitiveness influence the three types of green product evaluations? Third, did participants' moods were influenced by their prior physical sensation of cleanliness?

6.4.3.1 The physical sensation of cleanliness and Green Consumer Value

Green consumer value, measured by asking people to report to what extent they feel themselves as environmentally friendly consumers in their everyday consumption pattern, was found to significantly influence participants' evaluation of self-based green preference and dissociative green preference (discussed in the sections of 6.4.4 and 6.4.6). However, there is a need to clarify whether green consumer value was influenced by experimental manipulations so as to determine whether to treat this construct as a control variable or as a dependent variable in the analysis.

To justify the relationship, the researcher proposes three hypothetical correlations between consumers' physical sensation of cleanliness and green consumer value. First, did participants report different levels of green consumer value among three experimental conditions? Second, was there a significant correlation between the level of moral superiority and the level of green consumer value? Third, was there a significant correlation between perceived cleaning effectiveness and green consumer value? If none of the hypothetical correlations are supported by the analyses, it is reasonable to position green consumer value as a chronic trait of research participants and treat it as a control variable in the following analyses.

The researcher first conducted a One-way ANOVA to examine whether research participants reported significant different levels of green consumer value across the three experimental conditions. The results revealed that there were no significant differences in the way the researcher

participants reported the level of their green consumer value across the three experimental conditions ($M_{Control}$ = 4.67, $M_{Mild\ Sensation}$ = 5.07, $M_{Strong\ Sensation}$ = 5.09, p >.10). Second, the researcher conducted a Pearson correlation test to examine the correlation relationship between green consumer value and moral superiority; the result also rejected this congestion (p >.10). Third, the researcher conducted another Pearson correlation test to examine the correlation relationship between green consumer value and perceived cleaning effectiveness, the result was also insignificant in the analysis (p >.10).

Additionally, the researcher examined whether male and female participants reported different levels of green consumer value through performing an independent sample t test; the results revealed that there were no significant differences between their responses on green consumer value (M_{Male} = 4.91, M_{Female} = 5.24, p >.10). Moreover, gender did not moderate any of the aforementioned hypothetical relationships through the factorial ANOVA and the regression tests (p > .10).

To conclude, there is no statistical evidence to support that green consumer value was influenced by the experimental manipulations. Participants in all experimental conditions reported a similar level of green consumer value; green consumer value was neither correlated to moral superiority nor correlated to perceived cleaning effectiveness in the study. Moreover, in the additional analysis, the results indicated that there were neither main effects nor moderation effects of gender on green consumer value. Therefore, the researcher treats green consumer value as a chronic trait which were uninfluenced in the study.

6.4.3.2 Price Sensitiveness and Contamination Sensitiveness

The researcher examines whether participants reported different levels of price sensitiveness and contamination sensitiveness across experimental conditions as well as whether they influenced participants' three types of green product evaluations. The results indicated that there was a marginally significant difference in participants' responses of price sensitiveness and there was no significant difference on their responses of contamination sensitiveness. A Post hoc analysis revealed that participants in the mild sensation group revealed a marginally significant lower level of

price sensitiveness than those in the control condition (*p*=.055). The statistics are reported as Table 6-4.

Table 6-4 Price Sensitiveness and Contamination Sensitiveness

	Control	**Mild sensation**	**Strong sensation**	***F* test and *p* Value**
Price Sensitiveness	4.89	4.20	4.53	*F*(2,117) =2.87; *p* =.061
Contamination Sensitiveness	5.45	5.40	5.69	*F*(2,117) =.779; *p*=.461

However, in the Pearson correlation test, neither price sensitiveness nor contamination sensitiveness were found as significant predictors to influence the three types of green product evaluations. The statistics are reported as Table 6-5.

Table 6-5 Correlations Between Price Sensitiveness and Contamination Sensitiveness with Three Types of Green Product Evaluations

	SGP	**PGP**	**DGP**
Price Sensitiveness	*n.s*. (*p*=.223)	*n.s*. (*p*=.660)	*n.s*. (*p*=.973)
Contamination Sensitiveness	*n.s.* (*p*=.564)	*n.s.* (*p*=.319)	*n.s.* (*p*=.658)

6.4.3.3 Mood Assessments

The researcher also examines whether participants' physical sensation of cleanliness influenced their moods, which might be influential sources for the subsequent judgments. The researcher first conducted a Oneway ANOVA to investigate whether participants reported different levels of moods due to the their prior physical sensation of cleanliness. The results revealed that participants reported similar levels of happiness, sad, and calm among the three experimental conditions (*p* >.10). The mean values are reported in Table 6-6.

Table 6-6 Mood Assessments

	Control	Mild Sensation	Strong Sensation	F test and *p* Value
Happy	4.64	5.25	4.88	$F(2,117)= 2.10$; $p=.128$
Sad	1.41	1.51	1.53	$F(2,117)= .161$; $p=.851$
Calm	6.00	6.18	5.90	$F(2,117)= .494$; $p=.494$

Moreover, in the follow-up correlation tests, the results indicated that participants' three types of green product evaluations were not correlated to any of the resultant moods in the study. Therefore, the researcher rules out the possibility that participants' physical sensation of cleanliness influenced their moods so as to affect their three types of green product evaluations. The statistics are reported as Table 6-7.

Table 6-7 Correlations Between Moods and Three Types of Green Product Evaluations

	SGP	PGP	DGP
Happy	*n.s.* ($p=.536$)	*n.s.* ($p=.822$)	*n.s.* ($p=.584$)
Sad	*n.s.* ($p=.563$)	*n.s.* ($p=.823$)	*n.s.* ($p=.616$)
Calm	*n.s.* ($p=.735$)	*n.s.* ($p=.815$)	*n.s.* ($p=.486$)

6.4.3.4 Summary

In summary, the researcher excludes the possibility that participants' three types of green product evaluations were influenced by the following factors: price sensitiveness, contamination sensitiveness, and moods. These constructs were tested to be insignificantly correlated with these three evaluations. With regard to green consumer value, there is no sufficient evidence to support that it was influenced by participants' prior physical sensation of cleanliness, which is therefore treated as a chronic trait of research participants and statistically controlled in the following analyses.

6.4.4 H4: Perceived Cleaning Effectiveness, Inflated Moral Superiority, and Self-based Green Preference (SGP)

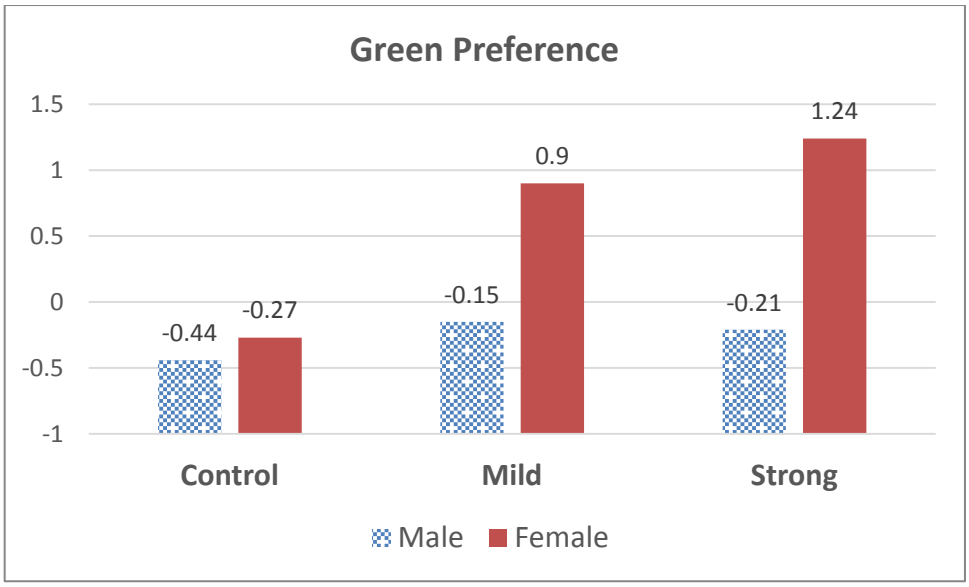
Self-based green preference was conceptualised to capture to what extent EcoKitchen, the green product, is more attractive than KitchenShine to participants themselves. The researcher first conducted a Oneway ANOVA to examine whether participants reported different levels of self-based green preference (SGP) across the three experimental conditions; the results revealed a marginally significant difference in participants' evaluation of SGP among the three experimental conditions ($M_{Control}$ = -.36, $M_{Mild\ Sensation}$ = .38, $M_{Strong\ Sensation}$ = .55, p =.09). A post hoc analysis revealed that participants in the strong sensation condition expressed a significant higher level of SGP than those in the control condition ($p < .05$); participants in the mild sensation condition expressed a marginally significant higher level of SGP than those in the control condition (p =.099); there were no significant differences on participants' responses of SGP between the strong and the mild sensation condition.

The researcher conducted several Pearson correlation tests and an independent sample t-test to examine whether moral superiority, green consumer value, and gender influenced the evaluation of SGP. The results revealed that apart from moral superiority (p =.953, *n.s.*), green consumer value (r =.557, p =.000), and gender (M_{Male} = -.274, M_{Female} = .681, $p < .05$) influenced the evaluation of SGP. The researcher conducted a Oneway ANCOVA to test the influences of all the aforementioned variables on SGP. The results indicated that the condition variable was not significant in the model; while green consumer value and gender were still significant in the model (p =.000 and .048 respectively; R^2=.345).

Therefore, it can be seen that there is no sufficient evidence to argue that the evaluation of SGP was influenced by participants' prior physical sensation of cleanliness. However, it is worthy of notice that male and female participants had different response patterns in the way they made the evaluation of SGP. The researcher split the data according to gender and conducted two Oneway ANOVAs to examine whether male and female participants expressed different levels of SGP due to their prior physical sensation of cleanliness. The results indicated that the male participants rated a similar level of SGP across the three experimental conditions (F (2, 59) =.142, p =.868) while there were marginally significant differences in the way how female participants made the evaluation of SGP across the three experimental conditions (F (2,57) = 2.79, p=.07). A post hoc analysis

revealed that the female participants in the mild sensation condition expressed a marginally significant higher level of SGP than those in the control condition ($M_{Control}$ = -.265, $M_{Mild\ Sensation}$ = .900, p =.086) and the female participants in the strong sensation condition expressed a significant higher level of SGP than those in the control condition ($M_{Control}$ = -.265, $M_{Strong\ Sensation}$ = 1.24, p < .05). The results are illustrated as Figure 6-2.

Figure 6-2 Gender Effect on SGP

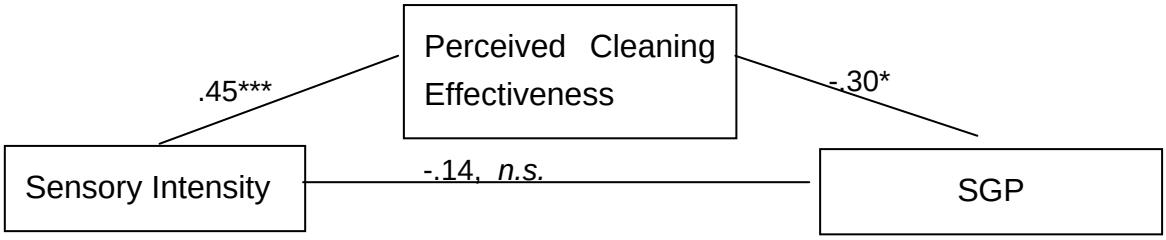


To further determine whether the intensity level of the sensation (sensory intensity) and the perceived sensory information of cleaning effectiveness (perceived cleaning effectiveness) influenced the evaluation of SGP, the researcher conducted the following analyses. First, the researcher conducted a Pearson correlation test to examine the correlations among SGP, sensory intensity, perceived cleaning effectiveness, moral superiority, green consumer value, and gender. The results revealed that apart from moral superiority (p =.505, *n.s.*) there were significant correlations between all the other variables ($r_{Sensory\ Intensity}$ = -.228, p =.042; $r_{Perceived\ Cleaning\ Effectiveness}$ = -.276, p =.013; $r_{Green\ Consumer\ Value}$ = .562, p =.000; r_{Gender} =.312, p =.005). The researcher regressed SGP with the aforementioned four variables in the model; the results revealed that apart from sensory intensity (p=.328, n.s.), perceived cleaning effectiveness, green consumer value, and gender were tested to be significant in the model ($B_{Green\ Consumer\ Value}$ = .867, p =.000; $B_{Perceived\ Cleaning\ Effectiveness}$ = -.347, p =.007; B_{Gender} = .859, p=.020; R^2= .454), indicating that the perceived sensory information of cleaning

effectiveness elicited through participants' prior physical sensation of cleanliness negatively influenced the evaluation of SGP while controlling the influences of green consumer value and gender in the model.

To test whether perceived cleaning effectiveness mediated the relationship between sensory intensity and SGP (green consumer value and gender as control variables), the researcher followed the criteria of Baron and Kenny (1986) and performed the following analyses. First, perceived sensory intensity was found a significant predictor to predict perceived cleaning effectiveness (B = .449, *p* =.000) and SGP (B = -.277, *p* =.043); perceived cleaning effectiveness was also found a significant predictor to predict SGP (B = -.298, *p* = .036). The effect of perceived sensory intensity turned insignificant when perceived cleaning effectiveness was entered in the model (*p* = .328, *n.s.*). The indirect effect was tested to be marginally significant both in bootstrapping mediation test (resample size= 5000; B=-.134; SE=.094; 90% confidence interval [CI] = -.327 to -.009) and Sobel test (Z= -1.89, *p*=.058) (Preacher & Hayes, 2008; Zhao, et al., 2010). The results revealed a marginally significant full mediation effect of perceived cleaning effectiveness on the relationship between perceived sensory intensity and SGP; the path coefficients are reported in Figure 6-3.

Figure 6-3 Mediation Analysis of Sensory Intensity, Perceived Cleaning Effectiveness, and Self-based Green Preference (SGP)



Note: *$p < .05$; **$p < .01$; ***$p < .001$

To conclude, participants in the mild sensation and strong sensation conditions reported a higher level of SGP than those in the control condition but there is no direct evidence to justify that participants' prior physical sensation of cleanliness boosted the evaluation of SGP in the study. However, the results revealed that female participants both in mild sensation and strong sensation conditions reported a marginally significant higher level of SGP than those in the control condition, implying that there was probably

other psychological effect elicited by participants' physical sensation and this effected influenced female participants' evaluation of SGP but not male participants. In addition, it is found that in the context of making the evaluation of SGP, it was perceived cleaning effectiveness rather than inflated moral superiority that influenced this evaluation: perceived cleaning effectiveness negatively influenced influence the evaluation of SGP.

The researcher argues that there are two possible explanations for this result. First, it appears that people focus more on the aspect of cleaning effectiveness when it comes to the evaluation of SGP. Therefore, even though both participants perceived the sensory information of cleaning effectiveness and their sense of moral superiority were inflated due to their prior physical sensation of cleanliness; it was only the former that systematically influenced SGP but not the latter. Second, the mediation role of perceived cleaning effectiveness on the relationship between sensory intensity and SGP reveals that even though the evaluation of SGP can be negatively influenced when consumers perceived a high level of cleaning scent, this negative effect happens only under the condition that consumers perceives the same cleaning scent as chemical and artificial, which indicates cleaning effectiveness.

6.4.5 H5: Perceived Cleaning Effectiveness, Inflated Moral Superiority, and Projective Green Preference (PGP)

Projective green preference (PGP) is conceptualised to measure to what extent participants percieve Ecokitchen will be relatively more popular than KitchenShine to other consumers. This type of assessment is categorised as the projective technique which helps to provide to probe different angles about people' evaluations and this technique is particularly helpful in finding people's hidden thoughts behind their moral or pro-social related to evaluations (i.e., how green you are as a consumer) (Epley, et al., 2004; Fisher, 1993; Kruger & Gilovich, 2004; Luchs, et al., 2010). As a result, it is expected that the evaluation of PGP can help to probe a different angle regarding how research participants feel rate the green product they see in the study.

The researcher conducted a Oneway ANOVA to test whether participants expressed different levels of PGP due to their prior physical sensation of cleanliness. The result revealed that participants in all conditions felt EcoKictehn would be less popular than KitchenShine to other consumers in a similar manner ($M_{Control} = -.925$, $M_{Mild\ Sensation} = -1.06$, M

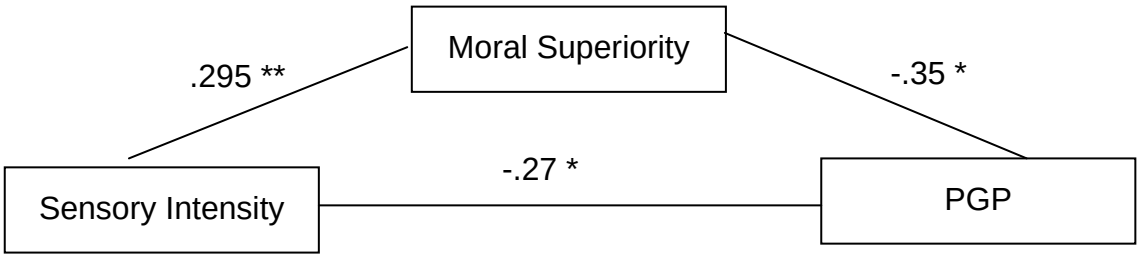
$_{\text{Strong Sensation}}$ = .-.750, p > .10). To test the influence of other focal predictors, the researcher conducted a Pearson correlation test and an independent sample t-test to examine whether moral superiority, green consumer value, and gender influenced participants' evaluation of PGP. The results revealed that green consumer value was not a significant predictor to predict PGP (p =.311, *n.s.*); the researcher found that there was a significant correlation between PGP and moral superiority and age as well as a marginally significant correlation between PGP and gender (r_{Morality} =-.217; r_{Age} =.402, p=.000; r_{Gender} =-.217, p=.085). The researcher regressed PGP with both moral superiority and age. The results revealed that both predictors were significant in the model (B_{Morality} = -.295, p =.006; B_{Age} = .103, p =.000; R^2 =.221).

To further examine how the evaluation of PGP was influenced by participants prior physical sensation of cleanliness within the strong sensation and mild sensation conditions, the researcher performed the following analyses. Firstly, in the Pearson correlation test, the results revealed that there were significant correlation relationships between PGP and perceived sensory intensity as well as PGP and moral superiority ($r_{\text{Perceived sensory intensity}}$ =-.357, p =.001; r_{Morality} = -.293, p= .008; r_{Age} =.399, p =.000). Green consumer value, gender, and perceived cleaning effectiveness were not significantly correlated to PGP (p =.150, .103, .524 respectively). The researcher performed a regression analysis in which perceived sensory intensity, moral superiority, and age were treated as predictors to predict PGP, the results indicated that all the three predictors were significant in the model ($B_{\text{Sensory Intensity}}$ = -.273, p=.043; $B_{\text{Moral Superiority}}$ = -.346, p=.029; B_{Age} = .110, p=.000; R^2=.291).

To further test whether moral superiority mediated the relationship between sensory intensity and PGP (age as a control variable), the researcher followed the criteria of Baron and Kenny (1986) and performed the following analyses. First, perceived intensity was found as a significant predictor to predict moral superiority (B =.295, p =.002) and PGP (B = -.346, p =.029); perceived cleaning effectiveness was also found as a significant predictor to PGP (B =-.375, p =.004). The effect of sensory intensity remained significant in the model when moral superiority was also entered in (B =-.273, p=.043). The indirect effect was tested to be significant in bootstrapping mediation test (resample size= 5000; B = -.110; SE = .127; 95% confidence interval [CI] = -.231 to -.021) (Preacher & Hayes, 2008; Zhao, et al., 2010). To conclude, it can be seen that there was a significant

partial mediation effect of moral superiority on the relationship between perceived sensory intensity and PGP. The path coefficients are reported in Figure 6-4.

Figure 6-4 Mediation Analysis of Sensory Intensity, Moral Suepriority and Projective Green Preference (PGP)



Note: *p < .05; **p < .01; ***p < .001

It can be seen that consumers' perception of other consumers' preferences, conceptualised as PGP in this study, is more moral (sustainability) oriented than effective oriented. Therefore, it was moral superiority instead of perceived cleaning effectiveness that significantly predicted PGP. Participants in general felt that EcoKitchen would be less popular than KitchenShine in the market. The higher the degree of their moral superiority, the higher the degree that they felt EcoKitchen would relatively even less popular to other consumers. Moreover, the researcher observed a marginally significant partial mediation effect of moral superiority which indicates that perceived sensory intensity, a feeling that this cleaning scent is strong, could negatively influence Consumers' evaluation of PGP; this effect was partially explained by the activation of moral superiority in the evaluation process.

6.4.6 H6: Perceived Cleaning Effectiveness, Inflated Moral Superiority, and Dissociative Green Preference (DGP)

Dissociative green preference was conceptualised to capture the gap between how attractive Ecokitchen is to participants themselves comparing to their perceptions of that to other consumers. The results indicated that participants across all experimental conditions felt that EcoKitchen is more attractive to themselves than to others. With regard to whether the experimental manipulation influenced the evaluation of DGP, the researcher

performed a Oneway ANOVA and the results indicated a marginally significant difference on participants' evaluation of DGP across the three experimental conditions ($M_{Control}$ = .325, $M_{Mild\ Sensation}$ = .938, $M_{Strong\ Sensation}$ = .850, p =.06) A post hoc analysis revealed that participants in the mild sensation condition reported a significant higher level of DGP than those in the control group; participants in the strong sensation condition reported a marginally significant higher level of DGP than those in the control group (p=.029 and .060 respectively).

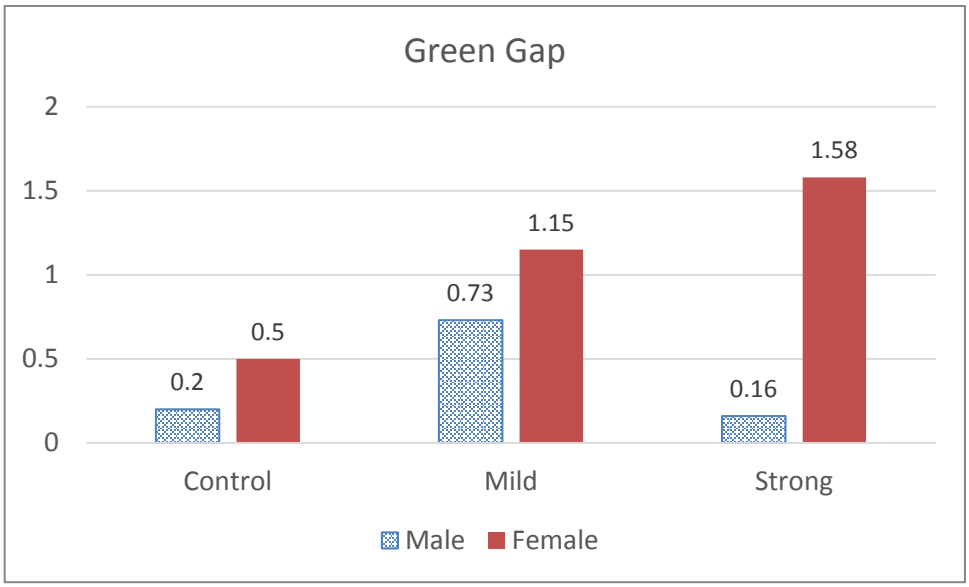
The researcher conducted the Pearson correlation tests and an independent sample t test to examine whether gender, green consumer value and moral superiority were significantly correlated to the evaluation of DGP. The results revealed that there were marginally significant correlation between DGP and green consumer value (r =. 437, p=.000) as well as marginally significant correlation between DGP and moral superiority (r =.153, p=.096). There were also significant differences between male and female participants on their responses of DGP. Male reported a significant lower level of DGP than female participants (M_{Male} = .355, M_{Female} = 1.08, p <.05).

To control the effect of the aforementioned factors, the researcher conducted a Oneway ANCOVA, treating gender, moral superiority, and green consumer value as covariates, to examine whether participants' evaluation of DGP was significantly influenced by their prior physical sensation of cleanliness. The results indicated that the condition variable and moral superiority turned insignificant in the model; green consumer value and gender were tested as significant predictors in the model (p =.000 and .009 respectively; R^2=.302).

Similar to the findings about self-based green evaluation (SGP), there was no sufficient evidence to argue the evaluation of DGP were influenced by consumers' prior physical sensation of cleanliness. However, the researcher also explored that male and female had different patterns in the way they made the evaluation of DGP. By splitting the data according to gender, the researcher conducted a Oneway ANOVA to test how male and female participants evaluated DGP across the three experimental conditions. The results revealed that male participants evaluated DGP in a similar way across the three experimental conditions (F (2, 59) = 1.49, p =.235) while female participants made this evaluation differently due to their prior physical sensation of cleanliness (F (2, 55) = 3.20, p =.048). A post hoc analysis revealed that female participants in the strong sensation condition reported a

significant higher level of DGP than those in the control condition ($M_{Control}$ = 0.50, $M_{Strong\ Sensation}$ = 1.48, p=.015). The results are illustrated as Figure 6-5.

Figure 6-5 Gender Effect on DGP



To further examine how the evaluation of DGP was influenced by participants' prior physical sensation of cleanliness within the strong sensation and the mild sensation conditions, the researcher conducted the following analyses. First, the Pearson correlation tests and an independent sample t tests were performed to determine whether sensory intensity, perceived cleaning effectiveness, moral superiority, green consumer value, and gender influenced the evaluation of DGP. The results revealed that there was a significant relationship between DGP and green consumer value (r =. 337, p=.001) and there was significant differences between males and females on their evaluation of DGP (M_{Male} = .45, M_{Female} = 1.32, p=.001). Sensory intensity, perceived cleaning effectiveness, and moral superiority were found insignificantly correlated to DGP (p=.328 and above).

However, the researcher observed an interaction effect of moral superiority and perceived cleaning effectiveness on DGP. A multiple regression analysis was performed where moral superiority, perceived sensory intensity, the 2-way interaction product term, as well as the control variables of gender and green consumer were entered. The results revealed that gender, green consumer value, and the 2-way interaction product term were significant in the model (B_{Gender} = .749, p=.003; $B_{Green\ Consumer\ Value}$ = .336, p=.001; $B_{Moral\ Superiority*\ Perceived\ cleaning\ effectiveness}$ = -.209, p=.014). The

whole model explains 31.3% of variance; the interaction product term contributed 5.9% of variance in the model.

To further illustrate how the evaluation of DGP were influenced by the interaction effect of perceived cleaning effectiveness and moral superiority, the researcher applied Johnson-Neyman technique to probe the conditional effect of moral superiority according to values of perceived cleaning effectiveness (Bauer & Curran, 2005; Hayes, 2013; Spiller, Fitzsimons, Lynch Jr., & McClelland, 2013). This approach illustrates the entire range of the values of the moderator so as to probe where the simple effect is significant as well as where it is not. The results indicated that moral superiority heightened the evaluation of DGP, feeling that Ecokitchen is far attractive to themselves than to other consumers, under the condition that value of perceived cleaning effectiveness is -.549 standard deviation below the mean value. In other words, the evaluation of DGP were positively significantly influenced by the inflated sense of moral superiority caused by participants' prior physical sensation of cleanliness; however, this positive influenced was significant only under low levels of perceived cleaning effectiveness that was concurrently elicited by participants prior physical sensation of cleanliness. The contingency table is illustrated as Table 6-8.

Table 6-8 The Conditional Effect of Moral Superiority (IV) on DGP (DV) Based on the Values of Perceived cleaning effectiveness (Moderator)

Perceived cleaning effectiveness by SD	b	se	t	*p*	LLCI(b)	ULCI(b)
-2.4313	**.5721**	**.2091**	**2.7364**	**.0078**	**.1554**	**.9888**
-2.1813	**.5250**	**.1916**	**2.7408**	**.0077**	**.1432**	**.9068**
-1.9313	**.4779**	**.1747**	**2.7353**	**.0078**	**.1297**	**.8261**
-1.6813	**.4308**	**.1588**	**2.7128**	**.0083**	**.1143**	**.7473**
-1.4313	**.3837**	**.1441**	**2.6626**	**.0095**	**.0965**	**.6709**
-1.1813	**.3366**	**.1310**	**2.5687**	**.0123**	**.0754**	**.5977**
-.9313	**.2895**	**.1201**	**2.4098**	**.0185**	**.0501**	**.5289**
-.6813	**.2424**	**.1120**	**2.1638**	**.0338**	**.0191**	**.4656**
-.5486	**.2174**	**.1091**	**1.9930**	**.0500**	**.0000**	**.4347**
-.4313	.1953	.1073	1.8193	.0730	-.0186	.4092
-.1813	.1482	.1065	1.3907	.1685	-.0642	.3605
.0688	.1011	.1097	.9211	.3600	-.1176	.3197
.3188	.0539	.1165	.4630	.6448	-.1783	.2862
.5688	.0068	.1264	.0541	.9570	-.2451	.2587
.8188	-.0403	.1387	-.2904	.7724	-.3166	.2361
1.0688	-.0874	.1528	-.5719	.5691	-.3919	.2171
1.3188	-.1345	.1682	-.7993	.4267	-.4698	.2008
1.5688	-.1816	.1847	-.9829	.3289	-.5498	.1866
1.8188	-.2287	.2020	-1.1321	.2613	-.6313	.1739
2.0688	-.2758	.2199	-1.2543	.2137	-.7140	.1624
2.3188	-.3229	.2382	-1.3556	.1794	-.7976	.1518
2.5688	-.3700	.2569	-1.4404	.1540	-.8820	.1419

6.5 Discussion

In this study, the researcher investigates whether the three types of green product evaluation, namely self-based, projective and dissociative green evaluation, were influenced by the inflated sense of moral superiority and perceived cleaning effectiveness elicited by consumers' prior physical sensation of cleanliness. The research findings are integrated as follows.

Firstly, the results verifies the findings from the first two empirical studies that consumers can perceive the sensory information that indicates cleaning effectiveness as well as consumers' sense of moral superiority can be inflated due to their prior physical sensation of cleanliness (H1 & H2). Furthermore, the two cognitive effects are tested that they are distinctive to each which supports the third research hypothesis that they two different cognitive effects elicited concurrently. Lastly, the researcher also found

As to how participants' subsequent three types of green product evaluations were influenced by the two cognitive effects elicited by their prior physical sensation of cleanliness, the results illustrated that they were influenced by different elicited cognitive effects respectively (H3 to H5). With regard to the evaluation of self-based green preference (SGP), the results revealed that participants in the strong sensation and the mild sensation conditions expressed a marginally significant higher level of SGP than those in the control condition but there is no sufficient evidence to justify that SGP was significantly by consumers' prior physical sensation of cleanliness. However, additional analyses revealed that there was a significant increase on female participants' in the way they evaluated the SGP, implying that there might be a third cognitive effect elicited by consumers' physical sensation of cleanliness so as to boost this increases[1].

To further examine how the evaluation of SGP were influenced by the perceived cleaning effectiveness and inflated moral superiority within the participants who were in the strong sensation and mild sensation condition, the results revealed that the evaluation of SGP was negatively influenced by

---

[1] The argument is made based on the following statistics: (1) There were no significant differences between male and female participants regarding their green consumer value in all experimental conditions (p= .393, .441, and .353 respectively). (2) In the control condition, there were no significant differences between male and female participants on their evaluations of green preference (p= .782).

perceived cleaning effectiveness elicited by their prior physical sensation of cleanliness.

As to the context of evaluating projective green preference (PGP), the findings demonstrated that it was inflated moral superiority, instead of perceived cleaning effectiveness, that significantly influenced this evaluation. Lastly, with regard to the evaluation of dissociative product evaluation (DGP), a similar finding was found that participants in the strong sensation and the mild sensation conditions expressed a marginally significant higher level of DGP than those in the control condition; yet there is no sufficient evidence to justify that DGP was significantly by participants' prior physical sensation of cleanliness. Similarly, additional analyses revealed that there was a significant increase on female participants' in the way they evaluated the DGP, implying that there might be a third cognitive effect elicited by consumers' physical sensation of cleanliness so as to boost this increases

With regard to which of the elicited cognitive effects influenced the evaluation of PGP, the results demonstrated that this evaluation was influenced by the interaction effect of the perceived cleaning effectiveness and inflated moral superiority. A follow up analysis revealed that DGP was positively significantly influenced by the inflated sense of moral superiority only under low levels of cleaning effectiveness perceived concurrently.

Chapter 7 Conclusion

This chapter begins with a summary of the research findings compared with the theoretical contributions in the literature before moving on to section 7.2 to revisit the five research questions presented in the Introduction chapter. Section 7.3 contains some implications for marketing practitioners in terms of how to convince consumers to purchase green products, as well as how to utilise sensory stimuli in the marketing environment to achieve their marketing goal. The limitations of the research are discussed in section 7.4 and some recommendations are made for future research in this field to conclude the study.

7.1 Summary of the Findings

Three empirical studies were conducted to test the five research hypotheses. How the findings support or reject these hypotheses are addressed below.

7.1.1 H1: Consumers' Physical Sensation of Cleanliness and their Inflated Sense of Moral Superiority

This hypothesis was tested in the first and the third empirical study. The results suggests that consumers' sense of moral superiority can be inflated by their prior physical sensation of cleanliness. In the first empirical study, the research participants who smelled a scent of an cleaning product (the scent of an citrus cleaner and that of air freshener in the experimental manipulation) expressed a significant higher level of moral superiority than those who smelled the water scent (the control condition).

As to the third empirical study, the results also revealed that the research participants who were in the two hand-cleaning conditions (cleaning their hands with an antiseptic wipe and a face wipe) expressed a significant higher level of moral superiority than those who did not clean their hands (the control conditions). With to respect to the relationship between the perceived intensity level of the physical sensation of cleanliness and the level of reported moral superiority, the results from the first and third

empirical study both proved a positive significant relationship between the two. Lastly, it is also worthy of notice that in the third empirical study, the results suggest that the level of consumers' chronic contamination sensitiveness, which makes them constantly make them to main a high hygienic level in their surroundings, also positively significantly related to their reported moral superiority in the study. This finding also supports the literature regarding consumers' physical sensation of cleanliness and their moral superiority.

To conclude, the findings echo the literature that consumers' sense of moral superiority can be inflated due to their prior physical sensation of cleanliness (Zhong, et al., 2010). Furthermore, the researcher further explores that the intensity level of consumers' physical sensation can be positively related to how this sensation can inflate the sense of moral superiority as well as the level of consumers' chronic contamination can be positively related to the level of reported moral superiority which have not yet been texted in the prior literature regarding people's physical cleanliness and moral superiority (Fayard, Bassi, Bernstein, & Roberts, 2009; Holland, et al., 2005; Liljenquist, et al., 2010; Preston & Ritter, 2012; Zhong, et al., 2010)

7.1.2 H2: Consumers' Physical Sensation of Cleanliness and the Perceived Sensory Information that Indicates Cleaning Effectiveness

Based on the literature, the researcher hypothesised that while experiencing a physical sensation of cleanliness, consumers can perceive the sensory of information of cleanliness that indicates cleaning effectiveness from the scent of the cleaning agent which makes them physically clean. The findings from the second and third empirical studies both support this hypothesis and suggests that the intensity level of the cleaning agent that creates consumers a physical sensation of cleanliness is positively related the level of the perceived sensory information that indicates cleaning effectiveness.

7.1.3 H3: The Co-existence of the Aforementioned Two Cognitive Effects from Consumers' Physical Sensation of Cleanliness

The findings from the third empirical study provide initial evidence to this hypothesis. Firstly, the level of the primed and the cued effect from consumers' physical sensation of cleanliness are proved to be independent in the study. Secondly, consumers' subsequent three types of green product evaluations are tested to be significantly influenced by either of the two cognitive effects respectively. To the best of the researcher's knowledge, this is one of the earliest studies that hypothesises and empirically investigates two possible cognitive effects that consumers' physical sensation of cleanliness can elicit; it is expected that this finding helps to contribute the existing literature about the cognitive effect elicited from consumers' prior physicals sensation of cleanliness (Gollwitzer & Melzer, 2012; Holland, et al., 2005; Lakoff & Johnson, 1999; Lee & Schwarz, 2010a, 2010b; Liljenquist, et al., 2010; Preston & Ritter, 2012; Schnall, 2011; Schnall, et al., 2008; Xu, Zwick, & Schwarz, 2012; Zhong & Liljenquist, 2006; Zhong, et al., 2010)

7.1.4H4 to H6: Consumers' Physical Sensation of Cleanliness, the Two Elicited Cognitive Effects, and the Subsequent Three Types of Green Product Evaluations

These three hypotheses are tested in the third empirical study. The results support these research hypotheses that consumers' subsequent three types of green product evaluations can be influenced by the two elicited cognitive effects from their prior physical sensation of cleanliness, though context specific. As to the evaluation of self-based green preference (SGP), the findings suggest that this evaluation can be negatively influenced by the perceived sensory information that indicated cleaning effectiveness elicited by consumers' prior physical sensation of cleanliness; the inflated sense of moral superiority did not influence the evaluation of SGP in the study. Concerning to the evaluation of projective green preference (PGP), the findings suggest that this evaluation can be negatively influenced by inflated sense of moral superiority but not the perceived cleaning effectiveness. With regard to the valuation of projective dissociative

preference (DGP), the findings suggest that this evaluation can be positively influenced by the inflated sense of moral superiority only under the condition that low levels of the sensory information of cleaning effectiveness perceived concurrently. A summary table of research hypothesis testing is presented as Table 7-1 at next page.

Table 7-1 A Summary Table of Research Hypothesis Testing

Hypothesis	Findings
H1: Consumers' physical sensation of cleanliness inflates their sense of moral superiority.	Supported
H2: Consumers perceive the sensory information that indicates cleaning effectiveness from their physicals sensation of cleanliness	Supported
H3: The effects of inflating consumers' sense of moral superiority and making consumers to perceive the sensory information that indicates cleaning effectiveness are independent cognitive effects that elicited from consumers' prior sensation of cleanliness	Supported
H4: The evaluation of self-based green preference (SGP) can be influenced by consumers' prior sensation of cleanliness H 4-1: The inflated sense of moral superiority can influence the evaluation of SGP H 4-2: The perceived sensory information of cleaning effectiveness can influence the evaluation of SGP	 Rejected Supported
H5: The evaluation of projective green preference (PGP) can be influenced by consumers' prior sensation of cleanliness H 5-1: The inflated sense of moral superiority can influence the evaluation of PGP H 5-2: The perceived sensory information of cleaning effectiveness can influence the evaluation of PGP	 Supported Rejected
H6: The evaluation of dissociative green preference (DGP) can be influenced by consumers' prior sensation of cleanliness H 5-1: The inflated sense of moral superiority can influence the evaluation of DGP H 6-2: The perceived sensory information of cleaning effectiveness can influence the evaluation of PGP ● It is found that the evaluation of DGP can be influenced by the interaction effect if perceived cleaning effectiveness and inflated moral superiority	 Rejected Rejected

7.2 Research Questions Revisited

7.2.1 RQ1-RQ2: Does the intensity level of consumers' physical sensation of cleanliness influence the way it inflates people's sense of moral superiority and makes people perceive the sensory information that indicates cleaning effectiveness

The research findings suggest that there is a positive significant relationship between the perceived intensity level of consumers' physical sensation of cleanliness and the reported level of moral superiority, as well as between the perceived intensity level of consumers' physical sensation of cleanliness and the perceived level of the sensory information that indicates cleaning effectiveness.

7.2.2 RQ3: How does consumers' physical sensation of cleanliness influence green product evaluation?

Based on the literature, the researcher examines whether the elicited two cognitive effects from consumers' physical sensation of cleanliness can influence three types of green product evaluations. The findings suggest that these three types of green product evaluations can be influenced by either of the two elicited cognitive effects based on the evaluation context as discussed in section 7.1.4.

These findings also provide implications to the green marketing literature by further delineating the nature of consumer's green product evaluations. It can be seen that it is an effectiveness oriented decision when consumers determine how attractive a green product is to them while it is a moral oriented decision when they determine whether a green product will be attractive to other consumers. This difference in terms of prioritising whether to go effectiveness or to go green echoes the literature regarding people unconsciously set different standards in making pro-social related evaluations based on their self-perception and their perception of others (Epley, Keysar, Van Boven, & Gilovich, 2004; Fisher, 1993; Kruger & Gilovich, 2004; Mason, 1950; Robertson & Joselyn, 1974).

Luchs et al. (2010) found that such effect also happens in the context of green product evaluation and their studies demonstrated that consumers'

hidden concern that green cleaning products are not effective can be revealed by comparing the level of how they rate this green product is attractive to themselves and the level of how they rate the same green product can be attractive to other consumers: the former is found significantly higher than the latter in their studies. The researcher captures this evaluation gap and conceptualised it as dissociative green product evaluation (DGP) in this research. The results not only verify the findings from Luch et al. (2010)'s that consumers tend to express a significant higher level of self-based green product attractiveness compared to the level of projective based product attractiveness. Furthermore, a boundary of this effect is also probed: such positive evaluation gap can be inflated by consumer's sense of moral superiority only under the condition that low levels of cleaning effectiveness perceived concurrently. In other words, this positive evaluation gap is mainly driven by consumers' sense of moral superiority; however if consumers' awareness of cleaning effectiveness is elicited concurrently, they tend to rate a green product to have a same level of product attractiveness regarding how this green product is attractive to me and how they perceive the same green product is attractive to other consumers.

7.2.3 RQ4: What is the difference between the influence of priming moral superiority and cueing moral concerns on consumers' green evaluation?

Differences can be seen between the two approaches in influencing consumers' evaluation of green products. As for cueing moral concerns, it can be seen that the likelihood of green choices can be promoted due to the reason that it heightens the concern of sustainability in the evaluation process (Goldstein, Cialdini, & Griskevicius, 2008; Kronrod, Grinstein, & Wathieu, 2011; Peloza, White, & Shang, 2013; White, MacDonnell, & Ellard, 2012; White & Simpson, 2013).

With regard to the effect of priming moral superiority on consumers' green product evaluation, it was expected that consumers would express a higher level of self-based green preference because choosing a green product can symbolically demonstrate their moral superiority (Griskevicius et al., 2010; Holland et al., 2005; Liljenquist et al., 2010; Sexton & Sexton, 2014). The findings does not support the initial hypothesis. It suggest that

the self-based green product evaluation is effectiveness oriented so that it was not systemically influenced by moral superiority in the study. However, moral superiority is found negatively influencing projective green product evaluation: a high level of moral superiority makes me feel other consumers won't find green products attractive because they are less moral (environmental friendly) than me. This finding echoes Zhong et al. (2010)'s research that a clean self makes harsh moral judgment due to the inflation of moral superiority.

To conclude, it can be seen that consumers' green product evaluation can be influenced if they are either cued with moral concerns or primed with moral superiority. The effects are however different. Cueing moral concerns makes consumers aware of the issue of sustainability so as to make green products more attractive to consumer themselves. However, cueing moral superiority can only make consumers feel that other consumers won't be that attracted by green products because the self-based green product evaluation is effectiveness oriented instead of sustainability oriented.

7.2.4 RQ5: Can a single stimulus simultaneously cue and prime different aspects of information to consumers?

The research findings provide initial evidence to support the proposition that, in some contexts, it is likely that a single stimulus can simultaneously have a cueing and priming effect on consumers' cognitive process. As in the case of consumers' physical sensation of cleanliness, it is found that it can inflate consumers' sense of moral superiority and make consumers perceive the sensory information that indicates cleaning effectiveness. These elicited two cognitive effects were proved to be independent in the way how research participants responded in the study. Furthermore, they were also proved to influence participants' evaluations of SGP and PGP respectively as well as to have an interaction effect on the evaluation of DGP. Altogether, these evidences support the research hypothesis that they can be elicited simultaneously from single source of experimental stimulus.

It expected that this research contributes the embodied cognition literature regarding studying how people's thinking process can be influenced by their body sensations. Prior researchers only investigated a single elicited cueing or priming effect from people's body perceptions (i.e., Hung & Labroo, 2011; Labroo & Nielsen, 2010; Larson & Billeter, 2013;

Thomas & Tsai, 2012; Zhang & Li, 2012). In this paper, the researcher demonstrated the capability of consumers' body perception in eliciting two distinctive cognitive effects that can influence their subsequent green product evaluations following the embodied cognition literature (Anderson, 2003; Bargh, et al., 2012; Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003; Damasio, 1994; Lakoff & Johnson, 1999; Landau, et al., 2010; Meier, et al., 2012; Williams, et al., 2009). To the best of the researcher's knowledge, this is the earliest empirical study that investigates the capability of a person's physical sensation in influencing their subsequent judgment through dual ways, which provides a new angle for future human cognition and consumer behaviour researchers to investigates the effects of human's body sensation in influencing their subsequent choices or behaviours.

7.3 Practical Implications

In this study, the researcher provides the implications for marketing practitioners in the following domains. First, it provides further insights in how to promote green products to consumers. Second, it underpins the importance of a product scent in product design. Thirdly, it also addresses the importance of the sensory cues in the shopping environment because it may influence consumers' choices. These three practical implications are discussed as follows.

Firstly, with regard to the nature of consumers' green product evaluation. Previous green marketing researchers suggest that it is likely to promote consumers to go green through the use of moral related claims. However, the research findings provide a different angle regarding this. It is suggested in the research findings that consumers' self-based green product evaluation is effectiveness oriented instead of moral oriented. A possible explanation is that consumers unconsciously prioritise the issue of effectiveness and the issue of sustainability differently in accordance with evaluation context due to ego-centric reasons. Therefore, as to deciding whether a green product is attractive to me, consumers generally care more about cleaning effectiveness instead of sustainability because they perceive themselves environmental friendly and morally enough so that it is the former that determined research participants' self-based green product evaluation in the study. Contrastingly, when it comes to deciding whether a green product would be popular to other consumers, consumers tend to focus on the level of other consumers' environmental friendliness in this

evaluation context. As a result, the researcher suggests green marketers to focus more on the effectiveness claim than the sustainability claim to encourage consumers to buy green products due to the reason that it is more a pragmatic question than a moral question to consumers.

Secondly, product scent is proved to be an important factor in influencing consumer behaviour according to this research. According to the literature and research findings, it can be seen that consumers determine the level of cleaning effectiveness of a cleaning product through scents: the contained chemical synthetics, such as the bleaches and perfumes, are the sensory cues that signal consumers how effective this cleaning product can be. Therefore, the researchers suggest to green cleaning products manufacturers that it is essential for them to ensure that the product scents are moderately strong and chemical (referring to the bleach and the perfume scents disseminated from the product) to consumers because consumers generally focus on the issue of cleaning effectiveness in their self-based decisions while product scents are the key in conveying this to consumers.

Lastly, the research findings underpin the importance of sensory cues in the marketing environment to influence consumers' evaluation of green products. It is suggested that sensory cues can influence the way in which consumers make an evaluation through a cognitive approach, signalling certain concepts and making them more ready to be processed in the brain activities. In terms of consumers' physical sensation of cleanliness, it is found that this type of sensation can activate different aspects of information through priming and cueing due to the metaphorical and computational relationship between consumers' physical sensation of cleanliness and the two activated concepts. Therefore, the researcher suggests marketing practitioners to make good use of the sensory cues in signalling consumers certain information which can potentially influence consumers' product evaluations, be it computational or metaphorical based.

7.4 Research Limitations

7.4.1 Actual Brain Responses

In this research, the sensory inputs of perceived cleaning effectiveness and the reported level of moral superiority were measured as a proxy to assess the effect of knowledge activation in the evaluation process

caused by a sensation of physical cleanliness. It is an accepted practice in the field of social psychology to capture the phenomenon of knowledge activation at the meta-cognitive stage (Förster & Liberman, 2007; Fiedler, 2003; Higgins, 1996). However, there is still likely to be a gap between the way in which the participants respond and the way their brain actually functions, and one possible solution is to use physiological data, such as capturing cortex activities through functional magnetic resonance imaging (fMRI) and examining the relationship between those activities and their decision-making (i.e., Plassmann, O'Doherty, Shiv, & Rangel, 2008; Yoon, Gutchess, Feinberg, & Polk, 2006).

7.4.2 External Validity

The generalisability of the findings is constrained by the fact that the studies were conducted in a laboratory environment due to the need to implement experimental manipulations (Lynch Jr., 1982; Shadish, et al., 2002); therefore, there is a need for a test to determine if both the priming and cueing effects of Consumers' physical sensation of cleanliness are supported outside the laboratory environment. There is also a further issue of generalisability across subjects; therefore, there is a need for a test to determine if the pattern in the way in which members of the general public evaluate green products according to different aspects is similar.

7.5 Implications for Future Research

7.5.1 Gender Differences and the Moderation Role in Priming Moral Superiority

Gender differences were considered and investigated in this research in terms of whether it moderated the way consumers' physical sensation in priming moral superiority as well as whether it moderated the way consumers' physical sensation in cueing cleaning effectiveness. The reason to consider so is due to the scientific fact that females and males have different sensitivities and mechanisms in detecting and responding to olfactory stimuli. Previous researchers have suggested that females have a more developed olfactory schema than males because of evolutionary and social reasons. Therefore, females generally outperform males in detecting, discriminating and recognising different scents (Bone & Ellen, 1999; Doty, 1991a, 1991b; Koelega, 1994; Morrin & Ratneshwar, 2003).

Moreover, researchers in the area of neural science have also found that there are different cerebral mechanisms regarding the way in which olfactory stimuli influence the cognitive performance of males and females. For example, Koch and her colleagues (2007) studied whether negative olfactory stimuli, inducing negative emotions, influenced Consumers' working memory performance. Their findings suggest that both males and females' working memory performance is significantly impaired by negative olfactory stimuli. However, using fMRI data, they found that there were different cerebral mechanisms that had a negative influence on male and female participants at the neuron stage. The prefrontal and superior parietal regions of the male participants were more activated by the introduction of negative olfactory stimuli, which influenced their thinking process, whereas the female participants had a stronger reaction in the amygdala and the orbitofrontal cortex (OFC) due to the introduction of negative olfactory stimuli. In this research, the findings suggest that gender moderated the priming effect in the first empirical study but not in the third empirical study.

In short, the researcher does not have sufficient evidences either to support or to reject the moderation role of gender in the priming relationship between consumers' physical sensation of cleanliness and moral superiority or the cueing relationship between consumers' physical sensation of cleanliness and cleaning effectiveness. The researcher suggests future researchers to consider the effect of gender differences in their studies when examining the priming effect and the cueing effect of olfactory stimuli.

7.5.2 Different Ways of Priming Moral Superiority

It is also suggested that future researchers use different ways to prime Consumers' physical sensation of cleanliness in order to test the generalisability of the priming effect found in this research. Moral superiority was primed through a sensation of physical cleanliness in this research, mainly via scents, but there are also other ways to prime participants' morality through the manipulation of physical cleanliness. For example, Zhong et al. (2010) also manipulated Consumers' physical sensation of cleanliness by asking participants to write a passage about physical cleanliness. Their findings also suggest that this conceptual-based priming source also influenced their participants to have a higher degree of moral superiority so that they criticised others' wrongdoing more severely.

Therefore, it is suggested that future researchers can apply different methods or materials to manipulate Consumers' physical sensation of cleanliness in order to examine its influence on different types of consumers' green evaluation and generalise the research findings.

7.5.3 Effect of Priming Guilt

It is also worthy to study whether priming guilt can influence different aspects of consumers' green evaluation. It has also been found in green marketing literature that consumers can be motivated to purchase green products when they are cued with the information of guilt prior to making their decision to purchase (Peloza, et al., 2013; Theotokis & Manganari, 2014). Therefore, future researchers are recommended to examine the effect of priming guilt on consumers' evaluation. It is expected that these findings would further enrich the green marketing literature in terms of different facets of consumers' evaluation of green products.

7.5.4 Other Potential Motivations or Concepts

It is argued that there may be other aspects of information that influence consumers' SGPs, triggered by the research manipulation. Theoretically speaking, a sensation of physical cleanliness can activate multiple aspects of the thinking process, since an abstract concept can be an integration of unlimited types of information from both perceptual and conceptual domains based on the embodied view of human cognition (Barsalou, 1999, 2003a, 2003b, 2008a; Barsalou, Kyle, et al., 2003). There is likely to be a third concept activated by a sensation of physical cleanliness that influences consumers' green evaluation.

A possible third concept for future studies is the motivation to avoid irritating materials, which is inferred by the second and third empirical studies in the research. The results of the second empirical study indicated that the participants expressed a lower level of preference for strong sensation scents than mild ones due to their sensory features being artificial and chemical. Also, the findings in the third empirical study revealed that female participants in the strong sensation and the mild sensation conditions expressed a higher level of the SGP, compared to the responses of the male participants in same conditions as well as the responses of other female participants in the control condition. Given that there were no significant differences in the way in which male and female participants reported their green consumer values among the three experimental conditions. This infers

that the motivation to avoid irritating materials may be an unidentified third concept that was activated due to Consumers' physical sensation of cleanliness.

In conclusion, it is suggested that future researchers can explore other aspects of information that may be activated by Consumers' physical sensation of cleanliness, and examine its influence on different aspects of consumers' green evaluation.

Bibliography

Aarts, H., & Dijksterhuis, A. (2002). Category activation effects in judgment and behaviour: The moderating role of perceived comparability. *British Journal of Social Psychology, 41*(1), 123-138.

Abdi, H., Edelman, B., Valentin, D., & Dowling, W. J. (2009). *Experimental Design and Analysis for Psychology*. New York: Oxford University Press.

Anderson, M. L. (2003). Embodied Cognition: A field guide. *Artificial Intelligence, 149*(1), 91-130.

Anderson, M. L. (2010). Neural reuse: A fundamental organizational principle of the brain. *Behavioral and Brain Sciences, 33*(04), 245-266.

Aquino, K., & Reed, A., II (2002). The Self-Importance of Moral Identity. *Journal of Personality & Social Psychology, 83*(6), 1423-1440.

Avnet, T., Pham, M. T., & Stephen, A. T. (2012). Consumers' Trust in Feelings as Information. *Journal of Consumer Research, 39*(4), 720-735.

Bargh, J. A. (1990). Auto-Motives: Preconscious Determinants of Social Interaction. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of Motivation and Cognition* (Vol. 2, pp. 93-130). London: The Guilford Press.

Bargh, J. A. (2002). Losing Consciousness: Automatic Influences on Consumer Judgment, Behavior, and Motivation. *Journal of Consumer Research, 29*(2), 280-285.

Bargh, J. A. (2006). What have we been priming all these years? On the development, mechanisms, and ecology of nonconscious social behavior. *European Journal of Social Psychology, 36*(2), 147-168.

Bargh, J. A., & Chartrand, T. L. (2000). Study the mind in the middle: A practical guide to priming and automaticity research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology*. New York: Cambridge University Press.

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of Social Behavior: Direct Effects of Trait Construct and Stereotype Activation on Action. *Journal of Personality & Social Psychology, 71*(2), 230-244.

Bargh, J. A., & Ferguson, M. J. (2000). Beyond Behaviorism: On the Automaticity of Higher Mental Processes. *Psychological Bulletin, 126*(6), 925-945.

Bargh, J. A., Schwader, K. L., Hailey, S. E., Dyer, R. L., & Boothby, E. J. (2012). Automaticity in social-cognitive processes. *Trends in Cognitive Sciences, 16*(12), 593-605.

Bargh, J. A., & Shalev, I. (2012). The Substitutability of Physical and Social Warmth in Daily Life. *Emotion, 12*(1), 154-162.

Baron, R. M., & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. [Miscellaneous Article]. *Journal of Personality & Social Psychology December, 51*(6), 1173-1182.

Barsalou, L. W. (1999). Perceptual symbol systems. *Behavioral and Brain Sciences, 22*(04), 577-660.

Barsalou, L. W. (2003a). Abstraction in perceptual symbol systems. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences, 358*(1435), 1177-1187.

Barsalou, L. W. (2003b). Situated simulation in the human conceptual system. *Language and Cognitive Processes, 18*(5-6), 513-562.

Barsalou, L. W. (2008a). Grounded Cognition. *Annual Review of Psychology, 59*(1), 617-645.

Barsalou, L. W. (2008b). Grounding symbolic operations in the brain's modal systems. In G. R. Semin & E. R. Smith (Eds.), *Embodied grounding: Social, cognitive, affective, and neuroscientific approaches*. New York: Cambridge University Press.

Barsalou, L. W., Kyle, S. W., Barbey, A. K., & Wilson, C. D. (2003). Grounding conceptual knowledge in modality-specific systems. *Trends in Cognitive Sciences, 7*(2), 84-91.

Barsalou, L. W., Niedenthal, P. M., Barbey, A. K., & Ruppert, J. A. (2003). Social Embodiment. In B. H. Ross (Ed.), *The Psychology of Learning and Motivation* (Vol. 43, pp. 43-92). San Diego, CA: Academic Press.

Bauer, D. J., & Curran, P. J. (2005). Probing Interactions in Fixed and Multilevel Regression: Inferential and Graphical Techniques. *Multivariate Behavioral Research, 40*(3), 373-400.

Bearden, W. O., Netmeyer, R. G., & Haws, K. L. (Eds.). (2011). *Handbook of Marketing Scales: Multi-item Measures for Marketing and Consumer Behavior Research* (3 ed.). London: Sage.

Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. *Psychological Review, 88*(4), 354-364.

Blocker, T. J., & Eckberg, D. L. (1997). Gender and Environmentalism: Results from the 1993 General Social Survey. *Social Science Quarterly, 78*(4), 841-858.

Bohlen, G., Schlegelmilch, B. B., & Diamantopoulos, A. (1993). Measuring Ecological Concern: A Multi-construct Perspective. *Journal of Marketing Management, 9*(4), 415-430.

Bone, P. F., & Ellen, P. S. (1999). Scents in the marketplace: explaining a fraction of olfaction. *Journal of Retailing, 75*(2), 243-262.

Bord, R. J., & O'Connor, R. E. (1997). The Gender Gap in Environmental Attitudes: The Case of Perceived Vulnerability to Risk. *Social Science Quarterly 78*(4), 830-840.

Boroditsky, L., & Ramscar, M. (2002). The Roles of Body and Mind in Abstract Thought. *Psychological Science, 13*(2), 185-189.

Brakus, J. (2008). Embodied cognition, affordances and mind modularity: using cognitive science to present a theory of consumer experiences. In Bernd H. Schmitt & D. L. Rogers (Eds.), *Handbook on Brand and Experience Management*. Cheltenham: Edward Elgar.

Briñol, P., & Petty, R. E. (2003). Overt Head Movements and Persuasion: A Self-Validation Analysis. *Journal of Personality and Social Psychology, 84*(6), 1123-1139.

Briñol, P., & Petty, R. E. (2008). Embodied Persuasion: Fundamental Processes by Which Bodily Responses Can Impact Attitudes. In G. R. Semin & E. R. Smith (Eds.), *Embodiment grounding: Social, cognitive,*

affective, and neuroscientific approaches. (pp. 184-207). Cambridge, England: Cambridge University Press.

Cascio, J., & Plant, E. A. (2015). Prospective moral licensing: Does anticipating doing good later allow you to be bad now? *Journal of Experimental Social Psychology, 56*, 110-116.

Catlin, J. R., & Wang, Y. (2013). Recycling gone bad: When the option to recycle increases resource consumption. *Journal of Consumer Psychology, 23*(1), 122-127.

Chaiken, S. (1980). Heuristic versus Systematic Information Processing and the Use of Source versus Message Cues in Persuasion. *Journal of Personality and Social Psychology, 39*(5), 752-766.

Chartrand, T. L., & Bargh, J. A. (2002). Nonconscious Motivations: Their Activation, Operation, and Consequences. In A. Tesser, D. Stapel, A., & J. Wood, V. (Eds.), *Self and Motivation: Emerging Psychological Perspectives*. Washington, DC: American Psychological Association.

Chebat, J.-C., & Michon, R. (2003). Impact of ambient odors on mall shoppers' emotions, cognition, and spending: A test of competitive causal theories. *Journal of Business Research, 56*(7), 529-539.

Chemat, F., & Vian, M. A. (Eds.). (2014). *Alternative Solvents for Natural Products Extraction*. London: Springer.

Clark, A. (1998). *Being There: Putting Brain, Body, and World Together Again*. Cambridge, Massachusetts: The MIT Press.

Cleveland, M., Kalamas, M., & Laroche, M. (2012). “It's not Easy Being Green”: Exploring Green Creeds, Green Deeds, and Internal Environmental Locus of Control. *Psychology & Marketing, 29*(5), 293-305.

Conway, P., & Peetz, J. (2012). When does feeling moral actually make you a better person? Conceptual abstraction moderates whether past moral deeds motivate consistency or compensatory behavior. *Personality and Social Psychology Bulletin, 38*(7), 907-919.

Costley, C. L., & Brucks, M. (1992). Selective Recall and Information Use in Consumer Preferences. *Journal of Consumer Research, 18*(4), 464-474.

Cozby, P. C. (2009). *Methods in Behavioral Research* (10 ed.). New York, NY: McGraw-Hill.

Dahlstrand, U., & Biel, A. (1997). Pro-Environmental Habits: Propensity Levels in Behavioral Change. *Journal of Applied Social Psychology, 27*(7), 588-601.

Dahlstrom, R. (2011). *Green Marketing Management*. Mason: Cengage Learning.

Damasio, A. R. (1989). Time-locked multiregional retroactivation: a systems-level proposal for the neural substrates of recall and recognition. *Cognition, 33*(1-2), 25-62.

Damasio, A. R. (1994). *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: The Hearst Corporation.

Damasio, A. R., Everitt, B. J., & Bishop, D. (1996). The Somatic Marker Hypothesis and the Possible Functions of the Prefrontal Cortex [and Discussion]. *Philosophical Transactions: Biological Sciences, 351*(1346), 1413-1420.

Damasio, A. R., Tranel, D., & Damasio, H. C. (1991). Somatic Markers and the Guidance of Behaviour: Theory and Preliminary Testing. In H. S.

Levin, H. M. Eisenberg & A. L. Benton (Eds.), *Frontal Lobe Function and Dysfunction* (pp. 217-229). Oxford: Oxford University Press.

Dennett, D. C. (1969). *Content and consciousness*. London: Routledge.

Diamantopoulos, A., Schlegelmilch, B. B., Sinkovics, R. R., & Bohlen, G. M. (2003). Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation. *Journal of Business Research, 56*(6), 465-480.

Dickerson, C. A., Thibodeau, R., Aronson, E., & Miller, D. (1992). Using Cognitive Dissonance to Encourage Water Conservation. *Journal of Applied Social Psychology, 22*(11), 841-854.

Dijksterhuis, A., & Bargh, J. A. (2001). The Perception-behavior Expressway: Automatic Effects of Social Perception on Social Behavior. *Advances in Experimental Social Psychology, 33*, 1-40.

Dijksterhuis, A., Spears, R., & Lépinasse, V. (2001). Reflecting and Deflecting Stereotypes: Assimilation and Contrast in Impression Formation and Automatic Behavior. *Journal of Experimental Social Psychology, 37*(4), 286-299.

Doron, G., Sar-El, D., & Mikulincer, M. (2012). Threats to moral self-perceptions trigger obsessive compulsive contamination-related behavioral tendencies. *Journal of Behavior Therapy and Experimental Psychiatry, 43*(3), 884-890.

Doty, R. L. (1991a). Olfactory function in neonates. In D. G. Laing, R. L. Doty & W. Breipohl (Eds.), *The human sense of smell* (pp. 155-165). Berlin: Springer-Verlag.

Doty, R. L. (1991b). Psychophysical Measurement of Odor Perception in Humans. In D. G. Laing, R. L. Doty & W. Breipohl (Eds.), *The Human Sense of Smell* (pp. 95-134). Berlin: Springer-Verlag.

Dru, V., & Cretenet, J. (2008). Influence of unilateral motor behaviors on the judgment of valenced stimuli. *Cortex, 44*(6), 717-727.

Effron, D. A. (2014). Making mountains of morality from molehills of virtue: Threat causes people to overestimate their moral credentials. *Personality and Social Psychology Bulletin, 40*(8), 972-985.

Effron, D. A., Miller, D. T., & Monin, B. (2012). Inventing Racist Roads Not Taken: The Licensing Effect of Immoral Counterfactual Behaviors. *Journal of Personality and Social Psychology, 103*(6), 916-932.

Effron, D. A., & Monin, B. (2010). Letting people off the hook: When do good deeds excuse transgressions? *Personality and Social Psychology Bulletin, 36*(12), 1618-1634.

Effron, D. A., Monin, B., & Miller, D. T. (2013). The unhealthy road not taken: Licensing indulgence by exaggerating counterfactual sins. *Journal of Experimental Social Psychology, 49*(3), 573-578.

Eisenberger, N. I., Jarcho, J. M., Lieberman, M. D., & Naliboff, B. D. (2006). An experimental study of shared sensitivity to physical pain and social rejection. *Pain, 126*(1–3), 132-138.

Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science, 302*(10), 290-292.

Englis, B. G., & Phillips, D. M. (2013). Does Innovativeness Drive Environmentally Conscious Consumer Behavior? *Psychology & Marketing, 30*(2), 160-172.

Epley, N., Keysar, B., Van Boven, L., & Gilovich, T. (2004). Perspective Taking as Egocentric Anchoring and Adjustment. *Journal of Personality & Social Psychology September, 87*(3), 327-339.

Epstein, S. (1994). Integration of the Cognitive and the Psychodynamic Unconscious. *American Psychologist, 49*, 709-724.

European Union. (2004). A.I.S.E. Guideline on Implementation of the Detergent Regulation Biodegradability of Surfactants and Annex VII (Labelling and Ingredient Datasheet). In E. Union (Eds.) (Vol. 47, pp. 1-35).

Evans, J. S. B. T. (1984). Heuristic and analytic processes in reasoning. *British Journal of Psychology, 75*(4), 451.

Evans, J. S. B. T., & Stanovich, K. E. (2013). Dual-Process Theories of Higher Cognition: Advancing the Debate. *Perspectives on Psychological Science, 8*(3), 223-241.

Förster, J. (2004). How Body Feedback Influences Consumers' Evaluation of Products. *Journal of Consumer Psychology 14*(4), 416-426.

Förster, J., Higgins, E. T., & Idson, L. C. (1998). Approach and Avoidance Strength During Goal Attainment: Regulatory Focus and the "Goal Looms Larger" Effect. *Journal of Personality & Social Psychology, 75*(5), 1115-1131.

Förster, J., & Liberman, N. (2007). Knowledge Activation. In A. W. Kruglanski & E. T. Higgins (Eds.), *Handbook of basic principles* (2 ed., pp. 201-231). New York, NY: Houghton Mifflin.

Förster, J., & Stepper, S. (2000). Compatibility between approach/avoidance stimulation and valenced information determines residual attention during the process of encoding. *European Journal of Social Psychology, 30*(6), 853-871.

Förster, J., & Strack, F. (1996). Influence of overt head movements on memory for valenced words: A case of conceptual-motor compatibility. *Journal of Personality and Social Psychology, 71*(3), 421-430.

Förster, J., & Strack, F. (1997). Motor actions in retrieval of valenced information: A motor congruence effect. *Perceptual and Motor Skills, 85*(3), 1419-1427.

Förster, J., & Strack, F. (1998). Motor actions in retrieval of valenced information: II. Boundary conditions for motor congruence effects. *Perceptual and Motor Skills, 86*(3), 1423-1426.

Fayard, J. V., Bassi, A. K., Bernstein, D. M., & Roberts, B. W. (2009). Is cleanliness next to godliness? Dispelling old wives' Tales: Failure to Replicate Zhong and Liljenquist (2006). *Journal of Articles in Support of the Null Hypothesis, 6*, 21-30.

Feldman, J., & Narayanan, S. (2004). Embodied meaning in a neural theory of language. *Brain and Language, 89*(2), 385-392.

Fiedler, K. (2003). The Hidden Vicissitudes of the Priming Paradigm in Evaluative Judgment Research. In J. Musch & K. C. Klauer (Eds.), *The Psychology of Evaluation: Affective Processes in Cognition and Emotion*. Mahwah, NJ: Psychology Press.

Fisher, R. J. (1993). Social Desirability Bias and the Validity of Indirect Questioning. *Journal of Consumer Research, 20*(2), 303-315.

Florack, A., Kleber, J., Busch, R., & Stöhr, D. (2014). Detaching the ties of ownership: the effects of hand washing on the exchange of endowed products. *Journal of Consumer Psychology, 24*(2), 284-289.

Fodor, J. A. (1975). *The language of thought*. New York: Harvard University Press.

Geller, E. S. (1995). Actively caring for the environment: An integration of behaviorism and humanism. *Environment and Behavior, 27*(2), 184-195.

Gibbs, R. W. (1994). *The poetics of mind: Figurative thought, language, and understanding*. Cambridge, England: Cambridge University Press.

Gibbs, R. W. (2006). *Embodiment and Cognitive Science*. Cambridge, UK: Cambridge University Press.

Gibbs, R. W. (Ed.). (2008). *The Cambridge Handbook of Metaphor and Thought*. Cambridge, England: Cambridge University Press.

Gibson, J. J. (1977). The Theory of Affordances. In R. E. Shaw & J. D. Bransford (Eds.), *Perceiving, Acting, and Knowing: Toward an Ecological Psychology.* (pp. 67-82). Hillsdale, NJ: Lawrence Erlbaum Associates.

Gintis, H., Smith, E. A., & Bowles, S. (2001). Costly Signaling and Cooperation. *Journal of Theoretical Biology, 213*(1), 103-119.

Goldsmith, E. B., & Sheldon, B. (2008). *Green Cleaning For Dummies*. New York: Wiley.

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of Consumer Research, 35*(3), 472-482.

Gollwitzer, M., & Melzer, A. (2012). Macbeth and the Joystick: Evidence for moral cleansing after playing a violent video game. *Journal of Experimental Social Psychology, 48*(6), 1356-1360.

Goodman, W. K., Price, L. H., Rasmussen, S. A., Mazure, C., Delgado, P., Heninger, G. R., et al. (1989). The Yale-Brown Obsessive Compulsive Scale II. Validity. *Archives of General Psychiatry, 46*(11), 1012-1016.

Goodman, W. K., Price, L. H., Rasmussen, S. A., Mazure, C., Fleischmann, R. L., Hill, C. L., et al. (1989). The Yale-Brown Obsessive Compulsive Scale I. Development, Use, and Reliability. *Archives of General Psychiatry, 46*(11), 1006-1011.

Green Seal. (2011). A Certification Guidebook for GS-42. from http://www.greenseal.org/Portals/0/Documents/Standards/GS-42/GS-42%20Guidebook%20Noted-reduced.pdf

Greifeneder, R., Bless, H., & Pham, M. T. (2011). When Do People Rely on Affective and Cognitive Feelings in Judgment? A Review. *Personality and Social Psychology Review, 15*(2), 107-141.

Griskevicius, V., Cantu, S. M., & van Vugt, M. (2012). The Evolutionary Bases for Sustainable Behavior: Implications for Marketing, Policy, and Social Entrepreneurship. *Journal of Public Policy & Marketing, 31*(1), 115-128.

Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010). Going Green to Be Seen: Status, Reputation, and Conspicuous Conservation. *Journal of Personality & Social Psychology, 98*(3), 392-404.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis*. New Jersey: Prentice Hall.

Hartmann, P., & Apaolaza-Ibáñez, V. (2012). Consumer attitude and purchase intention toward green energy brands: The roles of

psychological benefits and environmental concern. *Journal of Business Research, 65*(9), 1254-1263.

Haugeland, J. (1985). *Artificial intelligence: The very idea* London: The MIT Press.

Haws, K. L., Winterich, K. P., & Naylor, R. W. (2014). Seeing the world through GREEN-tinted glasses: Green consumption values and responses to environmentally friendly products. *Journal of Consumer Psychology, 24*(3), 336-354.

Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis*. New York: The Guilford Press.

Herbes, C., & Ramme, I. (2014). Online marketing of green electricity in Germany-A content analysis of providers' websites. *Energy Policy, 66*, 257-266.

Higgins, E. T. (1996). Knowledge Activation: Accessibility, Applicability and Salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133-168). New York: Guilford Press.

Hirsch, A. R. (1995). Effects of Ambient Odors on Slot-Machine Usage in a Las Vegas Casino. *Psychology & Marketing, 12*(7), 585-585.

Holland, R. W., Hendriks, M., & Aarts, H. (2005). Smells Like Clean Spirit: Nonconscious Effects of Scent on Cognition and Behavior. *Psychological Science, 16*(9), 689-693.

Hong, J., & Sun, Y. (2012). Warm It Up with Love: The Effect of Physical Coldness on Liking of Romance Movies. *Journal of Consumer Research, 39*(2), 293-306.

Hung, I. W., & Labroo, A. A. (2011). From Firm Muscles to Firm Willpower: Understanding the Role of Embodied Cognition in Self-Regulation. *Journal of Consumer Research, 37*(6), 1046-1064.

Iannuzzi, A. (2012). *Greener Products: The Making and Marketing of Sustainable Brands*. Boca Raton: CRC Press.

Ijzerman, H., & Koole, S. L. (2011). From Perceptual Rags to Metaphoric Riches-Bodily, Social, and Cultural Constraints on Sociocognitive Metaphors: Comment on Landau, Meier, and Keefer (2010). *Psychological Bulletin, 137*(2), 355-361.

Irwin, J. R., & Spira, J. S. (1997). Anomalies in the Values for Consumer Goods With Environmental Attributes. *Journal of Consumer Psychology, 6*(4), 339-363.

Jensen, A. R., & Rohwer Jr, W. D. (1966). The stroop color-word test: A review. *Acta Psychologica, 25*(0), 36-93.

Johnson, M. (1993). *Moral imagination: Implications of cognitive science for ethics*. London: The University of Chicago Press

Jones, K. S. (2003). What Is an Affordance? *Ecological Psychology, 15*(2), 107-114.

Jostmann, N. B., Lakens, D., & Schubert, T. W. (2009). Weight as an Embodiment of Importance. *Psychological Science, 20*(9), 1169-1174.

Kövecses, Z. (2010). *Metaphor: A Practical Introduction* (2 ed.). Oxford Oxford University Press.

Kahneman, D. (2003). A Perspective on Judgement and Choice. [Article]. *American Psychologist, 58*(9), 697-720.

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*(1), 31-36.

Kan, I. P., Barsalou, L. W., Solomon, K. O., Minor, J. K., & Thompson-Schill, S. L. (2003). Role of Mental Imagery in a Property Verification Task: fMRI Evidences for Perceptual Representations of Conceptual Knowledge. *Cognitive Neuropsychology, 20*(3-6), 525-540.

Kang, Y., Williams, L. E., Clark, M. S., Gray, J. R., & Bargh, J. A. (2011). Physical temperature effects on trust behavior: the role of insula. *Social Cognitive and Affective Neuroscience, 6*(4), 507-515.

Kantowitz, B. H., & Sanders, M. S. (1972). Partial advance information and stimulus dimensionality. [Article]. *Journal of Experimental Psychology March, 92*(3), 412-418.

Kates, R. M. (2001). Determinants of Chinese Consumers' Green Purchase Behavior. *Psychology & Marketing, 18*(4), 389-413.

Kaushik, G. (Ed.). (2015). *Applied Environmental Biotechnology: Present Scenario and Future Trends*. London: Springer.

Khan, U., & Dhar, R. (2006). Licensing Effect in Consumer Choice. *Journal of Marketing Research, 43*(2), 259-266.

Kidwell, B., Farmer, A., & Hardesty, D. M. (2013). Getting Liberals and Conservatives to Go Green: Political Ideology and Congruent Appeals. *Journal of Consumer Research, 40*(2), 350-367.

Koch, K., Pauly, K., Kellermann, T., Seiferth, N. Y., Reske, M., Backes, V., et al. (2007). Gender Differences in the Cognitive Control of Emotion: An fMRI study. *Neuropsychologia, 45*(12), 2744-2754.

Koelega, H. S. (1994). Sex Differences in Olfactory Sentivity the Problem of the Generality of Smell Acuity. *Perceptual and Motor Skills, 78*(1), 203-213.

Koller, M., Floh, A., & Zauner, A. (2011). Further insights into perceived value and consumer loyalty: A “Green” perspective. *Psychology and Marketing, 28*(12), 1154-1176.

Kouchaki, M. (2011). Vicarious moral licensing: The influence of others' past moral actions on moral behavior. *Journal of Personality and Social Psychology, 101*(4), 702-715.

Krishna, A., Lwin, May O., , & Morrin, M., . (2010). Product Scent and Memory. *Journal of Consumer Research, 37*(1), 57-67.

Kronrod, A., Grinstein, A., & Wathieu, L. (2011). Go Green! Should Environmental Messages Be So Assertive? *Journal of Marketing, 76*(1), 95-102.

Kruger, J., & Gilovich, T. (2004). Actions, Intentions, and Self-Assessment: The Road to Self-Enhancement Is Paved with Good Intentions. *Personality and Social Psychology Bulletin, 30*(3), 328-339.

Labroo, A. A., & Nielsen, J. H. (2010). Half the Thrill Is in the Chase: Twisted Inferences from Embodied Cognitions and Brand Evaluation. *Journal of Consumer Research, 37*(1), 143-158.

Laird, J. D. (1974). Self-attribution of Emotion: The Effects of Expressive Behavior on the Quality of Emotional Experience. *Journal of Personality & Social Psychology, 29*(4), 475-486.

Lakoff, G. (2008). The Neural Theory of Metaphor. In R. W. Gibbs (Ed.), *The Cambridge Handbook of Metaphor and Thought* (pp. 17-38). Cambridge, England: Cambridge University Press.

Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. London: The university of Chicago press.

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: the embodied mind and its challenge to western thought*. New York.

Landau, M. J., Keefer, L. A., & Meier, B. P. (2011). Wringing the Perceptual Rags: Reply to IJzerman and Koole (2011). *Psychological Bulletin, 137*(2), 362-365.

Landau, M. J., Meier, B. P., & Keefer, L. A. (2010). A Metaphor-Enriched Social Cognition. *Psychological Bulletin 136*(6), 1045-1067.

Larson, J. S., & Billeter, D. M. (2013). Consumer Behavior in “Equilibrium”: How Experiencing Physical Balance Increases Compromise Choice. *Journal of Marketing Research, 50*(4), 535-547.

Lee, S. W. S., & Schwarz, N. (2010a). Dirty Hands and Dirty Mouths: Embodiment of the Moral-Purity Metaphor Is Specific to the Motor Modality Involved in Moral Transgression. *Psychological Science, 21*(10), 1423-1425.

Lee, S. W. S., & Schwarz, N. (2010b). Washing Away Postdecisional Dissonance. *Science, 328*(5979), 709.

Lee, S. W. S., & Schwarz, N. (2012). Bidirectionality, Mediation, and Moderation of Metaphorical Effects: The Embodiment of Social Suspicion and Fishy Smells. *Journal of Personality & Social Psychology, 103*(5), 737-749.

Leonidou, L. C., Leonidou, C. N., & Kvasova, O. (2010). Antecedents and outcomes of consumer environmentally friendly attitudes and behaviour. *Journal of Marketing Management, 26*(13-14), 1319-1344.

Lichtenstein, D. R., Ridgway, N. M., & Netemeyer, R. G. (1993). Price Perceptions and Consumer Shopping Behavior: A Field Study. *Journal of Marketing Research, 30*(2), 234-245.

Liljenquist, K., Zhong, C.-B., & Galinsky, A. D. (2010). The Smell of Virtue: Clean Scents Promote Reciprocity and Charity. *Psychological Science, 21*(3), 381-383.

Lin, Y.-C., & Chang, C.-C. A. (2012). Double Standard: The Role of Environmental Consciousness in Green Product Usage. *Journal of Marketing, 76*(5), 125-134.

Luchs, M. G., Naylor, R. W., Irwin, J. R., & Raghunathan, R. (2010). The Sustainability Liability: Potential Negative Effects of Ethicality on Product Preference. *Journal of Marketing, 74*(5), 18-31.

Lynch Jr., J. G. (1982). On the External Validity of Experiments in Consumer Research. *Journal of Consumer Research, 9*(3), 225-239.

MacLeod, C. M. (1991). Half a Century of Research on the Stroop Effect: An Integrative Review. *Psychological Bulletin March, 109*(2), 163-203.

Mandler, J. M. (1992). How to Build a Baby: II. Conceptual Primitives. *Psychological Review, 99*(4), 587-604.

Mason, H. (1950). Projective Techniques in Marketing Research. *Journal of Marketing, 14*(5), 649-656.

Mazar, N., & Zhong, C.-B. (2010). Do Green Products Make Us Better People? *Psychological Science, 21*(4), 494-498.

McAndrew, F. T. (2002). New evolutionary perspectives on altruism: Multilevel-selection and costly-signaling theories. *Current Directions in Psychological Science, 11*(2), 79-82.

Meier, B. P., Hauser, D. J., Robinson, M. D., Friesen, C. K., & Schjeldahl, K. (2007). What's "up" with god? vertical space as a representation of

the divine. *Journal of Personality and Social Psychology, 93*(5), 699-710.

Meier, B. P., & Robinson, M. D. (2004). Why the Sunny Side Is Up Associations Between Affect and Vertical Position. *Psychological Science, 15*(4), 243-247.

Meier, B. P., & Robinson, M. D. (2006). Does “feeling down” mean seeing down? Depressive symptoms and vertical selective attention. *Journal of Research in Personality, 40*(4), 451-461.

Meier, B. P., Schnall, S., Schwarz, N., & Bargh, J. A. (2012). Embodiment in social psychology. *Topics in Cognitive Science*, 1-12.

Merritt, A. C., Effron, D. A., Fein, S., Savitsky, K. K., Tuller, D. M., & Monin, B. (2012). The strategic pursuit of moral credentials. *Journal of Experimental Social Psychology, 48*(3), 774-777.

Miller, Geoffrey F. (2000). *The mating mind: How sexual choice shaped the evolution of human nature*. New York: NY: Doubleday.

Miller, Geoffrey F. (2007). Sexual Selection for Moral Virtues. *The Quarterly Review of Biology, 82*(2), 97-125.

Miller, Geoffrey F. (2009). *Spent: Sex, evolution, and consumer behavior.* New York, NY: Viking.

Mitchell, D. J., Kahn, B. E., & Knasko, S. C. (1995). There's Something in the Air: Effects of Congruent or Incongruent Ambient Odor on Consumer Decision Making. *Journal of Consumer Research, 22*(2), 229-238.

Moisander, J. (2007). Motivational complexity of green consumerism. *International Journal of Consumer Studies, 31*(4), 404-409.

Morrin, M., & Ratneshwar, S. (2003). Does It Make Sense to Use Scents to Enhance Brand Memory? *Journal of Marketing Research, 40*(1), 10-25.

Mostafa, M. M. (2007). A hierarchical analysis of the green consciousness of the Egyptian consumer. *Psychology and Marketing, 24*(5), 445-473.

Muniglia, L., Claisse, N., Baudelet, P.-H., & Ricochon, G. (2014). Enzymatic Aqueous Extraction (EAE). In F. Chemat & M. A. Vian (Eds.), *Alternative Solvents for Natural Products Extraction*. London: Springer.

Muro, F. D., & Murray, K. B. (2012). An Arousal Regulation Explanation of Mood Effects on Consumer Choice. *Journal of Consumer Research, 39*(3), 574-584.

Musch, J., & Klauer, K. C. (2003). *The Psychology of Evaluation: Affective Processes in Cognition and Emotion*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Neumann, R., Förster, J., & Strack, F. (2003). Motor compatibility: The bi-directional link between behavior and evaluation. In J. Musch & K. C. Klauer (Eds.), *The Psychology of Evaluation: Affective Processes in Cognition and Emotion*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Neumann, R., & Strack, F. (2000). Approach and Avoidance: The Influence of Proprioceptive and Exteroceptive Cues on Encoding of Affective Information. *Journal of Personality & Social Psychology, 79*(1), 39-48.

Niedenthal, P. M., Barsalou, L. W., Winkielman, P., Krauth-Gruber, S., & Ric, F. (2005). Embodiment in Attitudes, Social Perception, and Emotion. *Personality & Social Psychology Review, 9*(3), 184-211.

Niedenthal, P. M., Winkielman, P., Mondillon, L., & Vermeulen, N. (2009). Embodiment of Emotion Concepts. *Journal of Personality & Social Psychology, 96*(6), 1120-1136.

Olson, E. (2013). It's not easy being green: the effects of attribute tradeoffs on green product preference and choice. *Journal of the Academy of Marketing Science, 41*(2), 171-184.

Olson, J. M., & Roese, N. J. (1995). The perceived funniness of humorous stimuli. *Personality and Social Psychology Bulletin, 21*(9), 908-913.

Orne, M. T. (1962). On the Social Psychology of the Psychological Experiment: With Particular Reference to Demand Characteristics and Their Implications. *American Psychologist November, 17*(11), 776-783.

Osterhus, T. L. (1997). Pro-Social Consumer Influence Strategies: When and How Do They Work? *Journal of Marketing, 61*(4), 16-29.

Ottman, J. A., Stafford, E. R., & Hartman, C. L. (2006). Avoiding Green Marketing Myopia: Ways to Improve Consumer Appeal for Environmentally Preferable Products. *Environment: Science and Policy for Sustainable Development, 48*(5), 22-36.

Panksepp, J. (2003). Feeling the Pain of Social Loss. *Science, 302*(5643), 237-239.

Peattie, K. (2010). Green consumption: Behavior and norms. *Annual Review of Environment and Resources, 35*, 195-228.

Pecher, D., Zeelenberg, R., & Barsalou, L. W. (2003). Verifying Different-Modality Properties for Concepts Produces Switching Costs. *Psychological Science, 14*(2), 119-124.

Peloza, J., White, K., & Shang, J. (2013). Good and Guilt-Free: The Role of Self-Accountability in Influencing Preferences for Products with Ethical Attributes. *Journal of Marketing, 77*(1), 104-119.

Petty, R. E., Wells, G. L., Heesacker, M., Brock, T. C., & Cacioppo, J. T. (1983). The effects of recipient posture on persuasion: A cognitive response analysis Personality and Social. *Personality and Social Psychology Bulletin, 9*(2), 209-222.

Pham, M. T. (1996). Cue Representation and Selection Effects of Arousal on Persuasion. *Journal of Consumer Research, 22*(4), 373-387.

Pham, M. T. (1998). Representativeness, Relevance, and the Use of Feelings in Decision Making. *Journal of Consumer Research, 25*(2), 144-159.

Plassmann, H., O'Doherty, J., Shiv, B., & Rangel, A. (2008). Marketing actions can modulate neural representations of experienced pleasantness. *Proceedings of the National Academy of Sciences, 105*(3), 1050-1054.

Polman, E., Pettit, N. C., & Wiesenfeld, B. M. (2013). Effects of wrongdoer status on moral licensing. *Journal of Experimental Social Psychology, 49*(4), 614-623.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3).

Preston, J. L., & Ritter, R. S. (2012). Cleanliness and godliness: Mutual association between two kinds of personal purity. *Journal of Experimental Social Psychology, 48*(6), 1365-1368.

Rachman, S. (2004). Fear of contamination. *Behaviour Research and Therapy, 42*(11), 1227-1255.

Reimann, M., Feye, W., Malter, A. J., Ackerman, J. M., Castano, R., Garg, N., et al. (2012). Embodiment in Judgment and Choice. *Journal of Neuroscience, Psychology, & Economics 5*(2), 104-123.

Riskind, J. H. (1984). They stoop to conquer: Guiding and self-regulatory functions of physical posture after success and failure. *Journal of Personality and Social Psychology, 47*(3), 479-493.

Riskind, J. H., & Gotay, C. C. (1982). Physical posture: could it have regulatory or feedback effects on motivation and emotion? *Motivation and Emotion, 6*(3), 273-298.

Roberts, J. A. (1996). Green consumers in the 1990s: Profile and implications for advertising. *Journal of Business Research, 36*(3), 217-231.

Robertson, D. H., & Joselyn, R. W. (1974). Projective Techniques in Research. [Article]. *Journal of Advertising Research, 14*(5), 27-31.

Ryan, T. P. (2007). *Modern Experimental Design*. Hoboken, New Jersey: John Wiley & Sons.

Schahn, J., & Holzer, E. (1990). Studies of Individual Environmental Concern: The Role of Knowledge, Gender, and Background Variables. *Environment and Behavior, 22*(6), 767-786.

Schlegelmilch, B. B., Bohlen, G. M., & Diamantopoulos, A. (1996). The link between green purchasing decisions and measures of environmental consciousness. *European Journal of Marketing, 30*(5), 35-55.

Schnall, S. (2011). Clean, Proper and Tidy Are More Than the Absence of Dirty, Disgusting and Wrong. *Emotion Review, 3*(3), 264-266.

Schnall, S., Benton, J., & Harvey, S. (2008). With a Clean Conscience: Cleanliness Reduces the Severity of Moral Judgments. *Psychological Science, 19*(12), 1219-1222.

Schubert, T. W. (2005). Your highness: Vertical positions as perceptual symbols of power. *Journal of Personality and Social Psychology, 89*(1), 1-21.

Schwartz, S. H. (1970). Elicitation of moral obligation and self-sacrificing behavior: An experimental study of volunteering to be a bone marrow donor. *Journal of Personality & Social Psychology 15*(4), 283-293.

Schwartz, S. H. (1977). Normative Influences On Altruism. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10, pp. 221-279). New York: Academic Press.

Sexton, S. E., & Sexton, A. L. (2014). Conspicuous conservation: The Prius halo and willingness to pay for environmental bona fides. *Journal of Environmental Economics and Management, 67*(3), 303-317.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Boston, MA: Houghton Mifflin Company.

Shrum, L. J., McCarty, J. A., & Lowrey, T. M. (1995). Buyer Characteristics of the Green Consumer and Their Implications for Advertising Strategy. *Journal of Advertising, 24*(2), 71-82.

Simmons, W. K., Hamann, S. B., Harenski, C. L., Hu, X. P., & Barsalou, L. W. (2008). fMRI evidence for word association and situated simulation in conceptual processing. *Journal of Physiology-Paris, 102*(1–3), 106-119.

Simmons, W. K., Martin, A., & Barsalou, L. W. (2005). Pictures of appetizing foods activate gustatory cortices for taste and reward. *Cerebral Cortex, 15*(10), 1602-1608.

Spangenberg, E. A., Crowley, A. E., & Henderson, P. W. (1996). Improving the Store Environment: Do Olfactory Cues Affect Evaluations and Behaviors? *Journal of Marketing, 60*(2), 67-80.

Spiller, S. A., Fitzsimons, G. J., Lynch Jr., J. G., & McClelland, G. H. (2013). Spotlights, Floodlights, and the Magic Number Zero: Simple Effects Tests in Moderated Regression. *Journal of Marketing Research, 50*(2), 277-288.

Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate? *Behavioral and Brain Sciences, 23*(5), 645-665.

Stepper, S., & Strack, F. (1993). Proprioceptive determinants of emotional and nonemotional feelings. *Journal of Personality and Social Psychology, 64*(2), 211-220.

Strack, F., Martin, L. L., & Stepper, S. (1988). Inhibiting and Facilitating Conditions of the Human Smile: A Nonobtrusive Test of the Facial Feedback Hypothesis. *Journal of Personality and Social Psychology, 54*(5), 768-777.

Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology December, 18*(6), 643-662.

Sudevan, P., & Taylor, D. A. (1987). The Cuing and Priming of Cognitive Operations. *Journal of Experimental Psychology: Human Perception and Performance, 13*(1), 89-103.

Tanner, C., & Kast, S. W. (2003). Promoting sustainable consumption: Determinants of green purchases by Swiss consumers. *Psychology and Marketing, 20*(10), 883-902.

Thøgersen, J., Jørgensen, A.-K., & Sandager, S. (2012). Consumer Decision Making Regarding a “Green” Everyday Product. *Psychology and Marketing, 29*(4), 187-197.

Theotokis, A., & Manganari, E. (2014). The Impact of Choice Architecture on Sustainable Consumer Behavior: The Role of Guilt. *Journal of Business Ethics*, 1-15.

Thomas, M., & Tsai, C. I. (2012). Psychological Distance and Subjective Experience: How Distancing Reduces the Feeling of Difficulty. *Journal of Consumer Research, 39*(2), 324-340.

Tom, G., Pettersen, P., Lau, T., Burton, T., & Cook, J. (1991). The Role of Overt Head Movement in the Formation of Affect. [Article]. *Basic & Applied Social Psychology, 12*(3), 281-289.

van Doorn, J., & Verhoef, P. C. (2011). Willingness to pay for organic products: Differences between virtue and vice foods. *International Journal of Research in Marketing, 28*(3), 167-180.

Wells, G. L., & Petty, R. E. (1980). The Effects of Over Head Movements on Persuasion: Compatibility and Incompatibility of Responses. *Basic & Applied Social Psychology, 1*(3), 219-230.

White, K., & Peloza, J. (2009). Self-Benefit Versus Other-Benefit Marketing Appeals: Their Effectiveness in Generating Charitable Support. *Journal of Marketing, 73*(4), 109-124.

White, K., & Simpson, B. (2013). When Do (and Don't) Normative Appeals Influence Sustainable Consumer Behaviors? *Journal of Marketing, 77*(2), 78-95.

Williams, L. E., & Bargh, J. A. (2008). Experiencing Physical Warmth Promotes Interpersonal Warmth. *Science, 322*, 606-607.

Williams, L. E., Huang, J. Y., & Bargh, J. A. (2009). The scaffolded mind: Higher mental processes are grounded in early experience of the physical world. *European Journal of Social Psychology, 39*(7), 1257-1267.

Wu, J.-H., Wu, C.-W., Lee, C.-T., & Lee, H.-J. (2015). Green purchase intentions: An exploratory study of the Taiwanese electric motorcycle market. *Journal of Business Research, 68*(4), 829-833.

Xu, A. J., Zwick, R., & Schwarz, N. (2012). Washing Away Your (Good or Bad) Luck: Physical Cleansing Affects Risk-Taking Behavior. *Journal of Experimental Psychology: General, 141*(1), 26-30.

Yoon, C., Gutchess, Angela H., Feinberg, F., & Polk, Thad A. (2006). A Functional Magnetic Resonance Imaging Study of Neural Dissociations between Brand and Person Judgments. *Journal of Consumer Research, 33*(1), 31-40.

Young, W., Hwang, K., McDonald, S., & Oates, C. J. (2010). Sustainable Consumption: Green Consumer Behavior When Purchasing Products *Sustainable Development, 18*(1), 20-31.

Zabkar, V., & Hosta, M. (2013). Willingness to act and environmentally conscious consumer behaviour: can prosocial status perceptions help overcome the gap? *International Journal of Consumer Studies, 37*(3), 257-264.

Zahavi, A. (1975). Mate selection—A selection for a handicap. *Journal of Theoretical Biology, 53*(1), 205-214.

Zahavi, A. (1977). The cost of honesty (Further remarks on the handicap principle). *Journal of Theoretical Biology, 67*(3), 603-605.

Zahavi, A., & Zahavi, A. (1997). *The handicap principle: A missing piece of Darwin's puzzle*. Oxford Oxford University Press.

Zhang, M., & Li, X. (2012). From Physical Weight to Psychological Significance: The Contribution of Semantic Activations. *Journal of Consumer Research, 38*(6), 1063-1075.

Zhao, X., Lynch Jr., J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis. *Journal of Consumer Research, 37*(2), 197-206.

Zhong, C.-B., & Leonardelli, G. J. (2008). Cold and Lonely: Does Social Exclusion Literally Feel Cold? *Psychological Science, 19*(9), 838-842.

Zhong, C.-B., & Liljenquist, K. (2006). Washing Away Your Sins: Threatened Morality and Physical Cleansing. *Science, 313*(5792), 1451-1452.

Zhong, C.-B., Liljenquist, K. A., & Cain, D. M. (2009). Moral Self-Regulation: Licensing & Compensation. In D. De Cremer (Ed.), *Psychological Perspectives on Ethical Behavior and Decision Making.* (pp. 75-89). Charlotte, NC Information Age.

Zhong, C.-B., Strejcek, B., & Sivanathan, N. (2010). A Clean Self Can Render Harsh Moral Judgment. *Journal of Experimental Social Psychology, 46*(5), 859-862.

Zimmer, M. R., Stafford, T. F., & Stafford, M. R. (1994). Green issues: Dimensions of environmental concern. *Journal of Business Research, 30*(1), 63-74.

Appendices

Appendix A- Materials for Study 1

Section 1 About your self

Please indicate how you rate yourself relative to your peers on these three characteristics in the table below.

For each characteristic, the rating can go from 0 to 100, whereas 0= worse than all others; 50= the same as others; 100= better than all others.

	Characteristics	How do you rate yourself? (from 0 to 100, see above)
1-1	Sense of Humour	
1-2	Moral Character	
1-3	Creativity	
1-4	Athleticism	

Section 2 About this product

Please indicate how much you agree and disagree with each of the following statements on a scale of 1 to 7 in relation to the advertisement you have seen.

2-1	The packaging is well designed.	Not at all ---------- Very much so 1 2 3 4 5 6 7
2-2	The product is environmentally friendly.	Not at all ---------- Very much so 1 2 3 4 5 6 7
2-3	The product causes little harm to the environment.	Not at all ---------- Very much so 1 2 3 4 5 6 7
2-4	I have heard of this product: Ovenshine oven & hob cleaner.	**Yes** **No**
2-5	I am familiar with Ovenshine oven & hob cleaner.	**Yes** **No**

Section 3 About this scent

3-1	This scent eliminates bad odour.	Not at all ---------- Very much so 1 2 3 4 5 6 7
3-2	This scent purifies the air efficiently.	Not at all ---------- Very much so 1 2 3 4 5 6 7
3-3	This scent makes me feel good.	Not at all ---------- Very much so 1 2 3 4 5 6 7
3-4	This scent is disgusting to me.	Not at all ---------- Very much so 1 2 3 4 5 6 7

Section 4: Background Questions

4-1	What Is your gender?	Male Female
4-2	What is your age?	
4-3	You are:	(1) Undergraduate (2) Postgraduate (3) Staff (4) Others
4-4	What do you think the purpose of the study is?	

Appendix B- Materials for Study 2

Section 1-6: The Evaluation of the Scents

Please smell the tester for 10 seconds and answer the following questions by circling from 1 to 7.

1-1	This scent is	Mild----------Strong 1 2 3 4 5 6 7
1-2	This scent is	Natural---------- Artificial 1 2 3 4 5 6 7
1-3	This scent contains	Little chemical----------A lot of chemical 1 2 3 4 5 6 7
1-4	This scent is disgusting to me	Not at all----------Very much 1 2 3 4 5 6 7
1-5	This scent makes me feel good	Not at all----------Very much 1 2 3 4 5 6 7

Section 7: Background Information

7-1	What Is your gender?	Male Female
7-2	What is your age?	
7-3	You are:	(1) Undergraduate (2) Postgraduate (3) Staff (4) Others

Appendix C- Materials for Study 3:

Mock Advertisement

EcoKitchen

Oven & Hob Cleaner

- Mild on hands; mild on the environment.
- Plant-based & bio-degradable ingredients.
- Product price £2.99

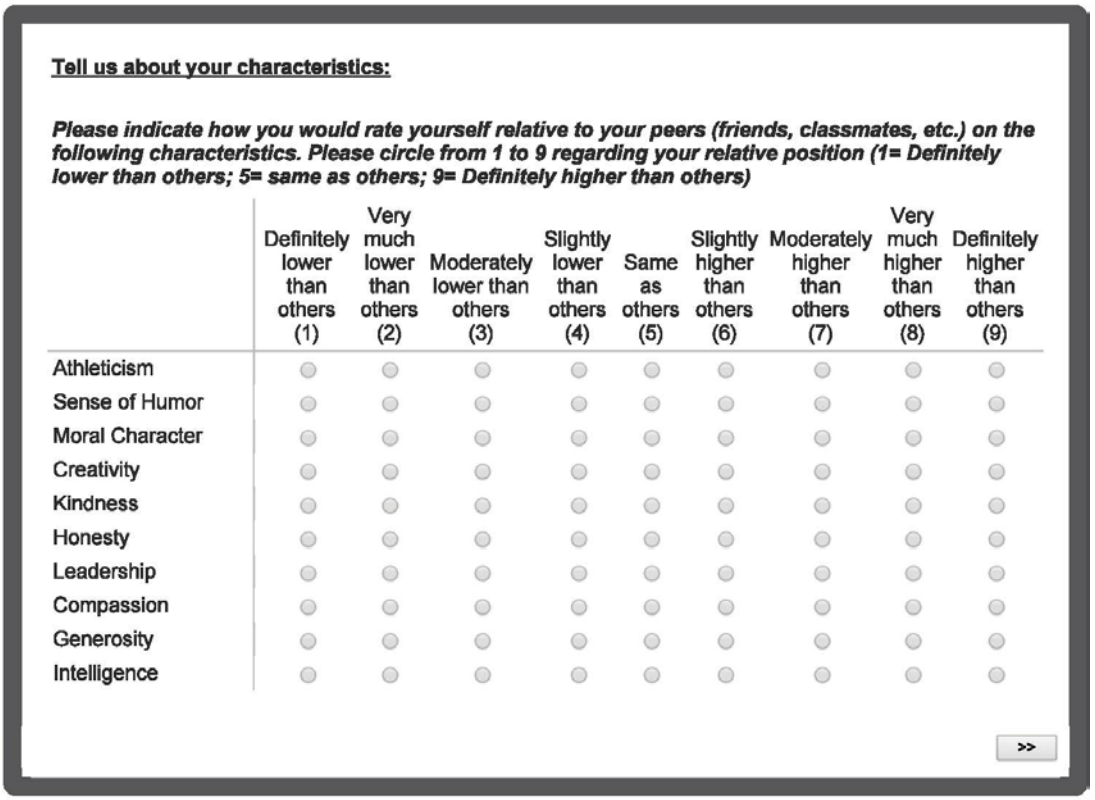
KitchenShine

Oven & Hob Cleaner

- Tough on grease; tough on dirt.
- Efficient, state-of-the-art formula!
- Product Price £ 1.69

Questionnaire- Control Condition

- Moral Measurements



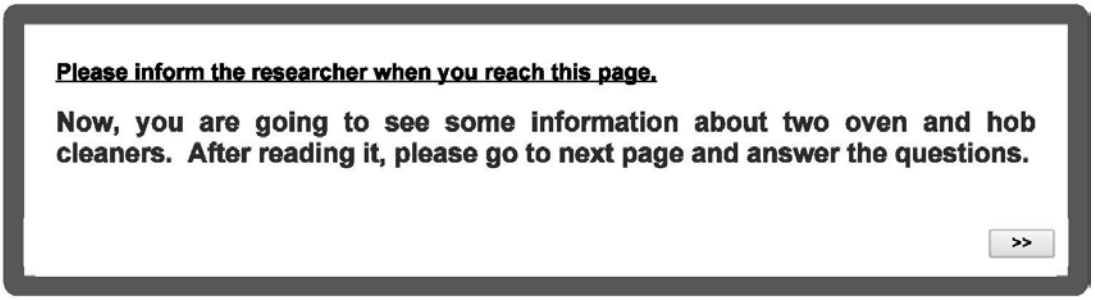
Tell us about your characteristics:

Please indicate how you would rate yourself relative to your peers (friends, classmates, etc.) on the following characteristics. Please circle from 1 to 9 regarding your relative position (1= Definitely lower than others; 5= same as others; 9= Definitely higher than others)

	Definitely lower than others (1)	Very much lower than others (2)	Moderately lower than others (3)	Slightly lower than others (4)	Same as others (5)	Slightly higher than others (6)	Moderately higher than others (7)	Very much higher than others (8)	Definitely higher than others (9)
Athleticism	○	○	○	○	○	○	○	○	○
Sense of Humor	○	○	○	○	○	○	○	○	○
Moral Character	○	○	○	○	○	○	○	○	○
Creativity	○	○	○	○	○	○	○	○	○
Kindness	○	○	○	○	○	○	○	○	○
Honesty	○	○	○	○	○	○	○	○	○
Leadership	○	○	○	○	○	○	○	○	○
Compassion	○	○	○	○	○	○	○	○	○
Generosity	○	○	○	○	○	○	○	○	○
Intelligence	○	○	○	○	○	○	○	○	○

>>

- Instruction page

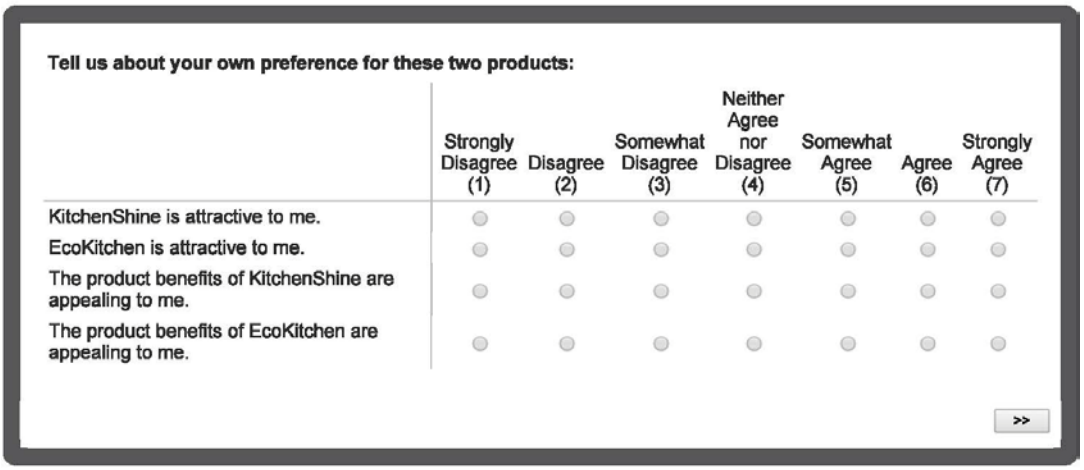


Please inform the researcher when you reach this page.

Now, you are going to see some information about two oven and hob cleaners. After reading it, please go to next page and answer the questions.

>>

- Product Evaluations (self based)

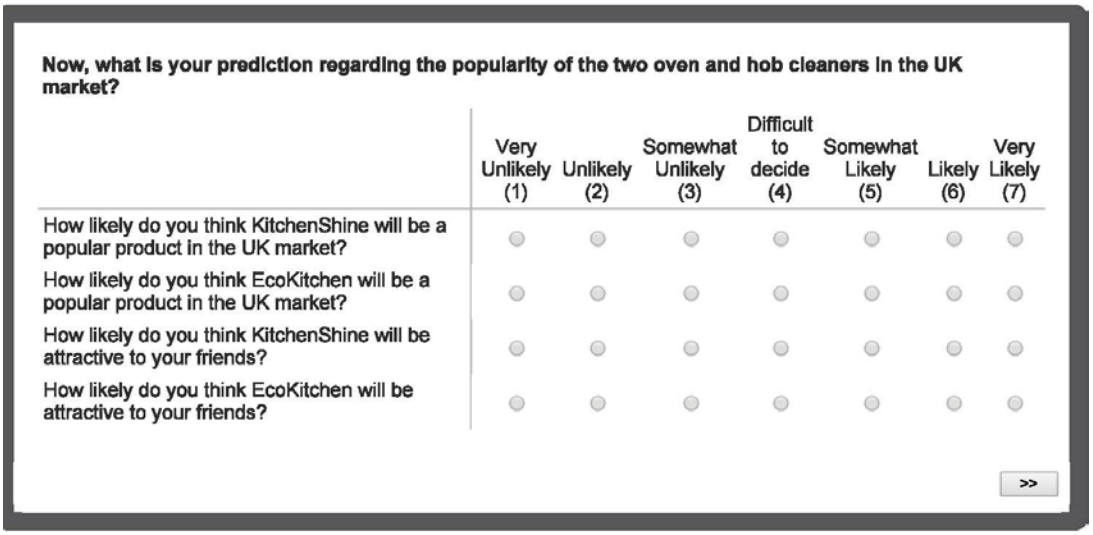


Tell us about your own preference for these two products:

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
KitchenShine is attractive to me.	○	○	○	○	○	○	○
EcoKitchen is attractive to me.	○	○	○	○	○	○	○
The product benefits of KitchenShine are appealing to me.	○	○	○	○	○	○	○
The product benefits of EcoKitchen are appealing to me.	○	○	○	○	○	○	○

>>

- Product Evaluation (other consumers based)

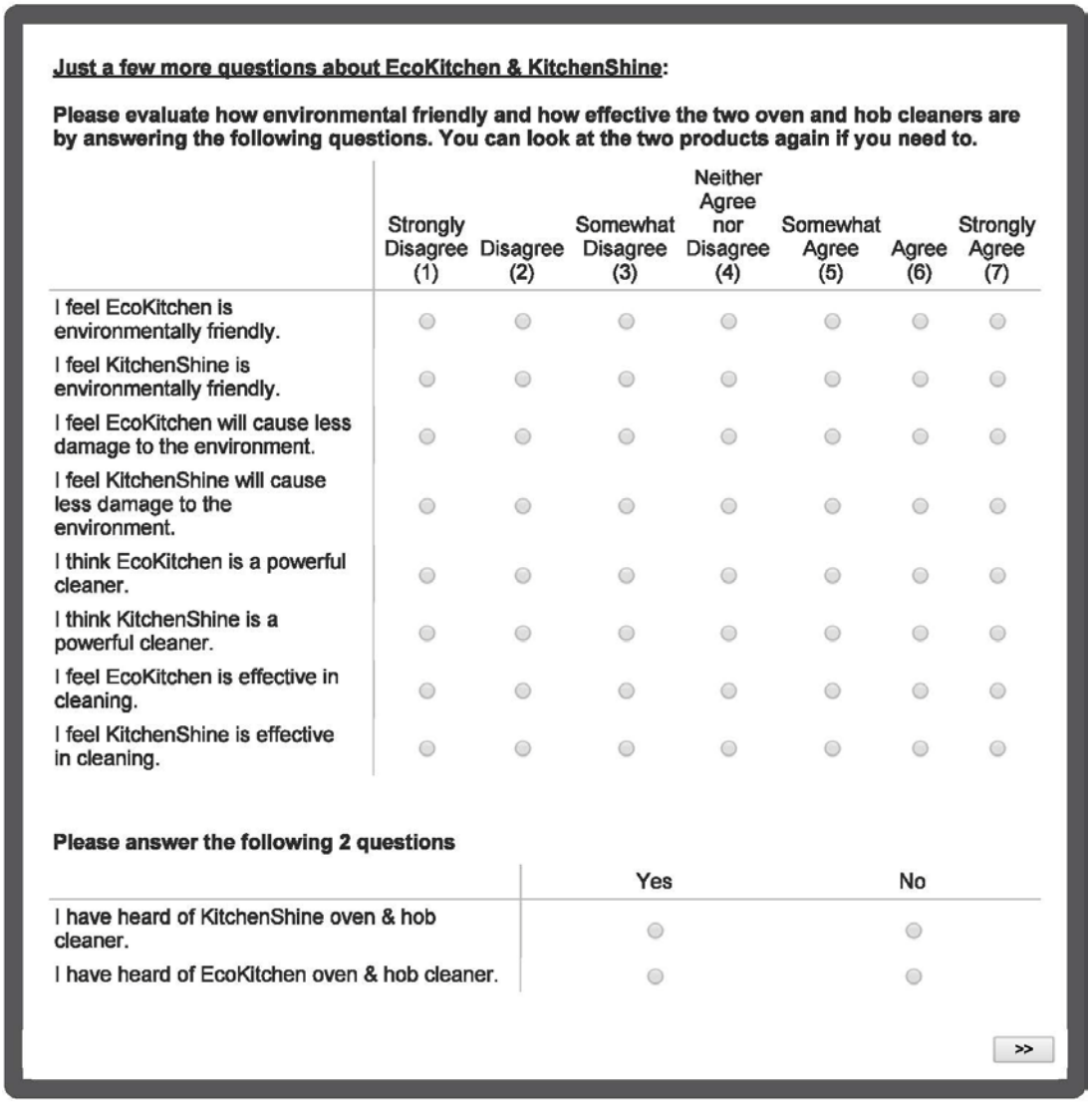


Now, what is your prediction regarding the popularity of the two oven and hob cleaners in the UK market?

	Very Unlikely (1)	Unlikely (2)	Somewhat Unlikely (3)	Difficult to decide (4)	Somewhat Likely (5)	Likely (6)	Very Likely (7)
How likely do you think KitchenShine will be a popular product in the UK market?	○	○	○	○	○	○	○
How likely do you think EcoKitchen will be a popular product in the UK market?	○	○	○	○	○	○	○
How likely do you think KitchenShine will be attractive to your friends?	○	○	○	○	○	○	○
How likely do you think EcoKitchen will be attractive to your friends?	○	○	○	○	○	○	○

>>

- Product Manipulation Check Questions



Just a few more questions about EcoKitchen & KitchenShine:

Please evaluate how environmental friendly and how effective the two oven and hob cleaners are by answering the following questions. You can look at the two products again if you need to.

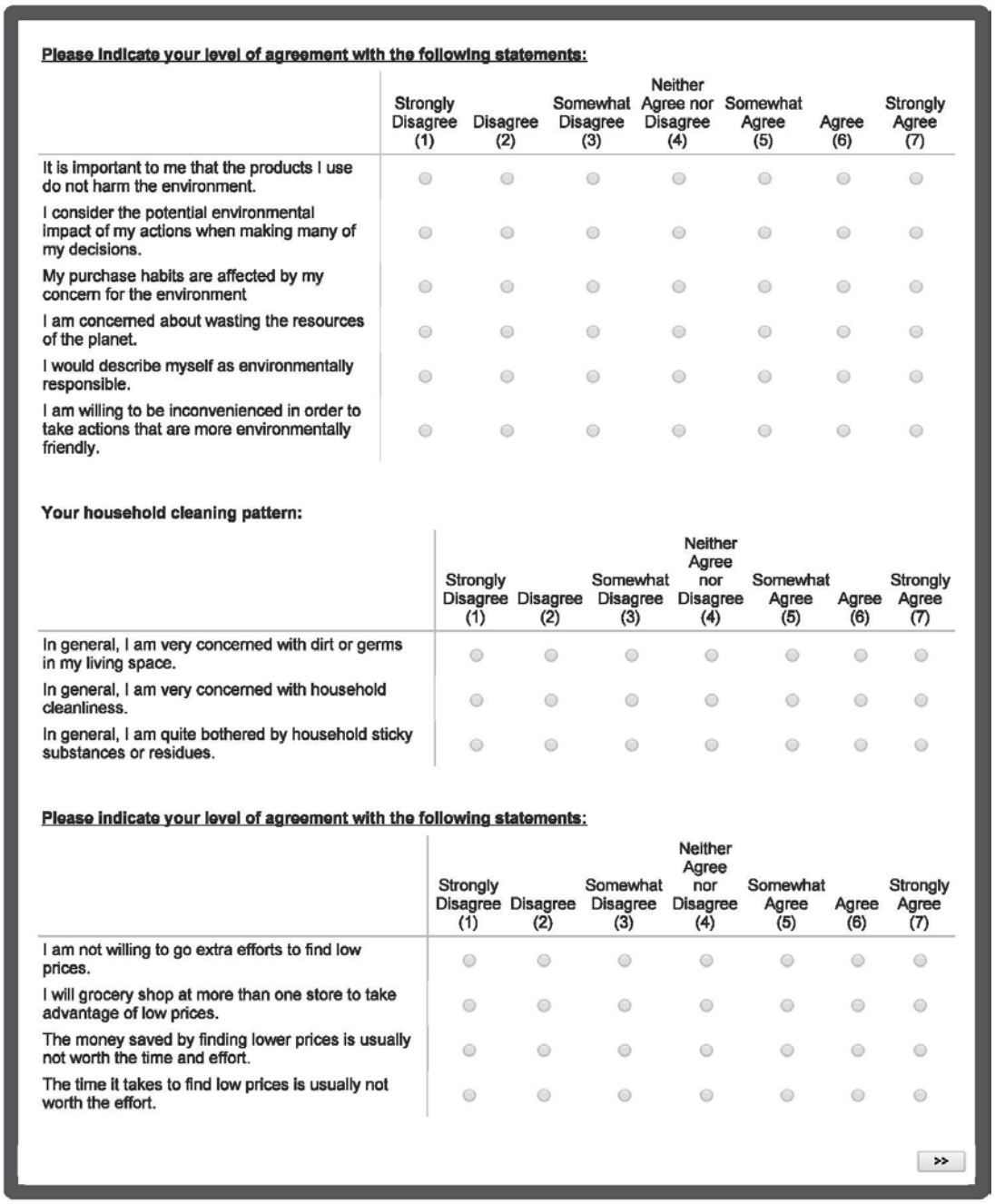
	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I feel EcoKitchen is environmentally friendly.	○	○	○	○	○	○	○
I feel KitchenShine is environmentally friendly.	○	○	○	○	○	○	○
I feel EcoKitchen will cause less damage to the environment.	○	○	○	○	○	○	○
I feel KitchenShine will cause less damage to the environment.	○	○	○	○	○	○	○
I think EcoKitchen is a powerful cleaner.	○	○	○	○	○	○	○
I think KitchenShine is a powerful cleaner.	○	○	○	○	○	○	○
I feel EcoKitchen is effective in cleaning.	○	○	○	○	○	○	○
I feel KitchenShine is effective in cleaning.	○	○	○	○	○	○	○

Please answer the following 2 questions

	Yes	No
I have heard of KitchenShine oven & hob cleaner.	○	○
I have heard of EcoKitchen oven & hob cleaner.	○	○

>>

- Control Measures



Please indicate your level of agreement with the following statements:

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
It is important to me that the products I use do not harm the environment.							
I consider the potential environmental impact of my actions when making many of my decisions.							
My purchase habits are affected by my concern for the environment							
I am concerned about wasting the resources of the planet.							
I would describe myself as environmentally responsible.							
I am willing to be inconvenienced in order to take actions that are more environmentally friendly.							

Your household cleaning pattern:

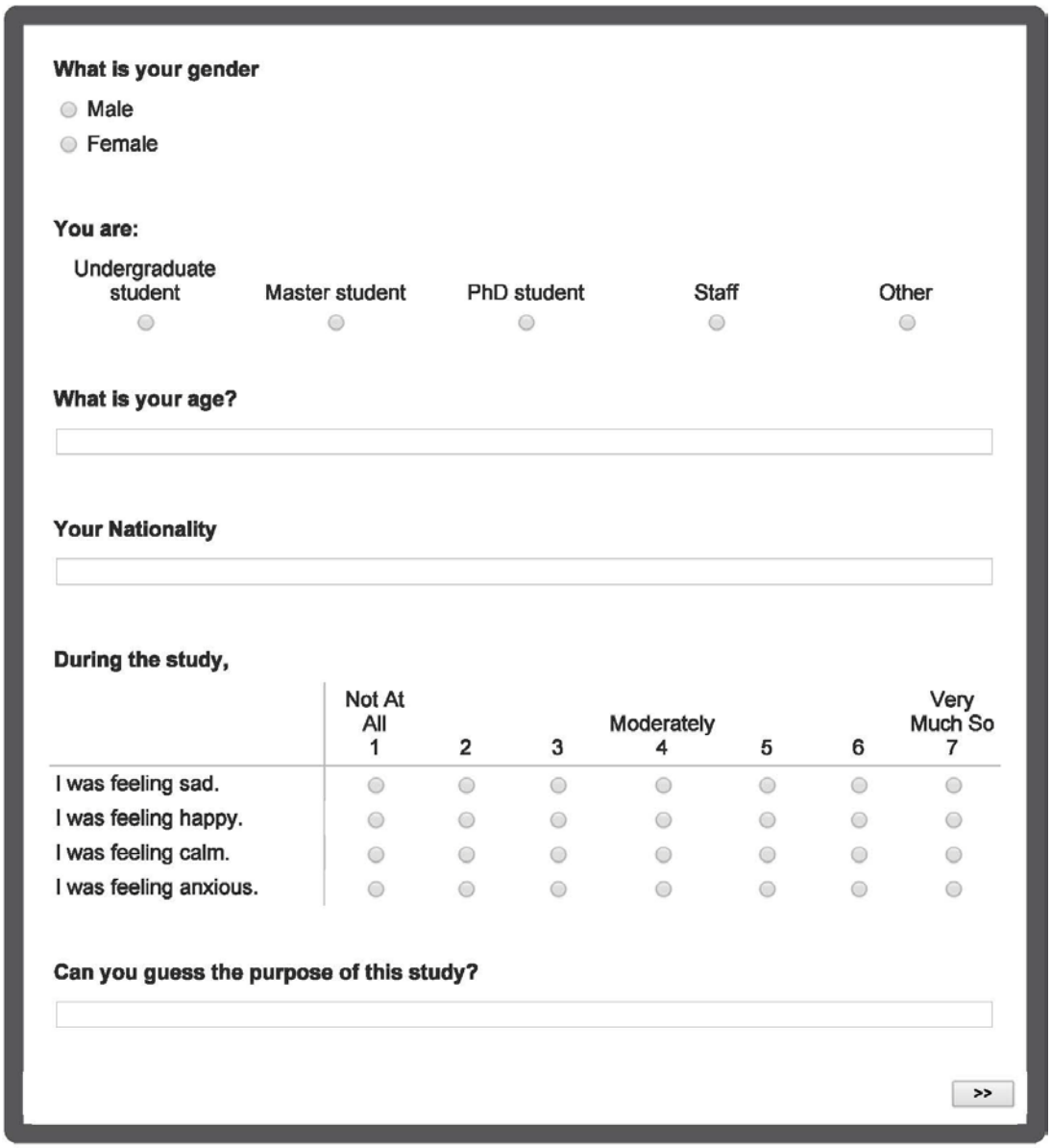
	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
In general, I am very concerned with dirt or germs in my living space.							
In general, I am very concerned with household cleanliness.							
In general, I am quite bothered by household sticky substances or residues.							

Please indicate your level of agreement with the following statements:

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I am not willing to go extra efforts to find low prices.							
I will grocery shop at more than one store to take advantage of low prices.							
The money saved by finding lower prices is usually not worth the time and effort.							
The time it takes to find low prices is usually not worth the effort.							

>>

- Background Information



What is your gender

- Male
- Female

You are:

Undergraduate student	Master student	PhD student	Staff	Other
○	○	○	○	○

What is your age?

Your Nationality

During the study,

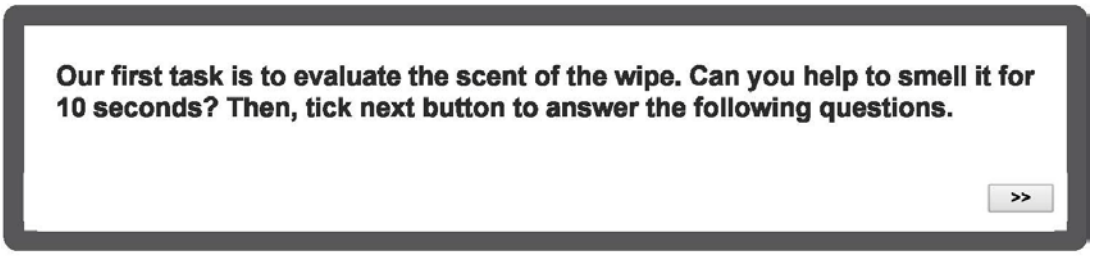
	Not At All 1	2	3	Moderately 4	5	6	Very Much So 7
I was feeling sad.	○	○	○	○	○	○	○
I was feeling happy.	○	○	○	○	○	○	○
I was feeling calm.	○	○	○	○	○	○	○
I was feeling anxious.	○	○	○	○	○	○	○

Can you guess the purpose of this study?

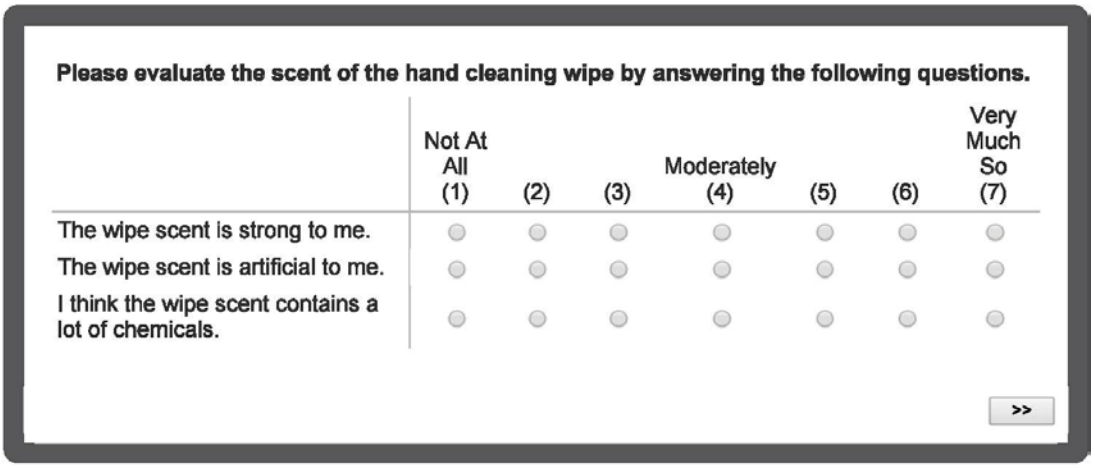
>>

Questionnaire- Strong and Mild Sensation Conditions

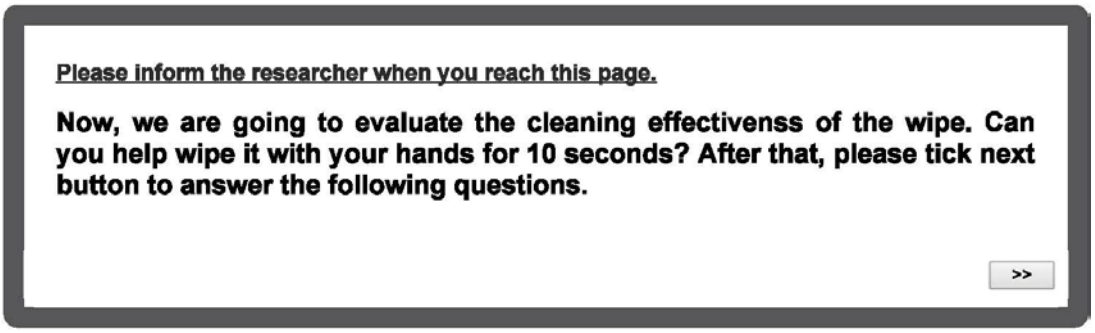
- Instruction Page 1



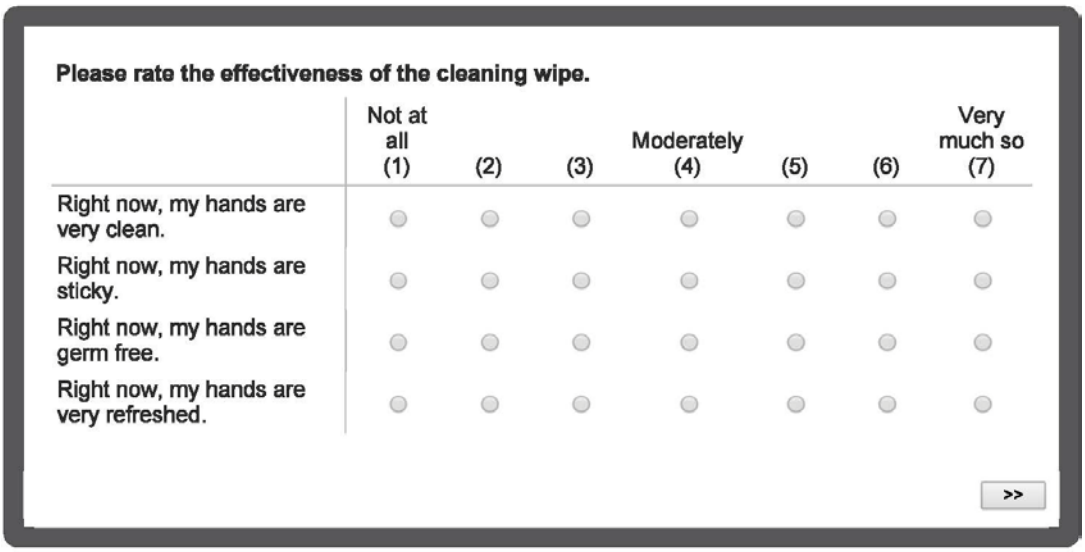
- Sensory Intensity and Perceived cleaning effectiveness



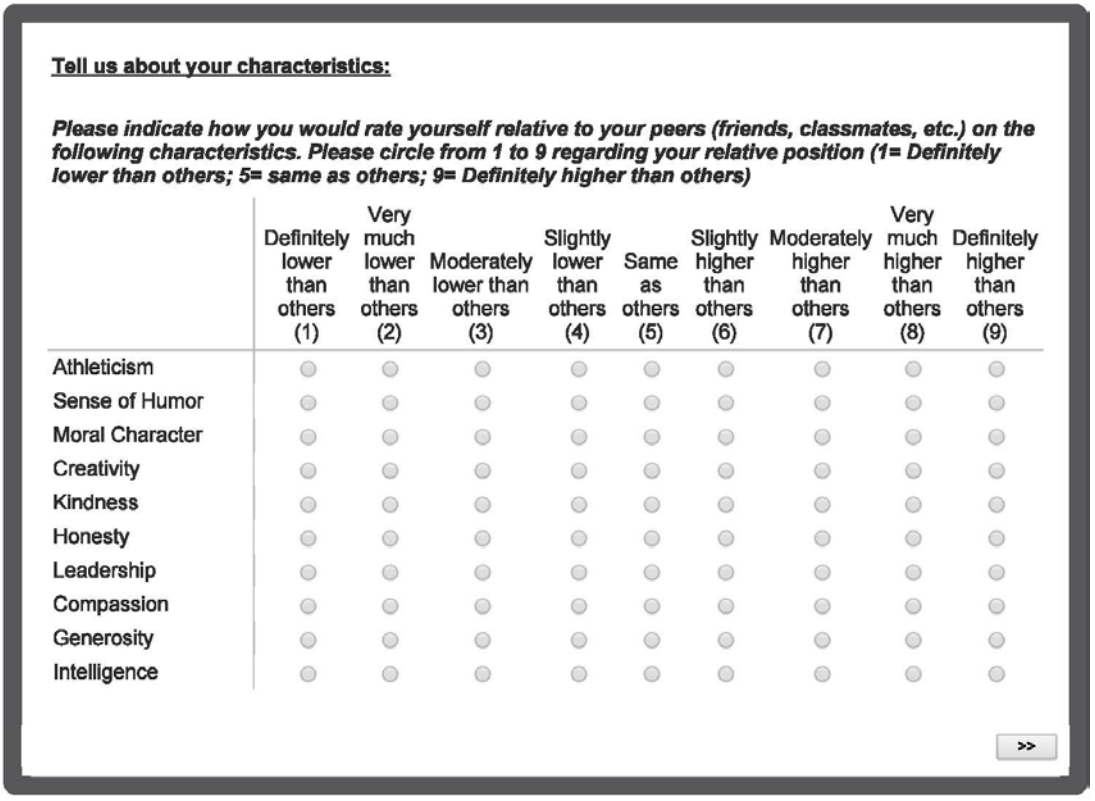
- Instruction Page 2



- Filter Question



- Moral Measurements



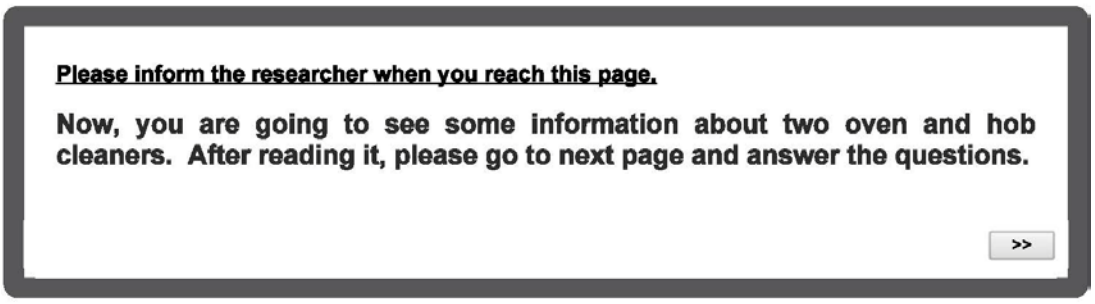
Tell us about your characteristics:

Please indicate how you would rate yourself relative to your peers (friends, classmates, etc.) on the following characteristics. Please circle from 1 to 9 regarding your relative position (1= Definitely lower than others; 5= same as others; 9= Definitely higher than others)

	Definitely lower than others (1)	Very much lower than others (2)	Moderately lower than others (3)	Slightly lower than others (4)	Same as others (5)	Slightly higher than others (6)	Moderately higher than others (7)	Very much higher than others (8)	Definitely higher than others (9)
Athleticism	○	○	○	○	○	○	○	○	○
Sense of Humor	○	○	○	○	○	○	○	○	○
Moral Character	○	○	○	○	○	○	○	○	○
Creativity	○	○	○	○	○	○	○	○	○
Kindness	○	○	○	○	○	○	○	○	○
Honesty	○	○	○	○	○	○	○	○	○
Leadership	○	○	○	○	○	○	○	○	○
Compassion	○	○	○	○	○	○	○	○	○
Generosity	○	○	○	○	○	○	○	○	○
Intelligence	○	○	○	○	○	○	○	○	○

>>

- Instruction page 3

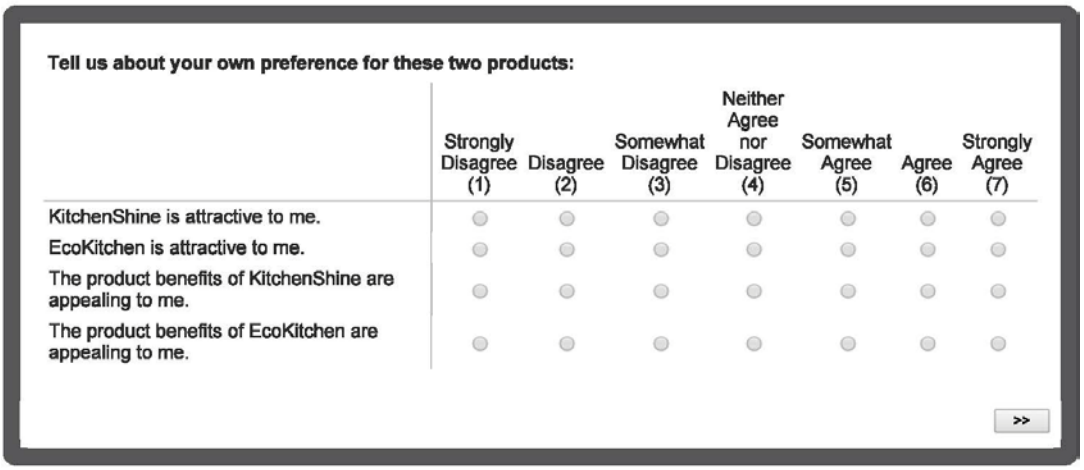


Please inform the researcher when you reach this page.

Now, you are going to see some information about two oven and hob cleaners. After reading it, please go to next page and answer the questions.

>>

- Product Evaluations (self based)

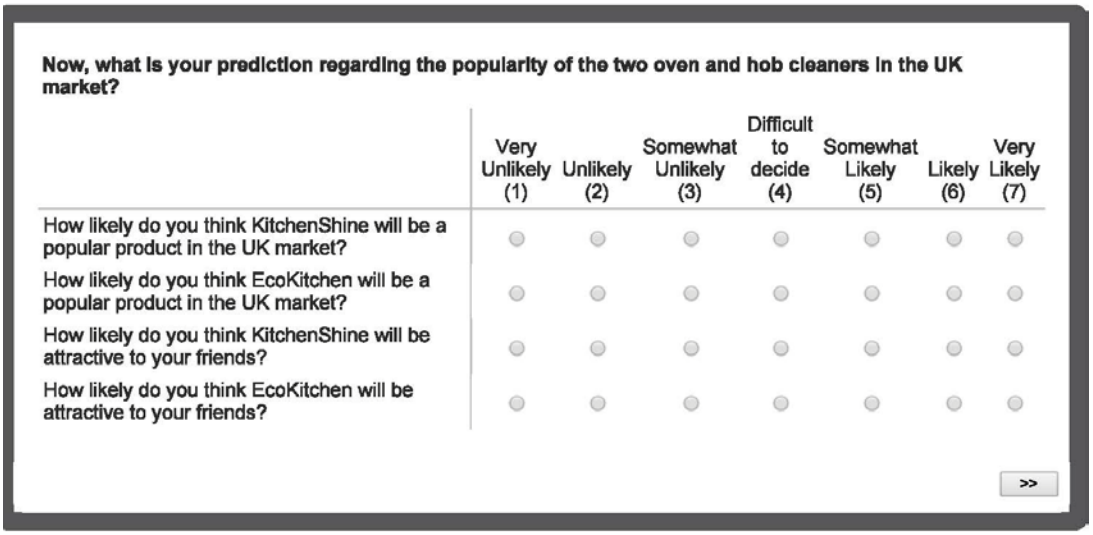


Tell us about your own preference for these two products:

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
KitchenShine is attractive to me.	○	○	○	○	○	○	○
EcoKitchen is attractive to me.	○	○	○	○	○	○	○
The product benefits of KitchenShine are appealing to me.	○	○	○	○	○	○	○
The product benefits of EcoKitchen are appealing to me.	○	○	○	○	○	○	○

>>

- Product Evaluation (other consumers based)

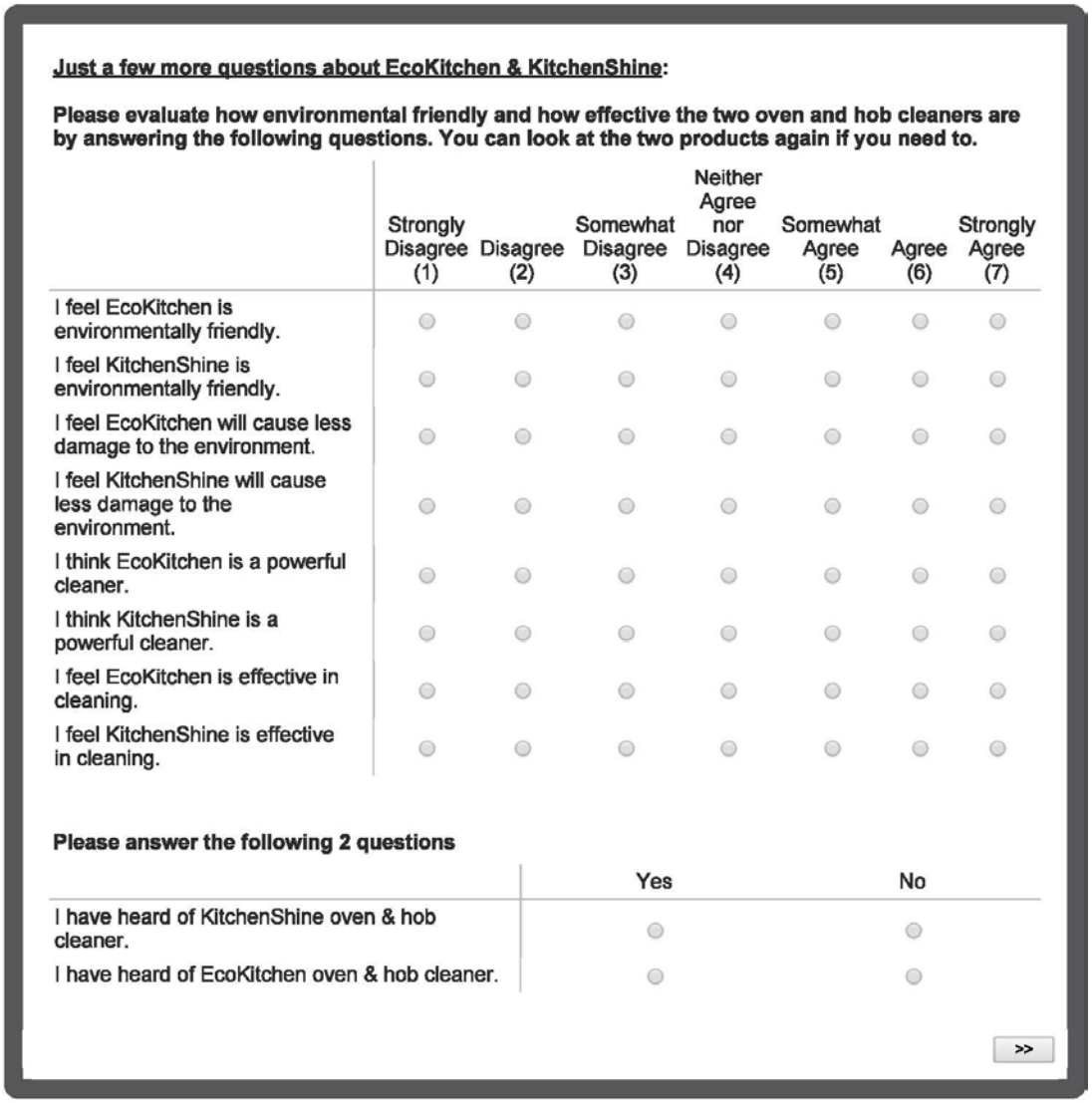


Now, what is your prediction regarding the popularity of the two oven and hob cleaners in the UK market?

	Very Unlikely (1)	Unlikely (2)	Somewhat Unlikely (3)	Difficult to decide (4)	Somewhat Likely (5)	Likely (6)	Very Likely (7)
How likely do you think KitchenShine will be a popular product in the UK market?	○	○	○	○	○	○	○
How likely do you think EcoKitchen will be a popular product in the UK market?	○	○	○	○	○	○	○
How likely do you think KitchenShine will be attractive to your friends?	○	○	○	○	○	○	○
How likely do you think EcoKitchen will be attractive to your friends?	○	○	○	○	○	○	○

>>

- Product Manipulation Check Questions



Just a few more questions about EcoKitchen & KitchenShine:

Please evaluate how environmental friendly and how effective the two oven and hob cleaners are by answering the following questions. You can look at the two products again if you need to.

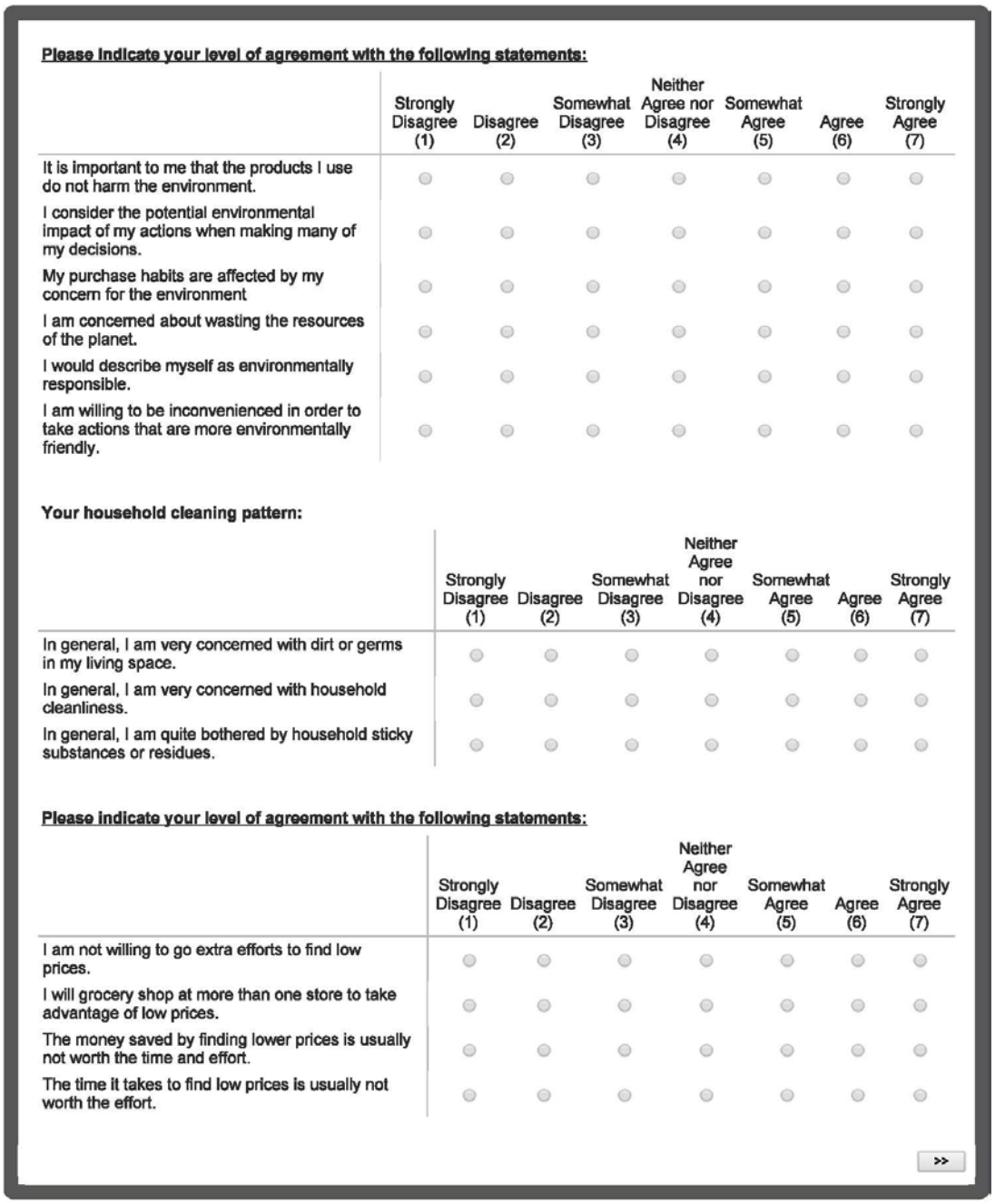
	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I feel EcoKitchen is environmentally friendly.	○	○	○	○	○	○	○
I feel KitchenShine is environmentally friendly.	○	○	○	○	○	○	○
I feel EcoKitchen will cause less damage to the environment.	○	○	○	○	○	○	○
I feel KitchenShine will cause less damage to the environment.	○	○	○	○	○	○	○
I think EcoKitchen is a powerful cleaner.	○	○	○	○	○	○	○
I think KitchenShine is a powerful cleaner.	○	○	○	○	○	○	○
I feel EcoKitchen is effective in cleaning.	○	○	○	○	○	○	○
I feel KitchenShine is effective in cleaning.	○	○	○	○	○	○	○

Please answer the following 2 questions

	Yes	No
I have heard of KitchenShine oven & hob cleaner.	○	○
I have heard of EcoKitchen oven & hob cleaner.	○	○

>>

- Control Measures



Please indicate your level of agreement with the following statements:

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
It is important to me that the products I use do not harm the environment.							
I consider the potential environmental impact of my actions when making many of my decisions.							
My purchase habits are affected by my concern for the environment							
I am concerned about wasting the resources of the planet.							
I would describe myself as environmentally responsible.							
I am willing to be inconvenienced in order to take actions that are more environmentally friendly.							

Your household cleaning pattern:

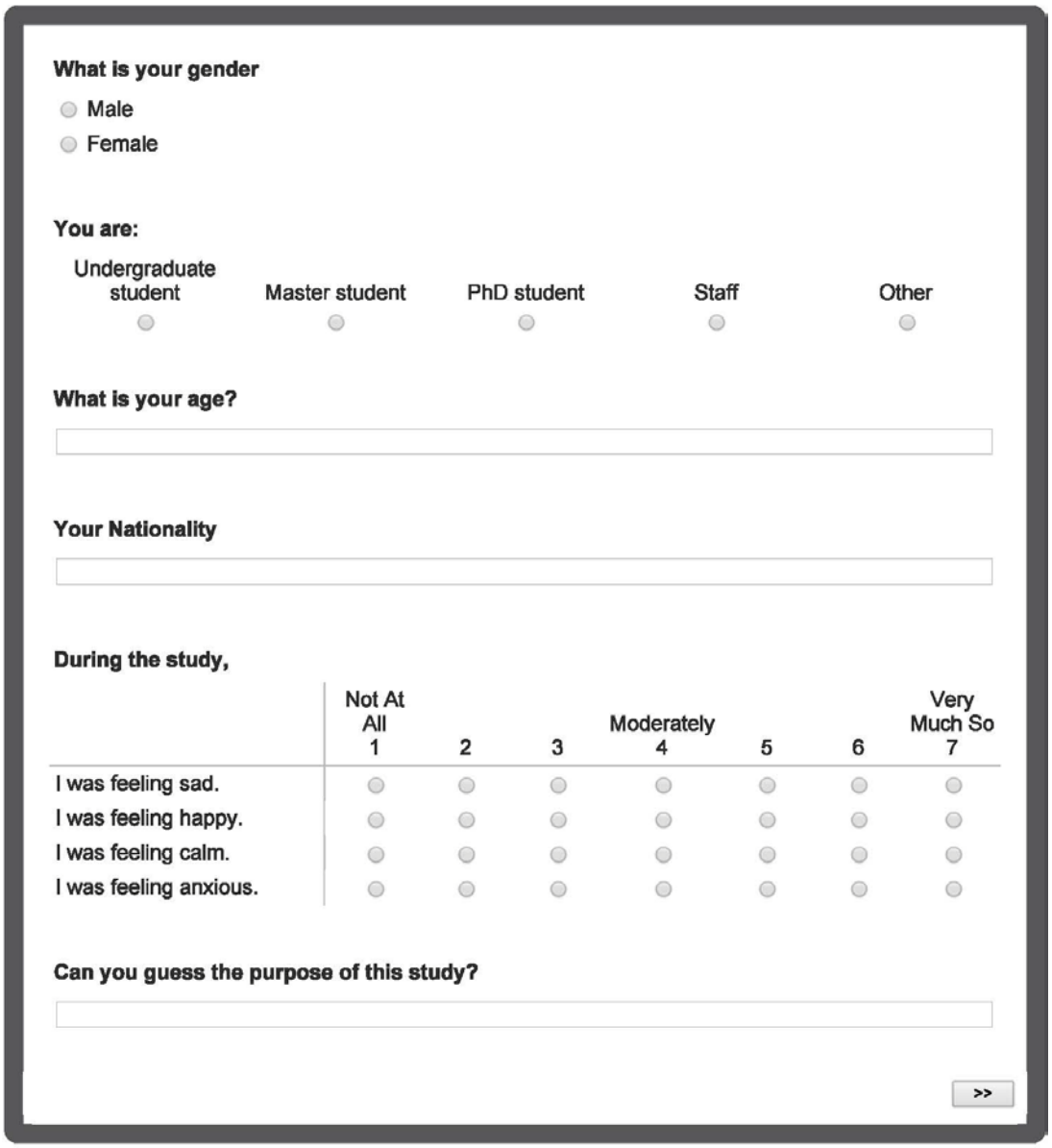
	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
In general, I am very concerned with dirt or germs in my living space.							
In general, I am very concerned with household cleanliness.							
In general, I am quite bothered by household sticky substances or residues.							

Please indicate your level of agreement with the following statements:

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I am not willing to go extra efforts to find low prices.							
I will grocery shop at more than one store to take advantage of low prices.							
The money saved by finding lower prices is usually not worth the time and effort.							
The time it takes to find low prices is usually not worth the effort.							

>>

- Background Information



What is your gender

- Male
- Female

You are:

Undergraduate student	Master student	PhD student	Staff	Other
○	○	○	○	○

What is your age?

Your Nationality

During the study,

	Not At All 1	2	3	Moderately 4	5	6	Very Much So 7
I was feeling sad.	○	○	○	○	○	○	○
I was feeling happy.	○	○	○	○	○	○	○
I was feeling calm.	○	○	○	○	○	○	○
I was feeling anxious.	○	○	○	○	○	○	○

Can you guess the purpose of this study?

>>