

A SURVEY ON THE EFFECTS OF PROGRESSIVE REMOVAL OF BRAND
IMAGERY ELEMENTS FROM CIGARETTE PACKS ON THE PERCEPTION
OF ADULT UNIVERSITY STUDENTS

by

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Submitted in partial fulfilment of the requirements
for the degree of Master of Health Administration

at

Dalhousie University
Halifax, Nova Scotia
August 2011

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DALHOUSIE UNIVERSITY
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DALHOUSIE UNIVERSITY

DATE: 15th August 2011

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TITLE: A SURVEY ON THE EFFECTS OF PROGRESSIVE REMOVAL OF
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PERCEPTION OF ADULT UNIVERSITY STUDENTS

DEPARTMENT OR SCHOOL: School of Health Administration

DEGREE: MHA CONVOCATION: October YEAR: 2011

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DEDICATION

Words cannot describe my appreciation for my parents' support throughout my life. I wish to make them proud of me. I would also like to express my appreciation for the support I have had from Dalhousie's health professions faculty members and thank them for their exceptional contribution in enhancing my academic experience and equipping me with the skills I need to carry out research in the years to come.

TABLE OF CONTENTS

LIST OF TABLES	vii
LIST OF FIGURES	viii
ABSTRACT	ix
LIST OF ABBREVIATIONS USED	x
ACKNOWLEDGMENTS	xi
Chapter 1 : Introduction	1
1.1 Thesis objectives	3
1.2 Thesis contribution.....	3
1.3 Thesis outline	4
Chapter 2 : Literature Review	6
2.1 Introduction to health warnings and constituents.....	6
2.2 Plain packaging and warning’s visibility	7
2.3 Elements of pack design marketing	8
2.3.1 Brand descriptors	9
2.3.2 References to product design and emissions.....	10
2.3.3 Brand imagery and colors	10
2.3.4 Others	10
2.4 Legal challenges.....	11
Chapter 3 : Methods.....	14
3.1 Why surveys.....	14
3.1.1 Surveys.....	14
3.1.2 Focus groups	15
3.2 Questionnaire development.....	16
3.2.1 Demographic questions	17
3.2.2 Studies to guide the perception section of the questionnaire	17
3.2.3 Studies to guide the health warning question.....	19
3.3 Design	26
3.4 Recruitment.....	28
3.5 Ethical issues.....	29
3.6 Inclusion/exclusion criteria	30
3.7 Data	31
3.8 Analysis and storage	32
3.8.1 Missing values.....	34
Chapter 4 : Results	36

4.1 Multicollinearity and transformations.....	36
4.1.1 Multicollinearity.....	36
4.1.2 Distribution of the rating responses on the 1-10 scale	37
4.2 Sample characteristics.....	41
4.3 MANOVA test results for the 1-10 scale.....	42
4.4 Bivariate logistic regression test results for the 0-1 scale	44
4.5 Health warnings	46
Chapter 5 : Discussion	48
5.1 Discussion of results in this study.....	48
5.1.1 Results compared to other studies.....	49
5.1.2 Comparison of the results of the two scales.....	51
5.1.3 Discussion of the health warning recall results	51
5.1.4 Strengths of this study.....	52
5.1.5 Limitations of this study	53
Chapter 6 : Recommendations And Conclusions.....	56
6.1 Recommendations.....	56
6.2 Conclusions.....	58
References.....	60
Appendix A1: Information Letter	64
Appendix A2: Survey	66
Appendix B: Recruitment Notice.....	70
Appendix C: VIF Tables For The Perception Attributes	71
Appendix D: Boxplots Of The Transformed Ratings	76
Appendix E: Histograms Of The Transformed Ratings.....	79
Appendix F: Multiple Comparison Tests.....	82

LIST OF TABLES

Table 3-1: Comparing plain packaging studies.....	24
Table 4-1: Characteristics of the sample.....	41
Table 4-2: MANOVA test of ratings of plain packs relative to the original pack.....	43
Table 4-3: ORs and CIs of plain packs relative to the reference pack.....	45
Table 4-4: ORs of correct warning recalls by pack.....	46

LIST OF FIGURES

Figure 3-1: Packs that were randomly assigned to the participants	27
Figure 4-1: Box plots of the original data set	37
Figure 4-2: Box plots of the square rooted data set	38
Figure 4-3: Histograms of the original data set.....	39
Figure 4-4: Histograms of the square rooted data set	40

ABSTRACT

Plain packaging can arguably reduce the appeal of cigarette packages and deter people from smoking. In this study, a 1 (brand type) X 4 (levels of plain packages) between-subject design was utilized. The method used was an internet survey. 220 adult smokers and non-smokers from Halifax Regional Municipality (HRM) rated packages in terms of their brand imagery characteristics and answered a single multiple choice question to test their recall of the health warning on their package. According to the results of a MANOVA test and a bivariate logistic regression test of perception attributes, the association between plainer packages and the participants' ratings for some attributes were significant, and ranged from slightly moderate to moderate strength levels of associations. Health warnings recall and plainer packages were also significantly and moderately associated. These associations provide a compelling argument for the need for plain packaging policies as a deterrent for smoking.

LIST OF ABBREVIATIONS USED

BC	British Columbia
FCTC	Framework Convention on Tobacco Control
HRM	Halifax Regional Municipality
JTI	Japan Tobacco International
MANOVA	Multivariate Analysis Of Variance
NAFTA	North American Free Trade Agreement
OR	Odds ratio
PI	Principal Investigator
PP	Plain pack
RICO	Racketeer Influenced and Corrupt Organizations
SES	Socio Economic Status
SUB	Student Union Building
TA	Teaching Assistant
US	United States
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

ACKNOWLEDGMENTS

First, I would like to thank my thesis supervisors, Dr. Simms and Dr. Luu, for their consistent support throughout my Master degree. I appreciate their patience and efforts in guiding me towards the completion of my Master degree.

I would also like to thank my colleagues and professors, especially Professor Hamilton-Hinch , Dr. John McCabe and Dr. Haardt who provided me with valuable advice throughout my academic experience at Dalhousie University.

My special thanks to my family, who have been always there for me whenever I needed them. Without their support and love I was not going to be able to accomplish my academic goals and reach my life aspirations.

Chapter 1 : Introduction

Tobacco companies are increasingly facing difficulties in advertising cigarettes to the public due to the development and implementation of comprehensive governmental tobacco control strategies which restrict the marketing of tobacco products (Hammond, 2007; Pollay & Dewhirst, 2002; Wakefield, Morley, Horan & Cummings, 2002).

Packaging is one of the very few remaining methods to market cigarettes. Therefore, pack design is one of the primary components of the industry's current overall tobacco marketing strategy (Dewhirst, 2004; Pollay 2001). The objective of the cigarette package is to attract consumers and capture their attention (Miller, 1963). This objective is accomplished through the utilization of trademarks, colors, images, and fonts of packages to serve as a badge product that describes the personality and identity of the brand and resonates with consumers (Hammond, 2007; Wakefield et al., 2002). The sophistication of the current packages is the product of extensive research by the tobacco industry to convey specific brand preferences, and influence the health perceptions of individuals and their sensory experience with cigarettes (Freeman, Chapman & Rimmer 2008; Hammond, 2007; Wakefield et al. 2002).

Generic packaging or plain packaging is the process through which a package is stripped from its colors, logos, brand imagery, and trademarks, while only keeping the brand name in a standardized font, size, and location, along legally mandated information which includes health warnings (Cunningham & Kyle, 1995; Freeman, Chapman & Rimmer 2008). The terms "generic" and "plain" are used interchangeably in this study to refer to such packages. The first calls for the introduction of generic packaging arose in the mid

1990s, in order to respond to the innovations in pack design by the industry and restrict their marketing venues (Cunningham & Kyle, 1995). In this thesis, the term “industry” is used to refer to the four biggest tobacco companies and their lobbyist groups. Descriptive studies that were conducted on generic packaging reported that compared to original brands, generic packages were perceived as unattractive, dissolved from brand imagery, and characterized as having more visible health warnings (Germain, Wakefield, & Durkin 2009).

Health warnings, whether in pictures or written statements, are used to convey information about the harms of cigarettes’ constituents and emissions. The inclusion of both visual warnings like those in Canada and written warnings like those in the United States of America (USA) decreases the attractiveness of the package to consumers, and creates high level of anxiety or fear amongst them (Kees, Burton, Andrews, & Kozup, 2006).

The legal challenges surrounding plain packaging policies are complex and challenging. That said, the incorporation of these policies within regulations and laws is essential to buffer the tobacco industry’s pressure to shut down plain packaging efforts. Australia’s efforts to introduce plain packaging policies represent an exemplary model for other countries to combat cigarette marketing. Australia’s plain packaging policies are based on local plain packaging evidence. Canada has a different external environment and requires more local evidence to support the decision for adopting plain packaging policies. Currently, none of the provinces and territories in Canada has adopted a generic packaging policy. The evidence around generic packaging in Canada has not been

thoroughly studied and more studies are needed to answer the policy question of whether it is recommended for Canada to adopt a generic packaging policy or not.

1.1 Thesis objectives

The purpose of this study is to examine the effect of progressive removal of brand imagery from packages on the perceptions of adult university students. This study has three main objectives. The first is to add to the library of generic packaging studies, and answer the policy question of whether or not Nova Scotia needs a plain packaging policy, from the perspective of students enrolled in HRM universities. The second objective has two sub-objectives which are to examine the effect of increasingly plain packaging on the perceptions of students through comparing packages in four categories, original pack, plain pack 1, plain pack 2, and plain pack 3 that are plainer as you go from plain pack 1 to plain pack 3, in the following manner:

To compare the mean of the participants' ratings of each plain pack relative to an original pack with respect to positive perception ratings on a 1-10 scale.

To compare the mean of the participants' ratings of each plain pack relative to an original pack with respect to negative perception ratings 1-10 scale.

The third objective is to examine the participants' recall of health warnings by pack condition. The "condition" of the packs refers to the degree of their plain packaging.

1.2 Thesis contribution

To date, there have been only two studies on generic packaging that examined the effect of progressive removal brand imagery elements of packages on the perceptions on individuals. The first was by Wakefield, Germain & Durkin in 2008, and the second

study was by Germain et al. in 2009. Both studies were conducted in Australia, a country that has different smoke-free policies and initiatives as compared to Canada. This study is similar to Wakefield's et al. 2008 study with the difference of examining both smokers and non-smokers instead of just smokers and dropping a few attributes, for which the rationale is provided in the methods chapter. This study also examines whether the participants' recognition of health warnings differed by plain packs as compared to an original pack.

1.3 Thesis outline

The thesis is organized as follows:

Chapter 2 This chapter contains a review on the evidence surrounding plain packaging, and provides a context for the need to conduct generic packaging studies in Canada. This chapter also consists of a brief overview on the importance of constituents and health warnings on cigarette packages, and the potential of plain packaging to increase the visibility of these health warnings. Finally, this chapter includes a section on the legal challenges associated with plain packaging.

Chapter 3 This chapter presents the rationale for choosing a survey as a method to study the perceptions of the participants of generic packaging. The chapter also describes the design, procedure, conditions, and questionnaire contents of this study.

Chapter 4 This chapter presents the results of the study with regards to the ratings of the participants of the packages and their ability to recall the health warning on their cigarette package.

Chapter 5 This chapter discusses the results of the study and compares the results of the study with other studies. It also compares the results of the two perception rating tests in the study, and presents its strengths and limitations.

Chapter 6 This chapter provides recommendations for future plain packaging studies based on the limitations of this study and a conclusion for this study.

Chapter 2 : Literature Review

This chapter contains a brief overview of the importance of constituents and health warnings on cigarette packages, and the potential of plain packaging to make health warnings on cigarette packs more visible. This is followed by a section on pack design and how it relates to marketing through the pack. The chapter ends with presenting the legal challenges related to plain packaging.

2.1 Introduction to health warnings and constituents

Emissions and constituents are words that refer to the substances found in cigarettes and other tobacco products. There are more than 4000 chemicals in cigarettes with about 60 carcinogens including hydrogen cyanide, benzene, and formaldehyde (Hoffmann & Hoffman, 2004). There is a struggle to highlight these harmful substances to consumers in a meaningful and concise manner. The most common practices in the world include displaying three emissions: carbon monoxide, nicotine, and tar on packages.

Nevertheless, any form of labeling seems essential to warn individuals about the risks of cigarettes to smokers (O'Connor, Kozlowski, Borland, Hammond & McNeill, 2006).

The German Tobacco Control Centre of the World Health Organization (WHO) stresses the importance of combining strong images along with written warnings on cigarette packs, in order to motivate smokers to quit, and deter non-smokers from attempting to smoke. According to a report by the aforementioned tobacco control centre, warnings should cover 50% or more of cigarette packages (Tuffs, 2009). The WHO's Framework Convention on Tobacco Control (FCTC) treaty requires that written warnings, pictorial

warnings, or a combination of both, cover 30% or more of the front and back of cigarette package (Kees et al., 2006). The inclusion of both visual warnings like those in Canada and written warnings like those in the USA can decrease the attractiveness of the package to consumers, and create a high level of anxiety or fear amongst them (Kees et al., 2006).

2.2 Plain packaging and warning's visibility

In 1989, the New Zealand Department of Health's Toxic Substances Board recommended selling cigarettes in white packages with no logos or colors and a standard text to strip the elements of pack design from the packages (Freeman, Chapman & Rimmer, 2008). A number of Canadian public health officials argue that plain packaging, with just the name of the brand and no logos and colors can increase the attention of consumers to the health warnings on packs, and subsequently assist in the reduction of smoking rates (Feinleib, 2001).

There are a few studies that demonstrate the usefulness of plain packaging in increasing the attention of individuals towards health warnings. For example: a Canadian study by Goldberg, Liefeld, Madill, & Vrenderberg (1999) was conducted in a mall in Vancouver, British Columbia (BC) with 401 participants between the ages 14-17. The subjects were exposed to one of three warning labels that were drawn from an initial eight mandated warnings: "smoking can kill you", "cigarettes are addictive", and "tobacco smoke causes fatal lung diseases in nonsmokers." The study concluded that the exposure to warnings on plain packs enhances the participants' recall for direct and brief messages such as "smoking can kill you" (95% CI= 14%, 34% for regular packages versus 95% CI= 44%, 67%), and "cigarettes are addictive" (95% CI=8%, 23% for regular packages versus 95%

CI=18%, 29%) but not for indirect and long messages, “tobacco smoke causes fatal lung diseases in nonsmokers” (95% CI=11%, 24% for regular packages versus 95% CI=0%, 6%) (Goldberg et al., 1999).

A similar study of 568 adolescents in New Zealand by Beede & Lawson (1992) has shown that adolescents demonstrated significantly higher accuracy in recalling health warnings on plain packages compared to branded counterparts. The same study has shown that with less presentation of cues for brand images respondents perceived and recalled non-image information with more accuracy. This shows that the less brand imagery elements a package has, the more likely adolescents are to recall health warnings.

A 2009 study of over 1000 adolescents by Germain et al. concluded that increasing the size of pictorial health warnings on plain packs from 30% to 80% can reduce its pack appeal amongst smokers, non-smokers and experimenters. These three groups rated the cigarette packages with bigger pictorial warnings, plain packages 4 with 80% warning size on the face of the pack, as having less positive package appeal compared cigarette packages with smaller pictorial warnings, plain packages 3 with 30% warning size on the face of the pack.

2.3 Elements of pack design marketing

Tobacco marketing played a vital role in the marked increase and then gradual decrease of smoking rates in the 20th century (Brandt, 2007; Royal College of Physicians, 2001). Packaging has been a central element of the industry’s marketing strategy (Dewhirst, 2004; Pollay 2001). The pack can act as a medium for communicating misleading

information to consumers (Pollay & Dewhirst, 2002). There are three ways through which packs communicate misleading information: brand descriptors, references to product design and emissions, and brand imagery and colors (Hammond 2007; US Department of Health and Human Services, 2001; Wakefield et al. 2002). The evidence on the effect of the size and shape of the pack on the perception of consumers is limited, and will therefore not be explored in detail in this study.

2.3.1 Brand descriptors

Brand descriptors such as mild or light are utilized to promote a false perception that cigarettes (with these words) are less harmful and deliver lower tar levels compared to regular brands (Pollay & Dewhirst, 2002). Research from the tobacco industry indicates that the utilization of these words targets health-concerned smokers in order to prevent or delay them from quitting (Ling & Glanz 2004; US Department of Health and Human Services, 2001) The International Tobacco Control Policy Evaluation Survey in New Zealand was conducted with 1376 adult smokers with the aim of examining the perception of smokers of light/mild cigarettes. The results of the survey revealed that 25% of smokers believed that light cigarettes are easier to quit, 42% believed that they are less harmful, and 43% believed that they deliver less harm (Wilson et al., 2009). Therefore, many jurisdictions have banned the utilization of the words light, mild, and low tar. However, the industry responded to this ban by substituting those words with “smooth” and words for the names of colors including blue and silver which misleadingly denote healthier alternatives, as a recent study concluded that 70% of smokers perceived these cigarettes as healthier alternatives relative to full flavor or regular brands (Hammond, 2007).

2.3.2 References to product design and emissions

Numbers are utilized on packages in order to differentiate between various kinds of cigarettes. These numbers are obtained through machine readings of tar levels which do not represent tar delivery to humans (US Department of Health and Human Services, 2001). About 80% of smokers state that lower number brands have less tar delivery and health risks (Hammond, 2007). In addition, packages that have pictures and references to special filters are also perceived by smokers to have less tar delivery and health risks (Hammond, 2007). According to the tobacco industry, these false technology and filter improvements seem to reassure smokers (Dunn & Johnston, 1966).

2.3.3 Brand imagery and colors

Colors are utilized in package design in order to influence and shape the perceptions of consumers about health risks (Wakefield et al., 2002). Research indicates that consumers associate color with the lightness or strength of brands. For instance, grey and white colors are perceived as the lightest brands, followed by blue, and then red. The lighter shades of the same colors and white spaces on packages can be utilized to manipulate the perceptions of individuals about the strength of brands (Freeman, Chapman & Rimmer, 2008; Hammond 2007). The application of these basic principles is broadly consistent around the globe.

2.3.4 Others

There is insufficient evidence on the effect of the size and shape of the package on the perception of consumers. However, there are a few studies that describe the attempts by the tobacco industry's meticulous efforts to manipulate the size of packs to tailor them to specific consumers. For example: the "purse pack" which is compact, rectangular, and

associates with women's fashion, and the "super slims" with their small diameter which associates women who smoke it with weight loss (Anonymous, 2008).

2.4 Legal challenges

Australia is the first country in the world to consider plain packaging policies (Kirby, 2009; Sweet, 2010). Australia's plain packaging initiative was criticized by leading tobacco companies in the country for its plain packaging measures and questioned their effectiveness. For example Imperial Tobacco stated:

"Plain packaging has not been introduced in any country in the world and there is no evidence to support the government's notion that this will reduce consumption. Plain packaging would seriously harm our brands and infringe the intellectual property rights in which both Imperial Tobacco and its shareholders have invested (The New York Times, 2010)."

The fact that Imperial Tobacco mentioned that the government is infringing on the intellectual property rights of its stakeholders leads to the anticipation of possible lawsuits. That said, it is necessary to carefully introduce policies either through incorporating them within Australia's Tobacco Act or as standalone regulations. As a consequence, the policies are going to be supported from a legal standpoint. Imperial Tobacco argues that plain packaging has not been implemented in other countries and is therefore inappropriate. This argument is insufficient to justify their claim.

Philip Morris International did not state whether they would take legal action with regard to the plain packaging measures. However, they stated that plain packaging would represent "an unconstitutional expropriation of valuable intellectual property, violating a variety of Australia's international trade obligations" (The New York Times, 2010). This hints that Philip Morris International could possibly take legal action against the

Australian government. In addition, they cited international trade laws which call for the careful introduction of policies that would allow Australia to implement plain packaging without the interference of other governments or jurisdictions. British American Tobacco also echoed the above comments by stating that the proposals for plain packaging “would not hold up to close scrutiny” (The New York Times, 2010).

Tobacco companies have shut down plain packaging efforts based on trade law grounds. Trade mark laws allowed them to have a solid stance that does not allow health issues to be part of the debate (Physicians for Smoke-free Canada, 2009). Tobacco companies focus their efforts on the World Intellectual Property Organization’s (WIPO)’s Intellectual Property agreements and North American Free Trade Agreement’s (NAFTA’s) investment protection agreements in the 1990s, as both of them did not allow exemptions based on health reasons (Physicians for Smoke-free Canada, 2009). Despite WIPO’s advice that their analysis was faulty, the tobacco companies continue to advise the public and the government that plain packaging is inconsistent with international intellectual property protections.

After 15 years of experience with trade agreements, government lawyers have gained a better understanding of the agreements (Physicians for Smoke-free Canada, 2009). They also realized that health reasons can be considered in such agreements. Consequently, the industry’s efforts to utilize these agreements have been recently rebuffed by governments (Legacy, 2007). In addition, the WHO’s FCTC agreement which co-existed with the World Trade Organization (WTO) agreements and is not subservient to it, is mandated to develop measures for the protection of the public and should arguably be utilized to settle plain packaging disputes. Finally, the increased knowledge of the governments about the

industry documents and their awareness of the limited protection of international trade agreements to the industry against plain packaging represent a good opportunity for governments to reconsider plain packaging policies (Physicians for Smoke-free Canada, 2007). Australia is taking the lead with its plans to introduce plain packaging policies. However, no other governments have taken notable steps to introduce such policies. Besides a plain packaging study, a policy analysis review that highlights legal challenges in Canada is also crucial to consider before the introduction of plain packaging policies.

Although this study highlights some of the legal challenges that are associated with plain packaging, its focus is to provide plain packaging evidence via studying the perceptions of individuals of plain packs. The legal challenges are only introduced to emphasize the importance of considering them along with the evidence about the perceptions of individuals of plain packs, as both are essential to consider when introducing plain packaging policies (Physicians for Smoke-free Canada, 2007). The next chapter presents the methods utilized in this study to examine the perceptions about plain packaging and testing health warning recall for individuals who view plain packs relative to original packs.

Chapter 3 : Methods

This chapter will provide the rationale for choosing a survey as a method to study the perceptions of the participants of generic packaging. This chapter will also provide a description of the design, procedure, conditions, and questionnaire contents of this study.

3.1 Why surveys

Surveys are ideal research tools for the flexible collection of data in order to describe populations, explore the relation between variables, and assess the effects of treatments on participants (Van Horn, Green & Martinuseen, 2009). The utilization of surveys seems to be increasing, especially email and web surveys (Van Horn et al., 2009). The implementation of new policies to address health issues requires research that explores a large segment of the population. Surveys have a wide-reach potential and have been utilized in former plain packaging studies (Germain, Wakefield, & Durkin 2009; Wakefield, Germain, & Durkin 2008; and Hammond, Dockrell, Arnott, Lee & McNeil 2009). Based on the following advantages and disadvantages of surveys relative to focus groups, a survey was chosen as the method for data collection.

3.1.1 Surveys

There are three main advantages of an online questionnaire. First, it is relatively inexpensive and easier to administer compared to other methods such as qualitative focus groups (Bertrand & Mullainathan, 2001). For this study, the PI had the advantage to use Opinio, a free of charge online survey system. This was both cost-effective and easy to administer through a link from any computer with an internet connection. Second, an

online questionnaire is efficient at collecting data from a large segment of the target population (Bertrand & Mullainathan, 2001). The online questionnaire method allowed the PI to recruit the desired number of participants from the accessible population, students. Third, an online survey is flexible and commonly used to learn about opinions, attitudes, and perceptions (Van Horn et al., 2009). Since the main objective of this study is to learn about perceptions, an online questionnaire was appropriate.

There are also several limitations to surveys. First, studies have demonstrated that cognitive factors can influence the way participants answer the questionnaires. The order of questions, their wording and their scales can influence the participants' answers. Second, the participants in a survey tend to focus on a single characteristic while ignoring others which could lead to a bias in estimating the importance of the tested characteristic (Bertrand & Mullainathan, 2011). Third, it is hard to set a standard of reference that is meaningful to all the participants as some of them might have more knowledge about the questions presented to them (Li & Mattsson, 1995).

3.1.2 Focus groups

Focus groups are detailed qualitative methods that are used to obtain information about a particular topic. They have three main advantages (Litosseliti, 2003; Marshall & Rossman, 1999). First, they are simple to perform and bear results in a short time. Second, they allow for discussions and clarifications. Third, they allow interaction amongst participants and can therefore address complex issues in depth.

Focus groups also have some limitations in addition to the limitations of surveys (Marshall & Rossman, 1999). First, the results of the participants might be influenced by

the researcher and the other participants due to peer influence. In this study, it would not have been appropriate for the PI to use focus groups because of his bias against the tobacco industry. Second, the groups can be very heterogeneous which makes it difficult to recognize the main themes of the discussions (Marshall & Rossman, 1999). Since the study involves university both smokers and non-smokers, the utilization of focus groups with these two heterogeneous groups could have led to the deviation from the main themes of the study. Third, the overall design of a focus group study such as the way the questions are phrased and the setting can influence the answers of the participants (Marshall & Rossman, 1999; Litosseliti, 2003). Fourth, focus groups typically include a low number of participants which is not representative of the target population of interest (Marshall & Rossman, 1999). This could have been an issue if a focus group was used in this study as it would affect the representativeness of the sample of the accessible population.

3.2 Questionnaire development

There are a number of studies that examined the effect of plain packaging on the perception of smokers and potential smokers. Before conducting this study, an online literature search of peer-reviewed studies on plain packaging and health warnings in the PubMed and ProQuest databases was performed. The terms used in the search are “plain packaging”, “policy”, “generic packaging”, “brand imagery”, “consumer perceptions”, “legal challenges”, “cigarette packages”, “deceptive marketing”, “colors and texts”, “shape”, “package appeal”, and “health warnings”. The inclusion criteria included studies between 1990 and 2011 that examined the effect of plain packaging of cigarettes on the

perceptions of individuals of cigarette packages, and their accuracy in recalling health warnings. Prior to 1990, plain packaging efforts were not notable, and health warning and labeling requirements were markedly different. The search yielded eight studies which are discussed below in terms of how they were useful in developing the two main parts of the questionnaire for this thesis study (the perception questions and health warning recall question) and setting the context for this study. The demographic characteristics questions were similar to the questions in one of the eight studies.

The gaps in the knowledge from the eight studies are identified to address the need for further plain packaging studies to guide plain packaging policies.

3.2.1 Demographic questions

The demographic questions are similar to those in Wakefield's et al. (2008) study. The participants in this study were asked some demographic questions only for the purposes of defining the sample. The participants had the choice between two age ranges, 19-24 years old, or 25+ years old. The participants also stated whether they were smokers or non-smokers. If they were smokers, they specified their cigarette consumption by picking one of the ranges of number of cigarettes given to them, 1-10, 11-15, 16-19, or 20+ cigarettes per day. The participants also specified their sex, since males and females have different smoking rates and therefore a sample should include both sexes in the study.

3.2.2 Studies to guide the perception section of the questionnaire

Three out of the eight studies, Germain et al. (2009); Wakefield et al. (2008), and Hammond et al. (2009), utilized online surveys. The administration of online surveys seemed to be more flexible and cost-effective way of conducting a study relative to focus

groups. It also had a wide outreach potential. That said, only studies that used online surveys as a method for data collection were considered for designing the perception questions section of this study. The study by Hammond et al. (2009) examined one package characteristic at a time, such as the effect of altering word descriptors on the perception of the participants of the smoothness of the taste of the cigarettes. In contrast, the two other online survey studies examined the effect of the progressive removal of pack characteristics simultaneously. The three online studies examined too many comparison groups with the same data set which increases the total number of pair wise tests and hence the chances for random error.

“Plain packaging policies” are legislative pieces that are mandated to remove brand imagery elements from cigarette packages. These policies focus on simultaneously dissolving multiple brand elements. Since the aim of this study is to examine the effect of plain packaging on the perceptions of individuals, the design of this study will focus on comparing packages where brand elements have been progressively dissolved. That said, the two online studies where brand elements were progressively removed, Germain et al. (2009) and Wakefield et al. (2008), were used to guide the development of the perception questionnaire of this thesis study.

Multiple brands were not studied because previous studies showed no interaction between brands and the condition of the packs (Wakefield et al., 2008). The questions in this thesis study are similar to the questions in the two aforementioned studies in order to ensure the reliability and validity of the questions. However, opposing attributes such as “old” and “young” are not included in this study because they complicate the analysis of the results, and one antonym is sufficient to demonstrate the association between the

perceptions of individuals and cigarette packages. That said, one of the two opposing attributes such as “young” out of: “young” and “old” was included. In addition, taste attributes are not included in this study based on the premise of the inappropriateness of the non-smokers ratings of the perceived taste of cigarettes. Finally, the number of comparison groups in this thesis study is minimized by studying one brand with different degrees of plain packaging instead of multiple brands. This reduces the number of comparison groups and further reduces the chances of random error.

One of the two studies, the Germain et al. (2009) study, recruited adolescents only, who could have been influenced by their parents to negatively rate packages regardless of the pack they received, which poses social desirability bias. This study examines the perception of adults to address the gap and alleviate the social desirability bias issue. One of the studies, Wakefield et al. (2008), tested smokers only. The other study by Germain et al. (2009), however, included both smokers and non-smokers. Since plain packaging policies affect smokers and non-smokers, both of these groups were considered for recruitment in this thesis study.

All the perception questions in this thesis study were directly taken from two studies, Wakefield et al. (2008) and Germain et al. (2009). For the questions please refer to Appendix A. The final number of perception attributes tested was ten.

3.2.3 Studies to guide the health warning question

With regard to the health warning question, four out of the eight studies were considered, Goldberg et al. (1999), Northup & Pollard (1995) and Rootman & Flay (1995), Beede & Lawson (1992), and Germain et al. (2009), because they directly examined the

association between health warnings' recall and plain packages. The other four studies did not examine the effect of plain packaging on health warning recall.

Goldberg et al.'s (1999) study presented mixed results to support plain packaging in improving health warnings recall. They concluded that plain packaging aggravates recall for long and indirect health warnings such as "Tobacco smoke causes fatal lung disease in non-smokers", and enhances health warning recall for short and direct health warnings such as "Smoking can kill you" and "Cigarettes are addictive." Consequently, further studies are required to test the effect of plain packaging on health warning recall. In addition, the results of the study are from 1999 which preceded the full introduction of more stringent pictorial health warnings in Canada in December 2000 where the warnings occupied 50% of the face of the pack with colored warnings which are different from the former black and white warnings that occupied 25% of the face of the pack in 1999 (Tobacco Labelling Resource Centre, n.d). Therefore a study that follows December 2000 is necessary.

Another issue that arises from Goldberg et al.'s study is the comparison of one regular package to one plain package because it does not provide meaningful conclusions in terms of the degree of plain packaging that is required for a pack in order to enhance health warning recall.

The Northup & Pollard (1995) and Rootman & Flay (1995) joint study used a focus group and a direct questioning method in its analysis. The focus group component of the study might have influenced the results, especially if the facilitator was more than an observer. Therefore, a study that utilizes an online survey in isolation of other methods

could be necessary to rule out the effect focus group discussions on health warning recall. The study concluded that plain packaging does not affect health warning recall but makes the package seem more “serious”. “Seriousness” refers to the adolescent’s consideration of health warnings as a threat to their health status. This conclusion is insufficient to conclude that plain packaging improves health warning recall.

Beede’s & Lawson’s (1992) study utilized a focus group method as well as visual recognition survey. This means that the results of the study might have been influenced by the focus group discussions through either the researcher who could have played more than the observer’s role, or the “group dominance effect” of one or more individuals who could influence the discussions in the study. “Group dominance” refers to the phenomenon whereby one or more individuals influence the input of other individuals in a group discussion. The results of health warning recall were mixed as there were significant differences in recall between regular and plain packages for the USA brands but not New Zealand (NZ) brands. In addition, the study was conducted in 1992 and regular packages were quite different from the packages that have been available in the market in NZ since February 2008 and Canada since December 2000. Therefore, the findings of Beede & Lawson (1992) study cannot be utilized to support the plain packaging of current cigarette packages (NZ Ministry of Health, 2008; Tobacco Labelling Resource Centre, n.d).

Germain et al.’s (2009) study utilized an online survey method and concluded that the participants recall of pictorial health warnings of plain packages that are occupied with 80% of warnings on the face of the pack are not significantly different from their recall of health warning with packages that are occupied with 50% of pictorial health warnings.

This result does not support an association between plain packaging and health warning recall for two reasons. First, the comparison is not made between a plain pack and a regular pack, which is necessary to determine the difference in recall between plain packs and regular packs. Secondly, the results of the study did not even demonstrate a significant difference in health warning recall between a plain pack and a relatively plainer pack, and this evidence is insufficient to conclude the need to develop policies for the plain packaging of cigarettes with respect to increasing health warning recall.

After recognizing the gaps in the plain packaging studies that are focused on the association between plain packaging and health warning recall, a question that examines this association was developed and included in the online questionnaire for this study. The question was included to test the association between health warning recall and plain packaging because former studies generated either mixed results or results that did not reveal a significant difference in the ability of participants to recall health warnings on plain packs relative to original packs. Therefore, the association between health warnings and plain packages required further examination. The participants in this study were randomly exposed one of four packages that all had the same health warning but differed by the degree to which they are plain in one webpage. This was necessary to determine whether the degree of plain packaging plays a role in health warning recall. Following that, the participants were asked through a multiple choice question to recall the health warning that was on their pack on the next page. The participants were not able to go back to the first webpage to avoid the re-exposure of the participants to the health warning. Through this question, the association between health warning and plain packaging was tested to address the inconclusive results of former studies. Table 3-1

compares the studies that were used to guide the design of this study by methods, sample and findings.

Table 3-1: Comparing plain packaging studies

<i>Authors</i>	<i>Method</i>	<i>Sample</i>	<i>Focus</i>	<i>Findings</i>
<i>Germain , Wakefield , & Durkin 2009</i>	Internet online survey	1087, Australians, 14-17 yrs olds	Study the effects of progressive removal of brand imagery elements from packs on the participant's ratings of pack characteristics, smoker's personality, and perceived sensory qualities	<ul style="list-style-type: none"> -Progressively plainer packs are likely to be associated with less positive brand elements associations - The increase of the size of pictorial warnings on plain packs from 30% to 80% on the face of the pack is likely to increase the perceived seriousness of adolescents' towards becoming adult smokers.
<i>Hammond , D. & Parkinson 2009</i>	Shopping mall survey conducted for a period of three months	312 smokers and 291 non-smokers in Ontario	Examine a) the perception of consumers of brand imagery and descriptors, b) the association between perceptions of health risk and perceptions of taste of cigarettes c) the differences between smokers and non-smokers and light and regular cigarette smokers.	<ul style="list-style-type: none"> -The participants were significantly more likely to rate packs with the 'mild, 'silver, 'smooth' and 'light descriptors as less tar delivery, lower health risks, and smoother taste cigarettes compared to regular brands. -The participants were significantly more likely to rate filtered cigarette packs and lighter colored packs as significantly more likely to have less tar delivery, a smoother taste, and lower health risks. - Relative to non-smokers, smokers were significantly more likely to perceive cigarette brands to have lower health risk. - Relative to other smokers, smokers of mild and light cigarettes were significantly more likely to perceive cigarette brands as having lower risk and smoother taste. - Perceptions of risk and tar level were significantly associated with perceptions of taste.
<i>Hammond ,Dockrell, Arnott Lee & McNeill 2009</i>	Online survey	806 youth, 516 adults in the UK	Examine the effect of differing brand descriptors and colors on the perception of participants on the tar levels, taste, health risk, attractiveness, and ease of quitting of adults or brand choice of youth	<ul style="list-style-type: none"> -Youth and adult participants significantly rated the packs with the descriptors 'gold', smooth', and 'silver' as having lower health risks, easier to quit (by adults), or choice of brand if they try smoking (by youth), and lower health risks. - Plain packs were significantly more likely to reduce the false beliefs about lower health risks, and easiness to quit, and were significantly rated as having less attractiveness and appeal to youth for attempting to smoke. -Participants perceived packs with lighter colors healthier alternatives in comparison to packs with darker colors.

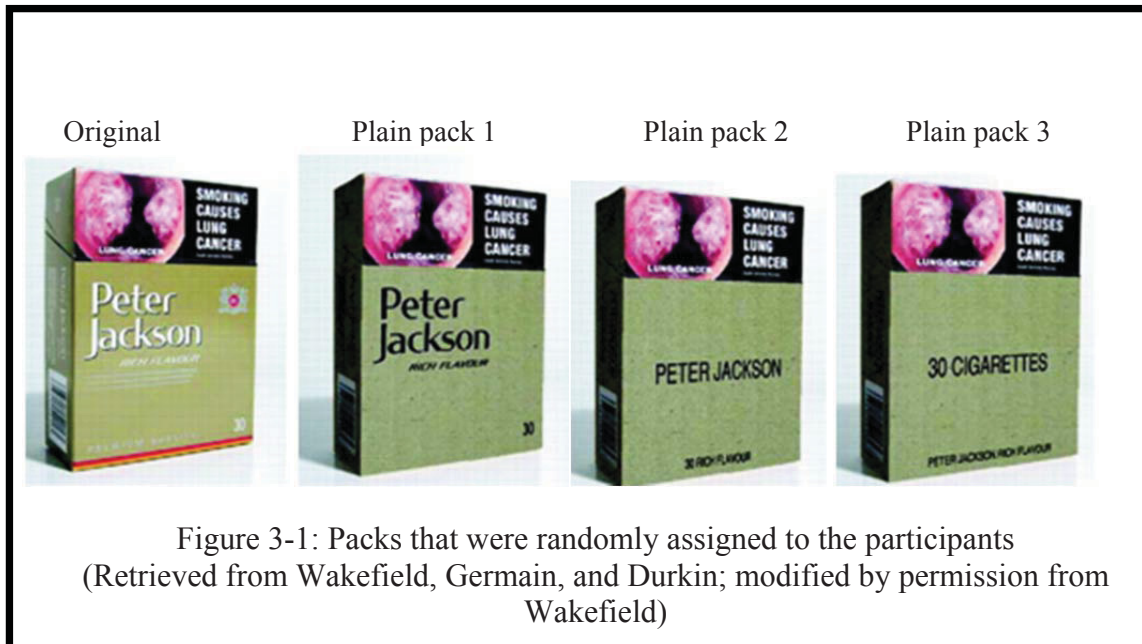
<i>Authors</i>	<i>Method</i>	<i>Sample</i>	<i>Focus</i>	<i>Findings</i>
<i>Wakefield, Germain & Durkin 2008</i>	Online survey	Smokers, 813 Australian adults (age range 18-49)	Study the effects of progressive removal of brand imagery elements from packs on the participant's ratings of pack characteristics, smoker's personality, and perceived sensory qualities	-Participants rated plain packs as significantly having less attractiveness compared to regular packs. -Participants rated smokers of plain packs as significantly less mature, stylish/trendy, outgoing/ sociable. -Participants rated plain packs' cigarettes as lower quality cigarettes, less rich in taste, and less satisfying
<i>Grant et al. 2008</i>	Direct questioning and structural equation modelling	1,123 participants between the ages 11-16 in the UK	Examine the effects of cigarette marketing on brand awareness, brand images attitudes, and intentions of adolescents to smoke	-Activities that are related to brands affect individuals' attitudes toward smoking and smoking intentions.
<i>Goldberg et al. 1999</i>	Visual experiment	401 participants, age range between 14-17 in a mall in Vancouver	Examine the effect of plain packaging on increasing the visibility of health warnings	-Plain packs increase health warning recall for long and indirect health messages and decreases recall for direct and short health messages
<i>Rootman & flay 1995; & Northup & Pollard 1995 (joint study)</i>	Direct questioning and focus groups	339 participants between the age of 12-17 in the focus groups. 2132 students in class room surveys Canadian/American study	Examine the a) association between the pack and the brand type b) impact of plain packaging on recalling health warnings c) impact of changing prices on youth smoking rates	-Generic packaging can reduce positive brand elements associated with certain cigarette brands and increases teenagers' seriousness towards health warnings.
<i>Beede & Lawson 1992</i>	Focus groups and visual recognition surveys	568 students, 13 years old in NZ	Examine health warnings and plain packaging	-Plain packs enhance the participants' ability to recall health warnings relative to branded packs.

Based on the literature search an online survey method was selected for data collection. Ten perception questions along with one health warning recall question was developed to recruit students enrolled in HRM universities.

3.3 Design

A former similar study by Wakefield et al. (2008) employed a 3 (type of brand) X 4 (degree of generic packaging) design. However, the study did not find significant differences in the perception of the participants of the packs with respect to brand type. Therefore this study dropped two brands and employed a 1 (type of brand) X 4 (degree of generic packaging) between-subject design. The Opinio Survey software from Dalhousie University was used to expose participants to one of the four packs in a random manner through an automated function of the survey system.

Figure 3-1 shows four packages. The first is the reference package which represents a regular package that is available in the market. The second package is plain package 1, which preserved the orientation and font of the brand and its type but removed the logo and a red line on the bottom of the package. The third package is plain package 2, which standardized the orientation and font of the brand, and standardized and moved the brand type to the bottom of the package. The fourth package is plain package 3 which standardized the brand name and type, and placed them at the bottom of the package. The packages become progressively plainer from the first package to the fourth package.



Once the participants were randomly assigned to their pack, they completed ten perception questions in the form of a rating scale. Following that, the participants were asked to recall the health warning that was on the pack which was displayed to them by picking one of four health warning choices presented to them. The participants were advised on the information sheet that preceded the survey to contact the PI if they had any questions or required any clarification. Please refer to Appendix A for the survey questions. All the attributes have been tested in two studies (Germain et al., 2009; Wakefield et al. 2008). Therefore, the attributes are well established measures and have reliability and validity. As for the health warning question, at least four former studies asked participants to recall a health warning on their pack, and the question was unequivocal and easy to comprehend (Beede & Lawson 1992; Germain et al. 2009; Goldberg et al. 1999; Northup & Pollard 1995 and Rootman & Flay, 1995).

3.4 Recruitment

The target population consisted of adults in Nova Scotia because their perceptions were essential to recommend a plain packaging policy for the province. The accessible population consisted of adult university students who attended three HRM universities: Dalhousie University, Saint Mary's University, and Mount Saint Vincent University. This accessible population represents the target population because it includes adults who come from different socioeconomic status, cultural backgrounds, and geographical locations in Nova Scotia.

The intended sample consisted of any students who were interested in participating in the study. The recruitment of the sample took place through two methods: 1- self-recruitment via the survey link which was advertised on information sheets that were posted at the Student Union Buildings (SUBs) of the universities in HRM. The recruitment notice template is attached in Appendix B. 2- Peer Health booths. Peer Health is a student-based health group at Dalhousie University. The latter recruitment method involved both the PI and three Peer Health volunteers. The PI and the volunteers stood at the booths and requested the students who passed by the booths to participate by saying "Are you interested in joining our generic packaging survey."

The interested students were asked to read the information letter, an informed consent on the laptop screen that was set up at the booth, clicked next, started the questionnaire, and finished it. The participants also had the option to enter a draw for one of 30 pre-paid credit cards valued at \$25 each as an incentive to participate. The PI paid for the \$750 for the pre-paid cards from his scholarship funds at Dalhousie University. The ethics

approval for recruiting the participants in the study was sought through the ethics review board of the three universities: Dalhousie University, Saint Mary's University, and Mount Saint Vincent University. Dalhousie University's and Mount Saint Vincent University's ethics offices required an ethics application for recruiting students from their campuses. Saint Mary's University ethics office did not require an ethics application to recruit students from their campus. The three universities granted the PI the ethics approval to recruit students from their campuses in this thesis study.

A sample size of 120 was estimated for the perception questions based on Cohen's (1988) sample size estimations manual (small to medium size effects; $p=0.05$; power=0.90). This meant that the Ns for each comparison group were 30. As for the health warning question, a minimum sample size of 100 was estimated (small to medium size effects; $p=0.05$; power=0.90), this meant that the Ns for each comparison group was 50 as two groups were compared at a time (Cohen, 1988). The total estimated sample size was 220.

3.5 Ethical issues

This study did not involve any physical or psychological harm. The only risk associated with the study was the minimal risk of stealing their personal information. This risk was no more than the risk that individuals face in their daily lives. The remedy to this risk was to utilize Opinio which is a secure system, and advice participants to utilize a secure computer to access the survey in order to protect their personal information. The participant's personal information was confidential and utilized only by the PI for the purposes of this study. The names and emails of the participants were only used for the prize draw and were not linked in any way to their responses.

The informed consent for this study was obtained from the participants in the form of an information letter that preceded the survey webpage and explained the aim of the study along with the aforementioned risks. It also explained the benefits and incentives for participating in the study. By reading the information letter and clicking next to go to the next webpage, the participant's gave the PI their informed consent.

3.6 Inclusion/exclusion criteria

There were three inclusion criteria for this study. The first was current students enrolled at any university in HRM where English is the primary language of teaching. Students enrolled at any English language based university in HRM, were welcomed to participate in the study as long as they met criterion two. The students learned about the study through information sheets which were posted at the SUB buildings of three universities in HRM where the primary language of instruction is English. Dalhousie University students also learned about the survey through the Peer Health booths which were setup across Dalhousie's three campuses. This criterion limited the students to those enrolled at HRM universities because the PI sought to answer the recommendation of generic packages policies for Nova Scotia, from the perspective of students residing in the HRM. French language based universities are excluded because the PI and the research assistants were only fluent in English. In addition, English is the first language in Nova Scotia. College students were excluded due to the differences in the educational curricula between colleges and universities which could have translated into different perceptions of generic packaging and hence yield mixed results.

The second criterion was that the participants had to be 19 years old or older. The rationale for this criterion is that parental informed consent of underage students would have been required if students under 19 years old were to be included. The students might not have lived with their parents and obtaining consent from their parents, who could have lived in geographically remote areas, prior to participation would have been challenging. Therefore, only students who were 19 years old or older were eligible to participate in this study.

The third criterion was to exclude any Teaching Assistant (TA) of any of the three Peer Health volunteers who approach the study through method 2, Peer Health booths.

The rationale for this criterion is to avoid student-teacher conflict of interest, since there is a potential that the Peer Health volunteers might emphasize the chances of winning a prize to their TAs in order to influence them to mark them higher in exams.

3.7 Data

The data was recorded through a quantitative online questionnaire which was designed using the Opinio system at Dalhousie University. The demographic questions were very basic as they inquired about the participants' gender, age range, current educational status, smoking status, and smoking consumption. All of these demographic variables were compared to define the sample in relation to each of the four package categories: original pack, plain pack 1, plain pack 2 and plain pack 3.

The perception questions/attributes fell under two categories and were rated from (not at all) 1-10 (extremely well). The first category was the positive perception attributes which constituted nine attributes: Attractiveness of the pack, value in terms of getting what you

paid for, the pack is exclusive or specialty brand, temptation to try/smoke this brand, trendy, young, masculine, social and outgoing, and confident and successful. The second category constituted one negative perception attribute, lower class.

The participants also answered one multiple choice question to test their recall of the health warning on the package that was displayed to them. The participants picked one of four health warnings choices: “*Smoking causes lung cancer*”, “*Smoking kills*”, and “*Smoking causes impotence*”, and “*Get help to stop smoking: consult your doctor or pharmacist*”. All the packs displayed the same health warning, “*Smoking causes lung cancer*” because it was on the packs that were utilized in this study from Wakefield, et al.’s (2008) study, through email permission from Dr. Wakefield, where Dr. Wakefield granted the PI, the permission to use the images in this study and confirmed that there was no need for a copyright permission to use these images for any research study purposes. The other choices were presented to examine whether the participants recalled the health warning on their pack. To facilitate analysis, the participants’ responses for the right health warning responses were grouped together into group A, and the participants’ responses for the three false warnings were grouped together into group B. The responses for the two groups of health warnings were compared across the four packages.

3.8 Analysis and storage

The choice of the Opinio system meant that the data remained within Dalhousie University’s secure server. For storage, the PI used Excel spreadsheets to make sure the data is arranged in a proper order. For analysis, the PI used the SPSS statistical software.

The analysis involved three main tests in addition to a multicollinearity test that preceded the three main tests.

A collinearity diagnostics test was performed to check for the multicollinearity of the attributes. Then the first main test, the MANOVA test, was performed in order to compare the means of the rating questions of the original pack with those of plain pack 1, plain pack 2, and plain pack 3, on a 1-10 rating scale at an alpha level of 0.05. The independent variable is the randomly assigned pack from the four, and the dependent variables were the perception attribute ratings. Since the distribution of the perception ratings was positively skewed and the ratings did not follow a normal distribution, a bivariate logistic regression test was performed to test the odds of rating the plain packs positively/negatively compared to the original pack and compare the results on the dichotomized scale to those on the 1-10 scale.

Second, a bivariate logistic regression test was performed to compare the Odds Ratios (ORs) of the rating questions for the original package compared to plain pack 1, plain pack 2, and plain pack 3 where the OR Confidence Intervals (CIs) that do not contain a "1" at a 95% CI were significant. In this test, Cramer's V values were also generated to test for the strength of the association between the perception questions and the packs. The second test was only utilized to compare its results to the first test because the results of the former test were skewed. Cramer's V values of 0.1 reflect a weak association, 0.3 represent a moderate association, and 0.5 represent a strong association. Moderate to strong associations provide further support for the conclusions of the logistic regression test.

Third, a bivariate logistic regression test to compare the ORs for picking the right health warning on the original pack compared to plain pack 1, plain pack 2, and plain pack 3. The independent variables in this test were the four packs, and the dependent variable was health warning recall. In this test, Cramer's V values were also generated to test for the strength of the association between correct health warning recall and the packs.

Before conducting the first test, the PI had to resolve the issue of missing values for the ratings of the perception questions.

3.8.1 Missing values

There were between 23 to 32 missing values for each perception question. 23 participants had completely missing values for both the perception attributes and the health warning questions. These participants were excluded from the study. For the rest of the missing values, the average of the rating of the attribute per pack was imputed to replace the missing value. For example: for the missing values of the "young" attribute for the original pack, the average of the ratings of the "young" attribute for the original pack was used to replace the missing values.

In this study an online survey was chosen as a method for data collection based on its flexibility, wide reach potential, and cost-effectiveness. The questionnaire was developed based on a literature review of eight plain packaging studies, and the recruitment took place across three HRM universities campuses after the ethics approval. The questionnaire involved three main sections: a demographic characteristics section, a perception ratings section, and a health warning recall section. The data in the latter two were analyzed through a MANOVA test and bivariate logistic regression tests in order to

fulfill the objectives of this study. After the data collection process was completed, missing values for some ratings were noticed. The issue was resolved by imputing the average of ratings per attribute per pack. A multicollinearity test preceded the MANOVA test and bivariate logistic regression tests in order to eliminate any collinear attributes. The results of both the multicollinearity test and the analysis tests are presented in the next chapter.

Chapter 4 : Results

This chapter presents the results of the multicollinearity test and transformation attempts. It presents the results of the sample characteristics in this study by sex, age, educational status, smoking status, and daily smoking consumption. This chapter also presents the results of the study with regards to the ratings of the participants of the packages on both the 1-10 scale and the 0-1 scale for the MANOVA and bivariate logistic regression tests respectively. Finally, the chapter presents the results of the participants' correct health warning recall for both the original pack and the three plain packages based on a bivariate logistic regression test.

4.1 Multicollinearity and transformations

The 10 perception attributes were tested for multicollinearity. Then the distribution of the responses was observed. The distributions did not follow a normal distribution and four transformations were attempted to normalize the distribution of the responses. However, none of the transformations normalized the distributions of the perception responses.

4.1.1 Multicollinearity

The 10 perception questions were tested for multicollinearity through the collinearity diagnostics test in SPSS to check their VIF values. VIF values or their inverse values, tolerance values, are commonly used to test for multicollinearity in multivariate tests (Larson-Hill, 2010). Typically a VIF value of 5 or higher present evidence that at least two variables are intercorrelated with each other and at least one of them has to be

removed from the model. After running the collinearity diagnostics test, the VIFs for none of the perception attributes were equal to or greater than 5 which meant that none of the variables were collinear with each other. Appendix C shows the results of the VIF values for each attribute when tested against the other attributes.

4.1.2 Distribution of the rating responses on the 1-10 scale

The distribution of the rating responses for five attributes (value, exclusive, temptation, young, and confident and successful) was positively skewed. The box plots in Figure 4-1 reveal the skewed responses.

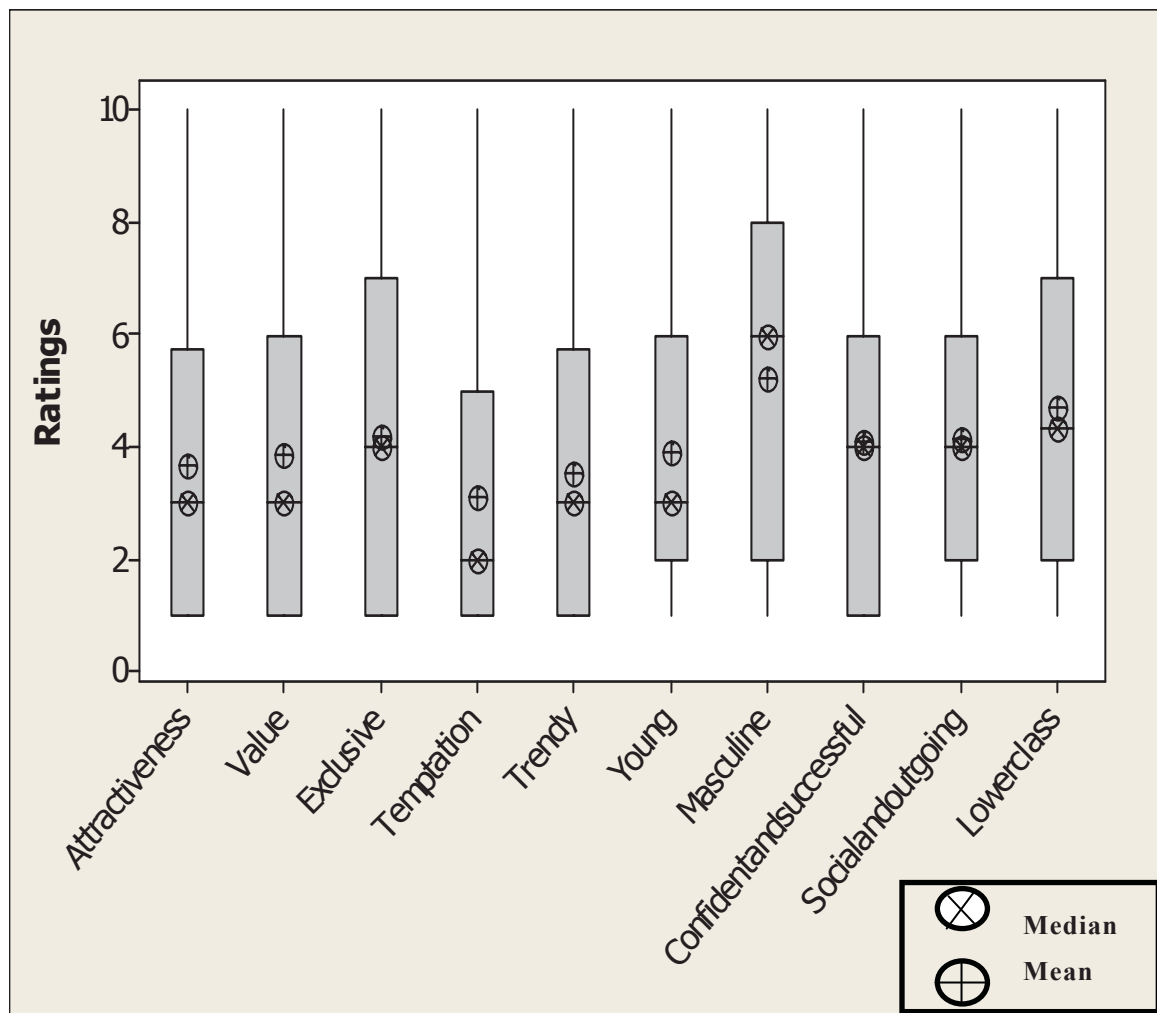


Figure 4-1: Box plots of the original data set

The positively skewed ratings were the reason the data did not have a normal distribution. To alleviate this issue, the PI attempted four non-linear transformations including: the square root, log10, square and natural log transformations. Although some of these transformations brought the mean and median closer to each other, they did not resolve the positive skew issue as shown in Figure 4-2 which shows the square root transformation. For the other transformed data box plots please refer to Appendix D.

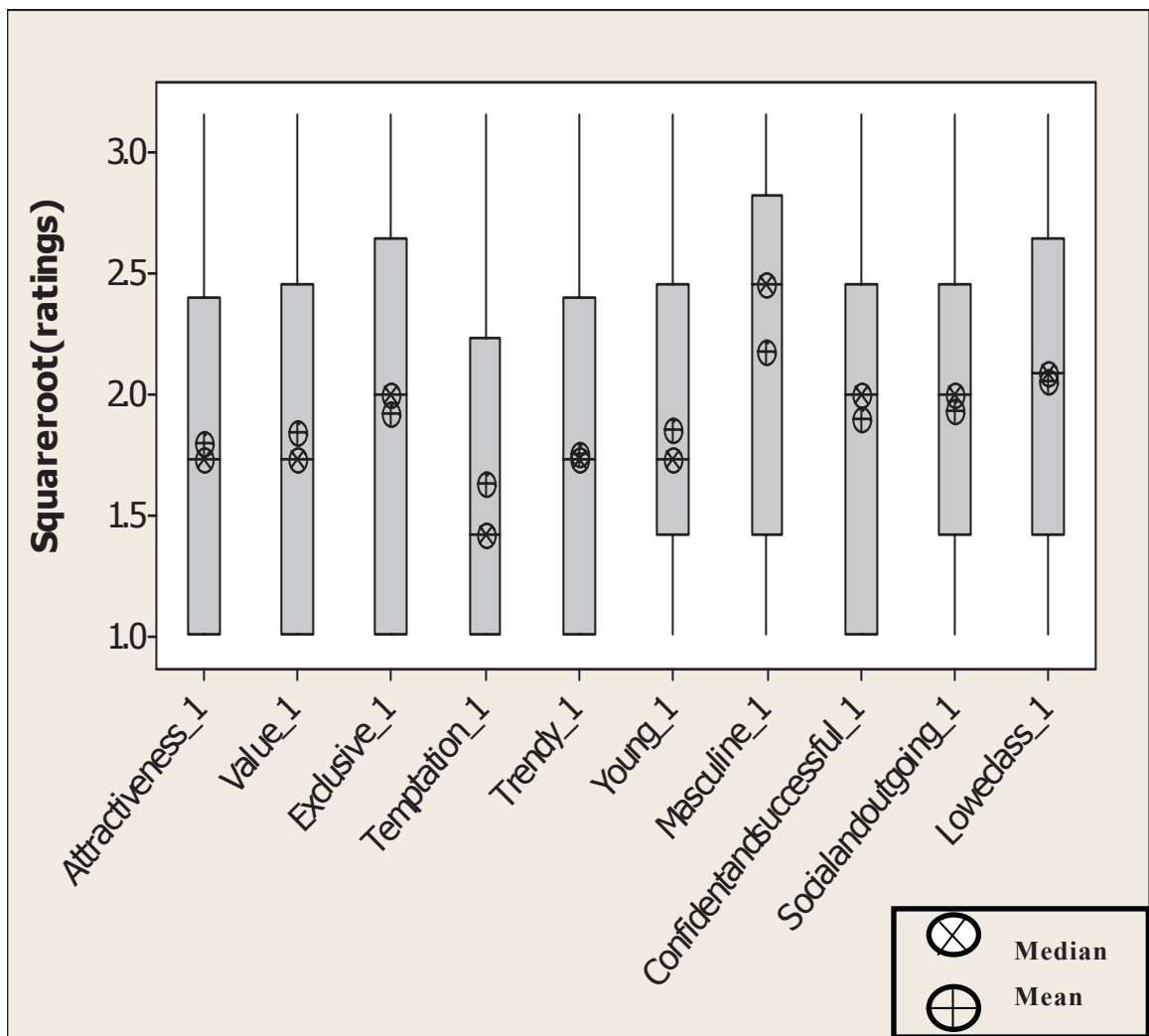


Figure 4-2: Box plots of the square rooted data set

Histograms were used to show which specific rating unit on the 1-10 scale was causing the left skewed distribution. The main reason for the skewed was the high frequency of the “1” rating on the 1-10 for most of the perception attributes as shown in Figure 4-3 which displays histograms of all the perception rating responses.

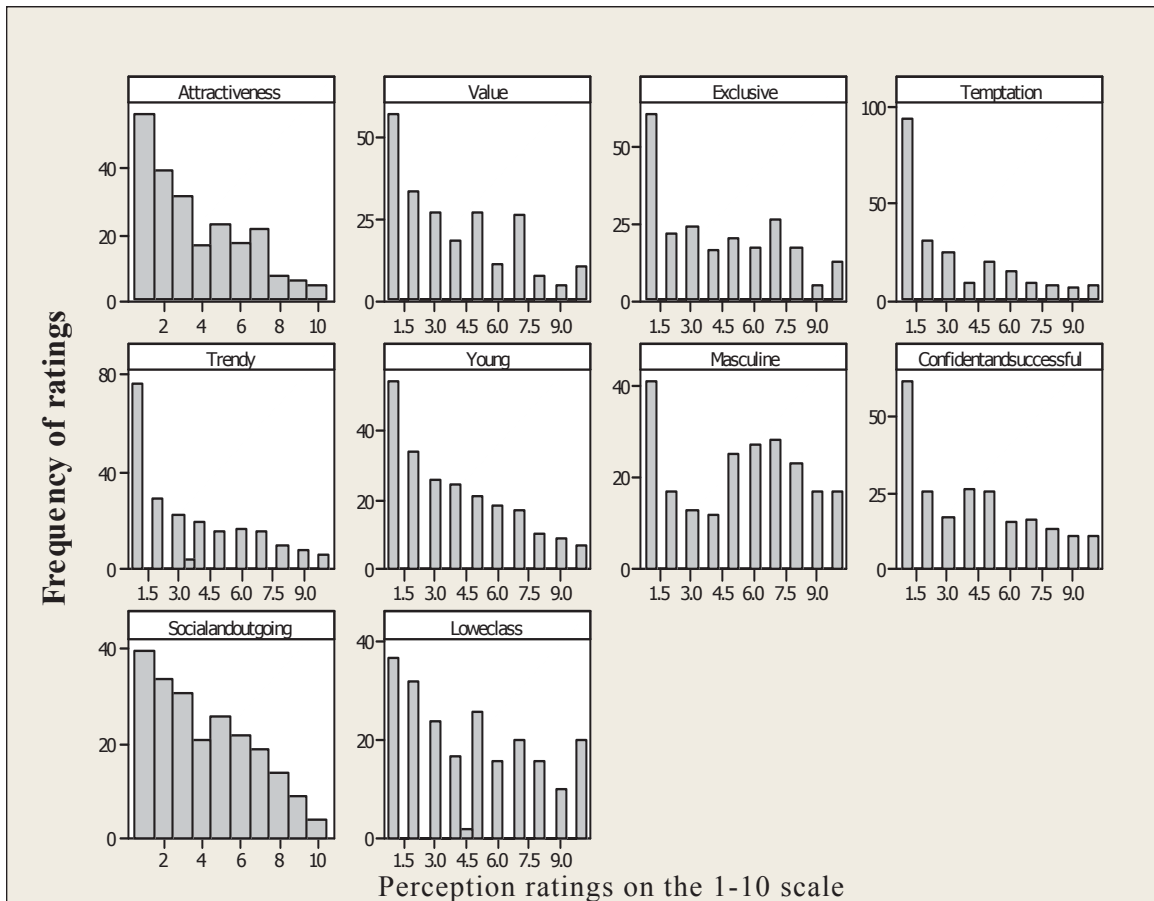


Figure 4-3: Histograms of the original data set

The square-rooted data as well as other transformed data histograms show that the transformations did not resolve the issue of the positively skewed data. Figure 4-4 shows the square rooted data where the ratings are still skewed. For other transformed data histograms please refer to Appendix E.

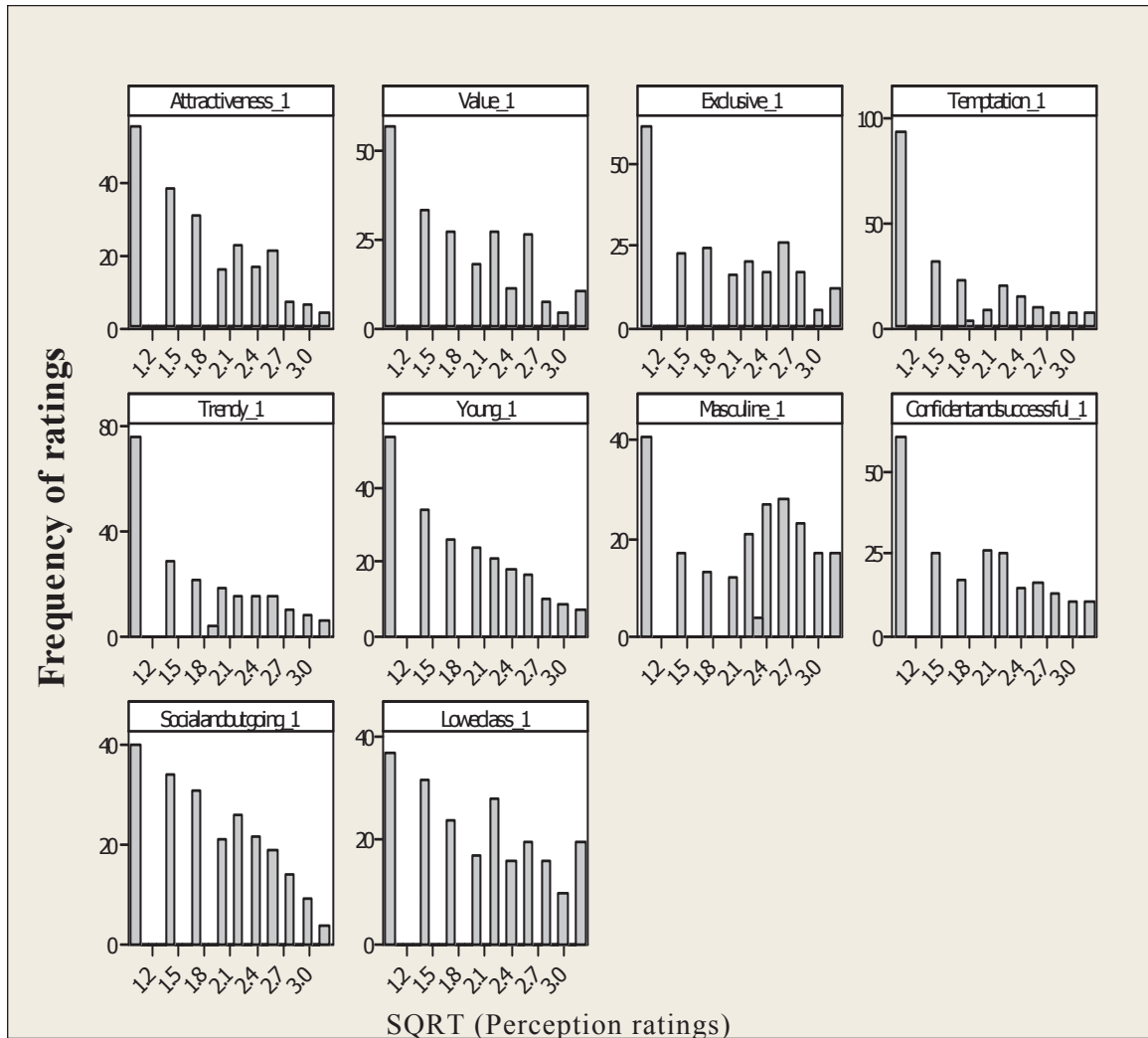


Figure 4-4: Histograms of the square rooted data set

Since the positively skewed distribution issue was not resolved after all the transformations. The second test, bivariate logistic regression, was important to check whether the results on a dichotomized scale would produce similar results compared to the 1-10 scale. The ten perception ratings were transformed from a 1-10 rating scale to a dichotomous scale where the responses from 1 to 5 were changed to 0 to indicate disagreement and responses from 6 to 10 were changed to 1 to indicate agreement.

4.2 Sample characteristics

Overall, 231 adult students from three HRM universities participated in the study, 193 provided complete demographics characteristics data. About 55% of the total participants were female and 45% were male. About 76.7% of the participants were between the ages of 19 and 24, while the rest were 25 years old or more. Over 74% of the participants were enrolled in a Bachelors program, and the rest were enrolled in other programs as shown in Table 4-1. About 26.9% of the participants were smokers, and most of them, 55.8% of total smokers, smoked between 1-10 cigarettes per day. Table 4-1 shows the details of the sample characteristics. The demographic characteristics are only presented to describe the sample in this study. The mean ratings and ORs for each pack were compared with respect to the randomly assigned pack only.

Table 4-1: Characteristics of the sample

		Randomly pick one of the four packages			
		1	2	3	4
		N	N	N	N
What is you sex?	Female	25	27	25	29
	Male	22	24	18	23
Age	19-24	36	38	35	39
	25+	11	13	8	13
Educational status	Bachelors	37	38	30	38
	Diploma	7	3	3	3
	Master	3	8	9	11
	PHD	0	2	1	0
Are you a smoker?	No	35	34	32	40
	Yes	12	17	11	12
Daily cigarette consumption	1-10 cigs	5	11	6	7
	11-15 cigs	3	3	3	2
	16-19 cigs	3	3	2	2
	20+	1	0	0	1

4.3 MANOVA test results for the 1-10 scale

There were 220 participants who responded to the perceptions test. The pack condition was a significant predictor of all the seven positive attributes ($p < 0.05$) and the negative attribute ($p < 0.05$). In order to be able to compare the mean ratings of each plain pack relative to the original pack, a post-hoc analysis was performed. Three non-equal variance tests, Tamhane, Dunnett T3, and Games-Howell were utilized to compare the perception ratings of each plain pack relative to the original pack, after running a Levene's homogeneity of variance test which showed significantly different variances ($p < 0.05$) amongst the perception attributes. Two of the three non-equal variance tests, Tamhane and Dunnett T3 post-hoc tests, are used to report conservative findings, and Games-Howell post-hoc test is used to report liberal findings with unequal Ns (Larison-Hall, 2010). The three non-equal variance tests yielded the same results in terms of revealing the significant mean differences in the perception ratings of each plain pack in pair wise comparisons with the original pack at $p < 0.05$. For the detailed results of the three unequal variance tests please refer to Appendix F. In this Appendix, it can also be seen that the differences in the CIs of the packs' ratings amongst the three tests are very minuscule and insufficient to change the conclusion about the results in terms of the significance of the pair wise comparisons.

Table 4-2 shows that as brand imagery elements were progressively removed from the packs, some of their mean ratings for the positive perceptions significantly decreased. However, the mean ratings of the plain packs for lower class, a negative perception, were not significantly higher as compared to the original pack. The mean ratings of plain pack

1 were not significantly different from the original pack ($p < 0.05$) for any of the perception ratings. However, the mean ratings of the next plainer pack, plain pack 2, were significantly lower for four positive attributes, “attractiveness” ($p < 0.05$), “value” ($p < 0.05$), “exclusive” ($p < 0.05$) and “temptation” ($p < 0.05$) as compared to the original pack. As for plain pack 3, the mean ratings were significantly lower for seven of the positive attributes, “exclusive” ($p < 0.05$), “temptation” ($p < 0.05$), “trendy” ($p < 0.05$), “young” ($p < 0.05$), “masculine” ($p < 0.05$), “confident and successful” ($p < 0.05$), and “social and outgoing” ($p < 0.05$) as compared to the original pack.

Table 4-2: MANOVA test for ratings of plain packs relative to the original pack

	Condition				Main effects	
	Original	PP1**	PP 2**	PP3**		
	(N=55)	(N=55)	(N=48)	(N=62)	F value	p
Attributes	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
<i>Positive perceptions</i>						
Attractiveness	4.20(2.57)	4.52(2.82)	2.77*(1.73)	3.10(2.25)	6.70	0.000
Value	4.64(2.92)	4.53(2.72)	2.77*(1.85)	3.45(2.56)	6.35	0.000
Exclusive	5.15(2.97)	5.02(3.05)	3.46*(2.18)	3.20*(2.66)	7.43	0.000
Temptation	4.02(3.11)	4.02(3.00)	2.10*(1.40)	2.34*(1.93)	9.58	0.000
Trendy	4.04(3.04)	4.56(2.96)	3.02(1.98)	2.59*(2.10)	7.02	0.000
Young	4.47(2.99)	4.73(2.61)	3.46(2.41)	3.01*(2.19)	5.78	0.001
Masculine	5.69(2.86)	5.66(2.85)	5.59(2.94)	4.20*(2.93)	3.72	0.012
Confident and successful	4.76 (2.96)	5.26(2.96)	3.57(2.41)	2.97*(2.43)	8.66	0.000
Social and outgoing	4.47(2.65)	5.15(2.48)	4.21(2.40)	2.94*(1.99)	8.76	0.000
<i>Negative perceptions</i>						
Lower class	4.26(2.71)	3.96(2.62)	5.13(3.06)	5.43(3.08)	3.33	0.02

*Significantly different at $p < 0.05$

**PP = Plain pack

There were 12 participants who rated their pack “1” on all the attributes. It is important to note that the abovementioned results report the means of the ratings after discarding the

results of participants who rated their pack “1” for all the perception attributes. Some of the other participants had high “1” ratings for the positive attributes only. The ratings of these participants were not discarded because they could be meaningful as they rated their packs low on positive attributes and high on the negative attribute.

4.4 Bivariate logistic regression test results for the 0-1 scale

Although the bivariate logistic regression test does not reveal significant differences in the odds of rating plain pack 1 positively/ negatively relative to the original pack, it shows significant differences in the odds of rating plain pack 2 and plain pack 3 positively/ negatively relative to the original pack. The odds of rating plain pack 2 positively were significantly lower as compared to the original pack for five positive perceptions, “attractiveness” (OR=0.15; CI=0.04,0.55), “value” (OR=0.17; CI=0.05, 0.55) “exclusive” (OR=0.27; CI=0.11, 0.63), “temptation” (OR=0.05; CI=0.01, 0.37), and “trendy” (OR=0.25; CI=0.09,0.69). For plain pack 3, the odds of rating it positively were significantly lower as compared to the original pack for seven of the positive perceptions “exclusive” (OR=0.22; CI=0.09, 0.49), “temptation” (OR=0.28; CI=0.11, 0.75), “trendy” (OR=0.26; CI=0.10,0.65) “young” (OR=0.24; CI=0.10, 0.60), “masculine” (OR=0.33; CI=0.16, 0.71), “confident and successful” (OR=0.35; CI=0.16,0.82) and “sociable and outgoing” (OR=0.36; CI=0.14, 0.93). In addition, the odds of rating plain pack 3 negatively was significantly higher compared to the original pack for the one negative perception, “lower class” (OR=2.67; CI=1.23, 5.79).

The Cramer’s V values for each perception attribute with the pack condition were computed and the values ranged from 0.22 to 0.33 as shown in table 4-3. These values

reflect a slightly moderate to moderate strength of association between the packs and the positive attributes (Larson-Hall, 2010). Cramer’s V values that are closer to 0.3 reflect moderate associations and support the differences in the odds of rating a pack positively/negatively relative to the original pack. Six attributes revealed this moderate association with the pack condition, “attractiveness”, “value”, “exclusive”, “temptation”, “trendy” and “sociable and outgoing.” The other attributes revealed only a slightly moderate association with the pack condition.

Table 4-3: ORs and CIs of plain packs relative to the reference pack

Attribute	Ref. Pack	pp 1		pp 2		pp 3		Cramer’s V
	N=62	N=68		N=72		N=54		
	OR	OR	95% CI	OR	95% CI	OR	95% CI	
<i>Positive perceptions</i>								
Attractiveness	1	1.49	0.68, 3.27	0.15*	0.04, 0.55	0.59	0.26, 1.37	0.28
Value for money	1	1.26	0.58, 2.74	0.17*	0.05, 0.55	0.50	0.22, 1.15	0.27
Exclusive	1	0.75	0.35, 1.59	0.27*	0.11, 0.63	0.22*	0.09, 0.49	0.30
Temptation	1	1.18	0.53, 2.62	0.05*	0.01, 0.37	0.28*	0.11, 0.75	0.33
Trendy	1	1.08	0.50, 2.34	0.25*	0.09, 0.69	0.26*	0.10, 0.65	0.28
Young	1	0.93	0.43, 2.00	0.54	0.23, 1.26	0.24*	0.10, 0.60	0.23
Masculine	1	0.90	0.42, 1.93	0.98	0.44, 2.17	0.33*	0.16, 0.71	0.23
Confident and successful	1	1.16	0.54, 2.50	0.48	0.20, 1.14	0.35*	0.16, 0.82	0.22
Sociable and outgoing	1	2.19	1.00, 3.77	1.46	0.64, 3.33	0.36*	0.14, 0.93	0.28
<i>Negative perceptions</i>								
Lower class	1	0.91	0.39, 2.13	2.26	0.99, 5.13	2.67*	1.23, 5.79	0.23

*Significantly different at p<0.05

4.5 Health warnings

231 participants answered the health warning question. The odds for picking the right health warning increased when participants were presented with plain pack 2 (OR=3.39, CI=0.33, 1.51) or plain pack 3 (OR=5.63, CI=1.93, 16.4) relative to the original pack. This shows progressively increasing odds for recalling the correct health warning rating for plain packages compared to the original pack. A Cramer's V of 0.32 represented a moderate association between pack condition and correct health warning recall.

Table 4-4: ORs of correct warning recalls by pack

Pack	N	Choice of health warning	ORs	95% CI for ORs		Cramer's V
				Lower bound	Upper bound	
<i>Original pack*</i>	39	A (correct)	-	-	-	0.323
	18	B (incorrect)				
<i>Plain pack 1</i>	35	A (correct)	0.70	0.33	1.51	
	23	B(incorrect)				
<i>Plain pack 2</i>	44	A(correct)	3.39	1.22	9.38	
	6	B(incorrect)				
<i>Plain pack 3</i>	61	A(correct)	5.63	1.93	16.40	
	5	B(incorrect)				

*Reference Group

The multicollinearity test in this study did not eliminate any perception attributes. The ten perception attributes were analyzed through a MANOVA test which produced skewed results that were not resolvable via four different transformations. Nevertheless, the

results show that the mean ratings of plain packs 2 and 3 relative to the original pack were lower with respect to the positive attributes. Plain pack 1 was not significantly different from the original pack in terms of its mean ratings with respect to the positive and negative attributes. As the ratings on the original 1-10 scale were positively skewed, they were analyzed through a dichotomized scale. The results were very similar to the results of the 1-10 scale. The health warning recall test showed that the odds of recalling a health warning with plain packs 2 and 3 are higher relative to the original pack. The results of both tests are compared to the results in two former studies, and to each other in the next chapter. The strengths and limitations are also discussed in the next chapter.

Chapter 5 : Discussion

This chapter compares the results of this study with two other studies. It also compares the two perception tests in this study. The chapter discusses the results of the health warning recall test in this study, and describes the strengths and limitations of this study.

5.1 Discussion of results in this study

This study suggests that plainer packages are less likely to be associated with positive attributes and more likely to be associated with negative attributes. The study also suggests that the plainer the pack, the less likely it will be associated with positive perceptions and the more likely it will be associated with a more negative perception. The Cramer's V values on the dichotomous scale present slightly moderate to moderate associations between the attributes and the packs. Combined with these Cramer's V values, the lower odds of rating a plain package positively and higher odds of rating a plain package negatively, compared to the original package, represent a reasonable justification for the importance of introducing plain packs.

The results of this study are broadly similar to two other studies. The results of this study based on a 1-10 scale and a dichotomous scale generates similar conclusions in favor of plain packaging. In addition, the health warning recall test demonstrates an additional benefit of plain packaging in terms of increasing the odds for recalling the correct health warning on a plain pack relative to the original pack. The results of this study have its strengths and limitations which are described in this section.

5.1.1 Results compared to other studies

The results of this study reveal some similarities and differences compared to two similar studies by Germain et al. (2009) and Wakefield et al. (2008). The results of the MANOVA test of this study and Germain et al.'s (2009) study, in terms of the mean ratings for positive perceptions of plain pack 2 and plain pack 3 compared to the original pack, are essentially the same as they show lower mean ratings for a higher number of positive attributes for the plain pack 3's pair wise comparison with the original pack relative to the plain pack 2's pair wise comparison with the original pack. The mean ratings of plain pack 2 in this study, for four positive perceptions, are lower compared to the original pack. This conclusion favors plain pack 2 over the original pack. The results with respect to plain pack 2 for this study are similar to those in Germain et al. (2009) as the latter shows that the mean ratings of plain pack 2 for two positive perceptions are lower as compared to the original pack. In this study, plain pack 3 has lower mean ratings for seven positive perceptions as compared to the original pack. These results are also similar to those of Germain, et al. (2009) study as it shows that the mean ratings for plain pack 3 are lower for three positive perceptions as compared to the original pack.

The results for this study does not show any significant differences in the mean ratings of the negative attribute for any of plain packs as compared to the original pack. These results are different from those in Germain et al.'s (2009) study as it shows that the mean ratings for plain pack 2 and plain pack 3 are higher for one of the negative attributes compared to the original pack.

The results of this study and Germain et al.'s (2009) study, in terms of positive perception ratings, support plainer packs over original packs, as they both demonstrate that the

plainer the pack, the lower the mean ratings are for a higher number of positive attributes relative to the original pack. In addition, both studies demonstrate progressively lower mean ratings for plain packs relative to the original pack.

The results of the logistic regression test in this study show no differences in the odds of rating plain pack 1 positively/ negatively as compared to the original pack. These results are different as compared to those of a study with similar perception attributes by Wakefield et al. (2008) which conclude that the odds of rating plain pack 1 positively in terms of the “sociable and outgoing” perception are higher compared to the original pack. However, the results with respect to plain pack 1 are broadly similar between the two studies since there are no other significant differences in the odds of rating plain pack 1 positively/ negatively as compared to the original pack in Wakefield’s et al. (2008) study. One minor difference between the two studies is that the odds of rating plain pack 3 negatively are higher for the “lower class” attribute compared to the original pack in this thesis study only.

For plain pack 2, the odds of rating this pack positively in terms of four positive perceptions are lower as compared to the original pack in this study. Wakefield et al.’s (2008) study also conclude that the odds of rating plain pack 2 positively in terms of eight positive perceptions are lower for plain pack 2 as compared to the original pack. In this study, the odds of rating plain pack 3 positively for seven positive perceptions are lower compared to the original pack. Wakefield’s et al. (2008) study also conclude that the odds of rating plain pack 3 positively are lower for ten of the positive perceptions as compared to the original pack.

This study and Wakefield's et al. (2008) study show lower odds for rating packs positively in terms of positive perceptions as they get progressively plainer in terms of brand imagery elements. This supports the introduction of plain packs instead of regular packs. The results of the two studies, however, do not strongly support plain pack 1 as compared to the original pack as there are no marked differences between these two packs.

5.1.2 Comparison of the results of the two scales

The results of the MANOVA test are similar to those of the bivariate logistic regression test for all the positive perception attributes. However, the results are different in terms of the single negative perception rating, as the odds of rating plain pack 3 negatively are higher as compared to the original pack, in the logistic regression test, but the mean ratings of the plain packs in terms of the negative perception are not significantly higher as compared to the original pack, for the MANOVA test. In terms of plain packs 2 and 3, both tests conclude that these packs are perceived less positively. This is evident as the mean ratings for plain packs 2 and 3 are progressively lower as compared to the original pack. Similarly, the odds for ratings plain packs 2 and 3 positively are progressively lower as compared to the original pack.

5.1.3 Discussion of the health warning recall results

The study suggests that people are more likely to recognize health warnings on plainer packs relative to regular packs, which suggests an additional benefit of plain packaging. Former studies suggest that plain packages increase the visibility of health warnings, seriousness of individuals toward health warning and hence the likelihood of recalling them (Beede & Lawson, 1992; Goldberg et al., 1999; Northup & Pollard, 1995 and

Rootman & Flay, 1995). This is the first study that demonstrates that the odds of recalling the correct health warning are higher for two degrees of plain packages as compared to the original pack. The Cramer's V value for the association between the pack condition and correct health warning recall reflect a moderate association which supports the introduction of plain packs to increase the likelihood of health warning recall and deter smokers and potential smokers from cigarettes.

5.1.4 Strengths of this study

This study has four main strengths. First, there are only two other plain packaging studies that examined the effect of the progressive removal of brand imagery elements on the perception of individuals. Both of these studies were conducted in Australia. This is the first study that examines the progressive removal of brand imagery elements in Canada and is therefore crucial to study the effect of plain packaging in individuals' perceptions.

Second, this study is the only one of three studies that mentions that the perception attributes are tested for multicollinearity to eliminate any collinear perception attributes. This is essential before conducting a multivariate test in order to ensure that some variables are not confounding the results of the study.

Third, the study presents an important conclusion in terms of the tendency of progressively plainer packs to increase health warning recall. All former studies present inconclusive results in terms the tendency of progressively plainer packs to increase the chance for health warning recall.

Fourth, this study eliminated taste perceptions which are inappropriate for non-smokers to rate. The inclusion of these perceptions threaten the validity of former studies as it is

problematic for non-smokers to rate taste perceptions for cigarettes based on the physical look of the package.

5.1.5 Limitations of this study

This study has a number of limitations. First, the perceptions of the participants in the study could have been influenced by social desirability bias. As public health messages in Canada are focused on de-normalizing smoking, the participants' could have negatively rated the packs regardless of which pack they received. For example: a participant might state that they strongly disagree that a pack is attractive whether it's a regular package or a plain package.

Second, within the three plain packages, multiple brand elements are dissolved at a time making it impossible to determine the element that influenced the negative perceptions of the participants. A study where brand elements are removed one at a time are more useful in determining which element influenced the perception of the participants.

Third, this study shows that the aggregate removal of brand elements, on brown background plain packs, influenced the participants to rate such packs more negatively relative to a regular pack. Different colors present alternatives to the brown background which would have produced different results. However, the brown color was chosen because previous studies have shown that this background color generated negative perceptions (Wakefield et al., 2008).

Fourth, the packs in this study were displayed on computer screens and the results would therefore have been possibly different if the participants physically handled the pack, as

the ability of an individual to view the colors and brand imagery elements on a computer screen and on a real package are different.

Fifth, the study did not stratify the participants by interest in tobacco control. Individuals with an interest in tobacco control could have participated in the study and negatively rate the packs regardless of whether they are plain or not. This factor could have resulted in the participation of some students in the survey which poses selection bias issues.

Sixth, the knowledge from this study did not necessarily generate concrete results that can be used to directly recommend or not recommend cigarette generic packaging in Nova Scotia because the results were taken from university students who do not necessarily represent Nova Scotia's population. This study presents an effort to highlight the issue of generic packaging and encourage conducting future studies that represent the population in Nova Scotia. The results of such a future study can then recommend or not recommend a generic packaging policy for Nova Scotia.

Seventh, this study did not stratify the population by cultural background SES and these two factors could influence the perception rating of plain packaging. This study also only utilized demographic characteristics to describe the sample but did not test the differences in perception ratings of plain packaging with respect to any demographic characteristics.

Eighth, the smoking status question could be ambiguous as it had a yes or no option; therefore, former smokers would not know whether they should answer yes or no on the smoking status question. The study could have specified what the definition of a smoker is for the purposes of the study. For example: any individuals who have been smoking a certain number of cigarettes for the last year.

Ninth, some participants had missing values, for which the mean of each perception attribute per pack was imputed. Although these average values represent an approximation of the missing values, they could be quite different from what participants could have actually rated. In addition, there were some participants that rated the pack “1” on almost every attribute. It is quite difficult to deduce whether those ratings are genuine or just a way to get in the prize draw.

Tenth, the study did not recruit students from NSCAD and King’s College, two HRM universities. It also did not include students from universities in HRM where French language is the primary language of instruction. The inclusion of the two above-mentioned universities, and French language based universities in the sample would have better represented the accessible population, adult students in HRM universities.

Eleventh, the study involves several tests which could increase the chances of random error and hence generate results that are not actually significantly different. Therefore, the conservative interpretation of the results is necessary. This study also tested nine positive attributes and only one negative attribute, which limits the examination of the negative attributes of the participants.

The recognition of these limitations and the consideration of the recommendations in the next section are essential in order to conduct future plain packaging studies in Canada that examine the effect of the progressive removal of brand imagery elements from packs on the perceptions of the public.

Chapter 6 : Recommendations And Conclusions

This chapter presents some recommendations based on the literature review, the results of this study, and its limitation. It also presents the overall conclusion of this thesis study.

6.1 Recommendations

Based on this study and the review of other plain packaging studies some recommendations can be made to better study plain packaging and implement plain packaging policies. First, conduct a province-wide plain packaging study on plain packaging in Nova Scotia. This will help to recruit a sample that is representative of the population in Nova Scotia and generate results that are generalizable to the population in this province. This is crucial to advocate for plain packaging policies as it would represent the public's view about the plain packaging of cigarettes. The same province-wide study could recruit individuals of different ages, sex, educational backgrounds, and professions and compare the ratings of these subgroups of plain packaging. This will help to control for these demographic variables that could influence the ratings for plain packs. The study could also stratify the sample by cultural background, SES, and interest in tobacco control in order to compare these stratified groups in terms of their perceptions of plain packs.

Second, consider a study that compares the perception of individuals of packs that have different shapes and sizes. This will help to determine whether the shape and size of the packs influence the perceptions of the public. Plain packaging should take into account

standardizing the shape of the pack as well as other brand elements that could influence public perceptions of packs.

Third, consider conducting a policy analysis review that provides a review of the Australian plain packaging policies and a comparison of the Australian and Canadian political environments in terms of trademark obligations, existing tobacco control policies that are grounded in statutes, and former tobacco lawsuits. A policy analysis review is crucial to avoid any lawsuits by the tobacco industry in Canada that could arise should plain packaging policies be introduced in the country.

Fourth, consider conducting fewer tests with the same dataset in order to avoid the chances of random error. This can be attained through testing fewer variables or choosing a design where two degrees of plain packages instead of three are compared to the original pack. In addition to testing fewer variables, it would be appropriate to balance the number of negative attributes and positive attributes to better understand the perception of individuals of plain packs. It would also be beneficial to pre-test the questionnaire in order to better validate it and have the option to include variables that have not been previously studied.

Fifth, consider conducting a study that compares the perception of smokers and non-smokers of plain packs and the smoking rates before and after the implementation of plain packaging policies. Such a study could be essential if plain packaging policies are already in place. This study should have a clear operational definition for who a smoker is in order to avoid confusion about smoking status.

Sixth, conduct a study to examine the effect of one brand imagery element at a time in order to determine which element influences individuals' perceptions.

6.2 Conclusions

This study presents an effort to study the effect of plain packaging on the perception of individuals and the ability of individuals to accurately recall health warnings on progressively plainer packages. The results of this study are broadly similar to the results of two studies in Australia, and all three studies present evidence that plain packaging influences the perception of individuals of cigarette packs. This study presents unique health warning findings as the results show that the participants were progressively more likely to recall health warnings on plainer packs relative to a regular pack. The findings of this study and former studies support the introduction of plain packaging policies based on the tendency of plain packaging to influence individuals to perceive cigarettes packs less positively. Further studies are required to confirm the findings of this study with respect to the ability of individuals to recall health warnings on plainer packs relative to regular packs.

Although this study presents findings in support of plain packaging, it has several limitations that need to be addressed in future plain packaging studies. A future study that considers the limitations and findings of this study and examines a wider segment of the population of Nova Scotia is needed to generate concrete results that either support or do not support plain packaging. The consideration of the legal domain of plain packaging is also crucial to supplement evidence from plain packaging and individual perceptions

studies and justify whether or not there is a need for the introduction of plain packaging policies.

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Appendix A1: Information Letter

Purpose and benefits:

Dear participant welcome to “A quantitative survey study on the effects of progressive removal of brand imagery elements from cigarette packs on the perception of adult university students in HRM.” We highly encourage you to participate in this study which will contribute to the understanding of the perceptions of students of generic cigarette packages and *hopefully* increase your knowledge about generic packaging. There is a hard copy of this letter at the booths, you are advised to keep it for your references or print it at your leisure.

Confidentiality and anonymity:

Please read this letter and let the Principal Investigator (PI) know if you have any questions. Be advised that your responses are confidential and will only be utilized for the purposes of evaluating your perceptions of the cigarette package presented to you. You can access the survey from either Peer Health booths or any computer. If you access this survey from a computer other than the one at the booths, please choose a computer where there are not many people around to protect your personal information, and avoid using unsecured shared computers. At the Peer Health booths we will ask you to face the laptop behind the booth table to protect your information. Opinio is a secured survey system which will further reduce the risks of stealing your personal information. You are not required to write your name on either this letter or the survey to ensure your anonymity. However, if you would like to enter a draw for pre-paid credit cards, you would have to provide us with your name and email which will be used by the PI for the sole purpose of contacting you in case you win.

Inclusion/ exclusion criteria:

To participate in this study you have to be a student who is currently enrolled at any program at an HRM university where English is the primary language of teaching. However, you have to be 19+ years old, and you cannot be a TA of anyone of the Peer Health volunteers who stand at the booth.

Study design and description of what the participants will do

The study will examine the perception of students of original packages vs. plainer packages in a 1 (brand) x 4 (packages), where brand imagery is progressively removed in three plain packages. Each participant will view one package and rate it based on package characteristics, individual characteristics, social characteristics, and taste, in addition to one recall question.

Time commitment:

The actual survey will take 6 minutes to be completed but your total commitment will be around 10-13 minutes as you are requested to take into account the time for reading this letter, receiving your compensation, and answering any questions you have.

Compensation:

All the participants will enter a draw to win one of thirty pre-paid credit cards, each valued at \$25 per card. The participants will be requested to provide their names and emails, in a web window which will pop up after they finish the survey. The names and emails will only be utilized to contact the participants if they win one of the pre-paid credit cards. The draw will take place after 220 participants finish the survey. The participants who win will be requested to go to one of the two booths that will have the cards ready for them. The time and date of the booths will be specified in an email which will be sent to the winning participants. If any of the 30 winning participants cannot make it to the booths, the PI will schedule a time and place that is convenient for them in order to hand them their pre-paid credit cards.

In addition to the draw for the cards, the participants who approach the Peer Health booths will be offered chocolates, at the time of completion, which will include nuts free chocolates for people with nuts allergies.

Considerations after the survey:

If you choose to complete the survey at the Peer Health booths, please save it and allow 0.5 minutes for the PI to check the proper completion of the survey. If you choose to complete the survey outside Peer Health booths, you'll be asked to fill in your name and email in an online window that will follow the completion of the survey. Your name and email will only be used to send you information on how to receive the pre-paid card in case you win in the draw. Only the PI will be responsible for data analysis to protect your information, and the information on the USB will be destroyed five years post-publication. You can request your individual responses before the data destruction period. The thesis will be available at Dalonline resources for your access, once the results are finalized.

Risks:

The risk associated with this study are minimal “no more than those you experience on a daily basis” these are characterized by the chance that someone around you might steal your information. However, we minimize this risk by situating/advising you to situate yourself in a position to minimize the exposure of your information to people in your surroundings.

By reading this letter and accepting to participate you **are giving the PI an Informed Consent.**

Thank you for considering our survey
Mohammed Al-hamdani cell: 902-478-7008 email: mh825846@dal.ca
School of Health Administration, Dalhousie University and Peer Health volunteers

Appendix A2: Survey

Demographic information

1. What is your gender?

M F

2. Please choose the age range you belong to

19-24 25+

3. Please choose your current educational status

Diploma Bachelors Master PHD

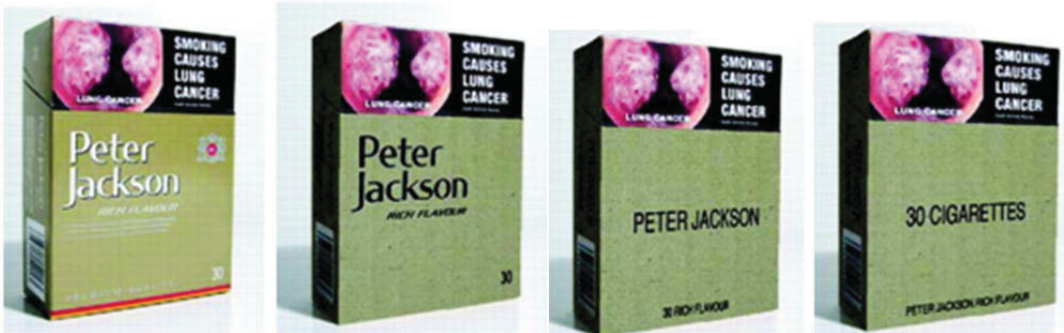
4. Are you a smoker

Yes No

5. Daily cigarette consumption

1-10 cigs 11-15 cigs 16-19 cigs 20+

Orig. Plain pack 1 Plain pack 2 Plain pack 3



Please note that whether you are a smoker or a non-smoker you are supposed to answer the following questions in terms of how would you perceive a smoker who would smoke the brand displayed to you, and how would you perceive the taste of the package displayed to you relative to the other cigarettes that you have seen in the past (you don't have to have tasted the cigarette before, just judge from the look of the package).

Take a good look at the package displayed to you as you will not be able to go back and look at it again once you click next.

Please click on the number on the 1-10 scale that best corresponds to your answer in relation to the displayed package:

Package characteristics

How would you rate each of the following attributes of the displayed pack?

1. Attractiveness of the pack
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
2. Value in terms of getting what you paid for
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
3. The pack is exclusive or a specialty brand
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
4. Temptation to try/smoke this brand relative to other brands
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)

Perceived individual characteristics

Somebody who smokes this brand is

1. Trendy
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
2. Young
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
3. Masculine
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
4. Confident and successful
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)

Perceived taste characteristics (These four attributes were not analyzed; refer to the “Data” section for more details)

How do you perceive the taste of the displayed brand **based on its look**

1. Rich in flavor
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
2. Low in tar and nicotine
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
3. Satisfying
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
4. High tobacco quality cigarette
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)

Social characteristics

Somebody who smokes this brand is

1. Sociable and outgoing
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)
2. Lower class
(Not at all) 1 2 3 4 5 6 7 8 9 10 (Extremely well)

Final Question:

What was the health warning on the pack that was displayed to you? Choose on the four choices below:

- a) Smoking causes lung cancer
- b) Smoking causes impotence
- c) Smoking Kills
- d) Get help to stop smoking: consult your doctor or pharmacist

Optional: Prize draw

Enter your email to enter a prize draw for one of 25 pre-paid credit cards each valued at \$25.

Email

Appendix B: Recruitment Notice

Recruitment notice for an online Generic packaging survey

What?

An online survey

Why?

Study the perceptions of students in HRM universities in relation to generic packaging of cigarettes

How?

- 1- Online access from any computer
- 2- Online access from Peer Health booths at Dalhousie University. Check this link for the survey
<https://surveys.dal.ca/opinio/s?s=9639>

When?

Between 10th of January 2010 and 21st of February 2011 or when 220 participants complete the survey

Where?

Any computer or at the scheduled Peer Health booths.

Cost?

10-13 minutes of your time or less

Benefit?

Improved knowledge about generic packaging of cigarettes

Compensation?

Instantly get chocolates if you approach Peer Health booths and enter a draw enter a draw to win 1 of 30 \$25 pre-paid credit cards. Out of booth participants can enter the draw online in a window that will pop up after they complete the online survey. Winners of the draw will be contacted to schedule a time and place that is convenient for them to receive their cards.

Contact?

Mohammed Al-hamdani cell: 902-478-7008 email: mh825846@dal.ca

Appendix C: VIF Tables For The Perception Attributes

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Value)	.469	2.131
	(Exclusive)	.418	2.391
	(Temptation)	.399	2.507
	(Trendy)	.322	3.105
	(Young)	.476	2.099
	(Masculine)	.644	1.552
	(Confidentandsuccessful)	.357	2.801
	(Socialandoutgoing)	.644	1.553
	(Lowerclass)	.885	1.130

a. Dependent Variable: (Attractiveness)

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Exclusive)	.391	2.557
	(Temptation)	.353	2.834
	(Trendy)	.316	3.167
	(Young)	.507	1.972
	(Masculine)	.652	1.534
	(Confidentandsuccessful)	.353	2.830
	(Socialandoutgoing)	.641	1.559
	(Lowerclass)	.892	1.121
	(Attractiveness)	.346	2.889

a. Dependent Variable: (Value)

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Temptation)	.361	2.772
	(Trendy)	.315	3.171
	(Young)	.476	2.099
	(Masculine)	.649	1.541
	(Confidentandsuccessful)	.357	2.798
	(Socialandoutgoing)	.641	1.559
	(Lowerclass)	.935	1.070
	(Attractiveness)	.328	3.044
	(Value)	.416	2.401

a. Dependent Variable: (Exclusive)

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Trendy)	.331	3.024
	(Young)	.476	2.099
	(Masculine)	.644	1.553
	(Confidentandsuccessful)	.360	2.780
	(Socialandoutgoing)	.640	1.563
	(Lowerclass)	.891	1.122
	(Attractiveness)	.338	2.960
	(Value)	.405	2.468
	(Exclusive)	.389	2.571

a. Dependent Variable: (Temptation)

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Young)	.569	1.756
	(Masculine)	.643	1.555
	(Confidentandsuccessful)	.394	2.537
	(Socialandoutgoing)	.641	1.561
	(Lowerclass)	.889	1.125
	(Attractiveness)	.305	3.276
	(Value)	.406	2.464
	(Exclusive)	.381	2.628
	(Temptation)	.370	2.702

a. Dependent Variable: (Trendy)

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Masculine)	.651	1.536
	(Confidentandsuccessful)	.354	2.828
	(Socialandoutgoing)	.658	1.519
	(Lowerclass)	.888	1.126
	(Attractiveness)	.299	3.347
	(Value)	.431	2.319
	(Exclusive)	.380	2.629
	(Temptation)	.353	2.835
	(Trendy)	.377	2.655

a. Dependent Variable: (Young)

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Confidentandsuccessful)	.419	2.384
	(Socialandoutgoing)	.640	1.563
	(Lowerclass)	.893	1.120
	(Attractiveness)	.300	3.336
	(Value)	.411	2.431
	(Exclusive)	.385	2.601
	(Temptation)	.354	2.827
	(Trendy)	.316	3.168
	(Young)	.483	2.069

a. Dependent Variable: (Masculine)

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Socialandoutgoing)	.674	1.484
	(Lowerclass)	.890	1.123
	(Attractiveness)	.307	3.253
	(Value)	.413	2.423
	(Exclusive)	.392	2.552
	(Temptation)	.366	2.734
	(Trendy)	.358	2.792
	(Young)	.486	2.059
	(Masculine)	.776	1.288

a. Dependent Variable: (Confidentandsuccessful)

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Lowerclass)	.893	1.119
	(Attractiveness)	.301	3.325
	(Value)	.406	2.463
	(Exclusive)	.381	2.623
	(Temptation)	.353	2.835
	(Trendy)	.316	3.168
	(Young)	.490	2.040
	(Masculine)	.642	1.558
	(Confidentandsuccessful)	.365	2.738

a. Dependent Variable: (Socialandoutgoing)

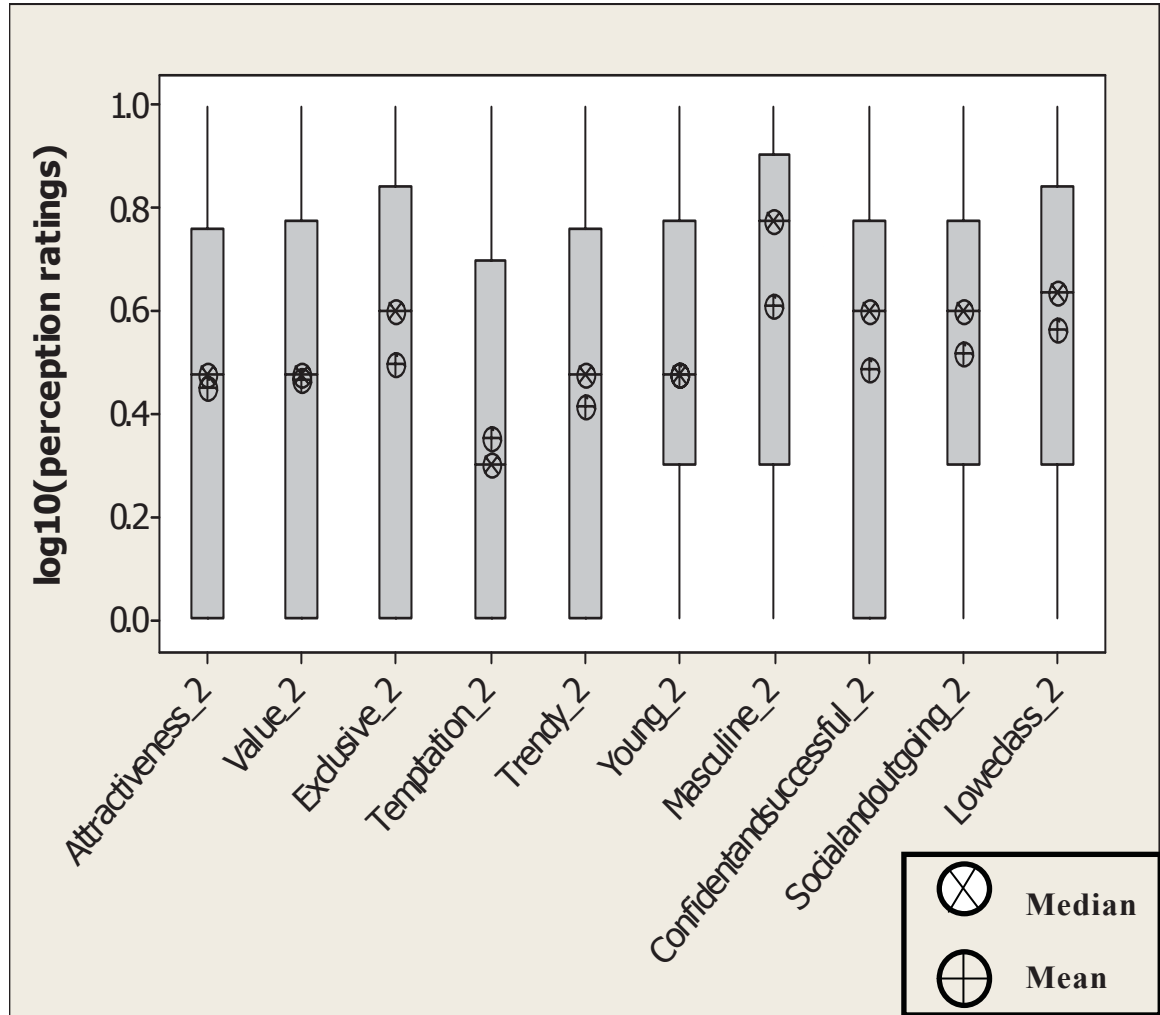
Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Attractiveness)	.299	3.347
	(Value)	.408	2.450
	(Exclusive)	.402	2.490
	(Temptation)	.355	2.816
	(Trendy)	.316	3.160
	(Young)	.478	2.091
	(Masculine)	.647	1.544
	(Confidentandsuccessful)	.349	2.866
	(Socialandoutgoing)	.646	1.548

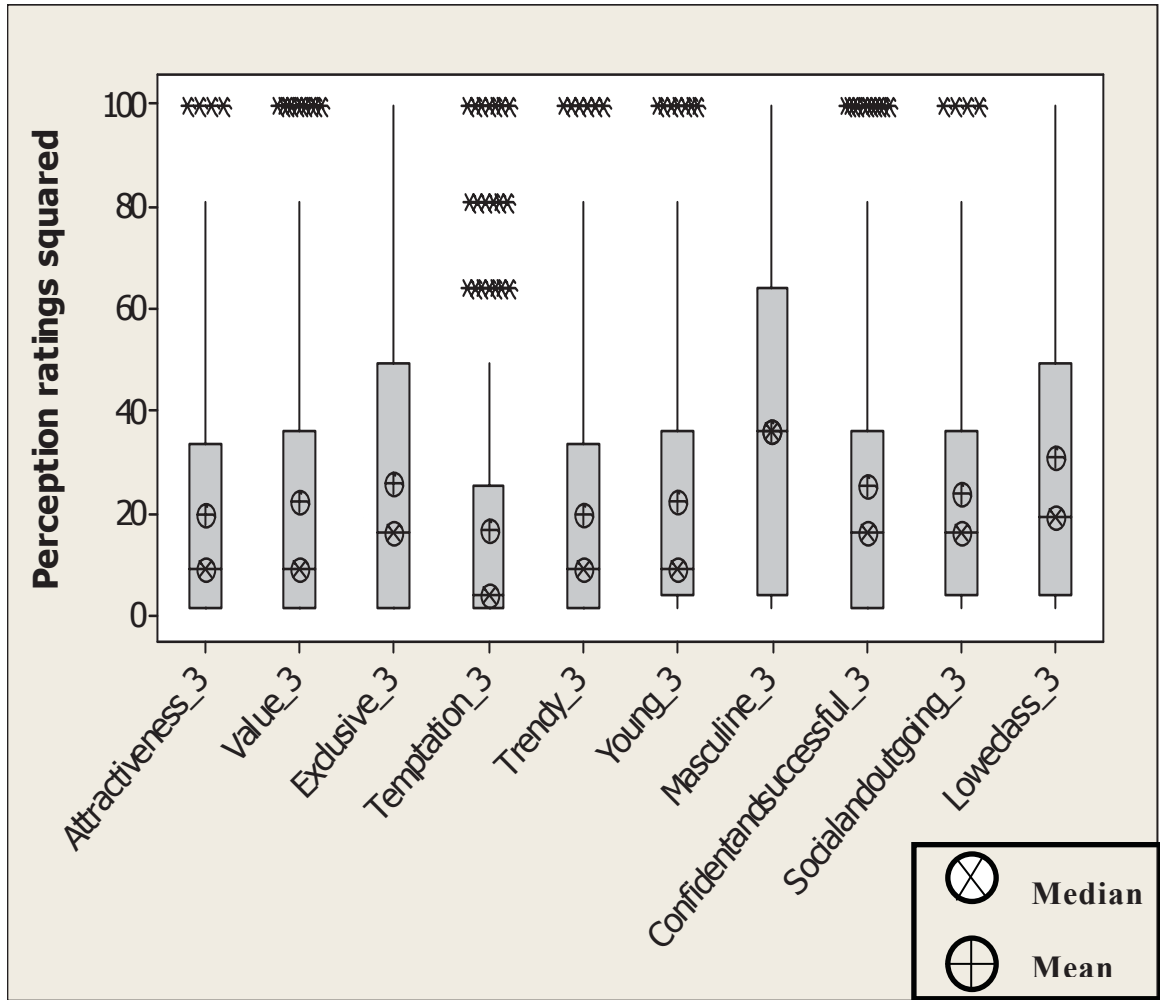
a. Dependent Variable: (Lowerclass)

Appendix D: Boxplots Of The Transformed Ratings

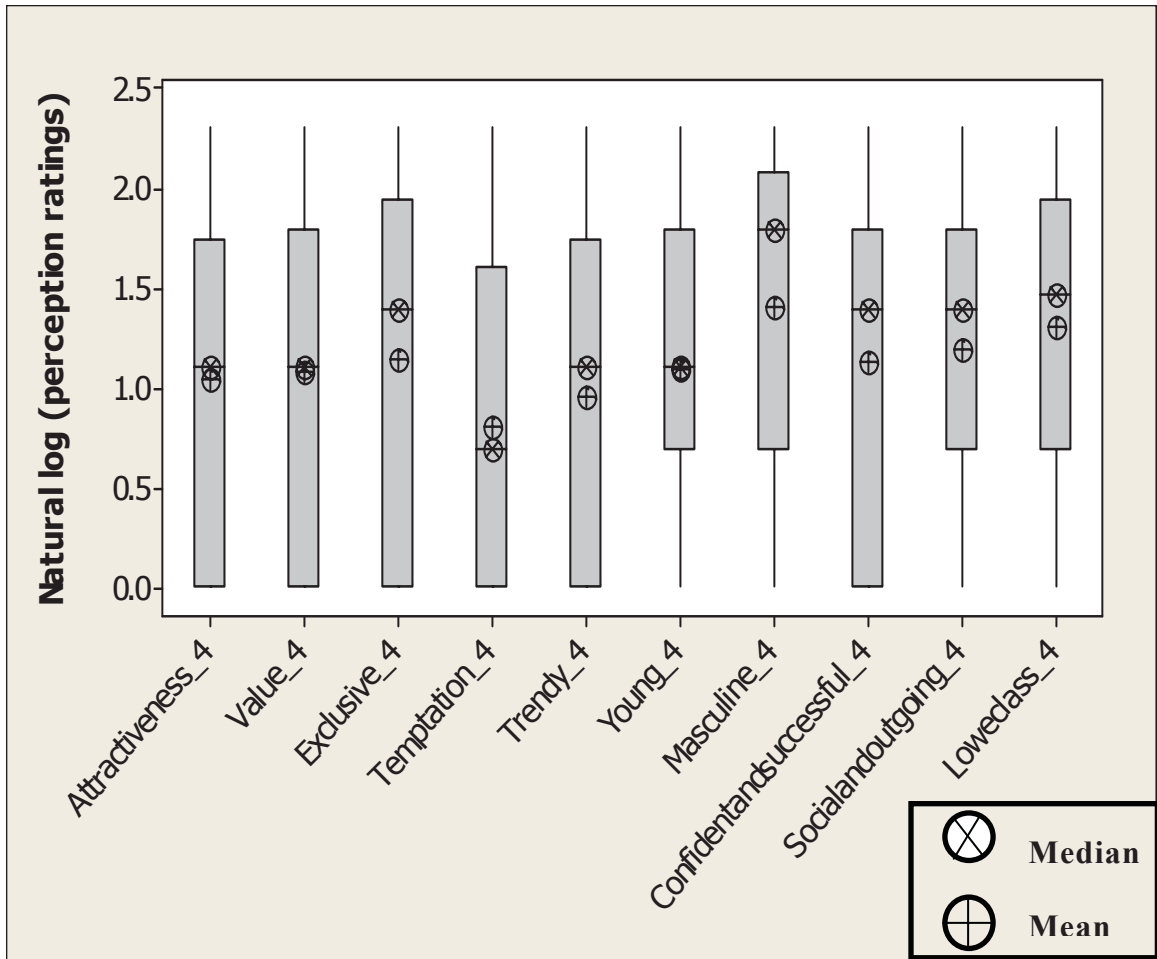
Box plots for transformed data Log10 (perception ratings)



Box plots of transformed data: Square (perception ratings)

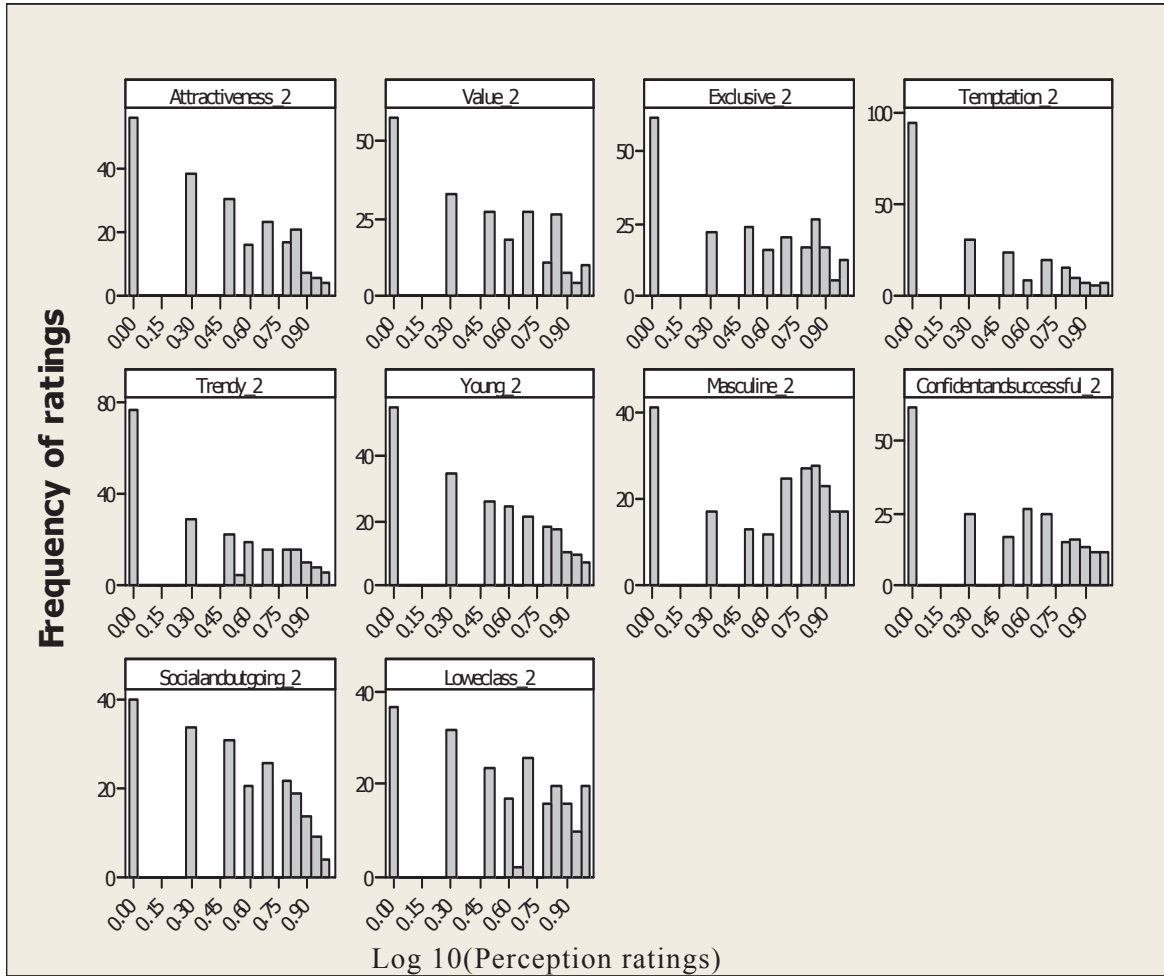


Box plots of transformed data: Natural log (perception)

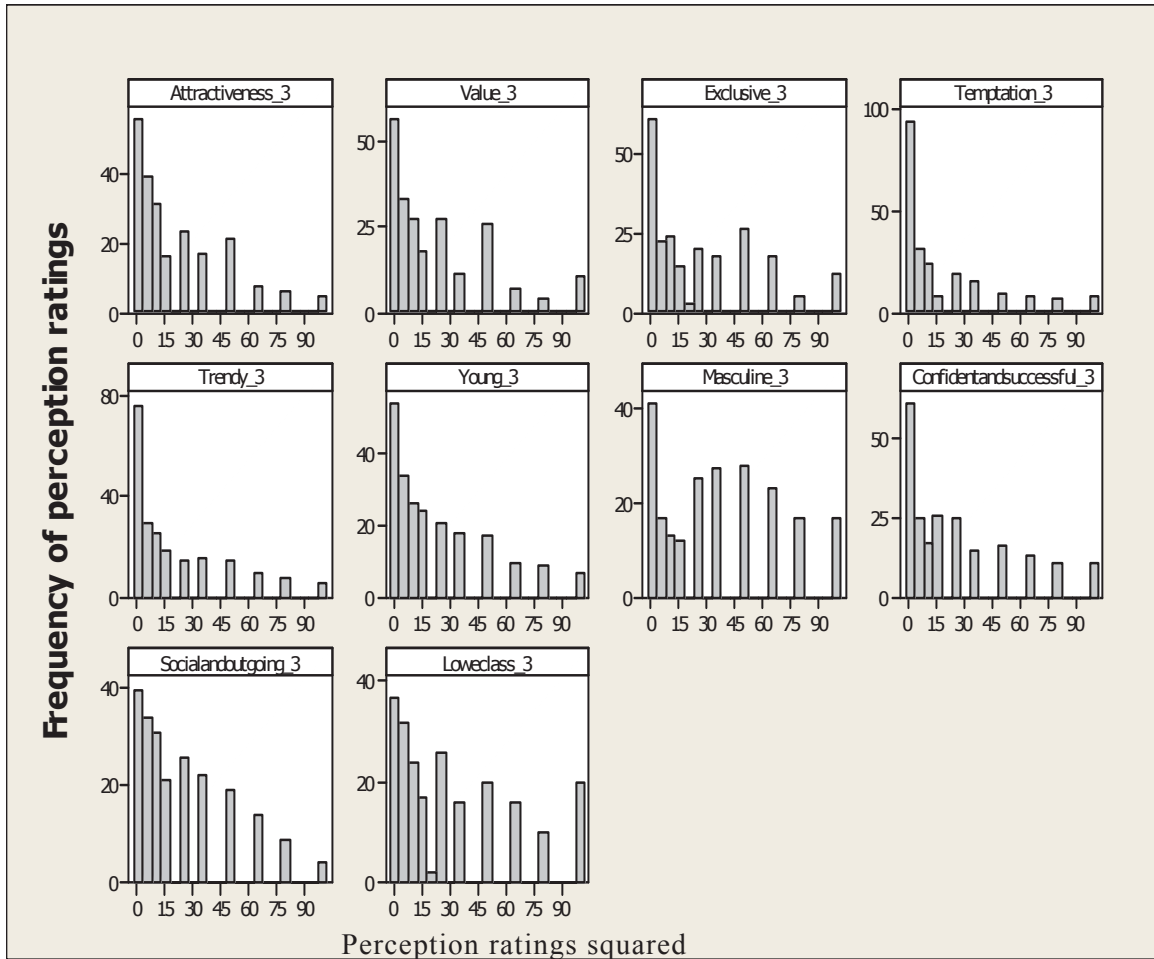


Appendix E: Histograms Of The Transformed Ratings

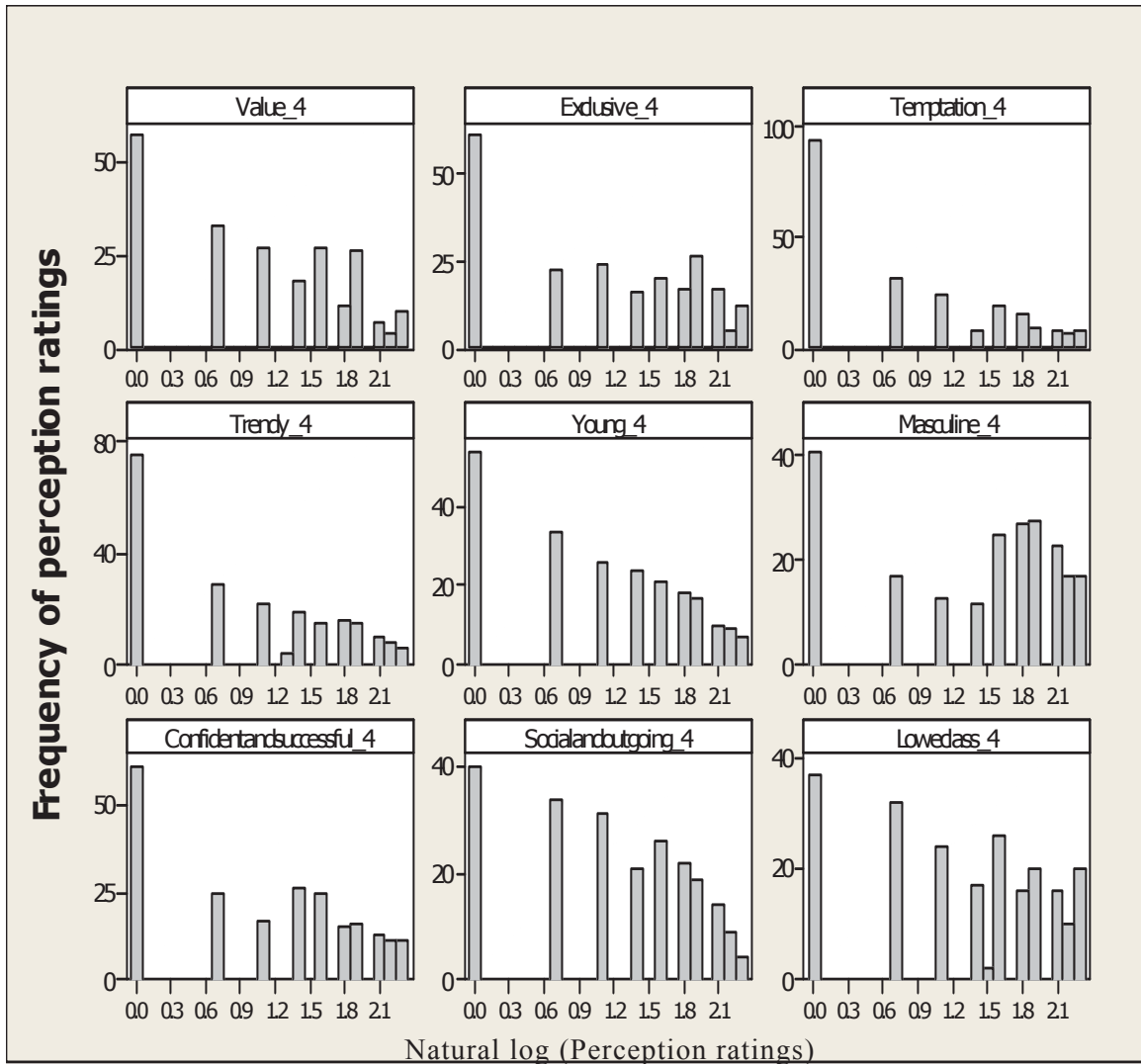
Histograms of transformed data: Log10 (perception ratings)



Histograms of transformed data: Square (perception ratings)



Histograms of transformed data: Natural log (perception ratings)



Appendix F: Multiple Comparison Tests

Multiple Comparisons

Dependent Variable	Test	(I) Pack ID	(J) Pack ID	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
							Lower Bound	Upper Bound	
(Attractiveness)	Tamhane	1	2	-.327	.5146	.989	-1.707	1.052	
			3	1.429*	.4271	.007	.282	2.577	
			4	1.103	.4494	.090	-.101	2.308	
	Dunnett T3	1	2	-.327	.5146	.988	-1.706	1.051	
			3	1.429*	.4271	.007	.283	2.576	
			4	1.103	.4494	.090	-.100	2.307	
	Games-Howell	1	2	-.327	.5146	.920	-1.670	1.016	
			3	1.429*	.4271	.006	.312	2.546	
			4	1.103	.4494	.073	-.069	2.276	
	(Value)	Tamhane	1	2	.109	.5382	1.000	-1.334	1.552
				3	1.866*	.4757	.001	.587	3.144
				4	1.189	.5105	.123	-.179	2.557
Dunnett T3		1	2	.109	.5382	1.000	-1.332	1.551	
			3	1.866*	.4757	.001	.588	3.143	
			4	1.189	.5105	.122	-.178	2.556	
Games-Howell		1	2	.109	.5382	.997	-1.296	1.514	
			3	1.866*	.4757	.001	.621	3.110	
			4	1.189	.5105	.098	-.143	2.521	
(Exclusive)		Tamhane	1	2	.127	.5738	1.000	-1.411	1.665
				3	1.683*	.5098	.008	.314	3.052
				4	1.900*	.5241	.003	.496	3.305
	Dunnett T3	1	2	.127	.5738	1.000	-1.409	1.664	
			3	1.683*	.5098	.008	.315	3.050	
			4	1.900*	.5241	.003	.497	3.303	
	Games-Howell	1	2	.127	.5738	.996	-1.370	1.625	
			3	1.683*	.5098	.007	.350	3.015	
			4	1.900*	.5241	.002	.533	3.268	

Dependent Variable	Test	(I) Pack ID	(J) Pack ID	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
(Temptation)	Tamhane	1	2	-.002	.5819	1.000	-1.562	1.557
			3	1.914*	.4652	.001	.658	3.170
			4	1.677*	.4850	.005	.372	2.983
	Dunnett T3	1	2	-.002	.5819	1.000	-1.561	1.556
			3	1.914*	.4652	.001	.660	3.169
			4	1.677*	.4850	.005	.374	2.981
	Games- Howell	1	2	-.002	.5819	1.000	-1.521	1.516
			3	1.914*	.4652	.001	.693	3.136
			4	1.677*	.4850	.005	.407	2.947
(Trendy)	Tamhane	1	2	-.519	.5721	.935	-2.052	1.015
			3	1.014	.4995	.242	-.328	2.356
			4	1.447*	.4889	.023	.133	2.761
	Dunnett T3	1	2	-.519	.5721	.933	-2.051	1.013
			3	1.014	.4995	.239	-.327	2.355
			4	1.447*	.4889	.023	.135	2.759
	Games- Howell	1	2	-.519	.5721	.801	-2.012	.974
			3	1.014	.4995	.184	-.292	2.320
			4	1.447*	.4889	.020	.169	2.726
(Young)	Tamhane	1	2	-.255	.5352	.998	-1.690	1.180
			3	1.013	.5317	.309	-.415	2.440
			4	1.458*	.4895	.022	.144	2.772
	Dunnett T3	1	2	-.255	.5352	.998	-1.688	1.179
			3	1.013	.5317	.305	-.413	2.438
			4	1.458*	.4895	.022	.145	2.771
	Games- Howell	1	2	-.255	.5352	.964	-1.652	1.143
			3	1.013	.5317	.233	-.377	2.402
			4	1.458*	.4895	.019	.179	2.737

Dependent Variable	Test	(I) Pack ID	(J) Pack ID	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
(Masculine)	Tamhane	1	2	.032	.5443	1.000	-1.427	1.491
			3	.103	.5739	1.000	-1.438	1.643
			4	1.490*	.5356	.037	.055	2.924
	Dunnett T3	1	2	.032	.5443	1.000	-1.426	1.490
			3	.103	.5739	1.000	-1.437	1.642
			4	1.490*	.5356	.037	.057	2.923
	Games- Howell	1	2	.032	.5443	1.000	-1.388	1.452
			3	.103	.5739	.998	-1.397	1.602
			4	1.490*	.5356	.032	.093	2.886
(Confidentandsuccessful)	Tamhane	1	2	-.495	.5643	.944	-2.008	1.017
			3	1.193	.5302	.149	-.229	2.616
			4	1.790*	.5049	.004	.436	3.144
	Dunnett T3	1	2	-.495	.5643	.942	-2.006	1.016
			3	1.193	.5302	.148	-.228	2.615
			4	1.790*	.5049	.004	.437	3.143
	Games- Howell	1	2	-.495	.5643	.816	-1.968	.977
			3	1.193	.5302	.117	-.192	2.579
			4	1.790*	.5049	.003	.472	3.108
(Socialandoutgoing)	Tamhane	1	2	-.673	.4973	.694	-2.006	.660
			3	.264	.4975	.996	-1.071	1.599
			4	1.537*	.4385	.004	.360	2.714
	Dunnett T3	1	2	-.673	.4973	.688	-2.004	.659
			3	.264	.4975	.995	-1.069	1.598
			4	1.537*	.4385	.004	.361	2.713
	Games- Howell	1	2	-.673	.4973	.532	-1.970	.625
			3	.264	.4975	.951	-1.035	1.564
			4	1.537*	.4385	.004	.391	2.683

Dependent Variable	Test	(I) Pack ID	(J) Pack ID	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
(Lowerclass)	Tamhane	1	2	.296	.5091	.993	-1.068	1.661
			3	-.870	.5735	.573	-2.411	.670
			4	-1.176	.5366	.169	-2.613	.260
	Dunnett T3	1	2	.296	.5091	.993	-1.067	1.660
			3	-.870	.5735	.567	-2.410	.669
			4	-1.176	.5366	.168	-2.611	.259
	Games-Howell	1	2	.296	.5091	.937	-1.032	1.625
			3	-.870	.5735	.431	-2.370	.629
			4	-1.176	.5366	.132	-2.575	.223

Based on observed means.

The error term is Mean Square(Error) = 8.290.

*. The mean difference is significant at the .05 level.