The impact of cigarette package design on young women in Brazil: brand appeal and perceptions of health risk

by

Christine White

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Science
in
Health Studies and Gerontology

Waterloo, Ontario, Canada, 2011

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Tobacco use is responsible for 5.4 million deaths every year worldwide and a leading cause of preventable death. The burden of these deaths is rapidly shifting to low and middle-income countries, such as Brazil. Brazil is widely regarded as an international leader in tobacco control. The country has prohibited most forms of advertising; however, the cigarette pack remains a primary source of tobacco marketing. The current study sought to examine how tobacco packaging influences brand appeal and perceptions of health risk among female youth in Brazil.

A between-subjects experiment was conducted in which 640 Brazilian females between the ages of 16 to 26 years participated in an online survey. Each participant was asked to view and rate a series of cigarette packages that were digitally altered to correspond to one of three experimental conditions: (1) "standard" branded cigarette packages, (2) the same packs with all brand imagery removed ("plain packaging"), or (3) the same packs with all imagery and brand descriptors removed. Participants rated the packages on perceived appeal, taste, smoothness, health risk, ease of quitting, desirability to be seen smoking, preference to try, and smoker attributes through single pack ratings and two-pack comparisons. A pack offer was used as a behavioural measure of general appeal. Linear and logistic regression modeling was used to test for differences between and within experimental conditions.

Branded packs were rated as significantly more appealing, better tasting, and smoother on the throat than plain packs. Branded packs were also associated with a greater number of positive smoker attributes including style and sophistication, and were perceived as more likely to be smoked by females than the plain packs. Removing descriptors from the plain packs further decreased the ratings of appeal, taste and smoothness, and also reduced associations with positive attributes. Results of the study also indicated that packages marketed as lighter, through use of lighter coloured pack imagery, and descriptors referring to lighter colours and flavours, were more likely to be rated favourably. Over 52% of

participants accepted a pack offer at the end of the study, and of those who selected a pack, more than three-quarters chose a branded pack over a plain pack.

Overall, the findings suggest that plain packaging and removing descriptors from cigarette packs, including those that refer to flavours, may help to reduce the appeal of smoking, and consequently reduce smoking susceptibility among young women in Brazil.

Acknowledgements

First of all, I would like to thank my supervisor, David Hammond, for his ongoing support and mentorship over the past two years. His encouragement and guidance has made my time as a graduate student not only enjoyable, but has also fostered my growth as a researcher.

I would also like to thank my committee members, Geoffrey Fong and Jim Thrasher, for their expertise, advice, and encouragement. Thank you to Said Bichara, Renato Costa, Samantha Daniel, Matt Grey, and Jessica Reid for your invaluable assistance conducting this research.

I would also like to thank my family and friends for their support throughout the process. Thank you Mom and Dad for all your encouragement, love, patience and proofreading. Special thanks to Karina and Erica, as well as my 'phenomenal' officemates, Lana, Sam and Seema, for your endless support and assistance, and last, but certainly not least, friendship and laughs along the way.

Finally, I would like to gratefully acknowledge the financial support I received for this project through a Canadian Institute for Health Research (CIHR) Banting and Best Canada Graduate Scholarship, Ontario Graduate Scholarship, CIHR Training Grant Program in Population Intervention for Chronic Disease Prevention, and Ontario Tobacco Research Unit (OTRU) Ashley Studentship for Research in Tobacco Control.

Table of Contents

List of Figures

List of Tables

1.0 Introduction

In the face of comprehensive restrictions on tobacco advertising and promotion, cigarette packaging has become a critical part of the overall marketing strategy of tobacco products (National Cancer Institute, 2008; Wakefield, Morley, Horan & Cummings, 2002; Carter, 2003; Hulit, 1994). Cigarette packaging helps establish brand image and brand identity in competitive markets and serves as an effective form of promotion, both at the point of purchase and while cigarettes are being used (Wakefield et al., 2002; Wakefield, Germain & Durkin, 2008).

Tobacco companies have long recognized the value of packaging in the promotion of their products, and as such, have made extensive use of package design in providing consumers with information about their products and influencing consumer brand appeal (Wakefield et al., 2002; Cummings, Morley, Horan, Steger & Leavell, 2002). Brand descriptors and design elements including colour, font, trademarks and imagery affect a brand's perceived attractiveness. These elements and descriptors also influence consumer perceptions about the product's characteristics, including the cigarette's expected strength, flavour, and sensation, and the potential risks associated with smoking different brands (Hammond, Dockrell, Arnott, Lee & McNeill, 2009; Wakefield et al., 2002; Instituto Nacional de Cancer, 2008). Some of the primary packaging strategies used to shape consumer perceptions include: (1) the use of misleading brand descriptors such as light, mild and low tar; (2) the incorporation of misleading colours, symbols and brand imagery; and (3) the inclusion of deceptive references to product design, such as flavour, filtration and emission properties (Hammond et al., 2009; National Cancer Institute, 2001; Wakefield et al., 2002; Hammond, 2009).

Legislation banning the use of the terms "light", "mild" and "low tar" has already been implemented in many countries, but has only resulted in a marginal reduction in false consumer beliefs (Borland et al., 2008). More extensive prohibitions on packages may be required to minimize false beliefs about the risk of different brands (Borland et al., 2008); however, additional evidence will be required to

support further changes in legislation. In recent years, research on consumer perceptions associated with cigarette package design has also been used to support regulatory proposals for "plain packaging" (Hammond & Parkinson, 2009; Hammond et al., 2009; Germain, Wakefield, & Durkin, 2010; Wakefield et al., 2008). These regulatory proposals have been met with strong opposition from the tobacco industry, thus additional evidence on the effectiveness of plain packaging in modifying smoking behaviours would be helpful (Alliance of Australian Retailers, 2010; Philip Morris International, 2010a).

Currently, there is a lack of research on the impact of cigarette package design on youth. Many of the potentially misleading packaging strategies are thought to be particularly influential among youth and young adults – the stage in life when smoking preferences and behaviours develop (Wakefield et al., 2002; Cummings, Morley, Horan, Steger & Leavell, 2002; DiFranza, Eddy, Brown, Ryan & Bogojavelnsky, 1994; Lynch & Bonnie, 1994). Yet, to date, studies on the impact of cigarette package design on consumer perceptions have largely focused on adults. Design techniques may be especially influential among young female smokers (Centres for Disease Control and Prevention, [CDC], 2001).

There is also a lack of research in low and middle income countries. Although tobacco-related deaths are expected to double in low- and middle-income countries over the next two decades (Mathers & Loncar, 2006), most of studies in this field have been based solely in developed countries. It is unclear whether packaging would have the same effects across very different cultural contexts.

The current study examined the impact of cigarette package design on smoking-related perceptions among female youth in Brazil. The study investigated how cigarette packaging impacts youth perceptions of brand appeal, perceived taste and health risks, and smoker image. A "between-subjects" experiment was conducted, whereby Brazilian participants viewed either "standard" packages of leading Brazilian and international cigarette brands, the same packs with all brand imagery removed ("plain packaging"), or the same packs with all imagery and brand descriptors removed. Participants completed an online survey and evaluated the packages based on their brand appeal, perceived taste, perceived health risk, brand identity characteristics. A pack selection task was used to assess the impact of plain packaging on potential smoking behaviours.

Overall, this study sought to expand the evidence base surrounding the impact of cigarette package design on youth, and address research gaps in this critical area. The study has the potential to inform the Brazilian regulations on cigarette package design. The findings have the potential to help evaluate the potential impact of "plain packaging" regulations and more extensive prohibitions on brand descriptors on consumer perceptions. Ultimately, the study sought to determine whether there is a case for plain packaging in Brazil.

2.0 Literature Review

2.1 Tobacco as a Global Health Issue

Tobacco use is the world's leading cause of preventable death (Makomaski Illing & Kaiserman, 2004; World Health Organization, [WHO], 2008a), accounting for ten percent of all deaths and 33 percent of all cancer deaths (Mathers & Loncar, 2006). In total, approximately 5.4 million people die of tobacco-related diseases every year world-wide (Mathers & Loncar, 2006). Unless action is taken, this number is predicted to rise to 8.3 million deaths per year by 2030 (Mathers & Loncar, 2006). In the past, most of these tobacco-related deaths occurred in high-income countries; however, over the next two decades, the burden of tobacco-attributable deaths is expected to shift to low- and middle-income countries. While the number of tobacco-attributable deaths is projected to decline by nine percent between 2002 and 2030 in high-income countries, it is expected to double from 3.4 million to 6.8 million in low- and middle-income countries (Mathers & Loncar, 2006). Steady population growth, accompanied by strategic tobacco industry targeting is thought to facilitate much of the rapid increases in tobacco use in these low- and middle-income countries (WHO, 2008a). According to the World Health Organization, increases in tobacco use will lead to large increases in tobacco-related illness and death, rising health care costs, and less productive workforces – all of which could otherwise be avoided (WHO, 2008a).

2.2 Tobacco Use in Brazil

Brazil represents an ideal marketplace for the tobacco industry (WHO, 2009). Geographically, Brazil is the largest country in South America; and with an estimated population of 193.2 million people, it has the fifth largest population in the world (Instituto Brasileiro de Geografia e Estatistica, 2010; Central Intelligence Agency, 2010). Approximately 16 percent or 31.3 million adults in Brazil currently smoke cigarettes or other tobacco products (Ministério da Saúde, 2007). Tobacco use in Brazil among youth is also prevalent. Recent studies have indicated that over 17 percent of youth age 13 to 15 in Brazil currently use tobacco products (2005 Global Youth Tobacco Survey as cited by WHO, 2009; CDC, 2009;

Hallal, Gotlieb, de Almeida & Casado, 2009; WHO, 2010a). Specifically, more than 13 percent of female youth and 21 percent of male youth in Brazil are current daily smokers (WHO, 2010a).

Studies have also shown that smoking in Brazil is more prevalent among the poorest and least educated groups of the population (WHO, 2010a; Iglesias, Jha, Pinto, Luiza da Costa e Silva & Godinho, 2007). Almost a quarter (23.4 percent) of individuals in the lowest income quartile are current daily smokers compared to just 13.1 percent of those in the highest income quartile (WHO, 2010a). Additionally, the prevalence of smoking among those with little or no education is between 1.5 to 2 times higher than among those with who have completed secondary school (Iglesias et al., 2007). The association between education and smoking in Brazil however is not linear. A greater proportion of people with university and post-graduate education smoke compared to people with secondary education (World Health Survey Brazil, 2003 as cited by Iglesias et al., 2007). Thus, there seems to be a threshold where once people have completed a certain level of education (secondary school), their likelihood of smoking begins to increase again.

Given the substantial prevalence of smoking among both youth and adults in Brazil, the country represents a lucrative market for the tobacco industry. According to the tobacco company Souza Cruz, Brazil is the biggest Latin American cigarette market. Although Brazil's population represents 34 percent of the entire Latin American population, its cigarette consumption accounts for 42 percent of the total sales in Latin America (Souza Cruz, 2010a). Trade and production data suggest that overall tobacco consumption in Brazil has declined since the 1990s, but as of 2005, more than a trillion cigarettes were still consumed each year (WHO, 2008a).

Multinational companies capitalize on this large market and have developed a sizable presence in Brazil. The two largest tobacco companies in Brazil are Souza Cruz SA, which is controlled by the British American Tobacco Company, and Philip Morris of Brazil (Food and Agriculture Organization of the United Nations, [FAO], 2003). Souza Cruz produces six of the ten best-selling cigarette brands sold in Brazil and reportedly accounts for 86% of the Brazilian market share in the tobacco industry

(Euromonitor International, 2010 as cited by Campaign for Tobacco-Free Kids, 2009). Their leading brands include Derby, Hollywood, Free Carlton and Dunhill (Souza Cruz, 2010b). Philip Morris is the second largest tobacco company in Brazil and reportedly accounts for 11% of the Brazilian tobacco market share (Euromonitor International as cited by Campaign for Tobacco-Free Kids, 2009). Philip Morris produces leading brands such as Marlboro, Shelton, Dallas and Galaxy (Philip Morris International, 2010b).

2.3 Tobacco Control in Brazil

2.3.1 Current Tobacco Control Regulations

Brazil is widely regarded as an international leader in tobacco control (Jurburg, 2009). In 2001, Brazil became the second country in the world to adopt graphic warning labels on cigarette packages. Pictorial warnings are required to cover at least 100% of one of the two main sides of a pack (Jurberg, 2009; Instituto Nacional de Cancer, 2008). Brazil has banned the use of misleading adjectives such as "light", "ultra-light", "mild" and "soft" from cigarette packages (Jurberg, 2009; Lee, Chagas & Novotny, 2010) and made it mandatory for manufacturers to include the "Disque-Saúde – Pare de Fumar" telephone number, a free quit-line from their Ministry of Health, on cigarette packages (Instituto Nacional de Cancer, 2008). Brazil was the first country in the world to create a body to regulate tobacco contents and emissions (Lee et al., 2010). Additionally, they have implemented federal restrictions on tobacco advertising in local magazines, newspapers, television, radio, and billboards; electronic advertising on the internet; publicity in stadiums, ballrooms, stages or similar locations; and tobacco company sponsorship of international cultural and sporting events (Instituto Nacional de Cancer, 2008; WHO, 2008a; Iglesias et al., 2007).

2.3.2 Framework Convention on Tobacco Control

Brazil was one of the first countries in the world to sign the World Health Organization's Framework Convention on Tobacco Control (FCTC) (WHO, 2010b). The FCTC is the first-ever

international health treaty and urges countries across the world to implement strong, evidence-based tobacco control policies (ITC, 2010). As a member of the FCTC, Brazil has legally binding obligations to meet the minimum tobacco control standards set out in the treaty (WHO, 2003). These standards are set for a wide variety of tobacco control measures and include provisions intended to both reduce the supply and demand for tobacco. For instance, the FCTC sets broad limits on tobacco production, sales, distribution, advertisement, taxation, and government policies (Lee et al., 2010). It includes provisions to decrease exposure to tobacco smoke, regulation on the advertising and promotion of tobacco products, and restrictions on the packaging and labelling of tobacco products (WHO, 2003).

One provision of particular relevance to the proposed study is Article 11.1(a). Article 11 specifies that within three years of entering into the treaty, each party should adopt and implement laws or measures to ensure the following:

> ...tobacco product packaging and labelling do not promote a tobacco product by any means that are false, misleading, deceptive or likely to create an erroneous impression about its characteristics, health effects, hazards or emissions, including any term, descriptor, trademark, figurative or any other sign that directly or indirectly creates the false impression that a particular tobacco product is less harmful than other tobacco products (WHO, 2003).

The FCTC Guidelines for Implementation of Article 11 state that these measures should include prohibiting terms such as "low tar", "light", "ultralight", or "mild", but also indicates that this list is not exhaustive and parties should also prohibit terms such as "extra", "ultra" and similar terms in *any* language that might mislead consumers (WHO, 2008c). The guidelines also encourage parties to adopt "plain" packaging – that is to "restrict or prohibit the use of logos, colours, brand images or promotional information on packaging other than brand names and product names displayed in a standard colour and font style" (WHO, 2008c). According to the WHO, this type of "plain" packaging may increase the noticeability and effectiveness of health warnings and messages, prevent the package from detracting attention from them, and address industry package design techniques that may suggest that some products are less harmful than others (WHO, 2008c).

2.3.3 Gaps in Tobacco Control Regulation

While Brazil is considered a leader in tobacco control, there are still a number of tobacco control policies to be implemented: bans on advertising and promotion, and the focus of the proposed study, regulations to avoid misleading packaging (WHO, 2008a). Currently, no complete ban on advertising and promotion exists. Tobacco companies are still permitted to advertise through point of sale advertisements and promotional discounts and through international mass media and sponsorship (WHO, 2008a; Campaign for Tobacco-Free Kids, 2010). In terms of packaging, regulations on misleading information have already been stipulated under Article 11 of the FCTC; however, there is a general consensus that the restrictions on the terms "light," "mild," and "low tar" are not sufficient and that broader regulations on other brand descriptors and brand imagery are required (Borland et al., 2008). These packaging regulations are of even greater importance in Brazil because there are no bans on covering point of sale displays, so the packages are still clearly visible to the consumers. Figure 1 provides an example of current cigarette packaging available in Brazil (front and back panels are shown).

Figure 1: Example cigarette package from Brazil (front and back panels)

2.4 Package Design and Cigarette Marketing Principles

2.4.1 Communication of Brand Image and Positioning

Packaging is an important tool in the overall marketing strategy of any consumer good, but has especially important functions in marketing tobacco products. Packaging does much more than protect and contain products; it also serves as an important communication device for cigarette brands. Manufacturers use packaging to communicate brand image and "position" their brand (Grewal, Levy, Persaud, & Lichti, 2009). They often attempt to convey an image by creating associations between their brand and positive human characteristics (Grewal et al., 2009). A brand "personality", - that is a set of human characteristics associated with a brand – can be developed to have symbolic or self-expressive meaning for consumers. These personality characteristics often include elements such feminine or masculine, young or mature, fun-loving or conservative, or can relate to other product qualities such as clean, fresh, and smooth (Grewal et al., 2009).

In the case of cigarettes, packaging is particularly useful in developing a brand image because the package is typically retained until all the cigarettes are consumed and it has a high degree of social visibility (Wakefield et al., 2002). The package is seen every time the product is used, and is often left on public display during use, acting as an advertisement. Wakefield and colleagues (2002) suggest this high degree of social visibility enables cigarette packages to function as "badge products" that smokers carry and use to communicate their style and image in a self-expressive manner (Wakefield et al., 2002). Common brand images communicated by tobacco packaging and advertising include social status (e.g., "cool" or "uncool"), glamour, slimness, masculinity or femininity (Scheffels, 2008). As a marketing executive working for the tobacco company Philip Morris once described, "Cigarette branding is on the pack - the 'badge' which people display... Outside the pack cigarettes are virtually indistinguishable…Colours and designs could be carried through to the cigarette itself - a visible extension of the personality of the brand (and the user)…" (Philip Morris, 1989).

2.4.2 Establishment of Unique Brand Identity in Competitive Markets

Packaging is used to establish brand identity in competitive markets and can act as a point of differentiation among relatively homogenous products (Grewal, Levy, Persaud, & Lichti, 2009; Wakefield et al., 2002). Unique packaging enables consumers to identify their preferred brand from the selection of other available brands. In the fight for market share, marketers have to design packaging to, in a matter of seconds, attract attention, describe the product and make the sale. Essentially, packaging helps create significant in-store presence at the point of purchase and acts as an advertising medium for the tobacco industry (Wakefield et al., 2002; Grewal et al., 2009).

As tobacco advertising restrictions have come into force, packaging has become an even more critical marketing and communication device (Wakefield et al., 2002; Carter, 2003; Hulit, 1994). In recent years, many countries have banned tobacco advertising and event sponsorship; and some countries, now require tobacco retail displays, or "power-walls" to be covered (Dewhirst, 2004; Rooke, Cheeseman, Dockrell, Millward, & Sandford, 2010). Internal documents from British American Tobacco indicate that packages are being designed to compensate for these restrictions in advertising:

> Given the consequences of a total ban on advertising, a pack should be designed to give the product visual impact as well as brand imagery… The pack itself can be designed so that it achieves more visual impact in the point of sale environment than its competitors (Miller, 1986).

Innovations in printing technology, package shape, and plastic wrapping are some of the ways the industry have expanded the boundaries of package design and attempted to attract consumer interest in a market with limited opportunity for advertising and promotion (Freeman, Chapman & Rimmer, 2008; Hammond, 2006). For example, Imperial Tobacco Canada recently re-vamped one of its leading brands, du Maurier, by packaging it into octagon-shaped packs (see figure 2).

Figure 2: Octagon-shaped du Maurier (Canada) package

2.5 Cigarette Package Design and Consumer Perceptions

Tobacco companies have made extensive use of cigarette packages to falsely reassure consumers about the potential risks of their products (Freeman et al., 2008; National Cancer Institute, 2001). Two key strategies used to influence perceptions of consumer risk involve integrating brand descriptors and brand imagery on the package.

2.5.1 Brand Descriptors and Consumer Perceptions

2.5.1.1 Misleading nature of 'light' and 'mild' descriptors

For over three decades tobacco companies have used words such as "light" and "mild" to distinguish between different types of cigarettes (Shiffman, Pillitteri, Burton, Rohay & Gitchell, 2001). These terms are used to denote flavour and taste, and to identify cigarettes with lower machine-tested yields of tar and nicotine (Shiffman et al., 2001). Tar and nicotine emission yields are generated for each brand of cigarette by a machine that 'smokes' cigarettes according to a standard set of puffing parameters (e.g., fixed puff size, puffing rate, puff duration, and butt length to which the cigarette is smoked) (National Cancer Institute, 2001). These parameters, however, are not consistent with human smoking patterns. The machine testing does not account for the fact that smokers can and do alter their smoking

patterns to compensate for reduced tar and nicotine yields. Additionally, the testing does not account for cigarette design elements such as filter ventilation holes that yield lower tar and nicotine levels under machine smoking, but much higher levels under human smoking conditions (National Cancer Institute, 2001; Gallopel-Morvan et al., 2010). Thus, in contrast to popular belief, there is no association between the tar and nicotine numbers printed on packages and the health risk of different brands.

Studies have consistently shown that many smokers mistakenly believe that cigarettes labelled as "light" actually deliver less tar and are less harmful to smokers, and consequently are "healthier" than regular cigarettes (Borland et al., 2008; Wilson et al., 2009). A Canadian study of adult smokers and non-smokers found that respondents were significantly more likely to rate packages with the terms "light" "mild" "smooth" and "silver" as having a smoother taste, lower tar delivery and lower health risk than regular or full-flavour brands (Hammond & Parkinson, 2009). "Light" cigarettes, however, do not actually convey health benefits. Smokers who switch to lower tar cigarettes are likely to inhale the same amount of hazardous chemicals and remain at high risk for developing smoking-related cancers and other diseases (National Cancer Institute, 2001). The descriptive terms may mislead consumers into believing that by choosing or switching to a "light" brand they are reducing their health risks. Furthermore, according to Borland and colleagues, given that health concerns are the most common motivation to quit smoking and remain abstinent (Curry, Grothaus, & McBride, 1997; Hyland, Li, Bauer, Giovino, Steger, & Cummings, 2004), the descriptive terms may result in additional undue harm to consumers. Smokers who may have otherwise attempted to quit smoking for health reasons may just switch to "low tar" cigarettes and continue to smoke under the false belief that they are reducing their health risks (Borland et al., 2008).

2.5.1.2 FCTC Response & Policy Impact

Given the concerns surrounding misleading descriptors, the WHO has incorporated Article 11.1 (a) into the FCTC. The article aims to prevent deceptive packaging and labelling and directs treaty parties to prohibit terms or descriptors that could create the false impression that some products are less harmful

such as “low tar”, “light”, “ultra-light” or “mild” (WHO, 2003). The WHO also *recommends* that parties prohibit other similar terms, such as “extra” or “ultra”, in *any* language that might mislead consumers (WHO, 2008c).

To date, more than 50 countries around the world, including Brazil, have prohibited the use of the words “light”, “mild”, and “low tar” on cigarette packaging with the aim of reducing erroneous risk perceptions (Hammond, 2009; Hammond, 2010a). Several studies, however, have shown that after removing the terms “light,” “mild” and “low tar” from cigarette packages, only modest reductions in the number of smokers with false beliefs are found. A sizeable proportion of smokers in Canada, Australia, the United Kingdom and the United States still continue to believe that “light” cigarettes offer a relative health advantage over regular cigarettes (Borland et al., 2008). In the United Kingdom, the proportion of smokers holding these beliefs decreased after the descriptors were banned, but the change was comparable to countries where there had been no policy change (Borland et al., 2008).

2.5.1.3 Factors Hypothesized to Mediate Policy Impact

A number of factors may contribute to, or be responsible for the marginal impact of the ban on descriptors. First, Hammond (2009) has suggested that the false beliefs associated with light and mild cigarettes are likely to persist for some time after descriptors disappear from packages. Additionally, retailers and consumers may still be using these terms to describe their products even though the terms have been removed from the packages (Hammond, 2009). It is possible that over time the effects will increase as smokers forget the descriptors, and new smokers never learn that certain cigarettes used to be called “lights” (Borland et al., 2008).

Second, although “light” and “mild” descriptors have been banned in many countries, tobacco manufacturers have invented a variety of other descriptors that replace the original terms and reinforce the same false beliefs and perceptions. In many jurisdictions with prohibitions, tobacco companies have just re-labelled “light” and “mild” products with alternative terms such as smooth, fine, refined or ultimate

(Peace, Wilson, Hoek, Edwards & Thomson, 2009; Borland et al., 2008). Numbers that correspond to machine levels of tar have also been incorporated into brand names to distinguish between varieties (e.g., Marlboro One). These numbers, however, often reinforce the idea of supposedly "healthier" lower tar products. Previous research has shown that when consumers are shown packages with different numbers in the brand name, as many as 80% of smokers reportedly believe that the brand with the lower number would deliver less tar and lower health risk (Hammond & Parkinson, 2009).

Colour differentiation on cigarette packages – both as descriptors and package backgrounds - may also be reinforcing consumer misperceptions about "light" brands. Colour descriptors such as "red", "gold", "blue" and "silver" are frequently found to have replaced the original "misleading" descriptors (Peace et al., 2009). Research has shown that consumers associate different colours and shades of colour with the "lightness" and "strength" of a brand (Peace et al., 2009; Hammond & Parkinson, 2009; Hammond, 2010a). For example, blue and silver are perceived as "lighter" cigarettes, where red and gold are typically perceived as "regular" or "extra-strength" cigarettes. As such, one might conclude that these colour descriptors could be used by smokers to identify former "light" or "mild" brands.

Packages with colour-coded backgrounds may also be reinforcing misperceptions about "light" cigarettes. Tobacco manufacturers began colour-coding package backgrounds before the descriptors "light" and "mild" were banned. After those descriptors were banned, the colour-coded imagery remained but new descriptors were attached (Peace et al., 2009). It is possible that because the same colour-coding pattern is used with the new descriptors, consumers may continue to identify certain packages as "lighter" cigarettes.

Lastly, packaging elements related to filtration may serve to re-enforce misperceptions about differences in health risk. References to filtration are often included on packages and used as "evidence" of emission reductions and lower risk. A review of evidence on tobacco packaging found that packages with references to special filters (e.g., laser holes, active carbon particles, and coloured cellulose particles) were more likely to be rated by the majority of smokers as having less tar and lower health risk, even

though the references were actually meaningless in terms of actual risk (Hammond, 2009). Misconceptions about "light" cigarettes may also be furthered by the sensory perceptions of an easier draw and cooler feel found in heavily ventilated cigarettes (Borland et al., 2008). Heavily ventilated cigarette brands generate lower machine tested levels of tar, and produce "lighter" tasting smoke that reinforces the misconceptions.

In summary, experts suggest that bans on brand descriptors such as "light" and "mild" are insufficient to markedly change false beliefs held by smokers about low tar cigarettes and will need to be supplemented by bans on alternative misleading descriptors such as smooth and ultimate, as well as tar yields, colouring, and references to filtration (Borland et al., 2008).

2.5.2 Brand Imagery and Consumer Perceptions

Consumer perceptions of risk can also be influenced by brand imagery - colours, symbols and graphics used in package design. Studies have shown that pack imagery variables such as colour and design have such a significant effect on an individual's perception of the product that they can actually affect consumer sensory perceptions of the product – a process known as "sensory transfer" (Wakefield et al., 2002). As mentioned earlier, different shades of colour are commonly used to manipulate perceptions of a product's strength and potential risk (Hammond & Parkinson, 2009). Progressively lighter colours promote perceptions of progressively lower cigarette strength (Wakefield et al., 2002). For example, products in packages with blue tones are perceived to be "lighter" than those in packages with red tones. Products in grey and white are perceived to be the "lightest" in terms of cigarette strength (Philip Morris, 1981; Wakefield et al., 2002; Hammond, 2009). The lighter grey and white and blue tones are often used to convey health; while red tones and logos are used to convey excitement, passion, strength, wealth and power; and silver and gold are used to convey status and prestige (CDC, 2001; Pollay, 2001). Pastel colours such as pink, purple, light yellow and white are often combined with feminine symbols and images and are used to target women and portray smoking as feminine and stylish; and suggest qualities

such as freshness, purity, health and intelligence (Gordon, Finlay & Watts, 1994 & Kindra, Lacroche & Muller, 1994 as cited by CDC, 2001; Carpenter, Wayne & Connolly, 2005).

Graphics are also used on packages to create specific perceptions. Images of nature scenes, physical activity and sports are strongly associated with health (Pollay, 2001). These graphics are also used to create brand identities. For example, according to Carter (2003), the cigarette brand Longbeach uses the tagline "you're miles ahead" against scenes of long deserted beaches to create a brand identity of "value for money" and feelings of escape and freedom.

2.6 Tobacco Packaging and Youth

There is a strong incentive for tobacco companies to use youth-oriented brand descriptors and imagery in tobacco packaging to capture share in the youth smoking market. First, smoking behaviour and brand preferences begin to develop in young adulthood (Miller, 1963; Lynch & Bonnie, 1994; DiFranza et al., 1994). The vast majority (71%) of adult smokers start to smoke before age 18 and very few ever take up smoking after age 25 (Lynch & Bonnie, 1994). Studies have also shown that cigarette brand choices are usually made early in life and are fairly consistent over time (DiFranza et al., 1994). In fact, cigarettes have such a high brand loyalty from customers that fewer than 10% of smokers change brands annually (Cummings, Hyland, Lewit, & Shopland., 1997). Moreover, youth and young adults serve as the main source of new customers for the tobacco industry. Without youth as new customers, cigarette brands will fail to grow. According to testimony from tobacco litigation cases and tobacco company websites, tobacco executives claim that they do not want minors to smoke and believe that tobacco products should not be marketed to minors (Beasley, 1998; Morgan, 1998; Souza Cruz, 2010b). Yet, as the following quote from RJ Reynolds indicates, tobacco companies are clearly aware that they are in a business where they need to make a profit and that this does in fact depend on their ability to recruit young adults as new smokers: "Appeal to younger adults is critical for long term brand growth. Brands that attract 18-24 year olds grow in total. Brands losing appeal among younger adults decline in total." (RJ Reynolds, 1991, p. 503795876).

2.6.1 Brand Imagery, Identity and Youth

Research has consistently demonstrated that brand imagery portrayed on packages is especially influential among youth and young adults (Pollay, 2000; Wakefield et al., 2002; Cummings et al., 2002; DiFranza et al., 1994). Studies have consistently shown that youth buy the most heavily advertised cigarettes (Pierce, Gilpin, Burns, Whalen, Rosbrook, Shopland & Johnson, 1991; Cavin & Pierce, 1996). Moreover, their brand choices are generally based less on relatively minor differences in the sensory properties of the actual cigarette and instead are dictated more by psychological and image factors (British American Tobacco, 1978). Youth brand choices are often self-expressive. According to Wakefield and colleagues (2002), consumers choose brands that appear to embody the qualities they wish they had and the lives they wish they lead (Thiboudeau & Martin, 2000 as cited by Wakefield et al., 2002). Social ties and peer acceptance are particularly important to teenagers. In fact, industry documents suggest that advertising that reinforces how a product will contribute to acceptance by one's peers may be especially effective among teenagers (Cummings et al., 2002). Other qualities, that market research documents recommend highlighting in advertising to young smokers, include the following: a mechanism for relieving stress, awkwardness, and boredom; something adventurous, 'in' and adult; and something that should not be perceived as a 'health' brand (Teague, 1973).

Package design may be especially useful in targeting female subgroups of youth and certain beliefs about smoking. Brand descriptors such as "slim" or "superslim" are used to exploit young women's concerns about body weight and the perceived relationship between cigarette smoking and thinness (Carpenter et al, 2005).

2.6.2 Flavoured Cigarette Brands and Youth

Cigarette taste and flavour are other important aspects that influence cigarette appeal for new smokers. The tobacco industry has long been aware that an adolescent's first contact with cigarettes can be unpleasant given the strong flavouring (Philip Morris, 1969). Consequently, the features of cigarette brands have been modified to make initial cigarette contact experiences less aversive and to increase

appeal to new smokers. This is primarily accomplished in two ways: (1) by ensuring that brands targeted to youth are smoother, milder and less harsh; and (2) by introducing flavoured brands that may be more palatable to youth and more appealing to high-sensation seeking youths (Lewis & Wackowski, 2006). Sweet flavours such as cherry, lime, citrus, vanilla, cinnamon and chocolate are thought to be more palatable to youth and as such, may promote initiation of smoking (Zuckerman, 1979 and Zuckerman, 1994 as cited by Manning, Kelly & Comello, 2009; Lewis & Wackowski, 2006). The names of these flavours are often reflected in the package descriptors and in the package colouring as a means to increase appeal among the youth. Furthermore, the flavoured brands may be especially attractive to young women because they counteract cosmetic concerns and social pressures that are specific to females (Carpenter et al., 2005).

2.7 Plain Packaging

Plain or "generic" packaging has been proposed as a possible way to address the impact of colour and other brand imagery elements on cigarette packaging (Germain et al., 2010; Hammond et al., 2009; Carr-Gregg & Gray, 1990; WHO, 2008c). Plain packaging would standardize the appearance of cigarette packages by requiring the removal of all brand imagery including logos, colours and images. The WHO Guidelines for Implementation of Article 11 in the FCTC recommend that packages would then display a standard background colour (typically brown) and manufacturers would only be permitted to print the brand name and product descriptors in a mandated size, font and position (WHO, 2008c).

2.7.1 Potential Impact of Plain Packaging

Plain packaging of tobacco products has the potential to impact youth smoking perceptions and behaviours in a number of ways. First, research has suggested that when cigarette packages are progressively stripped of colour, imagery, and branded fonts, adolescents find the package less appealing. Average ratings of positive perceptions are reduced and perceptions of the pack being "lower class" become stronger (Germain et al., 2010). Compared to branded packages, plain packages are less likely to be rated by youth as a "popular brand"; "attractive pack"; "value for money"; or "a brand they would

try/smoke" (Germain et al., 2010). Instead, plain packages are more likely to be perceived as boring, ugly and cheap-looking and tend to reduce the flair and appeal associated with smoking (Rootman & Flay, 2003; Northrun & Pollard, 1995 and Centre for Health Promotion, 1993 as cited by Freeman et al., 2008). The taste characteristics are rated less favourably – the cigarettes are expected to be less rich, less satisfying and of poorer quality tobacco (Germain et al., 2010).

Research also suggests that plain packages are less likely to be associated with favourable personality attributes. Adolescents rate typical smokers of plain packages as less trendy/stylish, less mature, less masculine, less sociable/outgoing and less confident/successful (Germain et al., 2010; Wakefield et al., 2008). Furthermore, studies have shown that youth are less likely to associate specific brands with specific "types" of people when the packages are plain (Goldberg et al., 1995).

Plain packaging also has the potential to reduce false beliefs about the harmfulness of different cigarette brands (Hammond, 2009). As discussed earlier, considerable proportions of smokers incorrectly believe that certain types of cigarette brands are less harmful than others. A recent study conducted with adult and youth smokers asked participants to compare cigarette brands – some of which were standard branded packs with and some were modified to be plain packages with white or brown backgrounds (Hammond et al., 2009). The investigators found that when comparing different plain packages with otherwise standardized appearances, smokers were less likely to believe that one brand delivered less tar, was less harmful, or was easier to quit (Hammond et al., 2009). They also found that false beliefs were significantly lower when participants compared brands in plain packs to the standard branded packages (Hammond et al., 2009). However, false beliefs were still evident when comparing two plain packages that still displayed different descriptors such as 'smooth' vs. 'gold' (Hammond et al., 2009). This may indicate that introducing plain packaging may not resolve the problem of misperceptions on its own; and re-enforces the need for simultaneous improvements in the prohibitions on misleading descriptors.

In addition, plain packaging may increase the salience and effectiveness of health warnings and prevent the package from detracting attention from these messages (Goldberg, Liefeld, Madill, & Vredenburg, 1999; WHO, 2008c). Beede and Lawson (1992) found that New Zealand youth were

significantly more likely to recall health warnings when they were presented on plain packages rather than "normal" branded packages. They also found that adolescents were able to retain a greater proportion of available warning information when fewer brand image cues were present on the packages.

Finally, there is some evidence that plain packaging may decrease the number of youth who start smoking and improve smoking cessation rates in teens and adult smokers (Goldberg et al., 1995). A national survey commissioned by Health Canada indicated that up to 49% of youth believe that their peers would be less likely to start smoking if all cigarettes were sold in plain packages and up to 38% believed their peers would be more likely to quit smoking. Still, over 45% of youth reported that such packaging would not actually change the number of youth who start or stop smoking (Goldberg et al., 1995).

2.7.2 Plain Packaging in Other Fields

Research on the impact of plain packaging and branding on consumer perceptions has also been conducted in non-tobacco related areas such as the fast-food industry. Similar findings have been obtained and demonstrate that brand identities constructed through fast food packaging can influence young children's taste perceptions and brand appeal (Robinson, Borzekowski, Matheson, & Kraemer, 2007). In 2007, researchers had pre-school age children taste two versions of each of five meal products (hamburgers, chicken nuggets, french fries, milk/apple juice and carrots). The children were presented with the products in two types of packaging – a package with McDonald's packaging graphics and a plain, white package. After tasting both versions of each product, the preschoolers were asked to indicate whether they had a preference between the products, and if so, which product they liked more. For almost every type of food, the children were significantly more likely to report they preferred the food wrapped in the McDonald's packaging than the food wrapped in the plain packaging and said it tasted better (Shrimp, 2009). A parallel may be drawn between these results and those related to tobacco packaging: just as the children in the fast-food study found the food in the McDonald's packaging more preferable and tastier, youth are more likely to find cigarettes in colourful packages with graphics more attractive and appealing.

2.7.3 Plain Packaging and Industry Opposition

Recently, the Australian government announced that they will be implementing standardized plain packaging regulations (Chapman & Freeman, 2010; Sweet, 2010). As of July 1, 2012, tobacco products in Australia will have to be sold in plain packaging with few or no logos, brand images, or colours. Promotional text will be restricted to brand and product names in a standardized position, type style and size.

The tobacco industry, however, is launching a vigorous campaign in opposition to these plain packaging regulations. Tobacco companies are expected to launch a legal challenge, claiming that the plain packaging breaches trademark law under international trade agreements and infringes on intellectual property rights (Taylor, 2011; Wassener & Foley, 2010; Philip Morris International, 2010c). An 'Alliance of Australian Retailers' has been formed to direct the campaign and is being financially supported by three of the largest tobacco firms: British American Tobacco Australia, Philip Morris Australia and Imperial Tobacco Australia (Alliance of Australian Retailers, 2010). Currently, one of their central arguments against plain packaging is that there is no evidence that plain packaging has any impact on smoking rates (Alliance of Australian Retailers, 2010; Philip Morris International, 2010c). They argue that a meaningful link between cigarette packaging and youth smoking uptake has not been established and that pack design – or "brand appeal" does not play a role in the uptake of smoking or continued smoking. They also maintain that brand and package are very minor components in the uptake process because most youth receive their first cigarette from friends, and simply have to decide whether to smoke or not to smoke (Philip Morris International, 2010a).

The Alliance of Australian Retailers (2010) also suggests that plain packaging regulations are unnecessary and "won't make a difference" because consumers already are unable to view cigarette packages in stores as a result of the recent ban on retail tobacco product displays. The Alliance and the tobacco industry assert that the Australian government should abandon the plain packaging policy not only because of the "speculative" nature of the evidence on the policy's potential, but also because they

believe it will harm small businesses and will encourage illicit trade and counterfeiting (Alliance of Australian Retailers, 2010; Philip Morris International, 2010a; Philip Morris International, 2010c).

Some of the major Brazilian tobacco companies have made public statements about their perspective on tobacco control policy. Philip Morris publicly acknowledges the health risks associated with smoking tobacco and states that they support comprehensive regulation of tobacco products based on the harm reduction principle. Their website states that they believe tobacco regulatory policy must be evidence-based, yet, they do not support regulation that "prevents adults from buying and using tobacco products or that imposes unnecessary impediments to the operation of the legitimate tobacco market". Essentially, they oppose measures such as plain packaging, point of sale display bans, and total bans on communications to adult consumers (Philip Morris International, 2010d). The industry generally concludes that instead of implementing generic or plain tobacco packaging, governments should focus on other initiatives such as enforcing laws that prevent sales of tobacco products to minors, requiring licenses for retailers to sell cigarettes, and supporting educational programs and campaigns (Philip Morris International, 2010a).

2.8 Summary and Implications

Tobacco use is a global health concern, and is becoming an increasingly important issue in low- and middle-income countries such as Brazil. Cigarette packaging is one of the primary marketing tools used by tobacco companies and has become increasingly critical to the tobacco industry as other promotional avenues are being restricted. Using brand descriptors and imagery, packaging can convey product characteristics and help "position" a brand so that a particular image is promoted. In competitive markets, packaging helps brands establish unique identities and achieve greater visual impact at the point of sale than their competitors. The branding conveyed on packages may influence youth beliefs in a way that increases the appeal of smoking, and consequently, increases youth susceptibility to smoking.

Research has shown that the brand descriptors and imagery included on cigarette packaging often falsely reassure consumers about the potential risks of their products. Tobacco control policies banning

the descriptors “light” and “mild” have already been instated in many countries, however, to date these bans have only marginally reduced false consumer risk perceptions. Tobacco control experts maintain that brand descriptors do result in false beliefs and suggest that the modest impact may result from long-lasting consumer beliefs, the replacement of previous descriptors with new alternative terms, and the use of colour-coded packages previously paired with “light” and “mild” descriptors. Plain packaging has been proposed as a possible way to address the impact of colour and other brand imagery elements on false risk perceptions, and may make smoking less appealing to youth. Overall, tobacco control experts conclude that more extensive descriptor prohibitions and plain packaging regulations are both required to help reduce false risk perceptions. However, given that proposals for both of these prohibitions and regulations have received considerable industry opposition, additional evidence would be helpful to show that they would be useful and do have the potential to impact adolescent smoking-related intentions or behaviours.

3.0 Study Rationale

3.1 Rationale

Tobacco packaging is an important form of marketing that shapes consumers' perceptions about smoking. There is consensus among the tobacco control community that current restrictions on the descriptors "light," "mild," and "low tar" are insufficient to markedly change false beliefs about the risks of smoking. However, further evidence is required to fully support broader regulations on additional descriptors such as smooth or ultimate, as well as descriptive numbers, colour words ("blue", "silver", etc.), filter references and flavours. More evidence demonstrating that plain packaging policies impact youth smoking rates and behaviours, not just perceptions of smoking would help support broader regulations. Similarly, additional evidence proving that package design does not just influence brand choice and encourage brand switching as suggested by the tobacco industry, but does in fact influence youth smoking behaviours would be useful.

There is a shortage of experimental evidence surrounding the effect of plain packaging on female youth perceptions related to smoking. The vast majority of youth-related cigarette package studies are qualitative in nature (Scheffels, 2008; DiFranza et al., 1994), are based on reviews of industry documents (Wayne & Connolly, 2002; Cummings et al., 2002) or focus on graphic warning labels rather than the package design (e.g.,Vardavas, Connolly, & Karamanolis, 2009; O'Hegarty, Pederson, Yenokyan, Nelson, & Wortley, 2007; Beede & Lawson, 1992). Experimental studies have only begun to be conducted on plain packaging and youth in the last year. In fact, so far, only three studies in this area have been conducted on youth (Hammond et al., 2009; Germain et al., 2010; Manning et al., 2009). Additional evidence in the area of plain packaging would be useful in countering the current resistance to plain packaging regulations by the tobacco industry and retailers in Australia.

Greater attention also needs to be paid on the impact of package design in low- and middle-income countries. Evidence in this field is currently based almost exclusively on studies conducted in

Australia, the European Union, Canada and the United States. Given that tobacco use and tobacco-related mortality is expected to increase in low- and middle-income countries over the next two decades, research should be expanded to examine the impact of package design in these other countries. The country of Brazil in particular warrants greater examination. As a newly industrialized, middle-income country with a growing population, Brazil represents an ideal marketplace for the tobacco industry. Consequently, it is also a country that stands to gain a lot from evidence-based tobacco policy. To date, no research in this field has been conducted in Brazil. The findings from this study could be used to support plain packaging policy and broader regulations on the use of misleading descriptors – and given the size of Brazil, could have a substantial impact on population health.

There are a few aspects of package design that are unique to Brazil and were taken into account when designing this study. First, given that Portuguese is the only official language spoken in Brazil, and most Brazilians are not fluent in English, this study should identify whether Portuguese words are used as descriptors on cigarette packages sold in Brazil. Another feature of cigarette package design that is unique to Brazil results from the country's regulations on graphic health warning labels. In Brazil, 100% of one of the main package panels is covered by the graphic health warning label; consequently, the opposite side of the package provides an uninterrupted panel of design. Previous studies in this area have involved packages from countries where graphic warning labels partially cover both sides of the package. Since this study used an online study, participants did not have the opportunity to view both sides of the package and were only able to view the side of the package that showing the full panel of design (graphic warning label was not visible).

Overall, this study sought to expand the evidence base surrounding perceptions of cigarette package design among female youth and will address critical gaps in this research area. It has the potential to inform governmental initiatives on brand descriptors and plain packaging around the world, but could be particularly useful for the newly industrialized country, Brazil.

3.2 Research Objectives

The specific research objectives for this study are:

1. To examine the impact of **brand descriptors** on brand appeal, perceived taste, perceived health risk, perceived smoker image, perceived brand quality, preferred brand to try, and perceived ease of quitting among youth in Brazil.
2. To examine the impact of **brand imagery and plain packaging** on brand appeal, perceived taste, perceived health risk, perceived smoker image, perceived brand quality, preferred brand to try, perceived ease of quitting and behavioural (pack selection) measures of brand appeal among youth in Brazil.
3. To examine **individual differences** (e.g., by age, education, ethnicity, smoking status) in the impact of brand descriptors and brand imagery on youth perceptions in Brazil.

4.0 Methods

4.1 Study Design

A "between-subjects" experimental study was conducted in which brand descriptors and brand imagery were systematically varied between conditions. Participants completed an online survey in which they were asked to view and rate a series of cigarette packages that were digitally altered to correspond to one of three experimental conditions: 1) "standard" branded packages of leading Brazilian and international cigarette brands; 2) the same packages with all brand imagery removed, including colours and graphics (i.e., "plain" packages), but with the descriptors in place; and 3) the same packages, but with both descriptors and images removed. See illustration in figure 3.

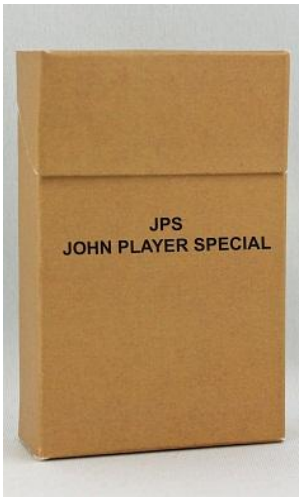
Condition 1	Condition 2	Condition 3
Branded (Standard)	Plain (No imagery)	Plain, no descriptors (No descriptors or imagery)
		

Figure 3: Experimental conditions

4.1.1 Participants

Participants consisted of 640 female youth and young adults age 16-26 years from Brazil (between 208 and 218 in each experimental condition), including both smokers and non-smokers.

Smokers were defined as those who had smoked at least one cigarette in the last 30 days. The female youth and young adult age group was chosen because this age is a critical period for smoking initiation and female youth are thought to be especially influenced by branding (CDC, 2001). Furthermore, packaging is expected to have a greater impact on youth and young adults' smoking behaviour compared to adults who may already be addicted to cigarettes.

Both smokers and non-smokers were included in the sample because they may perceive packaging and descriptors in unique ways. Established smokers are likely to have established brand preferences and greater experience with the sensory properties of cigarettes. As such, they may perceive packaging that highlights sensory characteristics such as "lighter" tasting smoke differently than non-smokers. The inclusion of non-smoking participants in the sample allowed the investigators to examine packaging related perceptions among those with little or no experience with the sensory properties of cigarette. Consequently, their perceptions of products were presumably based entirely on packaging and associated marketing.

4.1.2 Recruitment

Participants were recruited from an online participant panel of Global Market Insite, Inc. (GMI, www.gmi-mr.com), a commercial market research service. GMI maintains a panel of participants from over 200 countries, including a representative sample of over 490,000 Brazilians. The online survey was hosted by Sawtooth Software Inc. and participants were linked to the online survey through GMI. Respondents in GMI's participant pool were invited to participate in the online survey via e-mail communication which included a link to the externally hosted online survey, and upon survey completion were given remuneration from GlobalTestMarket (www.globaltestmarket.com/), a subsidiary of GMI (www.gmi-mr.com), in the form on "MarketPoints" worth a minimum of $2.50.

4.1.3 Power and Sample Size

A power calculation was conducted to determine the sample size required to detect a significant difference between experimental groups for the individual pack rating outcomes that use a *mean* rating (e.g., average rating of brand appeal). For a continuous measure using a 5-point rating scale, the sample of 640 participants (approximately 210 in each of the three conditions) would have provided 80% power to detect a 0.30 difference in means between groups, assuming a standard deviation of 1.1 (α=0.05, 2-tailed test).

A power calculation was also conducted to determine the sample size required to detect a significant difference between experimental groups for the two-pack comparison outcomes that compare *proportions* (e.g., percentage of people who suggest a particular pack tastes better). The originally projected sample of 610 participants would have provided 80% power to detect a difference of 13.2% between groups (α=0.05, 2-tailed test).

Estimates of standard deviation and effect size were based on data from previous studies that used similar measures and protocol compared to the present study (Doxey, 2009; Hammond, Wakefield, & Reid, 2010).

4.1.4 Protocol

4.1.4.1 Screening and Background Surveys

A brief screening survey was used to assess age and gender. Respondents had to be female and between 16 and 26 years of age in order to be eligible for participation. They also had to provide consent in order to be eligible. Initially the investigators tried to draw a sample that was within a 16 to 24 year old age bracket; however, GMI's online participant panel has a limited number of youth, so age eligibility was slightly increased to 16 to 26 years of age to obtain the required participant sample size.

After providing consent, participants completed a brief background survey that included key questions on smoking behaviours, and socio-demographics, followed by psychosocial measures relating

to attitudes and beliefs about smoking and health (see 'Section 4.2: Measures' below). Participants were then assigned to one of the three experimental conditions illustrated in Figure 3 and asked to provide their opinions of different cigarette packages in two ways: direct pack comparisons (participants were shown two packages simultaneously and asked to compare them on various measures) and individual pack ratings (participants were shown packages individually and asked questions about each package).

4.1.4.2 Cigarette Package Display and Selection

Protocol related to cigarette package display and selection varied slightly for the direct pack comparison and individual pack rating sections of the questionnaire. In the direct pack comparison section of the questionnaire, each participant viewed colour images of five randomly ordered pairs of cigarette packages: two packages from each of five different brand families (e.g., Marlboro and Marlboro Gold Original, where Marlboro is the brand family) and were asked to compare the two packages on various measures. Featuring pairs of brands from the same family helped to highlight the relative differences between brands that are communicated through descriptors and brand imagery. In the individual pack rating section of the questionnaire, each participant was shown colour images of 10 individual cigarette packages, one at a time, in a random order and was asked to answer questions about their perceptions of the packages.

The packages were purposefully selected from leading international and Brazilian cigarette brands to reflect key dimensions of interest in terms of the brand descriptors and brand imagery. For instance, brands were selected that featured different "colour" descriptors (e.g., red vs. silver), and "flavour" descriptors (e.g., cherry vs. original), as well as other descriptors such as 'slims'. Packages that featured different brand imagery were selected, including the use of different colours (e.g., red vs. gold), and packages in different sizes and shapes. Brands using English descriptors and brands using Portuguese descriptors were also selected. Efforts were made to select packages that appeared to be targeted towards female youth.

The pairs of cigarette brands selected for use in the direct pack comparison section of the study are listed in Table 1 and shown in Figure 4.

Table 1: Cigarette brands selected for use in direct pack comparisons

	Brand A	Brand B
Pair 1	DERBY: Vibrante	DERBY: Brilhante
Pair 2	L&M: Blue Label	L&M: Menthol Cool
Pair 3	L.A.: Kretek Clove Cigarettes	L.A.: Cereja (Cherry) – Kretek Clove Cigarettes
Pair 4	LUCKY STRIKE: Original Red	LUCKY STRIKE: Original Silver
Pair 5	MARLBORO: Filter Cigarettes	MARLBORO: Gold Original – Filter Cigarettes

Figure 4: Cigarette brands selected for use in direct pack comparisons

The cigarette brands selected for use in the individual pack rating section of the study are listed in Table 2 and shown in Figure 5. Note some of the Brazilian brand images used in the individual pack ratings were graphically altered to better illustrate the key descriptor dimensions of interest (e.g., changed 'Capri' descriptor 'Menthol Indigo' to 'Baunilha', added the descriptor 'Silver' to the Virginia Slims pack).

Table 2: Female-oriented cigarette brands selected for individual pack ratings

	Brands
1	BENSON & HEDGES: Superslims – Filter 100's – Park Avenue
2	CAPRI: Baunilha (vanilla)
3	DJ MIX: Strawberry Flavour – Special Feel
4	DUNHILL CARLTON: Carlton Mint Blend
5	JOHN PLAYERS SPECIAL: American Blend - PINK
6	MARLBORO: Gold Original – Filter Cigarettes
7	PEEL: Sweet Melon
8	SILK CUT: Menthol
9	VIRGINIA SLIMS: Silver
10	VOGUE: Bleue

Each of the packages selected were professionally photographed and digitally altered to remove the brand descriptors and brand imagery, corresponding to the experimental conditions illustrated in Figure 3. Portuguese text was digitally added to packages that only contained English to ensure that participants who could only read Portuguese would be able to distinguish the packages in the *Plain* condition and the *Plain, no descriptors* condition. Images of each cigarette package are also provided in Appendix A by experimental condition. Also, note that since graphic health warning labels are only shown on one side of

the package in Brazil and take up the entire panel, these were not visible to the participants in any of the images shown.

Pack 1 | Pack 2 | Pack 3 | Pack 4 | Pack 5

Pack 6 | Pack 7 | Pack 8 | Pack 9 | Pack 10

Figure 5: Female-oriented brands selected for individual pack ratings

4.1.4.3 Direct Pack Comparisons Protocol

As mentioned earlier, participants viewed and rated the packages in two ways: by comparing two packages simultaneously and then individually. In the direct pack comparison section of the questionnaire, the participants were asked to compare five pairs of two brands from the same brand family in terms of which variety they thought would taste better, be smoother on their throat, and be less harmful. They were also asked to indicate which brand they would prefer to be seen smoking, rather try and which brand would make it easier to quit smoking. Participants had the opportunity to select "no difference" between the packages, and for some of the questions were asked to further explain what they

meant by “no difference” (i.e., would they pick either brand, or neither brand). The packages appeared side-by-side on the screen in order to emphasize the comparative nature of the rating. The order in which the pairs of packages were viewed was counter-balanced across participants. The brand that serves as the “referent” for the comparative rating in each brand family was also counter-balanced across participants in terms of position on screen (i.e., left or right).

Note that for this section of the questionnaire, the participants in condition 2 (no imagery – i.e., “plain packaging”) and condition 3 (no imagery or descriptors) were assigned to the same condition because without imagery or descriptors the brand pairs shown in condition 3 would have appeared completely identical. Essentially, there were only two experimental groups for this section of the questionnaire: “branded” or “plain”. The packages selected for use in this section were all real packages available on the market in Brazil.

4.1.4.4 Individual Pack Ratings Protocol

For the individual pack ratings, participants were first instructed to rate each of the 10 packages “compared to other cigarette brands” on brand appeal, perceived taste, health risk, and smoothness on the throat. The participants were also asked several questions about smoker image - that is the kind of person they think would smoke the particular brand of cigarette. The order in which the packages were viewed was counter-balanced across participants.

4.1.4.5 Pack Selection Task Protocol

At the end of the study, the impact of plain packaging on brand appeal was assessed through a behavioural task. The participants were told that as a thank-you for completing the survey they could select one package and it would be sent to them. Participants were shown four packages: two standard “branded” packages and two packages with all brand imagery removed (i.e., “plain packaging”), but with descriptors intact. The specific packages displayed to each participant were drawn at random from the packages viewed earlier in the questionnaire. The participants had the option of selecting one of the four

packages shown, or they could select "I do not wish to receive a package". After responding to this question, the participants were informed that they would not actually receive a package because the investigators did not want to promote or endorse smoking in any way, and that the purpose of the question was actually to monitor whether or not they would chose a package. At the end of the study, participants who chose a package were asked about the reason why they chose the package.

4.1.5 Measure Translation

The survey questionnaire was initially drafted in English and then translated to Brazil's national language, Portuguese. A four-step translation process was used to ensure that the Portuguese survey questionnaire produced was as linguistically and culturally equivalent to the original English survey questionnaire as possible. First, a translator in Brazil independently translated the questionnaire items into Portuguese, and provided comments on any issues or potential problems with the questionnaire. Next, a second bilingual translator in Waterloo, originally from Brazil reviewed the initial translation, and identified any potential issues. The translations and comments were then reviewed by a coordinator in Waterloo. All issues identified were discussed with both translators and the questionnaire items were revised based on the discussions.

4.1.6 Pilot Testing

The survey questionnaire used in this study was adapted from a questionnaire previously used in the U.S. section of the International Cigarette Packaging Study (Hammond, 2010b). The International Cigarette Packaging Study questionnaire has undergone previous pilot testing, and thus, the majority of the measures to be included in the survey did not require additional pilot testing. Nonetheless, since cross-cultural differences in language, social conventions, cognitive abilities, and response styles can influence results and lead to differences in the meanings ascribed to a particular question, cognitive pre-testing was conducted to ensure that the intended question meaning, comprehension and measurement was not impeded by translation (Thrasher et al., 2010). The cognitive pre-testing involved interviewing five

Portuguese-speaking Brazilians about the core questionnaire measures. An interviewer asked participants the proposed questions, and then used structured follow-up questions to clarify how they interpreted the question of interest. This process allowed the investigators to ensure whether the participants understood and responded to the questions in similar ways, both within Brazil, and between Brazil and other countries that used a similar questionnaire. Modifications to survey questions and methodology were made as needed prior to running the full study. A copy of the questions tested, along with their accompanying cognitive interviewing follow-up questions are included in Appendix C.

4.2 Measures

A full version of the survey in English and all measures are included in Appendix B.

4.2.1 Socio-Demographic Variables

Socio-demographic measures included age, education level, race/ethnicity, and occupation. Most measures were assessed using the validated questions from the International Cigarette Packaging Study surveys and the Brazil National ITC survey, or adapted versions of the questions. Participants specified their **age** in years (continuous), and their **gender** as male or female. They were asked to identify their **race/ethnicity** using the same response options used in the National ITC survey for Brazil, including: white, black, Asian, pardo (mixed ancestry), Indian, or other. They could check all categories that applied. Race/ethnicity was recoded into three categories: White (respondents who only identified themselves as white), pardo (respondents who only identified themselves as pardo) and other (respondents who identified themselves as black, Asian, Indian, other, or multi-racial [chose multiple categories]). **Education** was assessed by asking participants, "What was the last year of school that you completed?" with response options including: have never attended school regularly, some 'Educação primária', complete 'Educação primária', some 'Ensino fundamental', complete 'Ensino fundamental', some 'Ensino médio', complete 'Ensino médio', some 'Ensino superior', complete 'Ensino superior' some 'Pós-graduação', complete 'Pós-graduação', or other. These education categories were developed

through discussions with individuals from Brazil. Education was re-coded to three categories: Low (completing 'ensino medio' or less), moderate (some 'ensino superior'), and high (completed 'ensino superior', some 'Pós-graduação'or completed 'Pós-graduação'). **Occupation** was assessed by asking participants to describe their "main" work status over the past 12 months as either employed (specifying full-time or part-time), attending school (specifying full-time or part-time), homemaker, unemployed (specifying able to work, or unable to work) or other.

4.2.2 Smoking Behaviours

Smoking behaviours were assessed using measures drawn from the International Cigarette Packaging Study surveys (Hammond, 2010b). Participants' current **smoking status** was determined based on the question, "In the last 30 days, how often did you smoke cigarettes?". Smokers were defined as respondents who reported smoking either daily, weekly, or monthly. Non-smokers were defined as respondents who reported smoking less than monthly or not at all. **Cigarette consumption** was calculated for daily/weekly/monthly smokers, respectively, as the usual number of cigarettes smoked per day/week/month divided by 1/7/30. **Ever** smoking status was assessed by asking participants "Have you ever smoked a cigarette, even just a few puffs?", with response options including "No" and "Yes". **Lifetime smoking frequency** was assessed by asking "Have you smoked 100 cigarettes or more in your lifetime?", with response options including "No" and "Yes".

Participants who smoked at least once a month and have smoked more than 100 cigarettes in their lifetime were asked follow-up questions regarding the heaviness of their smoking (using questions from the heaviness of smoking index), quit intentions, ever use of "light", "mild" or "low-tar" cigarettes, current cigarette brand, and use of other tobacco products. **Time to first cigarette** was assessed by asking, "How soon after waking do you usually have your first cigarette?" with response options "within the first 5 minutes", "6-30 minutes", "31-60 minutes", and "more than 60 minutes". **Quit intentions** was determined by response to the item "Are you planning to quit smoking cigarettes . . . within the next month, within the next 6 months, sometime in the future, or are you not planning to quit?". Participants

were asked if they have **ever tried light, mild, or low-tar cigarettes**, with response options including "Yes", "No", and "Don't Know". **Usual cigarette brand** was determined by asking "Do you have a brand of cigarettes that you usually smoke?", with response options including "Yes", "No" or "Don't Know". Participants who responded they have a usual brand were asked to indicate the brand name, variety, and size. Participants were also asked about past month **use of tobacco products**, including "Hookah/shisha/narghile/water pipe", "Cigars/small cigars/cigarillos", "Pipe", "Smokeless tobacco (including chewing tobacco, snuff, or snus)", or "Other", and could indicate all that applied.

4.2.3 Smoking Susceptibility

Smoking susceptibility was assessed using a 3-item scale previously validated by Pierce, Choi, Gilpin, Farkas and Merritt (1996). Susceptibility was measured by asking the participants: (a) "Do you think in the future you might try smoking cigarettes?" (b) "If one of your best friends were to offer you a cigarette, would you smoke it?" and (c) "At any time during the next year, do you think you will smoke a cigarette?" with response options ranging from "definitely not" to "definitely yes" (Pierce et al., 1996). Non-smokers were classified as "susceptible" if there was an absence of firm commitment not to smoke (i.e., selected anything other than "definitely not" on all 3 susceptibility measures).

4.2.4 Sensation Seeking Characteristics

Sensation seeking personality traits are thought to be associated with a variety of risky behaviours including smoking (Newcomb & McGee, 1991). This trait was assessed using a modified version of a brief index developed and evaluated by Stephenson and colleagues (2003). Participants were asked to indicate their agreement with the following four statements on a 5-point Likert scale ranging from strongly agree to strongly disagree: (a) "I would like to explore new and unusual places", (b) "I like to do frightening things", (c) "I like new and exciting experiences, even if I have to break the rules", and (d) "I prefer friends who are exciting and unpredictable".

4.2.5 Attitudes and Beliefs about Smoking & Health Beliefs

Psychosocial moderators including **general attitudes and beliefs about smoking** were examined because they may have affected how individuals perceive tobacco packaging. The psychosocial measures were drawn from the ITC surveys and included validated scales of perceived risk, cognitive dissonance from smoking and self-exempting beliefs/rationalization of smoking. Participants were asked about their overall opinion of smoking, as well as their opinions on the benefits of smoking, difficulty of quitting, health risks of smoking, and level of health information provided on cigarette packaging. See Appendix B for specific question wording.

Health beliefs about the effects of smoking were assessed using questions used in the International Cigarette Packaging Study surveys (Hammond, 2010b). Participants were presented with a list of six health effects and diseases and were asked to indicate, based on their knowledge, whether the health effects and diseases were caused by smoking cigarettes.

4.2.6 Direct Pack Comparisons

Participants were asked to compare five pairs of two brands from each brand family in terms of taste, smoothness, health risk, preference to be seen smoking, preference to try, and ease of quitting. **Taste** was assessed by asking the respondents to indicate "Which brand do you think would taste better?" **Smoothness** was assessed by asking the respondents to indicate "Which brand do you think would be smoother on your throat?" **Health risk** was assessed by asking participants "Which brand do you think would be less harmful?" **Brand quality** was assessed by asking "Which brand do you think is of higher quality?" **Preferred brand to try** was assessed by asking "Which brand would you rather try?" **Ease of quitting** was assessed by asking "Which brand would make it easier to quit smoking?" For each of these six perception questions, participants were asked to select either "Brand A", "Brand B", or "No Difference".

For three of the questions (taste, like to be seen and rather try questions), if the participants selected the 'no difference' option, they were then asked to specify what they meant by 'no difference'.

For example, for the *taste better* question, the participants were asked to specify if they meant 'both brands would taste good' or 'neither brand would taste good'. The participants also had the option to select 'refuse/don't know'.

Summary scores for pack selection similar to those previously used in other ITC studies, were also created. For each of the six questions (taste better, less harmful, etc.), a "Difference Score" was calculated to examine how often respondents selected either of the packs, as opposed to selecting 'no difference'. A score of '1' was assigned each time the respondents selected 'no difference' and '0' if they chose either of the two packages. A "neither brand" score was created for the three questions where a follow-up question was asked about the meaning of 'no difference'. A score of '1' was assigned each time the respondents selected 'neither brand' and '0' if they selected 'either brand', had chosen one of the two packages, or selected 'refuse/don't know'. Finally, for those who selected either of the packs, a "Light Brand" score was calculated to examine how often respondents select brands designated as "lighter". A score of '1' was assigned each time the respondents selected the package designated by the investigators as the 'lighter' brand, and a score of '0' was assigned when they chose the 'regular' brand.

4.2.7 Individual Pack Ratings and Smoker Image

Participants were asked to rate each of the 10 packages "compared to other cigarette brands" on perceived brand appeal, perceived taste, health risk and smoothness on the throat. Responses were recorded using a 5-point Likert scale where response options ranged from "a lot less" to "a lot more" with a "no difference" option in the middle. **Brand appeal** was assessed by asking, "Compared to other brands, how appealing is this brand of cigarettes?" with responses ranging from, "A lot less appealing than other brands" to "A lot more appealing than other brands". **Perceived taste** was assessed by asking, "Compared to other brands, how do you think these cigarettes would taste?" with response options ranging from "A lot worse than other brands" to "A lot better than other brands". **Health risks** was assessed by asking, "Compared to other cigarette brands, would these cigarettes be...", with response options ranging from "A lot less harmful than other brands" to "A lot more harmful than other brands".

Smoothness was assessed by asking, "Compared to other cigarette brands, how smooth do you think these cigarettes would be on your throat?", with response options ranging from "A lot less smooth than other brands" to "A lot more smooth than other brands". The perceived taste, health risks and smoothness measures were also evaluated through the direct pack comparison as described above in section 4.2.6.

A binary variable was created so that the two most positive or desirable ratings (e.g., a little more appealing and a lot more appealing) were coded as 1, and the two least positive ratings (e.g., a little less appealing and a lot less appealing) and 'no difference' were coded as 0. Two summary indices were created for each variable – one using the ratings on a 5-point scale and one using the binary ratings. For the 5-point scale index, the ratings were summed across the 10 packages to create a score out of 50, and then divided by 10 to obtain a score out of 5. For the binary index, a score of `1` was assigned each time respondents selected the more positive or desirable traits, and was summed across all 10 packages to create a score out of 10.

Smoker image was assessed by asking respondents to rate a number of attributes of typical smokers for each of the 10 cigarette packages. They were asked to answer the question, "In your opinion, is someone who smokes this brand regularly more likely to be…" with response options including: female/male, stylish/not stylish, popular/not popular, sophisticated/not sophisticated, slim/overweight. For each set of characteristics, the respondents were able to choose either trait, or "No Difference". A summary index was created for each variable, where responses were scored as a `1`if the respondent selected the more desirable trait (female, stylish, popular, etc.) and then summed across all 10 packages. A summary `positive smoker image` index was also created that combined the summary indices for all five characteristics, to obtain a score out of 50.

4.2.8 Pack Selection Task

A pack selection task, adapted from the International Cigarette Packaging Study, was conducted as a behavioural measure of appeal (Hammond, 2010b). Participants were told, "As part of this study, we

would like to send you a pack of cigarettes to thank-you for participating in this study". Participants had the option of selecting one of four packages shown, or could select "I do not wish to receive a package". Participants who chose a package were asked about the reason why they chose the package, specifically in terms of what they planned to do with the pack they chose. Response options included: "I will smoke the cigarettes", "keep the pack for myself but don't smoke them", "give the pack to someone as a gift', or "sell the pack to someone else'. The participants also had the option of not responding to this question, or selecting "other" or "don't know".

Two summary scores were created for the behavioural pack selection task. A "Difference Score" was calculated to examine how often respondents select a "branded" or "plain" pack, as opposed to selecting 'I don't want a pack'. A score of '1' was assigned each time respondents selected either of the branded or plain packs (i.e., where 0=selected 'I don't want a pack' and 1=selected a pack). A "Branded Score" was calculated for those who selected any of the four packs in order to examine how often respondents selected "branded" packs rather than "plain" packs. A score of '1' was assigned each time a respondent selected a branded pack and a score of '0' was assigned each time a respondent selected a "plain" product.

4.3 Hypotheses

The initial hypotheses for this study are outlined below.

<u>1- Experimental conditions will affect individual pack ratings.</u>

The removal of brand descriptors and imagery will reduce individual brand ratings of perceived brand appeal, taste and smoothness, and increase ratings of perceived health risk. Ratings for the individual packages will be significantly higher (more appealing, better taste, less health risk) in condition 1 (standard "branded" packages) than condition 2 (no imagery) or condition 3 (no imagery or descriptors). Smoker image (the type of smoker associated with each brand) will be rated most positively in condition 1 and least positively in condition 3.

2 - Experimental conditions will affect pack comparisons.

The removal of brand descriptors and imagery will reduce perceived differences between pairs of brands from the same family (e.g., Marlboro Red vs. Marlboro Gold) in terms of perceived taste, perceived risk, brand quality, brand they prefer to try, and perceived ease of quitting. The perceived differences between pairs of brands from the same family will be higher in condition 1 (standard "branded" packages) than condition 2 ("plain packaging").

3 - Package design will influence product selection.

Participants will be significantly more likely to select "branded" packages than "plain" packages or no package at all.

4 – Brand descriptors and imagery targeted at female youth will influence brand ratings and pack comparisons more strongly. Packages with flavour descriptors such as cherry and menthol will be rated more favourably, as will packages that incorporate lighter or more feminine colours (e.g., pink, blue) in the descriptors or background, have smaller package shape, or include soft, feminine graphic images.

5 – Brand ratings and pack comparisons will be influenced by moderators

Brand specific ratings and pack comparisons will be moderated by age, education and income, as well as smoking status. For example, we anticipate that regular smokers will be more likely than non-smokers to perceive some brands as having a better taste and lower health risk because of greater concern for their health and a need to rationalize their behaviour. We also anticipate that people with higher education will be less likely to indicate that one pack would be "more harmful" or "easier to quit" compared to another pack.

4.4 Analysis Plan

4.4.1 Descriptive Statistics

Univariate statistics were used to characterize the sample profile, assess missing values, confirm accurate coding, and examine the distribution of data for all relevant measures. ANOVAs and chi-square tests were used to analyze possible differences in key socio-demographic factors between experimental conditions to ensure that randomization was effective in equally distributing participants of various demographics across the three conditions.

4.4.2 Regression Analyses

Regression models were used to test for differences between the three experimental conditions. Linear regression models were used to examine continuous outcomes and logistic regression models were used to examine binary outcomes. Continuous outcomes included measures assessed through individual pack ratings such as index scores for brand appeal, perceived taste, health risk and smoothness. Binary outcomes included smoker image and pack selection as well as measures assessed through direct pack comparisons such as perceived taste, smoothness, harm, brand preferred to be seen smoking, brand preferred to try, and perceived ease of quitting.

4.4.2.1 Direct Pack Comparisons

Primary analyses for the five "binary" outcomes obtained from the direct pack comparison task utilized the summary scores and focused on three main questions: (i) the extent to which participants endorsed either of the packs as less harmful, easier to quit, etc., versus selecting 'no difference' (where 0= endorses one pack and 1= no difference); (ii) the extent to which participants endorsed either of the packs as tasting better, etc., or selected that 'either' brand would taste good in the follow-up question, versus selecting 'neither brand' in the follow-up question (where 0= endorses one/either pack and 1= neither brand); and (iii) of those who select a pack, the extent to which participants select the lighter pack as expected to taste better, be less harmful, etc. (where 0= select the lighter pack and 1= select the other

pack). Analyses for the 'no difference' and 'neither' questions were conducted between experimental conditions (e.g., "branded" to "plain") using the summary scores. Analyses for the 'lighter' question was conducted within each experimental condition for each "branded" and "plain" pair (e.g., Marlboro to Marlboro Original Gold) using the summary scores. Chi-square tests were used to detect differences for all three types of summary scores.

4.4.2.2 Individual Pack Ratings

Analyses for the four outcomes obtained from the individual pack rating task utilized the binary variables created from the 5-point scale, where 1= the two most positive or desirable ratings (e.g., a little more appealing and a lot more appealing) and 0= the two least positive or desirable ratings (e.g., a little less appealing and a lot less appealing) and 'no difference'. The primary analyses utilized these binary variables and focused on (a) determining differences in brand appeal, taste, harm, and smoothness between the three experimental conditions for each of the 10 cigarette brands, and (b) determining differences in the summary index scores that combined the 10 brands for each of the four outcomes. These analyses were also run for each individual package and index score based on the 5-point ratings and were evaluated to determine whether the ratings followed the same pattern of results as with the binary variables. The results based on the 5-point scale are included in Appendix D.

Analyses for the smoker image outcomes utilized the summary score created for the female trait (where 1= 'female' and 0 = 'male' or' no difference') and focused on determining differences between the experimental conditions for each of the 10 cigarette brands. Additional analyses combined the summary scores for each of the five smoker image variables (female, style, popular, sophisticated, and slim) to create one summary index for an overall "positive" smoker image and focused on determining the differences between the three experimental conditions.

Regression model building proceeded in three steps. First, the main effects model was run with the outcome variables of interest and the experimental condition as the independent variable. The

experimental condition was run as a "class" variable and was used to compare differences between the conditions. In the second step, the following covariates were added to the main effects model: age, smoking status, education, and race/ethnicity. In the third step, interactions between these covariates and the conditions were examined by including interaction terms to the aforementioned main effect regression models.

4.4.2.3 Pack Offer

Pack selection from the behavioural task was analyzed using the "difference" summary score and "branded" summary score and focused on two main questions: (i) the extent to which participants select a "branded" or "plain" pack versus no pack at all (where 0= selected a pack and 1= selected no pack); and (ii) of those who selected either a pack, the extent to which participants selected a "branded" pack rather than a "plain" pack (where 0= selected a "branded" pack and 1= selected a "plain" pack).

5.0 Results

5.1 Participation and Sample

A total of 1,771 individuals opened the survey; however, 1,105 of these individuals did not complete the survey or meet the eligibility criteria and therefore were not considered valid. Individuals were eligible to participate in the survey provided they were female, between the ages of 16 to 26, and provided consent. The breakdown of the 1,105 excluded respondents is as follows: 607 opened the survey but did not go past the opening screen; 39 did not go past the age question (either did not meet eligibility criteria or closed the survey); 75 did not go past the gender question (45 were male and thus ineligible; and 30 were females who closed the survey); 15 did not go past the consent question (6 declined to participate; and 9 provided consent but did not go further); and the remaining 369 got into the main survey but did not complete it. An additional 26 participants were excluded during "cleaning" of the dataset because although they completed the survey, they were missing data in key fields such as gender and experimental condition as a result of temporary technical errors with saving the data online. The final dataset used in the analyses is based on 640 respondents. Table 3 provides an overview on how the final dataset was derived.

Table 3: Derivation of final dataset

	N
Total respondents	1,771
Incomplete survey or ineligible	1,105
Complete but removed during data cleaning	26
Final Dataset	640

5.2 Descriptive Statistics

5.2.1 Sample Characteristics

Table 4 outlines how many respondents were assigned to each of the three study conditions and the sample characteristics for each condition.

ANOVA and chi-square analyses were run on key sample characteristics to check for differences across conditions for continuous and categorical variables, respectively. There were no statistically significant differences between the three conditions for any of the variables shown in Table 4.

Table 4: Sample demographics by experimental condition and overall (n=640)

Characteristic	**Branded (n=214)** % (n)	**Plain (n=208)** % (n)	**Plain, no descriptors (n= 218)** % (n)	**Overall (n=640)** % (n)
Age – mean (SD)	22.4 (SD=2.3)	22.4 (SD=2.4)	22.4 (SD=2.5)	22.4 (SD=2.4)
Education level*				
Low	18.8 (40)	21.6 (45)	25.1 (55)	21.9 (140)
Moderate	48.8 (104)	50.5 (105)	45.7 (100)	48.3 (309)
High	32.4 (69)	27.9 (58)	29.2 (64)	29.8 (191)
Ethnicity**				
White	54.5 (116)	64.9 (135)	68.5 (150)	62.7 (401)
Pardo	32.4 (69)	23.6 (49)	19.6 (43)	25.2 (161)
Other	12.7 (27)	11.1 (23)	11.9 (26)	11.9 (76)
Refused/missing	0.5 (1)	0.5 (1)	0.0 (0)	0.3 (2)
Smoking status				
Smoker	28.2 (60)	27.9 (58)	29.2 (64)	28.4 (182)
Non-smoker	71.8 (153)	72.1 (150)	70.8 (155)	71.6 (458)

*****For education level, 'low' refers to completing ensino medio or less, 'moderate' refers to some ensino superior, and 'high' refers to completed ensino superior or some/completed post-graduate.
****** For Ethnicity, "other" includes Black, Asian, Indian, other, and multi-racial.

Table 5 presents additional summary statistics on smoking characteristics for the overall sample. As shown in the table, the vast majority (70.8%) of respondents had not used any of the other tobacco products listed in the survey in the past month. Nine of the respondents listed 'cigarettes' as products they had used in the past month under the "other" category. The relatively high frequency of this unexpected answer may be attributed to an error in the Portuguese translation of the survey. The question about use of tobacco products in the past month was intended to say "use of other tobacco products", but the Portuguese translation of this question was missing the word "other", and as evidenced by some of the responses, may have contributed to some confusion in the respondents.

Table 5: Sample smoking characteristics (n=640)

Characteristic	% (n)
Current smoking status	
Smoker	28.4 (182)
Non-smoker	71.6 (458)
Smoking frequency*	
Daily	39.0 (71)
Weekly	24.2 (44)
Monthly	36.8 (67)
Ever smoked a cigarette**	
Yes	48.3 (237)
No	51.7 (221)
Smoked 100 cigarettes or more in life	
Yes	44.4 (186)
No	54.2 (227)
Don't know	1.4 (6)
Cigarettes per day*** (mean)	10.8 (SD=7.6; range 1-40)
Time to first cigarette*	
< 5 minutes	7.7 (14)
6-30 minutes	14.8 (27)
31-60 minutes	13.2 (24)
> 60 minutes	39.6 (72)
NA/missing	4.9 (45)
Quit intentions*	
Within the next month	9.9 (18)
Within the next 6 months	13.7 (25)
Sometime in the future	40.7 (74)
Not planning to quit	12.1 (22)
NA/don't know/missing	23.6 (43)
Past month use of tobacco products	
No other products	70.8 (453)
Hookah/shisha/narghile/water pipe	21.4 (137)
Cigars/cigarillos	8.3 (53)
Smokeless tobacco (including chewing tobacco, snuff, or snus)	2.8 (18)
Pipe	1.4 (9)
Bidis	0.9 (6)
Other	1.9 (12)
Refuse/Don't know	1.1 (7)
Susceptibility – try in the future**	
Definitely not	65.9 (302)
Probably not	22.9 (105)
Probably yes	6.1 (28)
Definitely yes	0.7 (3)
NA/refuse/don't know	4.3 (20)
Susceptibility – accept friend offer**	
Definitely not	64.6 (296)
Probably not	24.9 (114)
Probably yes	6.8 (31)
Definitely yes	0.9 (4)
NA/don't know	2.9 (13)

Susceptibility – smoke in the next year**	
Definitely not	67.2 (308)
Probably not	20.3 (93)
Probably yes	9.6 (44)
Definitely yes	0.7 (3)
NA/refuse/don't know	2.1 (10)
% Susceptible******	42.6 (195)

* Among smokers (n=182)
**Among non-smokers (n=458)
*** For daily smokers (n=71).
**** Where susceptible = absence of firm commitment not to smoke (i.e., anything other than "definitely not" on all 3 susceptibility measures) among non-smokers.

5.2.2 Sensation Seeking

Participants were asked to indicate their level of agreement with four statements in order to measure their sensation seeking tendencies. Responses are shown in Table 6.

Table 6: Sensation seeking characteristics (n=640)

Like to explore new and unusual places	**% (n)**
Strongly agree	66.7 (427)
Agree	27.3 (175)
Neither agree nor disagree	4.7 (30)
Disagree	0.5 (3)
Strongly disagree	0.2 (1)
Don't know	0.6 (4)
Like to do frightening things	
Strongly agree	9.1 (58)
Agree	18.6 (119)
Neither agree nor disagree	26.1 (167)
Disagree	29.4 (188)
Strongly disagree	16.0 (102)
Don't know/missing	1.0 (6)
Like new and exciting experiences, even if break rules	
Strongly agree	20.5 (131)
Agree	30.0 (192)
Neither agree nor disagree	30.2 (193)
Disagree	15.3 (98)
Strongly disagree	3.4 (22)
Don't know	0.6 (4)
Prefer exciting and unpredictable friends	
Strongly agree	17.0 (109)
Agree	24.4 (156)
Neither agree nor disagree	38.8 (248)
Disagree	15.8 (101)
Strongly disagree	3.1 (20)
Refuse/ don't know	1.0 (6)

5.2.3 Cigarette Brands

Participants were asked if they have ever tried light, mild, or low-tar cigarettes. They were also asked if they have a brand of cigarettes that they usually smoke, and if so, they were asked to list the brand name, variety and size. Responses are shown in Table 7.

Table 7: Cigarette brands among current smokers (n=182)

Ever tried light, mild, or low-tar	**% (n)**
Yes	83.5 (152)
No	15.9 (29)
Don't know	0.5 (1)
Have a usual brand	
Yes	81.3 (148)
No	17.6 (32)
Don't know	1.1 (2)
Usual brand*	
1 Marlboro	34.5 (51)
2 Free	18.2 (27)
3 Carlton / Dunhill Carlton	10.8 (16)
4 L.A	9.9 (14)
5 Lucky Strike	6.1 (9)
6 Hollywood	5.4 (8)
7 Black / Djarum Black	5.4 (8)
8 Derby	3.4 (5)
9 Other**	8.1 (12)
10 Don't know/missing	1.4 (2)
Usual Brand Variety*	
1 Menta / Ice Mint	26.4 (39)
2 Red / Vermelho	24.3 (36)
3 Light	14.2 (21)
4 Gold	9.5 (14)
5 Blue / Azul	7.4 (11)
6 Cereja	3.3 (9, including 4 cereja menta)
7 Other**	11.5 (17)
8 Missing	1.4 (2)
Usual Brand Size	
1 Regular/normal/standard	83.1 (123)
2 Slims	10.1 (15)
3 Other**	6.1 (9)
4 Missing	0.7 (1)

*Among participants with a usual brand. Three participants listed more than one brand at a time. One participant listed more than one variety.

** "Other" category is made up of 6 brands/11 varieties/5 sizes, which 5 or fewer people chose as their usual brand/variety/size, respectively.

Participants were presented with a list of smoking related health effects and diseases, and asked whether they know or believe that smoking causes those health effects. They could select yes, no or don't know (or refuse). Responses are shown in Table 8.

5.2.4 Health Beliefs

Table 8: Proportion of respondents who believe smoking causes various health effects (n=640)*

Based on what you know or believe, does smoking cause . . .	**%**
Harm to unborn babies?	97.0
Impotence in male smokers?	90.9
Heart disease?	90.3
Lung cancer in non-smokers from breathing cigarette smoke?	84.9
Stroke?	67.3
Gangrene?	55.8

* % responding "Yes"; remainder include "No" and "Don't know" responses.

As shown in Tables 9 and 10, participants were asked to indicate their level of agreement with 11 statements regarding smoking, with the option to refuse to answer the question, or select "don't know".

5.2.5 Attitudes and Beliefs

Table 9: Opinions about smoking and warning labels (n=640)

What is your overall opinion of smoking? Is it . . . ?	**%**
Positive	1.1
Neither positive nor negative	21.4
Negative	77.5

Table 10: Attitudes and beliefs about smoking (n=640)

Please tell me whether you agree, disagree, or neither agree nor disagree with each of the following statements.	**% Agree**	**% Disagree**	**% Neither agree nor disagree**
Society disapproves of smoking.	50.2	23.9	25.9
Cigarette smoke is dangerous to non-smokers.	96.6	0.8	2.7
Smoking helps people control their weight.	15.6	69.7	14.8
Smoking helps people stay slim.	14.9	69.7	15.4
Smoking cigarettes is addictive.	92.6	2.5	4.9
It is difficult to quit smoking cigarettes.	78.9	8.6	12.4
Cigarettes that taste strong and harsh are worse for your health.	40.9	11.3	47.9
Smoking a cigarette every once in a while does not damage your health.	12.9	73.3	13.8
Tobacco companies target young people.	61.9	12.6	25.5

5.3 Direct Package Comparisons

In this section of the survey, respondents were asked to compare pairs of packages from the same cigarette brand family and were assigned to view either branded packs, or plain packages with descriptors. They viewed a series of five pairs of cigarette brands sold in Brazil in random order and answered the following six questions for each pair: (i) 'Which brand do you think would *taste better*?'; (ii) 'Which brand do you think would be *smoother on your throat*?'; (iii) 'Which brand do you think would be *less harmful*?'; (iv) 'Which brand would *you like to be seen smoking*?'; (v) 'Which brand would you *rather try*?'; and (vi) 'Which brand would make it *easier to quit smoking*?'. Participants were could select either of the two packs or a clearly visible 'no difference' option. They also had the option to select 'refuse' or 'don't know'.

The packs labelled with flavour descriptors, or lighter colour descriptors and backgrounds (e.g., silver vs. gold) were designated as 'lighter' and are displayed in the second column in Table 11. Portuguese text was digitally added to some packages to ensure that participants who could only read Portuguese would be able to read the text on the plain packages which would otherwise be hard to distinguish or recognize without the typical branding.

For three of the questions, if the participants selected the 'no difference' option, they were then asked to specify what they meant by 'no difference'. For the *taste better* question, the participants were asked to specify if they meant 'Both brands would taste good' or 'Neither brand would taste good'. For the *like to be seen* question, the participants were asked if they meant 'I would like to be seen smoking either brand' or 'I would not like to be seen smoking either brand'. Similarly, for the *rather try* question, the participants were asked if they meant 'I would try either brand' or 'I would not try either brand'. The participants also had the option to select 'refuse/don't know'.

Responses to both the main pack comparison question, and follow-up question on "no difference" (where applicable) are displayed in Table 11. Note that the percentages shown for the main question are only based on people who selected pack A, pack B, or 'no difference' and exclude those who selected

refuse, or don't know. The percentages shown for the follow-up question responses are based on analyses of all people who selected 'no difference' in the main question, including individuals who selected 'refuse /don't know'. These 'refuse/don't know' responses are not listed the table, thus, the proportions for the follow-up question do not always sum to the percentage reported as 'no difference'.

Participants were significantly more likely to rate the packages designated by the researchers as the 'lighter' pack as tasting better for 4 of the 5 brand pairs (i.e., L&M Cool Menthol, L.A. Cereja, Lucky Strike Original Silver, and Marlboro Gold Original. This pattern was found for brand pairs in both the branded condition and the plain condition. In general, the participants were also more likely to rate the package pre-selected by the researchers as 'lighter' as smoother on the throat, less harmful, preferable to be seen smoking, preferable to try, and as easier to quit smoking. This pattern was found for pairs in the branded condition and the plain condition. Chi-square tests were conducted to detect differences between the regular and light pack pairs in both conditions.

Chi-square tests were also conducted to detect differences in the likelihood of respondents choosing 'no difference' rather than a particular pack in the branded condition compared to the plain condition. Significant differences are indicated in Table 11 with asterisks in the 'no difference' column in the plain condition. For most of the questions and brand pairs, there were no significant differences in terms of whether respondents were more likely to select that there was 'no difference' between the packs in terms of taste/ smoothness on the throat/ harm/preference to be seen smoking/rather try/ease of quitting in the *branded* condition compared to the *plain* condition. However, respondents in the *plain* condition were more likely to report there was 'no difference' in the taste and the smoothness of the cigarettes for two of the brand pairs (Derby and L.A.) than respondents in the *branded* condition. Respondents in the *plain* condition were also more likely to report that there was 'no difference' in which brand they would prefer to be seen smoking for the L.A. brand than respondents in the *branded* condition.

Finally, for the three variables where the follow-up question was asked (taste better/ prefer to be seen smoking/rather try), a chi-square test was conducted to detect differences in the likelihood of respondents choosing 'neither brand' rather than choosing a brand, selecting 'both/either brand' or

'refuse/don't know'. Significant differences are indicated with asterisks in the 'neither brand' column on the far right column. For most questions and brand pairs, there were no significant differences in terms of whether respondents were more likely to select that 'neither' brand tastes good/ is preferable to be seen smoking/preferable to try in the *branded* condition compared to the *plain* condition. The two exceptions to this include that: (1) respondents in the *plain* condition were more likely to report that neither brand tastes good compared to respondents in the *branded* condition for the Derby and L.A. brand pairs; and (2) respondents in the *plain* condition were more likely to report that they would not want to be seen smoking either brand for the L.A. brand pairs.

Table 11: Ratings for pack comparisons with follow-up explanation of "no difference"

	Condition 1 (Branded) (n=203)					Condition 2/3 (Plain) (n=407)				
			No difference	Both/ either brand	Neither brand			No difference	Both/ either brand	Neither brand
Taste better	41.8	26.4**	31.8	4.0	27.4	31.9	19.2***	48.9***	4.2	43.1*
Smoother on throat	15.0	50.5***	34.5	--	--	10.8	39.3***	49.9***	--	--
Less harmful	12.3	29.1***	58.6	--	--	6.9	27.5***	65.6	--	--
Like to be seen smoking	25.0	15.6*	59.4	6.3	52.1	20.8	18.7	60.5	4.7	55.3
Rather try	29.6	22.4	48.0	3.6	43.9	26.8	20.5	52.8	8.1	44.6
Easier to quit smoking	12.7	23.5**	63.7	--	--	8.3	24.5***	67.2	--	--
			No difference	Both/ either brand	Neither brand			No difference	Both/ either brand	Neither brand
Taste better	13.9	64.9***	21.3	3.0	17.8	13.0	66.5***	20.5	1.2	18.6
Smoother on throat	25.2	52.0***	22.8	--	--	18.4	55.0***	26.5	--	--
Less harmful	18.0	25.2	56.8	--	--	18.1	22.2	59.7	--	--
Like to be seen smoking	9.3	37.1***	53.6	8.2	44.8	13.0	35.2***	51.8	6.0	45.8
Rather try	11.3	56.4***	32.3	3.1	29.2	11.1	53.9***	35.1	3.1	32.0
Easier to quit smoking	18.2	22.7	59.1	--	--	20.5	16.5	63.0	--	--
			No difference	Both/ either brand	Neither brand			No difference	Both/ either brand	Neither brand
Taste better	8.8	77.0***	14.2	2.0	11.8	13.8	64.9***	21.3*	2.7	17.9*
Smoother on throat	18.3	62.4***	19.3	--	--	14.1	56.1***	29.8**	--	--
Less harmful	14.2	26.5**	59.3	--	--	12.4	24.1***	63.4	--	--
Like to be seen smoking	7.7	50.0***	42.3	6.2	36.1	9.9	38.2***	51.9*	4.9	45.7*
Rather try	8.7	63.3***	28.1	3.6	24.5	10.4	56.0***	33.7	4.9	28.8
Easier to quit smoking	19.7	19.7	60.6	--	--	16.7	19.4	64.0	--	--

	Condition 1 (Branded) (n=203)					Condition 2/3 (Plain) (n=407)				
			No difference	Both/ either brand	Neither brand			No difference	Both/ either brand	Neither brand
Taste better	17.2	45.8***	36.9	4.4	32.0	26.4	35.4*	38.2	4.2	33.4
Smoother on throat	12.3	47.3***	40.4	--	--	14.1	46.7***	39.2	--	--
Less harmful	6.8	36.6***	56.6	--	--	8.3	31.9***	59.8	--	--
Like to be seen smoking	14.1	28.6**	57.3	6.3	51.0	19.0	25.9*	55.0	5.6	49.2
Rather try	15.9	37.4***	46.7	5.6	40.5	21.7	36.7***	41.6	6.5	35.1
Easier to quit smoking	11.3	24.5**	64.2	--	--	10.4	23.8***	65.8	--	--
			No difference	Both/ either brand	Neither brand			No difference	Both/ either brand	Neither brand
Taste better	24.3	46.0***	29.7	4.0	25.7	14.0	54.1***	31.9	2.9	28.7
Smoother on throat	11.6	54.8***	33.7	--	--	20.8	46.3***	32.9	--	--
Less harmful	11.8	35.3***	52.9	--	--	16.1	32.9***	51.0	--	--
Like to be seen smoking	19.6	30.7*	49.7	4.8	45.0	8.1	42.9***	49.1	4.9	43.9
Rather try	18.8	41.1***	40.1	4.7	35.4	8.5	50.0***	41.5	6.4	34.8
Easier to quit smoking	12.7	27.0**	60.3	--	--	20.5	16.9	62.6	--	--

Note: Chi-square tests were conducted to detect (a) differences between the brand pairs of regular and light packs in each condition; (b) differences in the likelihood of respondents choosing 'no difference' rather than a particular pack in the branded versus plain condition; and (c) differences in the likelihood of respondents choosing 'neither brand' rather than choosing a brand, selecting both/either brand or refuse/don't know.

Significant differences are indicated with * at p<0.05, ** at p<0.01, and *** at the p<0.00l level on the lighter pack; the 'no difference' column in the plain condition; and the 'neither brand' column in the plain condition, respectively.

5.4 Individual Pack Ratings

Participants were assigned to one of three conditions and viewed either 1) branded packs, 2) plain packs with brand descriptors, or 3) plain packs with descriptors removed (i.e., only the brand name). They viewed a series of 10 individual packs, one at a time, in a random order and were asked to rate each package on its brand appeal, perceived taste, harm, and smoothness compared to other brands on a 5-point Likert scale (e.g., 1= a lot less appealing, 2= a little less appealing, 3= no difference, 4 = a little more appealing, 5 = a lot more appealing).

The sections that follow provide the findings for each of the four variables, at an individual pack level and as an index across the packs. A summary table of the percent of respondents who rated each pack as “a little” or “a lot” more appealing / better taste / less harmful / more smooth than other brands is also included in Appendix D, Table 1. Additionally, the mean values for each pack based on the 5-point scale and associated standard deviations are reported in Appendix D, Table 2.

5.4.1 Effect of Cigarette Packaging on Perceptions of Brand Appeal

5.4.1.1 Brand Appeal: Ratings for individual packs

Participants were asked to rate how appealing they thought each of the 10 cigarette brands were compared to other cigarette brands they can buy in stores on a 5-point Likert scale (where 1= 'a lot less appealing', 2= 'a little less appealing', 3= 'no difference', 4= 'a little more appealing', and 5= 'a lot more appealing'). These ratings were subsequently recoded into a binary variable where 1= 'a little more appealing', or 'a lot more appealing', and 0= 'a little less appealing', 'a lot less appealing' and 'no difference'. As shown in Table 12, over 70% of participants rated the branded Virginia Slims Silver pack and the Peel Sweet Melon pack as more appealing than other brands. Responses for all packs are shown in table 12.

Table 12: Brand appeal for individual cigarette packages by experimental condition (n=601)

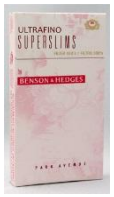
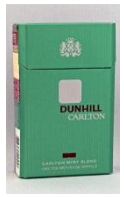
										
Condition	**% Agreeing that pack is "a little" or "a lot" MORE APPEALING than other brands**									
Branded	77.1	72.5	71.6	69.5	68.9	58.1	50.0	49.5	45.9	23.4
Plain w/ desc.	48.7	39.9	32.8	33.9	51.1	60.6	40.2	45.9	39.1	39.8
Plain no desc.	49.5	13.8	29.1	29.1	14.6	50.5	33.8	27.5	59.7	38.5

Table 13 displays the results of a logistic regression predicting brand appeal ratings for each cigarette pack. When examining the ratings for each of the 10 packs across three conditions, a main effect of condition was significant for all packs with the exception of one: Silk Cut Menthol.

The brand appeal ratings were significantly lower in the *plain* condition than the *branded* condition for six of the 10 packs (i.e., Benson & Hedges Superslim, DJ Mix Strawberry, Dunhill Carlton Mint, JPS American Pink, Peel Sweet Melon, and Virginia Slims Silver), but higher in the *plain* condition than the *branded* condition for one pack (Marlboro Gold Original). Similarly, the ratings of brand appeal were significantly lower in the *plain, no descriptors* condition than the *branded* condition for seven of the 10 packs (same packs as the *plain* condition, with the addition of Capri Baunilha); but higher in the *plain, no descriptors* condition than the *branded* condition for two packs (Marlboro Gold Original and Vogue Bleue). Ratings of brand appeal were lower in the *Plain, no descriptors* condition compared to the *Plain* condition for the majority of the flavoured cigarette packages: Capri Baunilha, DJ Mix Strawberry, Peel Sweet Melon and Silk Cut Menthol, but higher in the *Plain, no descriptors* condition than the *Plain* condition for Vogue Bleue. Note that although the brand appeal ratings were significantly lower for the Silk Cut pack in the *Plain, no descriptors* condition than the *Plain* condition; overall, the model for that pack was not significant.

Note a linear regression was also run based on the 5-point Likert ratings and showed a similar pattern of results. Regression analyses based on these 5-point ratings are included in Appendix D, Table 3.

Table 13: Adjusted logistic regression predicting individual pack brand appeal ratings (n=599)

	χ^2	Significance	Odds Ratio	95% CI	Significance
Pack 1 – Benson & Hedges Superslim	*81.24*	*p<0.001*			
Branded (ref) vs. plain			*0.22*	*0.14, 0.34*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.18*	*0.11, 0.27*	*p<0.001*
Plain (ref) vs. plain, no descriptors			0.80	0.51, 1.23	p=0.305
Pack 2 – Capri Baunilha	*40.45*	*p<0.001*			
Branded (ref) vs. plain			0.80	0.54, 1.20	p=0.280
Branded (ref) vs. plain, no descriptors			*0.34*	*0.22, 0.53*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.43*	*0.28, 0.66*	*p<0.001*
Pack 3 – DJ Mix Strawberry	142.00	*p<0.001*			
Branded (ref) vs. plain			*0.47*	*0.31, 0.71*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.08*	*0.05, 0.13*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.16*	*0.10, 0.27*	*p<0.001*
Pack 4 – Dunhill Carlton Mint	*15.41*	*p=0.052*			
Branded (ref) vs. plain			*0.650*	*0.44, 0.97*	*p=0.036*
Branded (ref) vs. plain, no descriptors			*0.50*	*0.33, 0.75*	*p=0.001*
Plain (ref) vs. plain, no descriptors			0.77	0.51, 1.16	p=0.211
Pack 5 – JPS American Pink	101.08	*p<0.001*			
Branded (ref) vs. plain			*0.18*	*0.12, 0.28*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.16*	*0.10, 0.24*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.87*	*0.56, 1.34*	*p=0.513*
Pack 6- Marlboro Gold Original	30.30	*p<0.001*			
Branded (ref) vs. plain			*2.19*	*1.41, 3.40*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*2.03*	*1.31, 3.16*	*p=0.002*
Plain (ref) vs. plain, no descriptors			0.93	0.62, 1.40	p=0.725
Pack 7 – Peel Sweet Melon	153.72	*p<0.001*			
Branded (ref) vs. plain			*0.24*	*0.16, 0.38*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.06*	*0.04, 0.10*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.24*	*0.15, 0.41*	*p<0.001*
Pack 8 – Silk Cut Menthol	7.88	p=0.445			
Branded (ref) vs. plain			1.09	0.73, 1.65	p=0.668
Branded (ref) vs. plain, no descriptors			0.72	0.48, 1.07	p=0.108
Plain (ref) vs. plain, no descriptors			*0.66*	*0.44, 0.99*	*p=0.044*
Pack 9 – Virginia Slims Silver	*51.09*	*p<0.001*			
Branded (ref) vs. plain			*0.28*	*0.18, 0.43*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.28*	*0.18, 0.43*	*p<0.001*
Plain (ref) vs. plain, no descriptors			1.01	0.68, 1.51	p=0.957
Pack 10 – Vogue Bleue	*24.46*	*p=0.002*			
Branded (ref) vs. plain			0.73	0.48, 1.10	p=0.135
Branded (ref) vs. plain, no descriptors			*1.67*	*1.11, 2.49*	*p=0.013*
Plain (ref) vs. plain, no descriptors			*2.27*	*1.51, 3.42*	*p<0.001*

*****Model adjusted for the following covariates: age, education, smoking status, and race/ethnicity.

5.4.1.2 Brand Appeal: Index scores

The brand appeal responses were recorded using a 5-point Likert scale and were subsequently recoded as a binary variable where 1= a little/ a lot more appealing, and 0= a little/ a lot less appealing and no difference. An overall index rating for brand appeal was created based on the binary variable by summing the scores across the 10 packages to yield a score between 0 and 10, with the number corresponding to the total number of packs rated as more appealing. The mean index scores and standard deviations for each condition are displayed in Table 14. The mean brand appeal score was highest for the branded condition, and lowest for the plain, no descriptors condition.

Table 14: Brand appeal index scores (n= 538)

Condition	Mean (SD)
Branded	5.96 (2.65)
Plain	4.35 (2.69)
Plain, no descriptors	3.44 (2.53)

Table 15 displays the results of a linear regression predicting brand appeal scores for the index measure. A significant main effect was found for the model, where packs in the *plain* condition and the *plain, no descriptors* condition were less likely to be rated as more appealing compared to those in the *branded* condition. Packs in the *plain, no descriptors* condition were less likely to be rated as more appealing than those in the *plain* condition. There were no significant differences by age, smoking status, education or ethnicity, and no significant 2-way interactions between any of the moderators and experimental condition.

Table 15: Adjusted linear regression predicting brand appeal index score (n=537)

	Model (F)	**Significance**	**Beta (β)**	**95% CI for β**	**Significance**	**Moderators (β, significance)**
	11.59	*p<0.001*				
Branded (ref) vs. Plain			*-1.64*	*-2.18, -1.10*	*p<0.001*	
Branded (ref) vs. Plain, no descriptors			*-2.53*	*-3.08, 1.99*	*p<0.001*	
Plain (ref) vs. Plain, no descriptors			*-0.89*	*-1.45, -0.34*	*p=0.002*	

*****Model adjusted for the following covariates: age, education, smoking status, and race/ethnicity. Beta values are unstandardized coefficients.

Note that a linear regression was also run for each individual package based on the 5-point Likert ratings and showed a similar pattern of results as the logistic regression shown in Table 13. An index score based on the 5-point ratings was also created by summing the ratings across the 10 packages ratings and dividing by 10 for a total score between 0 and 5. The mean index scores and regression results for this index are included in Appendix D, Tables 7 and 8.

5.4.2 Effect of Cigarette Packaging on Perceptions of Taste

5.4.2.1 Perceived Taste: Ratings for individual packs

Participants were asked to rate how they thought each of the 10 cigarette brands would taste compared to other cigarette brands they can buy in stores on a 5-point Likert scale where 1= 'a lot worse than other brands', 2= 'a little worse', 3= 'no difference', 4= 'a little better', and 5= 'a lot better'. These ratings were subsequently recoded into a binary variable where 1= 'a little better', or 'a lot better', and 0= 'a little worse', 'a lot worse' and 'no difference'. As shown in Table 16, the branded DJ Mix Strawberry, Peel Sweet Melon, and Silk Cut Menthol packs had the highest ratings with over 60% of participants rating them as likely to taste better than other brands. Responses for all packs are given in table 16.

Table 16: Perceived taste for individual cigarette packages by experimental condition (n=594)

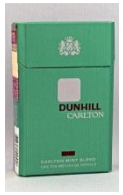
										
Condition	**% Agreeing that pack TASTES "a little" or "a lot" BETTER than other brands**									
Branded	66.3	65.5	60.6	57.7	56.8	45.7	45.3	39.6	25.3	24.5
Plain w/ desc.	55.8	50.0	59.1	55.2	20.5	23.7	50.3	25.4	26.6	29.8
Plain no desc.	12.0	9.7	32.8	18.7	20.6	21.5	27.0	35.0	33.2	30.8

Table 17 displays the results of a logistic regression predicting taste ratings for each cigarette pack. When examining the ratings for each of the 10 packs across three conditions, a main effect of condition was significant for all packs.

The taste ratings were significantly lower in the *plain* condition than the *branded* condition for five of the 10 packs (i.e., Benson & Hedges Superslim, DJ Mix Strawberry, JPS American Pink, Peel Sweet Melon, and Virginia Slims Silver). Similarly, the taste ratings were significantly lower in the *plain, no descriptors* condition than the *branded* condition for seven of the 10 packs (i.e., Benson & Hedges Superslim, Capri Baunilha, DJ Mix Strawberry, Dunhill Carlton Mint, JPS American Pink, Peel Sweet Melon, and Silk Cut Menthol). Ratings of taste were also lower in the *Plain, no descriptors* condition compared to the *Plain* condition for all five of the flavoured cigarette packages: Capri Baunilha, DJ Mix Strawberry, Dunhill Carlton Mint, Peel Sweet Melon and Silk Cut Menthol; but marginally higher in the *Plain, no descriptors* condition than the *Plain* condition for Virginia Slims Silver.

A linear regression was also run based on the 5-point Likert ratings and showed a similar pattern of results. Regression analyses based on these 5-point ratings are included in Appendix D, Table 4.

Table 17: Adjusted logistic regression predicting individual pack perceived taste ratings (n= 592)

	χ^2	Significance	Odds Ratio	95% CI	Significance
Pack 1 – Benson & Hedges Superslim	*82.62*	*p<0.001*			
Branded (ref) vs. plain			*0.18*	*0.11, 0.29*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.19*	*0.12, 0.30*	*p<0.001*
Plain (ref) vs. plain, no descriptors			1.02	0.62, 1.70	p=0.99
Pack 2 – Capri Baunilha	*99.10*	*p<0.001*			
Branded (ref) vs. plain			*0.90*	*0.60, 1.37*	p=0.632
Branded (ref) vs. plain, no descriptors			*0.16*	*0.10, 0.25*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.17*	*0.11, 0.28*	*p<0.001*
Pack 3 – DJ Mix Strawberry	*144.34*	*p<0.001*			
Branded (ref) vs. plain			*0.65*	*0.43, 0.98*	*p=0.040*
Branded (ref) vs. plain, no descriptors			*0.07*	*0.04, 0.12*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.11*	*0.07, 0.18*	*p<0.001*
Pack 4 – Dunhill Carlton Mint	40.51	*p<0.001*			
Branded (ref) vs. plain			1.22	0.82, 1.83	p=0.331
Branded (ref) vs. plain, no descriptors			*0.43*	*0.28, 0.66*	*p<0.001*
Plain (ref) vs. plain, no descriptors			0.35	0.23, 0.54	*p<0.001*
Pack 5 – JPS American Pink	*41.62*	*p<0.001*			
Branded (ref) vs. plain			*0.35*	*0.22, 0.55*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.32*	*0.20, 0.50*	*p<0.001*
Plain (ref) vs. plain, no descriptors			0.92	0.57, 1.50	p=0.734
Pack 6- Marlboro Gold Original	*32.80*	*p<0.001*			
Branded (ref) vs. plain			1.34	0.84, 2.12	p=0.221
Branded (ref) vs. plain, no descriptors			1.36	0.86, 2.15	p=0.187
Plain (ref) vs. plain, no descriptors			1.02	0.65, 1.59	p=0.936
Pack 7 – Peel Sweet Melon	*147.87*	*p<0.001*			
Branded (ref) vs. plain			*0.52*	*0.35, 0.79*	*p=0.002*
Branded (ref) vs. plain, no descriptors			*0.06*	*0.03, 0.10*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.11*	*0.06, 0.19*	*p<0.001*
Pack 8 – Silk Cut Menthol	49.19	*p<0.001*			
Branded (ref) vs. plain			0.92	0.60, 1.39	p=0.916
Branded (ref) vs. plain, no descriptors			0.31	0.20, 0.47	*p<0.001*
Plain (ref) vs. plain, no descriptors			0.33	0.22, 0.51	*p<0.001*
Pack 9 – Virginia Slims Silver	*29.05*	*p<0.001*			
Branded (ref) vs. plain			*0.49*	*0.31, 0.76*	*p=0.002*
Branded (ref) vs. plain, no descriptors			0.77	0.50, 1.17	p=0.216
Plain (ref) vs. plain, no descriptors			*1.57*	*1.00, 2.47*	*p=0.049*
Pack 10 – Vogue Bleue	*20.43*	*p=0.009*			
Branded (ref) vs. plain			1.06	0.66, 1.69	p=0.813
Branded (ref) vs. plain, no descriptors			1.44	0.92, 2.26	p=0.114
Plain (ref) vs. plain, no descriptors			1.36	0.87, 2.13	p=0.177

*****Model adjusted for the following covariates: age, education, smoking status, and race/ethnicity.

5.4.2.2 Perceived Taste: Index scores

The perceived taste responses were recorded using a 5-point Likert scale and were subsequently recoded as a binary variable where 1= tastes a little better, and tastes a lot better, and 0= tastes a little worse or a lot worse and no difference. An overall index rating for perceived taste was created based on the binary variable by summing the scores across the 10 packages to yield a score between 0 and 10, with the number corresponding to the total number of packs rated as tasting better. The mean index scores and standard deviations for each condition are displayed in Table 18. Similar to appeal, the mean perceived taste score was highest for the branded condition, and lowest for the plain, no descriptors condition.

Table 18: Perceived taste index scores (n=509)

Condition	Mean (SD)
Branded	4.94 (2.82)
Plain	3.93 (2.48)
Plain, no descriptors	2.31 (2.35)

Table 19 displays the results of a linear regression predicting perceived taste scores for the index measure. A significant main effect was found for the model, where packs in the *plain* condition and the *plain, no descriptors* condition were less likely to be rated as 'tasting better than other brands in stores' compared to those in the *branded* condition. Packs in the *plain, no descriptors* condition were also less likely to be rated as 'tasting better' compared to those in the *plain* condition. There was a significant difference by smoking status, such that smokers were more likely to think the packs would taste better compared to the non-smokers. There were no significant 2-way interactions between any of the moderators and experimental condition.

Table 19: Adjusted linear regression predicting perceived taste index score (n=508)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance	Moderators (β, significance)
	13.31	*p<0.001*				*Smoking status (non-smoker-ref vs. smoker): 0.88 (p<0.001)*
Branded (ref) vs. Plain			*-1.01*	*-1.55, -0.47*	*p<0.001*	
Branded (ref) vs. Plain, no descriptors			*-2.62*	*-3.16, -2.07*	*p<0.001*	
Plain (ref) vs. Plain, no descriptors			*-1.60*	*-2.16, -1.05*	*p<0.001*	

*Model adjusted for the following covariates: age, education, smoking status, and race/ethnicity. Beta values are unstandardized coefficients.

Note that a linear regression was also run for each individual package based on the 5-point Likert ratings and showed a similar pattern of results as the logistic regression shown in Table 17. An index score based on the 5-point ratings was also created by summing the ratings across the 10 packages ratings and dividing by 10 for a total score between 0 and 5. The mean index scores and regression results for this index are included in Appendix D, Tables 9 and 10.

5.4.3 Effect of Cigarette Packaging on Perceived Health Risk

5.4.3.1 Perceived Health Risk: Ratings for individual packs

Participants were asked to rate how harmful they thought each of the 10 cigarette brands would be compared to other cigarette brands they can buy in stores on a 5-point Likert scale where 1= 'a lot less harmful than other brands', 2= 'a little less harmful', 3= 'no difference', 4= 'a little more harmful', and 5= 'a lot more harmful'. These ratings were subsequently recoded into a binary variable where 1= 'a little less harmful', or 'a lot less harmful', and 0= 'a little more harmful', 'a lot more harmful' and 'no difference'. As shown in Table 20, the branded Benson & Hedges Superslim and Peel Sweet Melon packs had the greatest number of participants (>22%) rating them as 'a little' or 'a lot' less harmful' than other brands. Responses for all packs are given in table 20.

Table 20: Perceived health risk for individual cigarette packages by experimental condition (n=599)

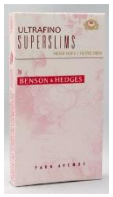
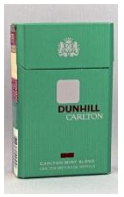
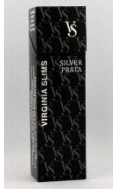
										
Condition	**% Agreeing that pack is "a little" or "a lot" LESS HARMFUL than other brands**									
Branded	24.0	22.5	18.0	14.1	13.9	12.5	11.4	10.3	9.3	8.8
Plain w/ desc.	17.9	10.7	10.9	9.8	14.5	8.5	16.1	7.4	11.5	9.7
Plain no desc.	10.6	14.1	14.1	11.5	9.0	10.6	10.8	11.0	8.9	11.6

Table 21 displays the results of a logistic regression predicting health risk ratings for each cigarette pack. When examining the ratings for each of the 10 packs across three conditions, a main effect of condition was significant for seven of the 10 packs (Benson & Hedges Superslim, Capri Baunilha, DJ Mix Strawberry, Dunhill Carlton Mint, Peel Sweet Melon, Silk Cut Menthol, and Vogue Bleue).

Health ratings in the *Plain* condition were significantly lower (meaning greater health risks) than the *Branded* condition for one of the 10 packs (Peel Sweet Melon). Similarly, the health ratings were significantly lower (greater health risk) in the *Plain, no descriptors* condition than the *Branded* condition for one of the 10 packs (Benson & Hedges Superslim). There were no significant differences between the *Plain, no descriptors* condition and the *Plain* condition.

Note a linear regression was also run based on the 5-point Likert ratings and showed a similar pattern of results. Regression analyses based on these 5-point ratings are included in Appendix D, Table 5.

Table 21: Adjusted logistic regression predicting individual pack perceived health risk ratings (n=597)

	χ^2	Significance	Odds Ratio	95% CI	Significance
Pack 1 – Benson & Hedges Superslim	*18.68*	*p=0.017*			
Branded Vs. Plain			0.69	0.41, 1.14	p=0.144
Branded Vs. Plain, no descriptors			*0.38*	*0.21, 0.67*	*p=0.001*
Plain Vs. Plain, no descriptors			0.55	0.30, 1.00	p=0.548
Pack 2 – Capri Baunilha	*18.07*	*p=0.021*			
Branded Vs. Plain			1.09	0.61, 1.95	p=0.765
Branded Vs. Plain, no descriptors			0.64	0.34, 1.22	p=0.640
Plain Vs. Plain, no descriptors			0.59	0.31, 1.11	p=0.100
Pack 3 – DJ Mix Strawberry	*24.47*	*p=0.002*			
Branded Vs. Plain			0.67	0.35, 1.28	p=0.220
Branded Vs. Plain, no descriptors			0.86	0.47, 1.60	p=0.636
Plain Vs. Plain, no descriptors			1.30	0.66, 2.56	p=0.457
Pack 4 – Dunhill Carlton Mint	*15.98*	*p=0.043*			
Branded Vs. Plain			1.31	0.67, 2.56	p=0.432
Branded Vs. Plain, no descriptors			1.06	0.53, 2.13	p=0.862
Plain Vs. Plain, no descriptors			0.81	0.41, 1.59	p=0.546
Pack 5 – JPS American Pink	12.35	p=0.136			
Branded Vs. Plain			0.68	0.33, 1.42	p=0.303
Branded Vs. Plain, no descriptors			1.16	0.61, 2.21	p=0.658
Plain Vs. Plain, no descriptors			1.70	0.83, 3.51	p=0.150
Pack 6- Marlboro Gold Original	14.11	p=0.079			
Branded Vs. Plain			1.54	0.85, 2.78	p=0.152
Branded Vs. Plain, no descriptors			0.98	0.52, 1.85	p=0.952
Plain Vs. Plain, no descriptors			0.64	0.35, 1.15	p=0.135
Pack 7 – Peel Sweet Melon	*16.29*	*p=0.038*			
Branded Vs. Plain			*0.43*	*0.24, 0.76*	*p=0.004*
Branded Vs. Plain, no descriptors			0.59	0.34, 1.00	p=0.050
Plain Vs. Plain, no descriptors			1.38	0.74, 2.56	p=0.311
Pack 8 – Silk Cut Menthol	*21.26*	*p=0.006*			
Branded Vs. Plain			0.58	0.32, 1.05	p=0.072
Branded Vs. Plain, no descriptors			0.78	0.45, 1.36	p=0.377
Plain Vs. Plain, no descriptors			1.35	0.73, 2.52	p=0.344
Pack 9 – Virginia Slims Silver	15.14	p=0.057			
Branded Vs. Plain			1.19	0.59, 2.40	p=0.624
Branded Vs. Plain, no descriptors			1.49	0.76, 2.91	p=0.243
Plain Vs. Plain, no descriptors			1.25	0.65, 2.43	p=0.507
Pack 10 – Vogue Bleue	*28.77*	*p<0.001*			
Branded Vs. Plain			0.70	0.35, 1.38	p=0.297
Branded Vs. Plain, no descriptors			0.87	0.46, 1.66	p=0.671
Plain Vs. Plain, no descriptors			1.25	0.62, 2.52	p=0.530

*****Model adjusted for the following covariates: age, education, smoking status, and race/ethnicity.

5.4.3.2 Perceived Health Risk: Index Scores

The perceived health risk responses were recorded using a 5-point Likert scale and were subsequently recoded as a binary variable where 1= a lot less harmful, and a little less harmful, and 0= a little more harmful and a lot more harmful and no difference. An overall index rating for perceived health risk was created based on the binary variable by summing the scores across the 10 packages to yield a score between 0 and 10, with the number corresponding to the total number of packs rated as being less harmful. The mean index scores and standard deviations for each condition are displayed in Table 22. Similar to appeal, the mean perceived harm score was highest for the branded condition.

Table 22: Perceived health risk index scores (n=536)

Condition	Mean (SD)
Branded	1.47 (2.18)
Plain	1.13 (1.68)
Plain, no descriptors	1.17 (2.24)

Table 23 displays the results of a linear regression predicting perceived health risk scores for the index measure. A significant main effect was found for the model; however, there were no significant differences between conditions. There was a significant difference in health risk ratings by age, smoking status, and race/ethnicity. Older participants were less likely to think that certain packs would be less harmful than others on the market compared to younger participants. Smokers were more likely than non-smokers to think the packs would be less harmful; and people identifying as 'other' were more likely than people identifying as 'white' to think that the packs would be less harmful. There were no significant 2-way interactions between any of the moderators and experimental conditions.

Table 23: Adjusted linear regression predicting health risk (less harm) index score (n=536)

	Model (F)	**Significance**	**Beta (β)**	**95% CI for β**	**Significance**	**Moderators (β, significance)**
	3.47	*p=0.001*				*Age:-0.11 (p=0.007)*
Branded (ref) vs. Plain			-0.29	-0.71, 0.14	p=0.181	
Branded (ref) vs. Plain, no descriptors			-0.22	-0.64, 0.20	p=0.297	*Smoking status (non-smoker-ref vs. smoker): 0.45 (p=0.019)*
Plain (ref) vs. Plain, no descriptors			0.07	-0.36, 0.49	p=0.764	*Race (white-ref vs. other):0.74 (p=0.008)*

*Model adjusted for the following covariates: age, education, smoking status, and race/ethnicity. Beta values are unstandardized coefficients.

A linear regression was also run for each individual package based on the 5-point Likert ratings and showed a similar pattern of results as the logistic regression shown in Table 21. An index score based on the 5-point ratings was also created by summing the ratings across the 10 packages ratings and dividing by 10 for a total score between 0 and 5. The mean index scores and regression results for this index are included in Appendix D, Tables 11 and 12.

5.4.4 Effect of Cigarette Packaging on Perceived Smoothness

5.4.5 Perceived Smoothness: Ratings for Individual Packs

Participants were asked to rate how smooth they thought each of the 10 cigarette brands would be on their throat compared to other cigarette brands they can buy in stores on a 5-point Likert scale where 1= 'a lot less smooth than other brands', 2= 'a little less smooth', 3= 'no difference', 4= 'a little more smooth', and 5= 'a lot more smooth'. These ratings were subsequently recoded into a binary variable where 1= 'a little more smooth', or 'a lot more smooth', and 0= 'a little less smooth', 'a lot less smooth' and 'no difference'.

As shown in Table 24, the branded and flavoured cigarette brands Peel Sweet Melon, DJ Mix Strawberry, Silk Cut Menthol, and Capri Baunilha packs had the greatest number of participants (≥50%) rating them as 'more smooth' than other brands. Responses for all packs are shown in table 24.

Table 24: Perceived smoothness for individual cigarette packages by experimental condition (n=591)

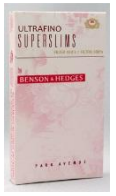
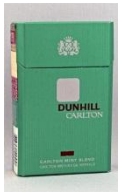
										
Condition	**% Agreeing that pack is "a little" or "a lot" MORE SMOOTH than other brands**									
Branded	56.5	54.2	51.5	50.0	46.2	40.5	35.0	26.3	23.3	21.1
Plain w/ desc.	41.1	42.1	43.8	45.1	25.9	36.0	16.8	19.5	22.0	25.9
Plain no desc.	12.2	7.5	19.8	19.5	11.1	16.2	11.6	29.1	29.1	13.4

Table 25 displays the results of a logistic regression predicting smoothness ratings for each cigarette pack. When examining the ratings for each of the 10 packs across three conditions, a main effect of condition was significant for all packs.

The smoothness ratings were significantly lower in the *plain* condition than the *branded* condition for four of the 10 packs (i.e., Benson & Hedges Superslim, DJ Mix Strawberry, JPS American Pink, and Peel Sweet Melon). The smoothness ratings were also significantly lower in the *plain, no descriptors* condition than the *branded* condition for eight of the 10 packs (i.e., Benson & Hedges Superslim, Capri Baunilha, DJ Mix Strawberry, Dunhill Carlton Mint, JPS American Pink, Marlboro Gold Original, Peel Sweet Melon, and Silk Cut Menthol). In addition, ratings of taste were lower in the *Plain, no descriptors* condition compared to the *Plain* condition for seven of the cigarette packages (Benson & Hedges Superslim, Capri Baunilha, DJ Mix Strawberry, Dunhill Carlton Mint, Marlboro Gold Original, Peel Sweet Melon and Silk Cut Menthol; but higher in the *Plain, no descriptors* condition than the *Plain* condition for Vogue Bleue.

Note a linear regression was also run based on the 5-point Likert ratings and showed a similar pattern of results. Regression analyses based on these 5-point ratings are included in Appendix D, Table 6.

Table 25: Adjusted logistic regression predicting individual pack perceived smoothness ratings (n=589)

	χ^2	Significance	Odds Ratio	95% CI	Significance
Pack 1 – Benson & Hedges Superslim	*70.55*	*p<0.001*			
Branded Vs. Plain			*0.39*	*0.25, 0.60*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.14*	*0.08, 0.24*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.36*	*0.20, 0.62*	*p<0.001*
Pack 2 – Capri Baunilha	*71.73*	*p<0.001*			
Branded Vs. Plain			0.77	0.51, 1.17	p=0.224
Branded Vs. Plain, no descriptors			*0.22*	*0.14, 0.35*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.28*	*0.18, 0.45*	*p<0.001*
Pack 3 – DJ Mix Strawberry	*117.08*	*p<0.001*			
Branded Vs. Plain			*0.60*	*0.40, 0.90*	*p=0.015*
Branded Vs. Plain, no descriptors			*0.07*	*0.04, 0.12*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.11*	*0.06, 0.21*	*p<0.001*
Pack 4 – Dunhill Carlton Mint	*42.70*	*p<0.001*			
Branded Vs. Plain			0.79	0.52, 1.21	p=0.276
Branded Vs. Plain, no descriptors			*0.27*	*0.17, 0.44*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.34*	*0.21, 0.56*	*p<0.001*
Pack 5 – JPS American Pink	*40.75*	*p<0.001*			
Branded Vs. Plain			*0.36*	*0.22, 0.60*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.25*	*0.14, 0.42*	*p<0.001*
Plain Vs. Plain, no descriptors			0.67	0.38, 1.21	p=0.188
Pack 6- Marlboro Gold Original	*23.15*	*p=0.003*			
Branded Vs. Plain			1.33	0.82, 2.15	p=0.248
Branded Vs. Plain, no descriptors			*0.58*	*0.34, 0.99*	*p=0.047*
Plain Vs. Plain, no descriptors			*0.44*	*0.26, 0.74*	*p=0.002*
Pack 7 – Peel Sweet Melon	*106.10*	*p<0.001*			
Branded Vs. Plain			*0.50*	*0.33, 0.76*	*p=0.001*
Branded Vs. Plain, no descriptors			*0.10*	*0.06, 0.16*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.19*	*0.11, 0.33*	*p<0.001*
Pack 8 – Silk Cut Menthol	54.57	*p<0.001*			
Branded Vs. Plain			0.73	0.48, 1.09	p=0.126
Branded Vs. Plain, no descriptors			*0.23*	*0.14, 0.36*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.31*	*0.20, 0.50*	*p<0.001*
Pack 9 – Virginia Slims Silver	*35.21*	*p<0.001*			
Branded Vs. Plain			0.88	0.54, 1.44	p=0.610
Branded Vs. Plain, no descriptors			1.27	0.80, 2.03	p=0.309
Plain Vs. Plain, no descriptors			1.45	0.90, 2.35	p=0.130
Pack 10 – Vogue Bleue	*32.79*	*p<0.001*			
Branded Vs. Plain			0.64	0.39, 1.05	p=0.078
Branded Vs. Plain, no descriptors			1.11	0.70, 1.75	p=0.671
Plain Vs. Plain, no descriptors			*1.73*	*1.06, 2.83*	*p=0.028*

*****Model adjusted for the following covariates: age, education, smoking status, and race/ethnicity.

5.4.5.1 Perceived Smoothness: Index Scores

The perceived smoothness responses were recorded using a 5-point Likert scale and were subsequently recoded as a binary variable where 1= a lot more smooth, and a little more smooth, and 0= a little less smooth, a lot less smooth and no difference. An overall index rating for perceived smoothness was created based on the binary variable by summing the scores across the 10 packages to yield a score between 0 and 10, with the number corresponding to the total number of packs rated as being smoother. The mean index scores and standard deviations for each condition are displayed in Table 26. Similar to appeal and perceived taste, the mean perceived smoothness score was highest for the B*randed* condition, and lowest for the *Plain, no descriptors* condition.

Table 26: Perceived smoothness index scores (n=520)

Condition	Mean (SD)
Branded	4.12 (2.99)
Plain	3.14 (2.47)
Plain, no descriptors	1.63 (2.12)

Table 27 displays the results of a linear regression predicting perceived smoothness scores for the index measure. A significant main effect was found for the model, where packs in the *plain* condition and the *plain, no descriptors* condition were less likely to be rated as 'smoother' compared to those in the *branded* condition. Packs in the *plain, no descriptors* condition were also less likely to be rated as smooth compared to those in the *plain* condition. There was a significant difference in smoothness ratings by smoking status such that smokers were more likely than non-smokers to think the brand would be smoother. There were no significant 2-way interactions between any of the moderators and experimental condition.

Table 27: Adjusted linear regression predicting perceived smoothness index scores (n=518)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance	Moderators (β, significance)
	12.42	*p<0.001*				*Smoking status (non-smoker-ref vs. smoker): 0.79 (p=0.001)*
Branded (ref) vs. plain			*-1.01*	*-1.55, -0.47*	*p<0.001*	
Branded (ref) vs. plain, no descriptors			*-2.50*	*-3.03, -1.96*	*p<0.001*	
Plain (ref) vs. plain, no descriptors			*-1.49*	*-2.03, -0.95*	*p<0.001*	

*Model adjusted for the following covariates: age, education, smoking status, and race/ethnicity. Beta values are unstandardized coefficients.

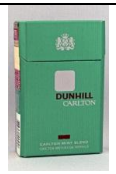
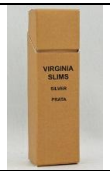
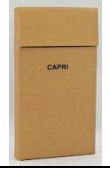
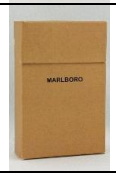
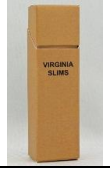
A linear regression was also run for each individual package based on the 5-point Likert ratings and showed a similar pattern of results. An index score based on the 5-point ratings was also created by summing the ratings across the 10 packages ratings and dividing by 10 for a total score between 0 and 5. The mean index scores and regression results for this index are included in Appendix D, Tables 13 and 14.

5.4.6 Effect of Cigarette Packaging on Smoker Image Ratings

For each of the ten packages, participants were also asked to rate whether someone who chooses to smoke each brand would more likely be female or male, stylish or not stylish, popular or not popular, sophisticated or not sophisticated, and slim or overweight. For each of these traits, the participants could select one of the traits, or no difference. Responses for each package were scored as either 1 (e.g., "female" or other desirable traits), or 0 (e.g., "male" or other less desirable traits, no difference, and don't know).

Table 28 displays the percent of respondents who rated each pack as more likely to be smoked by people who are female, stylish, popular, sophisticated, or slim.

Table 28: Smoker image ratings for individual cigarette packages by experimental condition (n=640)

Branded										
Plain with descriptors										
Plain, no descriptors										
					% selected **FEMALE**					
Branded	88.2	30.8	90.1	13.1	86.4	2.8	57.5	22.1	17.4	31.6
Plain with desc.	27.1	58.5	52.4	18.4	42.3	7.7	50.7	42.7	48.1	37.4
Plain no desc.	11.1	25.3	8.8	9.8	4.6	7.3	11.5	43.1	59.6	60.6
					% selected **STYLISH**					
Branded	55.0	37.1	52.6	34.4	57.5	20.8	57.3	36.6	63.4	40.4
Plain with desc.	35.7	33.8	44.4	28.2	34.1	26.7	24.6	50.0	43.0	44.4
Plain no desc.	30.4	25.3	17.6	23.5	26.7	22.1	9.7	41.5	45.6	54.8
					% selected **POPULAR**					
Branded	30.8	19.0	35.4	26.4	39.9	18.9	41.8	20.2	33.8	24.9
Plain with desc.	21.3	22.2	30.0	20.4	23.7	20.9	18.9	30.4	24.6	30.0
Plain no desc.	20.7	18.1	17.7	20.3	20.7	28.6	11.1	28.9	33.2	37.2
					% selected **SOPHISTICATED**					
Branded	51.9	30.8	40.1	35.4	48.4	21.8	39.3	40.6	61.0	35.7
Plain with desc.	36.2	28.2	36.7	28.2	31.9	27.7	20.9	48.5	41.7	39.6
Plain no desc.	26.1	25.9	13.0	22.5	29.2	16.2	11.9	34.9	41.7	49.1
					% selected **SLIM**					
Branded	31.6	18.5	20.3	11.7	23.5	8.5	18.8	17.4	28.6	23.5
Plain with desc.	17.9	15.9	22.3	14.6	22.3	15.0	14.5	25.9	24.3	26.1
Plain no desc.	12.9	16.7	10.6	11.5	16.1	10.2	6.9	25.3	28.9	36.1

5.4.6.1 Male versus female ratings

For each of the ten packages viewed, participants were asked to rate whether they thought someone who chooses to smoke each brand would more likely be male, female or no difference. Responses for each package were coded as either 1 ("Female") or 0 ("Male", "No difference", or "Don't know).

Table 28 displays the percentage of respondents for each experimental condition agreeing that someone who chooses to smoke this brand is more likely to be female. Over 85% of respondents who viewed the branded packages agreed that the packs with pink coloured backgrounds (Benson & Hedges Superslim, DJ Mix Strawberry, and JPS American Pink) were female.

Table 29 displays the results of a logistic regression predicting whether people believed that the smoker of each pack was more likely to be female. When examining the package ratings for each of the ten packs in the three conditions, a main effect of condition was significant for five packages (Capri Baunilha, Dunhill Carlton Mint, Silk Cut Menthol, Virginia Slims Silver, and Vogue Bleue).

Some packages were less likely to be rated as female as colours, and descriptors were removed from the packaging; however, others were more likely to be rated as female as these features were removed, and only the brand name remained. Three packs in the *Plain* condition were significantly less likely to be rated as "female" than their counterparts in the *Branded* condition; all three of these packages had pink coloured backgrounds (Benson & Hedges, DJ Mix, and JPS American Pink). In contrast, four packs in the *Plain* condition were significantly more likely to be rated as "female" than their matching counterparts in the *Branded* condition (Capri Baunilha, Marlboro Gold, Silk Cut Menthol, Virginia Slims). Four packs in the *Plain, no descriptors* condition were significantly less likely to be rated as "female" compared to their *Branded* counterparts (Benson & Hedges Superslim, DJ Mix Strawberry, JPS American Pink, and Peel Sweet Melon), and four packs were significantly more likely to be rated "female" (Marlboro Gold Original, Silk Cut Menthol, and Vogue Bleue). Finally, four of the packs in the

Plain, no descriptors condition that originally had flavour descriptors (plus one described as Superslim) were less likely to be rated as "female" than their matching counterparts in the *Plain* condition (Benson & Hedges Superslim, Capri Baunilha, DJ Mix Strawberry, Dunhill Carlton Mint, and Peel Sweet Melon). On the other hand, three packages in the *Plain, no descriptors* condition were more likely to be rated as "female" (Silk Cut, Virginia Slims Silver & Vogue Bleue) than their counterparts in the *Plain* condition.

Table 29: Adjusted logistic regression predicting individual pack female image ratings (n= 636)

	χ^2	Significance	Odds Ratio	95% CI	Significance
Pack 1 – Benson & Hedges Superslim	9.93	p=0.128			
Branded (ref) vs. plain			*0.046*	*0.03, 0.08*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.015*	*0.01, 0.03*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.327*	*0.19, 0.56*	*p<0.001*
Pack 2 – Capri Baunilha	*26.37*	*p<0.001*			
Branded (ref) vs. plain			*3.43*	*2.26, 5.22*	*p<0.001*
Branded (ref) vs. plain, no descriptors			0.75	0.48, 1.16	p=0.193
Plain (ref) vs. plain, no descriptors			*0.22*	*0.14, 0.33*	*p<0.001*
Pack 3 – DJ Mix Strawberry	9.28	p=0.158			
Branded (ref) vs. plain			*0.12*	*0.07, 0.21*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.01*	*0.01, 0.02*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.09*	*0.05, 0.15*	*p<0.001*
Pack 4 – Dunhill Carlton Mint	*13.65*	*p=0.034*			
Branded (ref) vs. plain			1.58	0.92, 2.72	p=0.099
Branded (ref) vs. plain, no descriptors			0.74	0.40, 1.37	p=0.336
Plain (ref) vs. plain, no descriptors			*0.47*	*0.26, 0.84*	*p=0.010*
Pack 5 – JPS American Pink	5.93	p=0.431			
Branded (ref) vs. plain			*0.11*	*0.07, 0.18*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*0.01*	*0.003, 0.02*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.07*	*0.03, 0.13*	*p<0.001*
Pack 6- Marlboro Gold Original	4.80	p=0.570			
Branded (ref) vs. plain			*2.87*	*1.09, 7.55*	*p=0.033*
Branded (ref) vs. plain, no descriptors			*2.68*	*1.02, 7.07*	*p=0.046*
Plain (ref) vs. plain, no descriptors			0.93	0.45, 1.93	p=0.854
Pack 7 – Peel Sweet Melon	9.63	p=0.141			
Branded (ref) vs. plain			0.75	0.51, 1.11	p=0.145
Branded (ref) vs. plain, no descriptors			*0.09*	*0.06, 0.15*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*0.12*	*0.07, 0.20*	*p<0.001*
Pack 8 – Silk Cut Menthol	*14.82*	*p=0.022*			
Branded (ref) vs. plain			*2.80*	*1.81, 4.33*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*2.84*	*1.85, 4.38*	*p<0.001*
Plain (ref) vs. plain, no descriptors			1.02	0.69, 1.50	p=0.942
Pack 9 – Virginia Slims Silver	*14.64*	*p=0.023*			
Branded (ref) vs. plain			*4.53*	*2.87, 7.17*	*p<0.001*
Branded (ref) vs. plain, no descriptors			*7.20*	*4.56, 11.38*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*1.59*	*1.07, 2.35*	*p=0.020*
Pack 10 – Vogue Bleue	*32.15*	*p<0.001*			
Branded (ref) vs. plain			1.33	0.88, 2.02	p=0.183
Branded (ref) vs. plain, no descriptors			*3.58*	*2.37, 5.43*	*p<0.001*
Plain (ref) vs. plain, no descriptors			*2.70*	*1.80, 4.04*	*p<0.001*

Ratings for each participant were summed across the ten package ratings to create an index score between 0 and 10. Table 30 shows the means and standard deviations for the female ratings index for each of the three conditions. The highest mean female rating score was in the *Branded* condition; the lowest was for packs in the *Plain, no descriptors* condition.

Table 30: Female rating index scores (n=601)

Condition	Mean (SD)
Branded	4.72 (1.72)
Plain	4.06 (2.16)
Plain, no descriptors	2.65 (1.76)

Table 31 shows the results of a linear regression predicting female image rating scores for the overall index measure. A significant main effect was found, such that packs in the *Plain* condition and the *Plain, no descriptors* condition were less likely to be rated as "female" compared to their counterparts in the *Branded* condition. The packs in the *Plain, no descriptors* condition were also less likely to be rated as "female" compared to the packs in the *Plain* condition. The moderator smoking status was significant, such that smokers were more likely to rate the packs as "female" compared to non-smokers.

Table 31: Adjusted linear regression predicting female image rating index scores (n=599)

	Model (F)	Significance	Beta (β)	Significance	95% CI for β	Moderators (β, significance)
	20.17	*p<0.001*				*Smoking status*
Branded (ref) vs. plain			*-0.65*	*p=0.001*	*-1.01,-0.28*	*(non-smoker-ref*
Branded (ref) vs. plain, no descriptors			*-2.06*	*p<0.001*	*-2.43, -1.70*	*vs. smoker): 0.85 (p<0.001)*
Plain (ref) vs. plain, no descriptors			*-1.42*	*p<0.001*	*-1.78, -1.05*	

5.4.6.2 Other smoker traits

Participants were asked to rate each pack along five smoker image traits (female/male, stylish/not stylish, popular/ not popular, sophisticated/ not sophisticated, and slim/overweight). For each trait, respondents were scored as '1' if they selected the more desirable trait (e.g., female, stylish), and '0' if

they selected the less desirable trait (e.g., male, not stylish), no difference or don't know. Table 32 shows the number of packs endorsed for each trait across the ten packs viewed by each participant. Letters are used to indicate statistical significance between values based on linear regression models adjusting for age, smoking status, education and ethnicity. Values in each column with the same letter are significantly different at the $p < 0.05$ level.

Smoker image ratings were significantly lower in the plain condition than the branded condition for the following traits: female, style, and sophistication. Similarly, the ratings were significantly lower in the *plain, no descriptors* condition and the *branded* condition for the female, style, popularity, and sophistication traits. Finally, the ratings were significantly lower in the *plain, no descriptors* condition than the *plain* condition for the female, style and sophistication traits. There were no significant differences between any of the conditions for the slim/overweight smoker image trait.

Table 32: Index scores of perceived smoker image and significance levels between experimental conditions (n=623)

Condition	**Female** (mean, SD)	**Stylish** (mean, SD)	**Popular** (mean, SD)	**Sophisticated** (mean, SD)	**Slim** (mean, SD)
Branded	4.72^{ab} (1.72)	4.61^{ab}(2.75)	3.03^{ab}(2.53)	4.11^{ab}(2.77)	2.29 (2.58)
Plain	4.06^{ac} (2.16)	3.65^{ac} (2.64)	2.51^{a}(2.52)	3.43^{ac} (2.62)	2.12 (2.64)
Plain, no descriptors	2.65^{bc} (1.76)	3.02^{bc} (2.54)	2.42^{b}(2.51)	2.74^{bc} (2.46)	1.89 (2.25)

Note: values in each column with the same letter are significantly different at the $p < 0.05$ level.

5.4.6.3 Summary of positive traits

A summary score of the five smoker image traits was created by summing the ratings across each of the 10 packs, and the five image traits for a total score between 0 and 50. As shown in Table 33, the highest mean for the positive smoker image rating scores was in the *Branded* condition; the lowest was for packs in the *Plain, no descriptors* condition.

Table 33: Positive smoker image summary scores (n=586)

Condition	**Positive Traits** (mean, SD)
Branded	19.20[ab] (10.20)
Plain	16.11[ac] (10.68)
Plain, no descriptors	13.33[bc] (10.08)

Note: values in each column with the same letter are significantly different at the p <0.05 level.

Table 34 shows the results of a linear regression predicting positive image rating scores. A significant main effect was found, such that packs in the *Plain* condition and the *Plain, no descriptors* condition were less likely to be rated as having a "positive" smoker image compared to their counterparts in the *Branded* condition. The packs in the *Plain, no descriptors* condition were also less likely to be rated as having a "positive" smoker image compared to the packs in the *Plain* condition. The moderator "smoking status" was significant, such that smokers were more likely to rate the packs as having a "positive" smoker image compared to non-smokers.

Table 34: Linear regression predicting positive smoker image summary score (n=585)

	Model (F)	**Significance**	**Beta (β)**	**Significance**	**95% CI for β**	**Moderators (β, significance)**
	8.56	*p>0.001*				*Smoking status (non-smoker-ref vs. smoker): 5.23 (p<0.001)*
Branded (ref) vs. plain			*-3.12*	*p=0.003*	*-5.15, -1.10*	
Branded (ref) vs. plain, no descriptors			*-5.99*	*p<0.001*	*-7.99, -3.98*	
Plain (ref) vs. plain, no descriptors			*-2.86*	*p=0.005*	*-4.88, -0.85*	

5.4.6.4 Interactions between experimental condition and moderators for smoker image traits

Analyses were conducted to examine whether interactions existed between covariates and experimental condition for the smoker image indices. A significant two-way interaction was found between experimental condition and education for the slim index. Participants who had a high level of education and viewed branded packs were more likely to endorse the packs as smoked by someone 'slim' than participants with the same level of education who viewed plain packages (p=0.048).

5.5 Pack Offer Outcomes

At the end of the survey, participants were told that as part of this study, we would like to send them a pack of cigarettes to thank them for their participation, and were asked to select a package from one of four packages shown on the screen. The four packs displayed on screen were randomly selected from the 10 packs previously viewed in the study. Two packages were from the branded condition, and two packages were from the plain condition. Participants could select one of the brands or choose the option of not receiving a pack.

The main outcome measure was whether they choose "any" pack versus no pack at all, and of those who chose a pack, whether they were more likely to select a branded pack or plain pack. (Note: the participants did not actually receive any cigarette packs). As shown in Table 35, over half of participants elected to choose a package. Almost 40% of participants chose a branded package, and more than 12% chose a plain package. The remaining 47.9% indicated they did not wish to receive a package.

Table 35: Pack offer response (n=624)

Outcome	**% (n)**
Chose a branded pack	39.6 (247)
Chose a plain pack	12.5 (78)
Chose "I don't want a pack"	47.9 (299)

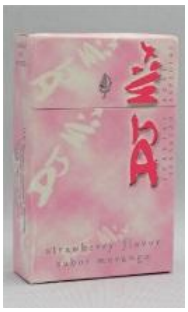
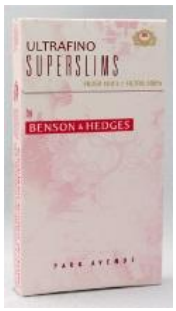
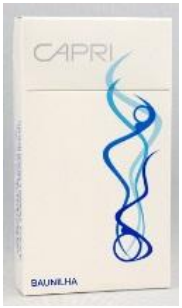
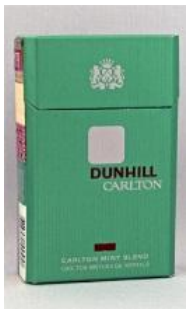
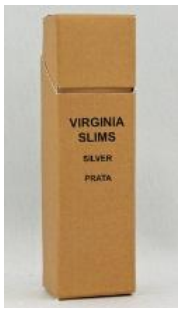
Responses to "As part of this study, we would like to send you a pack of cigarettes to thank you for your participation. Please select from one of the four packages below. You can also choose not to receive a package."

The packages shown in the pack offer were randomly selected, and thus each pack was expected to appear approximately an equal number of times. Some packages, however, were shown slightly more or less frequently due to chance. In order to 'adjust' for this, the number of times each pack was selected was divided by the number of times it was displayed. Table 36 displays the proportion of times each package was selected as a function of the number of times it ended up being displayed. The packages are displayed in order of those chosen most frequently to least frequently by participants.

After adjusting for the number of times each pack was displayed, eight of the top 10 most frequently chosen packages were branded. Of the participants who chose a package (branded or plain),

the most frequently chosen packages were the branded DJ Mix Strawberry flavour pack, JPS American Pink pack, Benson & Hedges Superslim pack, Virginia Slims Silver pack and the Peel Sweet Melon pack. These were the most colourful packs. The top four plain packages that were chosen most frequently all had flavour descriptors.

Table 36: Proportion of times package selected as a function of times displayed (n=624)

				
30.3%	29.3%	28.3%	27.8%	23.1%
				
19.0%	11.9%	11.1%	10.2%	10.1%
				
8.7%	8.7%	8.3%	6.9%	6.1%
				
5.6%	4.9%	4.3%	3.6%	2.8%

Note: Excludes 15 people who did not give permission to use their data on pack offer question, and 1 ‘missing’.

Participants who selected a package were asked about the reason they chose the package. Specifically, they were asked what they were most likely to do with the package. The reasons given are displayed in Table 37. More than 45% of the participants planned to smoke the cigarettes, and almost 40% planned to give the pack away as a gift.

Table 37: Anticipated use of package selected (n=323)

Anticipated use of package	**% (n)**
Smoke the cigarettes	45.5 (148)
Keep the pack, but don't smoke	12.7 (41)
Give the pack as a gift	38.4 (124)
Sell the pack	1.9 (6)
Other*	5.2 (4)

*"Other" responses mainly included a combination of two of the above options.

Table 38 shows the reasons participants indicated for choosing a package by those who selected a branded pack and those who selected a plain package. The majority (65.4%) of people who selected a plain package planned to smoke the cigarettes. In contrast, most people who selected a branded package planned to give the pack to someone as a gift (40.9%) or smoke the cigarettes themselves (39.3%). Most of the participants who selected a branded package with the purpose of giving it away as a gift were non-smokers (80%).

Table 38: Anticipated use of package chosen by package type selected (n=323)

	Type of package selected	
Anticipated use of package	**Branded package % (n)** (n=245)	**Plain package % (n)** (n=78)
Smoke the cigarettes	39.3 (97)	65.4 (51)
Keep the pack, but don't smoke	15.4 (38)	3.8 (3)
Give the pack as a gift	40.9 (101)	29.5 (23)
Sell the pack	2.4 (6)	0.0 (0)
Other	1.2 (3)	1.3 (1)

A logistic regression of sample characteristics predicting whether participants chose a pack or selected “I don’t want a pack” was conducted. The characteristic smoking status was significant, such that smokers were more likely to pick a pack than non-smokers (OR= 9.11; $p<0.001$; 95% CI=5.78, 14.34).

A logistic regression of sample characteristics predicting whether participants chose a branded pack or plain pack was also conducted. The characteristic smoking status was significant, such that smokers were less likely to pick a branded pack than non-smokers (OR=0.35; 95% CI=0.20, 0.61; $p<0.001$). Experimental condition was also significant, such that participants in the *plain, no descriptors* condition were more likely to pick a branded pack than people in the *branded* condition (OR= 2.25; 95% CI=1.14, 4.41; p=0.019).

6.0 Discussion

To my knowledge, this is the first experimental study to examine the impact of cigarette package design on consumers in Brazil. In addition, this study is among the first to examine the impact of "plain packaging" and restrictions on the use of brand descriptors on female youth.

6.1 Perceptions of Cigarette Brands on the Market in Brazil

This study provides evidence that the brand imagery and descriptors on packs currently available in Brazil influence young women's perceptions of cigarettes. The use of lighter coloured imagery, descriptors that highlight flavours and descriptors referring to lighter colours (e.g., the word 'silver' or 'gold') are particularly influential on perceptions. In the direct pack comparison, the packages labelled and designed as 'lighter' were more likely to be rated favourably. In fact, for most of the 'branded' pairs of packs, the 'lighter' pack was perceived as less harmful, better tasting, smoother on the throat, preferable to be seen smoking, preferable to try and easier to quit. Almost a quarter of participants had the misperception that the packs branded as 'lighter' would be less harmful and easier to quit.

Plain packaging reduced the number of youth who reported that either brand would taste better for two of the brands and reduced the desirability of being seen smoking either brand for one of the five pairs. In addition, regardless of condition (branded or plain), there were consistently a greater number of people who rated the 'lighter' pack more favourably (e.g., taste better, be less harmful, better to try, easier to quit) than the 'regular pack' showing that the descriptors and not just the imagery influence perceptions. The findings also indicate that removing colour and imagery can make the descriptors that remain on packs more noticeable, and more likely to have a greater influence on perceptions than when colours and brand imagery are present.

Although plain packaging did not impact the proportion of women in the study who indicated that there would be "no difference" between the two packs in terms of health risk, ease of quitting, or packs they would rather try, this does not necessarily mean that the plain packaging was ineffective in reducing

false beliefs. Instead, it may have just indicated that the women in Brazil were already informed that all cigarettes were harmful and difficult to quit.

6.2 Perceptions of International Brands Targeted Towards Females

Removing colour and descriptors significantly reduced **brand appeal** for the individual pack ratings. Across the brands, the greatest decrease in brand appeal was seen when both brand imagery and descriptors were removed from packages. Removing brand imagery from the packages significantly lowered brand appeal for six of the 10 individual packs. For the majority of individual packs, further decreases in brand appeal were evident when descriptors were removed from the plain packages. These findings are consistent with previous studies which suggest that when cigarette packages are stripped of their colour, imagery and fonts, adolescents find the packs less appealing (Doxey & Hammond, 2011; Hammond, Doxey, Daniel, & Bansal-Travers, 2011; Germain et al., 2010).

A few plain packages without descriptors were actually more likely to be rated as appealing than the corresponding plain packages with descriptors. For example, the Vogue pack was rated as 'more appealing' by a significantly greater proportion of women after the descriptor 'Bleue' was removed. By removing the descriptor, the popular brand name 'Vogue' became a more prominent and desirable feature, increasing the appeal of the product. This highlights the influence that brand family names can have in shaping consumer perceptions. Certain well-known brand names, which are arguably targeted towards young adults, can increase the appeal of a product, regardless of whether colour and imagery are present. Furthermore, although many of these brand names originated in Western society, people in other countries still recognize them as desirable. Vogue and Virginia Slims for example, are not Portuguese terms, but the women still appeared to recognize the terms as feminine and appealing. If plain packaging is implemented, one can expect that the tobacco industry will innovate to create not only more appealing brand descriptors, but more alluring brand names.

Removing imagery and descriptors was particularly influential on smoker's **perceptions of taste**. This was especially true for the five flavoured cigarette packages. After the flavour descriptors were

removed from these packs, they were less likely to be perceived as better tasting. This finding indicates that plain packaging and greater restriction on descriptors—or even prohibiting flavoured cigarettes—could reduce positive perceptions of taste, and potentially undermine a smoker's desire to smoke. Previous studies have concluded that flavoured cigarettes can be especially attractive to potential new smokers because the brands are targeted to youth as smoother, milder, less harsh, and overall more palatable (Lewis & Wackowski, 2006). In many ways, this conclusion is consistent with our findings, where women who smoke were enticed by the descriptors and more likely to believe the packs with flavour descriptors would taste better. At the same time, it is worth noting that in this study the non-smokers were actually less likely to be persuaded by flavour descriptors. One explanation for this is that these individuals may have been unaware or unfamiliar with the initial aversive taste of cigarettes, and not intrigued by the flavours. Alternatively, they may have simply been less susceptible to smoking in the first place. Future research should examine differences in taste ratings by smoking experience (e.g., ever smoked) and smoking susceptibility.

Removing brand imagery from the packages had a significant impact on perceived **health risk** for one of the ten packages (Peel Sweet Melon). Although it was hypothesized that plain packaging would reduce the misperception that particular brands were less harmful than others, a significant difference between conditions was not observed for most of the packages. One reason this difference may not have been observed is a "floor effect" in the health risk ratings. For the majority of the packs, less than 15% of the participants in the branded conditions rated the packs as 'less harmful compared to others available in stores'. Therefore, there was little room for this proportion to significantly decrease across conditions, particularly given the level of statistical power to detect differences between conditions with the sample size of the study.

The presence of a floor effect may indicate that the tobacco control messages in Brazil have been effective in communicating that all cigarette brands are equally harmful, and that there are no "safe" cigarettes. The effectiveness of packaging and descriptors on perceptions of health risk may be much different in other low-and middle-income countries where there is less awareness regarding the effects of

smoking. For example, when a similar study was conducted in Mexico, over 50% of the participants viewing the branded packs agreed that the package would be less harmful than others on the market for certain packages (Hammond & Reid, 2011).

Across the brands, **perceived smoothness** was lowest for plain packs without descriptors. Removing the brand imagery significantly reduced smoothness ratings for four packs –the four packages that were also rated most frequently as "female". This suggests that consumers may assume that the packs with a more feminine appearance are more gentle or smooth on the throat. Previous research indicates that perceived smoothness is an important predictor for smoking initiation among youth and is strongly correlated with perceptions of risk (Wayne & Connolly, 2002; Borland et al., 2004; Hammond et al., 2009). Brands perceived as smooth may promote experimental or smoking initiation by reducing harshness and irritation (Wayne & Connolly, 2002). For many smokers, the physiological sensation of smoothness serves as a cue that certain brands may be less harmful (Borland et al., 2004). In this study, smokers were more likely to rate certain packages as 'smoother on the throat' than non-smokers. It is possible that the smokers were more likely to perceive differences in terms of smoothness because they are more familiar with the sensations and physiological cues.

One of the initial hypotheses was that packs with overtly feminine designs and descriptors would be perceived more favourably in terms of appeal and taste. The findings are consistent with this hypothesis. The packs in the branded condition with more feminine colour backgrounds (e.g., pinks, light green), and more sophisticated designs (the black Virginia Slim pack) were rated more favourably than the packs that were arguably more gender neutral (e.g., the white Marlboro Original Gold, and darker green Dunhill Carlton Mint). The smaller 'slim' and 'lipstick' packages were also rated relatively favourably, even in the plain conditions. In fact, these smaller packages were rated as "more appealing" by the largest proportion of people across all 10 packs in the 'plain, no descriptors' condition. It is unclear whether this was due to the "slim" pack shape or the overtly feminine brand family names that remained on packs (e.g., Silk Cut, and Virginia Slims). These findings suggest that regulators may need to consider restricting pack size and shape if they wish to reduce brand appeal among young women.

6.3 Smoker Image

Plain packaging reduced the likelihood that young women will associate particular packs with attributes such as being female, stylish, and/or sophisticated. After removing the descriptors from packages, young women were even less likely to associate particular brands with these desirable attributes. For example, when flavour descriptors and slim descriptors were removed from packs, young women were significantly less likely to associate packs with female smokers. These findings add to the evidence that cigarette packaging acts as a type of "lifestyle" advertising, helping tobacco companies establish a particular brand image and "position" their brands by creating an association between the brand and positive lifestyle characteristics, such as style. The findings also add to the growing evidence that implementing plain packaging and more extensive restrictions on descriptors can decrease the likelihood of young women associating particular brands with desirable characteristics (Hammond, et al., 2011; Germain et al., 2010).

There was no significant difference between experimental conditions in perceptions of "slim" as a smoker trait. The proportion of people who associate certain packages with "slim" characteristics was much lower in the present study than in other countries where similar studies have been conducted. For example, in a study based in Mexico, more than 60% of participants in the branded condition rated individual packs as "more likely to be smoked by someone slim" Hammond & Reid , 2011). In Brazil, however, a maximum of 32% of people in the branded condition held this belief for any individual brand. A few possible explanations for this finding exist. First, women in Brazil may have different beliefs about the effects of smoking on weight, or may not associate different packs with weight - potentially a result of strong educational messaging in Brazil. Alternatively, cultural differences may have existed such that the Portuguese translation of the word 'overweight' may have had more negative connotations in Brazil than it did in Mexico, and subsequently may have lead participants to be less likely to associate a pack with being overweight. The cognitive interviews conducted for pre-testing the survey did not indicate any issues with the translation of the words 'slim' or 'overweight'. One individual commented that they rated a pack as slim because they thought it was glamorous, and that in turn was related to being thin; another

chose overweight because they thought the pack was wider. The feedback did however provide qualitative indication that the women in Brazil may simply not associate packs with weight. Three of the five pre-testing respondents commented that they did not think there was a link between that characteristic and the packages.

6.4 Pack Offer

The pack offer question at the end of the survey provides additional evidence that branded packages are more desirable to young women. More than 52% of participants accepted the pack offer at the end of the study, and branded packs were 3 times more likely to be selected than plain packs, consistent with previous research (Hammond et al., 2011). This question also demonstrated that as one might expect, plain packages with more engaging brand names and descriptors were more likely to be selected than those with less interesting names and descriptors. The two plain packages that were chosen most frequently had flavour descriptors that would likely appeal to young women (DJ Mix Strawberry, and Peel Sweet Melon). This finding highlights the appeal of flavoured cigarettes to young women (Lewis & Wackowski, 2006), and consequently provides support for increased restrictions on use of flavour descriptors, and even restrictions on the production of flavoured cigarettes which are arguably meant to target youth.

The pack offer question provided a behavioural measure of general appeal. The order in which the packs were chosen most frequently was generally consistent with the ratings of appeal in the individual pack rating section. In fact, the five packs chosen most frequently in the pack offer were also among the five packs that were most frequently rated as appealing in the branded condition of the individual pack rating question. This consistency provides a measure of validation for the pack rating questions as meaningful proxy measures that can predict how consumers may actually behave.

Among those who selected a pack, most respondents said they planned to smoke the cigarettes themselves. Over 65% of people who chose a plain package said they planned to smoke the cigarettes

themselves. The majority (>40%) of people who chose a branded package also said they planned to smoke the cigarettes; although a large proportion (39%) also said that they planned to give the pack away as a gift. but this was likely because they were mainly non-smokers. The non-smokers likely did not want to smoke them but recognized that the packs were valuable and could be used by friends who smoke.

6.5 Socio-Demographic Predictors

It was initially hypothesized that the brand ratings would be moderated by age, education, race, and smoking status. As predicted, smokers were more likely than non-smokers to rate the individual packs as having a better taste and being less harmful than others on the market. They were also more likely to rate some packs as being "smoother" on the throat. People with higher education were no less likely to indicate that certain packs were less harmful than others; however, older participants were less likely to believe some packs would be less harmful than younger participants. People who identified as white were less likely to identify some packs as less harmful compared to people in the 'other' ethnicity category. Overall, although some socio-demographic differences were observed the direction and pattern of the findings was consistent among all sub-groups. This suggests that although the influence of packaging may be greater among some groups than others, the general effects of packaging are present among all groups examined in the study.

6.6 Strengths and Limitations

Participants in this study were recruited from an online commercial panel of volunteers rather than through a population-based sample. The sample was limited to individuals with internet access who were thus likely to have a higher degree of education and income than the general population. As a result, the findings may not necessarily be representative of all female youth in Brazi1. Findings in a less educated sample may have been slightly different. For example, people in the general population may have higher levels of illiteracy than the sample that enrolled in the online study. The participants in this study may have been better able to read and comprehend the brand names and descriptors on the plain packaging than people in the general population. As a result, the study sample may have been more likely

to perceive differences between plain packages with ‘lighter’ and ‘regular’ descriptors. Some degree of selection bias was also likely given that participants self-selected into the study by enrolling in GMI's participant panel; however, participants were unaware of the topic of the study when beginning the survey.

It is not possible for packaging studies to replicate human behaviour as it occurs in “real-life”. Multiple factors such as package display, advertising, peer influence and even the weight and feel of packs may enhance the influence of package design. Therefore, the findings may have actually underestimated the impact of package design. The online administration of the survey also may have influenced the realism of the pack rating and selection experience. The participants were only able to view an image of the front of the package and as such were not able to see the graphic health warning on the reverse side of the package. It is unknown how strongly this might have impacted perceptions of harm and appeal.

Portuguese text was added to most of the cigarette packages to ensure that participants who did not read English would still be able to differentiate between the plain packages. This additional text may have lead many of the plain packages to appear more cluttered and may have lowered the pack appeal ratings. Nonetheless, it was essential to include this information as to reduce bias in the results based on English literacy. Moreover, it is likely that if plain packaging was introduced in Brazil that more Portuguese text would be added to the packages, similar to the current study.

The current study has several notable strengths. The inclusion of the pack selection task allowed brand appeal to be assessed using not only a 5-point Likert scale within the individual pack ratings section of the questionnaire but also as a behavioural measure. The study helped to address an important evidence gap regarding the effect of cigarette packaging in low and middle income countries. Finally, this study involved random assignment to experimental conditions which increases the internal validity of the findings.

6.7 Future Research

There are a number of additional analyses that may be useful to conduct in the future to assess the effect of covariates. First, in the present study, the main effect regression models for the individual pack ratings were adjusted for age, smoking status, education level and race/ethnicity. Interactions between these covariates and the experimental conditions were examined by adding the interaction term to the regression model. In the future, further hypothesized covariates, including sensation seeking, smoking susceptibility, attitudes and beliefs towards smoking, and health beliefs about smoking could be added to the regression model and examined. The health belief questions could be assessed using a summary index, where a score of '1' would be assigned each time the respondents "correctly" answer a health question. Second, the significance tests conducted for the pack comparison task did not adjust for covariates. Future analyses should examine the effect of these covariates, and any interactions with the experimental conditions. It would also be useful to create a summary scale in the pack comparison task to assess the overall effects across the five brand pairs. A score of '0' could be assigned each time the respondents selected 'no difference' and '1' if they chose either of the two packages. The scores could then be summed across the five brand pairs for a total score between 0 and 5.

The present study focused on the impact of cigarette package design specifically among female youth. Female youth were chosen as a study population partially for feasibility reasons (i.e., to limit the cost and scope of the project), and partially because it is believed that design techniques in packaging may be especially influential among young females (CDC, 2001). Future packaging research should examine the impact of plain packaging and brand descriptors on male youth. It is possible that males would be affected by package design in a different way, and it would be helpful to identify specific aspects that may lead them to have false beliefs about smoking.

The implementation of plain packaging regulations in Australia, scheduled for July 2012, provides a unique opportunity to examine the impact of pack branding and plain packaging. Research should examine the impact of the regulations on brand appeal and perceptions of risk among youth, as well as among established adult smokers. In particular, research should consider the extent to which the

regulations result in brand switching versus an overall decline in prevalence, perhaps due to lower initiation.

7.0 Conclusions

The present study examined the impact of cigarette packaging among young women in a critical region for global tobacco control. Overall, the study provides strong support for the potential effectiveness of plain packaging and greater restrictions on brand descriptors. Plain packaging and removing brand descriptors reduced the appeal of cigarette brands, associations with positive attributes, as well as several key false beliefs about smoking. Participants who were shown plain packs stripped of their colours, fonts, and imagery were significantly less likely to rate the packs as appealing, better tasting, smoother on the throat, and less likely to associate them with female smokers, being stylish and being sophisticated compared to those who were shown branded packages. When flavour descriptors and light colour descriptors were removed from the plain packaging, the participants were even less likely to rate the packs favourably. This indicates that the current restrictions on brand descriptors such as "light" and "low-tar" are not sufficient, and should be extended to include terms that make reference to flavours, and lighter colours. The finding from this study are generally consistent with a quote from tobacco industry documents which suggested that brand choices youth make are often based less on minor differences in sensory properties, and more psychological and image factors, including brand appeal (British American Tobacco, 1978).

Although removing the brand imagery in this study did not significantly impact ratings on health risk, this does not necessarily mean that plain packaging is ineffective in reducing misperceptions; instead, it likely signalled a low baseline in the ratings where most people in Brazil were already aware that there are no "safe" cigarettes. Furthermore, when women in Brazil were shown two packages from the same brand family, they were almost always more likely to rate the pack with the lighter colour descriptors and flavour descriptors as less harmful, better tasting, smoother on the throat, preferable to try and be seen smoking.

The findings highlight that the impact of plain packaging varies to some extent by brand: some designs and descriptors are inherently more appealing than others. Among young women, plain packaging

was particularly effective for brands with overt feminine elements. Therefore, plain packaging may reduce the ability to target young women—a key target group for the industry in many low and middle income countries.

Packaging elements that remain after colour and imagery are removed, including descriptors, brand family names, and pack size, can still influence perception of appeal and are likely to have a relatively greater influence than in the presence of colour and brand imagery. Several countries, such as Malaysia and Thailand, have prohibited a range of descriptors other than "light" and "mild" (Hammond, 2011). In addition, the proposed plain packaging regulations in Australia will address concerns related to the influence of pack design by standardizing the shape and size of packs. The current findings suggest that both of these measures will be important components in reducing false health beliefs and brand appeal among young people.

This study provided information about the impact of package design in a middle-income country with advanced tobacco control policies. Many of the findings in this study are consistent with those obtained from similar studies in other countries. There were, however, some notable differences between the current findings and studies conducted in Mexico and Australia using a very similar protocol. The "baseline" level of beliefs and perceptions varied considerably across countries. In Mexico, for example, as many as 90% of youth respondents selected one brand variety among brand pairs as less harmful; in Australia, the prevalence of false beliefs was generally around 50%, much closer to the current findings from Brazil (Hammond & Reid, 2011;Hammond et al., 2010). These contrasts highlight differences between countries in terms of beliefs, and likely education and awareness regarding smoking. However, the impact of plain packaging and removing descriptors was very similar across all three countries, with few exceptions. The consistent findings across countries suggest that the effects of plain packaging are not particularly dependent upon geographic or cultural context. Overall, these findings support recommendations in Article 11 of the Framework Convention on Tobacco Control and the proposed plain packaging regulations in Australia.

References

Alliance of Australian Retailers Pty Ltd. (2010). *The Alliance of Australian Retailers Pty Ltd: What we stand for.* Retrieved November 25, 2010, from http://www.australianretailers.com.au/

Beasley, L. [VP for marketing at RJR - testimony] recorded by Stirewalt & Associates. (1998, April 20). *State of Minnesota et al., vs. Philip Morris Incorporated. Transcript of Proceedings. Direct Examination – Lynn J. Beasley.* Bates No. 523780344/0637. Retrieved November 30, 2010 from http://legacy.library.ucsf.edu/tid/vts40d00

Beede, P., & Lawson, R. (1992). The effect of plain packages on the perception of cigarette health warnings. *Public Health, 106*(4), 315-322.

Borland, R., Yong. H., King, B., Cummings, K.M., Fong, G., Elton-Marshall, T., Hammond, D., McNeill, A. (2004). Use of and beliefs about light cigarettes in four countries: Findings from the International Tobacco Control Policy Evaluation Survey. *Nicotine & Tobacco Research*, 6, S311-S321.

Borland, R., Fong, G.T., Yong, H.H., Cummings, K.M., Hammond, D., King, B., … Zanna, M.P. (2008). What happened to smokers' beliefs about light cigarettes when "light/mild" brand descriptors were banned in the UK? Findings from the International Tobacco Control (ITC) Four Country Survey. *Tobacco Control, 17*(4), 256-62.

British American Tobacco. (1978). *The vanishing media*. British American Tobacco. Bates No. 500062147/2159. Retrieved October 15, 2010, from http://legacy.library.ucsf.edu/tid/jlf17a99

Campaign for Tobacco-Free Kids. (2009). *Tobacco Industry Profile – Latin America.* Retrieved August 15, 2010, from http://www.tobaccofreecenter.org/files/pdfs/en/IW_facts_countries_%20Latin America.pdf

Campaign for Tobacco-Free Kids. (2010). *Brazil: Overview.* Retrieved August 15, 2010, from http://tobaccofreecenter.org/resources_country/brazil

Carpenter, C.M., Wayne, G.F., & Connolly, G.N. (2005). Designing cigarettes for women: new findings from the tobacco industry documents. *Addiction, 100,* 837-851.

Carr-Gregg, M.R., & Gray, A.J. (1990). Generic packaging – a possible solution to the marketing of tobacco to young people. *Medical Journal of Australia, 153*, 685-686.

Carter, S. (2003). Going below the line: creating transportable brands for Australia's dark market. *Tobacco Control, 12*(Suppl 3), iii87-iii94.

Cavin, S.W., & Pierce, J.P. (1996). Low-cost cigarettes and smoking behaviour in California, 1990-1993. *American Journal of Preventive Medicine, 12*(1),17-21.

Central Intelligence Agency [CIA]. (2010). *The World Fact Book – Brazil.* Retrieved August 24, 2010, from https://www.cia.gov/library/publications/the-world-factbook/geos/br.html

Centres for Disease Control and Prevention [CDC] (US). (2001). *Women and Smoking: A Report of the Surgeon General*. Atlanta, GA: Centres for Disease Control and Prevention. Retrieved November 28, 2010, from http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=womsmk&part=A9658#A9788

Centers for Disease Control and Prevention. (2009). *Smoking and Tobacco Use: GYTS: Brazil, Rio de Janeiro Fact Sheet*. Retrieved November 28, 2010 from http://www.cdc.gov/tobacco/global/gyts/factsheets/amr/2005/brazilriojaneiro_factsheet.htm

Chapman, S. & Freeman, B. (2010). The cancer emperor's new clothes: Australia's historic legislation for plain tobacco packaging. *British Medical Journal, 340*, 1035.

Cummings, K.M., Hyland, A., Lewit, E., & Shopland, D. (1997). Discrepancies in cigarette brand sales and adult market share: are new teen smokers filling the gap? *Tobacco Control, 6*(suppl 2), s38-s43.

Cummings, K.M., Morley, C.P., Horan, J.K., Steger, C., & Leavell, N.R. (2002) Marketing to America's youth: evidence from corporate documents. *Tobacco Control, 11*(suppl 1), i5-i17.

Curry, S.J. Grothaus, L., & McBride, C. (1997). Reasons for quitting: intrinsic and extrinsic motivation for smoking cessation in a population-based sample of smokers. *Addictive Behaviours, 22*(6), 727-739.

Dewhirst, T. (2004). POP goes the power wall? Taking aim at tobacco promotional strategies utilised at retail. *Tobacco Control, 13*(3), 209-210.

DiFranza, J.R., Eddy, J.J., Brown, L.F., Ryan, J.L., & Bogojavlensky, A. (1994). Tobacco acquisition and cigarette brand selection among youth. *Tobacco Control, 3*, 334-338.

Doxey, J. (2009). *Deadly in pink: The impact of female-oriented cigarette packaging on brand appeal, beliefs about smoking and risk perceptions among young women.* (Master's thesis, University of Waterloo). Retrieved from http://hdl.handle.net/ 10012/4823

Doxey, J., & Hammond, D. (2011). Deadly in pink: the impact of cigarette packaging among young women. *Tobacco Control*, (epub) doi:10.1136/tc.2010.038315

Food and Agriculture Organization of the United Nations [FAO]. 2003. *Issues in the global tobacco economy – selected case studies. Rome.* Retrieved August 12, 2010 fromhttp://www.fao.org/docrep/006/y4997e/ y4997e09.htm#TopOfPage

Freeman, B., Chapman, S., & Rimmer, M. (2008). The case for the plain packaging of tobacco products. *Addiction, 103*(4), 580-590.

Gallopel-Morvan, K., Moodie, C., Hammond, D., Eker, F., Beguinot, E., & Martinet, Y. (2010, July 2). Consumer understanding of cigarette emission labelling. *European Journal of Public Health Advance Access,* 1-3.

Germain, D., Wakefield, M., & Durkin, S.J. (2010). Adolescent's perceptions of cigarette brand image: does plain packaging make a difference? *Journal of Adolescent Health, 46*(4), 385-392.

Goldberg, M.E., Liefeld, J., Kindra, G., Madill-Marshall, J. Lefebvre, J.,…Vredenburg, H (1995). *Expert Panel Report: When packages can't speak: possible impacts of plain and generic packaging*

of tobacco products. Bates No. 521716345/6771. Retrieved October 7, 2010, from http://legacy.library.ucsf.edu/tid/rce50d00

Goldberg, M.E., Liefeld, J., Madill, J., & Vredenburg, H. (1999). The effect of plain packaging on response to health warnings. *American Journal of Public Health, 89*(9), 1434-5.

Grewal, D. L., Levy, M., Persaud, A., & Lichti, S. (2009). *Marketing.* United States: McGraw-Hill Ryerson Limited.

Hallal, A.L., Gotlieb, S.L., Almeida, L.M., & Casado, L. (2009). Prevalence and risk factors associated with smoking among school children, Southern Brazil. *Revista de Saude Publica, 43*(5), 779-788.

Hammond, D. (2006). Canada: a new angle on packs. *Tobacco Control, 15*(3), 150.

Hammond, D. (2009). *Tobacco labelling & packaging toolkit: A guide to FCTC Article 11.* Retrieved August 15, 2010, from http://davidhammond.ca/Old%20Website/Publication%20new/Labelling Tookit%20-%20Final%20(March%202009).pdf

Hammond, D., Dockrell, M., Arnott, D., Lee, A., & McNeill, A. (2009). Cigarette pack design and perceptions of risk among UK adults and youth. *European Journal of Public Health, 19*(6), 631-637.

Hammond, D., & Parkinson, C. (2009). The impact of cigarette package design on perceptions of risk. *Journal of Public Health (Oxford), 31*(3), 345-53.

Hammond, D. (2010a). *Tobacco Labelling Resource Centre.* Retrieved November 15, 2010, from http://www.tobaccolabels.ca/

Hammond, D. (2010b). International Cigarette Packaging Study. Waterloo, ON: University of Waterloo.

Hammond, D., Wakefield, M., Reid, J. et al. (2010, November). Australia packaging study: preliminary findings. Waterloo, ON: University of Waterloo.

Hammond, D. (2011). *Thailand – Tobacco Labelling Regulations.* Retrieved August 22, 2011 from http://www.tobaccolabels.ca/healthwarningimages/country/thailand

Hammond, D., Doxey, J., Daniel, S., & Bansal-Travers, M. (2011). Impact of female-oriented cigarette packaging in the United States. *Nicotine & Tobacco Research*, 13(7), 579-588.

Hammond, D., & Reid, J. (2011). *International cigarette packaging study: Mexico. Technical report.* Waterloo, University of Waterloo.

Hulit, M. (1994). *Marketing Issues Corporate Affairs Conference. May 27, 1994 – Manila.* Bates No: 2504015017/5042. Retrieved October 15, 2010, from http://legacy. library.ucsf.edu/tid/jga42e00

Hyland, A. Li, Q., Bauer, J.E., Giovino, G.A., Steger, C., & Cummings, K.M. (2004). Predictors of cessation in a cohort of current and former smokers followed over 13 years. *Nicotine & Tobacco Research, 6*(3), S363-S369.

Iglesias, R., Jha, P., Pinto, M., Luiza da Costa e Silva, V., & Godinho, J. (2007). *Tobacco Control in Brazil.* Retrieved August 15, 2010, from http://siteresources.worldbank.org/HEALTHNUTRITION ANDPOPULATION/Resources/281627-1095698140167/BrazilTobaccoControlFinal.pdf

Instituto Brasileiro de Geografia e Estatistica (IBGE). (2010). *Estimated Population.* Retrieved July 21, 2010, from http://www.ibge.gov.br/english/

Instituto Nacional de Cancer (INCA) (2008). *Brazil - Health warnings on tobacco products – 2009.* Retrieved August 15, 2010, from http://www.inca.gov.br/tabagismo/publicacoes/livro_advertencia_ ingles.pdf

Jurberg, C. (2009). Brazil and tobacco use: a hard nut to crack. *Bulletin of the World Health Organization, 87*(11), 805-885. Retrieved August 15, 2010, from http://www.who.int/bulletin/ volumes/87/11/09-031109/en/index.html

Lee, K., Chagas, L.C., & Novotny, T.E. (2010). Brazil and the framework convention on tobacco control: global health diplomacy as soft power. *PLoS Medicine, 20*(7).

Lewis, M.J., & Wackowski, O. (2006). Dealing with an innovative industry: a look at flavored cigarettes promoted by mainstream brands. *American Journal of Public Health, 96,* 244-251.

Lynch, B.S., & Bonnie, R.J. (Eds.). (1994). *Growing up tobacco free: preventing nicotine addiction in children and youths.* Washington, DC: National Academy Press. Retrieved July 15, 2010 from, http://www.nap.edu/openbook.php?record_id= 4757&page=6

Makomaski Illing, E., & Kaiserman, M. (2004). Mortality attributable to tobacco use in Canada and its regions, 1998. *Canadian Journal of Public Health , 95*(1), 38-44.

Mathers, C.D., & Loncar, D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Medicine, 3*(11), 2011-2030.

Manning, K.C., Kelly, K.J., & Comello, M.L. (2009) Flavoured cigarettes, sensation seeking and adolescents' perceptions of cigarette brands. *Tobacco Control*, *18*, 459-465.

Miller A. Arthur D Little Inc. Liggett and Myers. (1963, October 14). *Development of Cigarette Packaging.* Bates No. AMSRLIG00000000.RM Retrieved from http://legacy.library.ucsf. edu/tid/irp76b00

Miller L. Group Research & Development Centre, British American Tobacco Co Ltd (1986, May 23). *Principles of measurement of visual standout in pack design*. British American Tobacco Co Ltd. Bates No. 102699347/9500. Retrieved from http:// legacy.library.ucsf.edu/tid/bks46a99

Ministério da Saúde (2007). *VIGITEL Brasil 2006 - Vigilância de fatores de risco e proteçâo para doenças por inquérito telefônico.* Brasilia: Ministério da Saúde. Pg.28 Retrieved August 15, 2010, from http://www4. ensp.fiocruz.br/informe/anexos/ relatorio_vigitel_2006_marco_2007.pdf

Morgan, J. [former CEO of Philip Morris Tobacco Company – testimony] in State of Minnesota and Blue Cross and Blue Shild of Minnesota, Plaintiffs, v. Philip Morris, Inc. et al.,. (1998, April 22). *Minnesota vs. Tobacco April 22, 1998.* Bates No. C1-94-8565. Retrieved November 30, 2010, from http://legacy.library.ucsf.edu/tid/rbo76b00

National Cancer Institute. (2001). *Smoking and Tobacco Control Monograph 13: Risks Associated with Smoking Cigarettes with Low Machine-Measured Yields of Tar and Nicotine*. (NIH Publication No.

02-5047). Bethesda, MD: US Department of Health and Human Services, Public Health Services, National Institutes of Health, National Cancer Institute. Retrieved from http://cancercontrol.cancer.gov/tcrb/monographs/13/

National Cancer Institute. (2008). *Tobacco Control Monograph No. 19: The role of media in promoting and reducing tobacco use.* (NIH Publication No. 07-6242). Bethesda, MD: US Department of Health and Human Services, National Institutes of Health, National Cancer Institute. Retrieved from http://cancercontrol.cancer.gov/tcrb/monographs/19/index.html

Newcomb, M.D., McGee, L. (1991). Influence of sensation seeking on general deviance and specific problem behaviors from adolescence to young adulthood. *Journal of Personality & Social Psychology*, 61, 614–628.

O'Hegarty, M., Pederson, L.L., Yenokyan, G., Nelson, D., & Wortley, P. (2007). Young adults' perceptions of cigarette warning labels in the United States and Canada. *Preventing Chronic Disease, 4*(2), 1-9.

Peace, J.., Wilson, N., Hoek, J., Edwards, R., Thomson, G. (2009) Survey of descriptors on cigarette packs: still misleading consumers? *The New Zealand Medical Journal, 122*, 90-96.

Philip Morris. (1969, Fall). *Why one smokes*. Bates No. 1003287836/7848 Retrieved from http://legacy.library.ucsf.edu/tid/pds74e00

Philip Morris. (1981, February 9). *Marketing Research Department Report: Marlboro Ultra Light Pack Study: Top line results*. Bates No. 2048718182/8194. Retrieved fromhttp://legacy.library.ucsf.edu/tid/fpc36e00

Philip Morris. Kelly Weedon Shute Advertising. (November 1989). *Philip Morris Cigarette marketing – A new perspective.* Philip Morris International. Bates No. 2501057693/7719. Retrieved from http://legacy.library.ucsf.edu/tid/lti49e00

Philip Morris International. (2010a). *Generic Packaging.* Retrieved September 6, 2010 from http://www.pmi.com/eng/tobacco_regulation/regulating_tobacco/pages/generic_packaging.aspx

Philip Morris International. (2010b). *Brazil.* Retrieved August 12, 2010 from http://www.pmi.com/marketpages/pages/market_en_br.aspx

Philip Morris International (2010c). *Plain packaging of tobacco products – issues with plain packaging.* Retrieved November 29, 2010, from http://www.plainpackaging.com/Templates/MediaTemplate.aspx

Philip Morris International. (2010d). *Regulating tobacco products.* Retrieved November 29, 2010, from http://www.pmi.com/eng/tobacco_regulation/regulating_tobacco/pages/regulating_tobacco.aspx

Pierce, J.P., Choi, W.S., Gilpin, E.A., Farkas, A.J., & Merritt, R.K. (1996). *Health Psychology, 15*(5), 355-361.

Pierce, J.P., Gilpin, E., Burns, D.M., Whalen, E., Rosbrook, B., Shopland, D., & Johnson, M. (1991). Does tobacco advertising target young people to start smoking? Evidence from California. *JAMA, 266*, 3154-3158.

Pollay, R.W. (2000). Targeting youth and concerned smokers: evidence from Canadian tobacco industry documents. *Tobacco Control, 9*, 136-147.

Pollay R,W. (2001). The role of packaging seen through industry documents: Expert Report prepared for: JTI-Macdonald., Imperial Tobacco Canada Ltd and Rothmans, Benson & Hedges Inc. v. Attorney General of Canada and Canadian Cancer Society (intervenor). Supreme Court, Province of Quebec, District of Montreal. Defense Exhibit D-116.

Robinson, T.N., Borzekowski, D.L.G., Matheson, D.M., & Kraemer, H.C. (2007). Effects of Fast Food Branding on Young Children's Taste Preferences. *Archives of Pediatrics & Adolescent Medicine, 161*(8), 792-797.

Rooke, C., Cheeseman, H., Dockrell, M., Millward, D., & Sandford, A. (2010). Tobacco point-of-sale displays in England: a snapshot survey of current practices. *Tobacco Control, 19*(4), 279-284.

Rootman, I., & Flay, B.R. (2003*). A Study on Youth Smoking: Plain Packaging, Health Warnings, Event Marketing and Price Reductions*. Retrieved October 7, 2010, from http://www.utoronto.ca/chp/download/RptsandPresents/youthsmoking.pdf

Scheffels, J. (2008). A difference that makes a difference: young adult smokers' accounts of cigarette brands and package design. *Tobacco Control*, *17*(2), 118-122.

Shiffman, S. Pillitteri, J.L., Burton, S.L., Rohay, J.M., & Gitchell, J.G. (2001). Smokers' beliefs about "light" and "ultralight" cigarettes. *Tobacco Control, 10*(S1), i17-i23.

Shrimp, T. (2010). *Advertising, Promotion, and Other Aspects of Integrated Marketing Communications. 8th Ed.* South-Western Cengage Learning, Mason, OH, p 35-36. Retrieved August 15, 2010, from http://books.google.ca/books?id=wUB9cczGxiAC&pg=PA36&lpg=PA36&dq=mcdonalds+plain+packaging&source=bl&ots=sUT8w8lTZg&sig=88B9kt2ZmP-Ulajs7EWVUvEDkLc&hl=en&ei=IatNTPHwD-bnnQfp0fHXCw&sa=X&oi=book_result&ct=result&resnum=10&ved=0CDoQ6AEwCQ#v=onepage&q&f=false

RJ Reynolds. (1991, May 15).*YAX/TSB Project Briefing.* Bates Number: 503795865/5885. Retrieved from http://legacy.library.ucsf.edu/tid/vyb85d00

Souza Cruz. (2010a). *The Cigarette Market.* Last updated June 10, 2010. Retrieved August 12, 2010 from http://www.souzacruz.com.br/group/sites/SOU_7YKDBY.nsf/vwPagesWebLive/DO7ZHFS?opendocument&SKN=1

Souza Cruz. (2010b). *Our Brands.* Last updated June 17, 2010. Retrieved August 12, 2010 from http://www.souzacruz.com.br/group/sites/SOU_7YKDBY.nsf/vwPagesWebLive/DO7ZWHZR?opendocument&SKN=1

Souza Cruz. (2010b). *Marketing.* Last updated June 18, 2010. Retrieved August 16, 2010 from http://www.souzacruz.com.br/group/sites/SOU_7YKDBY.nsf/vwPagesWebLive/DO7V9HYN?opendocument&SKN=1

Sweet, M. (2010). Australia to mandate plain packs for cigarettes as part of new tobacco control offensive. *BMJ, 340*, 993.

Taylor, R. (2011, August 24). Big tobacco to take Australia packaging fight to higher court. *Reuters.* Retrieved August 24, 2011 from http://www.reuters.com/article/2011/08/24/us-australia-smoking-idUSTRE77N0TC 20110824

Teague, C.E. Jr. (1973, February 2). *Research planning memorandum on some thoughts about new brands of cigarettes for the youth market.* RJ Reynolds Tobacco Company, Inc. Bates No. 502987357-502987368. Retrieved October 15, 2010 from http://legacy.library.ucsf.edu/tid/qvb76b00/pdf

Thrasher, J., Quah, A.C.K., Driezen, P., Borland, R., Dominick, G., Awang. R., Omar, M., Hosking, W., Sirirassamee, B., & Boado, M. (2010 – in progress). Technical report: Cross-cultural comparisons of International Tobacco Control Policy Evaluation (ITC) survey questionnaires: A multinational, multicultural and multilingual cognitive interviewing study. 96 p.

Vardavas, C.I., Connolly, G., Karamanolis, K., & Kafatos, A. (2009). Adolescents perceived effectiveness of the proposed European graphic tobacco warning labels. *European Journal of Public Health, 19*(2), 212-217.

Wakefield, M.A., Germain, D., Durkin, S.J. (2008). How does increasingly plainer cigarette packaging influence adult smokers' perceptions about brand image? An experimental study. *Tobacco Control, 17*(6), 416-421.

Wakefield, M., Morley, C., Horan, J., & Cummings, K. (2002). The cigarette pack as image: new evidence from tobacco industry documents. *Tobacco Control , 11* (Suppl 1), i73-i80.

Wassener, B. & Foley, M. (2010, April 29). Australia fights tobacco with taxes and plain packs. *New York Times.* Retrieved July 15, 2010 from http://www.nytimes.com/2010/04/30/business/global/30tobacco.html

Wayne, G.F. & Connolly, G.N. (2002). How cigarette design can affect youth initiation into smoking: Camel cigarettes 1983-93. *Tobacco Control, 11*(suppl.1), 132-139.

Wilson, N., Weerasekera, D., Peace, J., Edwards, R., Thomson, G., & Devlin, M. (2009). Misperceptions of "light" cigarettes abound: national survey data. *BMC Public Health, 9*, 126-137.

World Health Organization. (2003). *WHO Framework Convention on Tobacco Control.* Retrieved August 15, 2010 from http://www.who.int/fctc/text_download/en/index.html

World Health Organization. (2008a). *WHO Report on the Global Tobacco Epidemic, 2008: The MPOWER package.* Brazil: World Health Organization. Retrieved July 22, 2010, from http://whqlibdoc.who.int/ publications/2008/9789241596282_eng.pdf

World Health Organization (2009). *WHO Report on the Global Tobacco Epidemic.* France: World Health Organization. Retrieved July 22, 2010, from http://whqlibdoc.who.int/publications/2009/9789241563918_eng_full.pdf

World Health Organization (WHO). (2010a). *World Health Survey Results 2003: Report on Brazil*. Retrieved August 15, 2010, from http://www.who.int/healthinfo/survey/whsresults/en/index.html

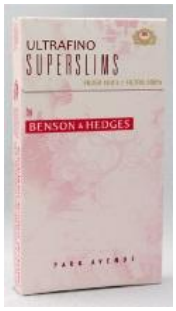
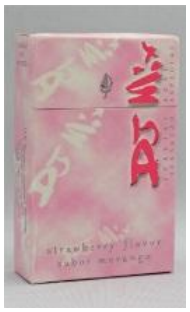
World Health Organization. (2010b). *Parties to the WHO Framework Convention on Tobacco Control.* Retrieved August 15, 2010, from http://www.who.int/fctc/signatories_parties/en/index.html

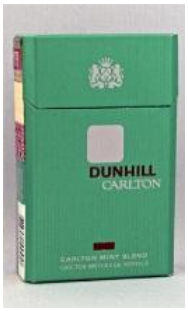
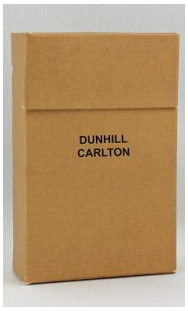
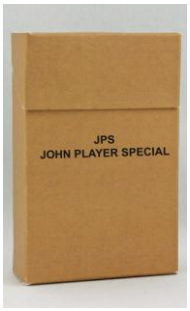
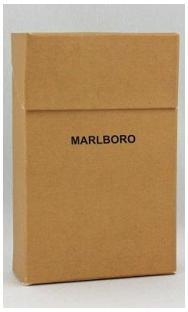
World Health Organization. (2008c). *Guidelines for implementation of Article 11 of the WHO Framework Convention on Tobacco Control (Packaging and labelling of tobacco products).* Retrieved August 15, 2010 from http://www.who.int/fctc/guidelines/article_11/en/index.html

Appendices

Appendix A: Cigarette Pack Images by Experimental Condition

Table 1: Individual pack ratings – female packs

Condition 1	Condition 2	Condition 3
1 		
2 		
3 		

Condition 1	Condition 2	Condition 3
4 		
5 		
6 		
7 		

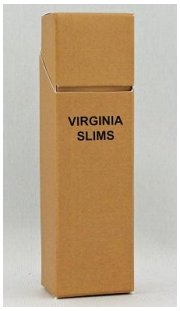
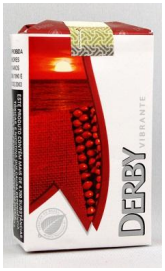
Condition 1	Condition 2	Condition 3
8 		
9 		
10 		

Table 2: Direct pack comparisons – real packages from Brazil

Condition 1			Condition 2	
				
				
				
				
				

Appendix B: Brazil Youth Packaging Study Questionnaire

SCREENER & INFO / CONSENT	
Welcome, and thank you for your interest in our cigarette packaging study! Please press "continue" to begin the study.	
age	Before we begin, how old are you? _____ "Unfortunately, we can only include people age 16 to 24 in this study. Sorry, you are not eligible to participate, but thank you for your time." "Click 'End Survey' button to complete survey and 'Continue' to close window" "Must be a number between 1 and 99"
gender	Are you…. 1 Female 2 Male "Unfortunately, we can only include females in this study. Sorry, you are not eligible to participate, but thank you for your time."
INTRODUCTION	
You are now going to be provided with some information about the study. Please read the following information carefully, and once you have read the study details and agree to them, you can begin the survey. • You are being asked to participate in a research study that asks for people's opinions about cigarette packaging. The Cigarette Pack Survey is being conducted by Dr. David Hammond of the University of Waterloo, Canada. • The survey takes approximately 20 minutes to complete. • You must be between 16 and 24 years of age to participate in this study. • Participation is voluntary and you may decline to answer particular questions if you wish. • In appreciation of your time, you will receive remuneration from GMI in accordance with their usual rate as a token of our thanks. • Your identity and all of the information you provide in this study will be kept strictly confidential - only the investigators and research assistants directly associated with the study will have access to this information. Study data, with no personal information, will	

be retained indefinitely in a secure location at the University of Waterloo.

- You are free to choose whether or not to participate in this study, and you can choose to stop being a part of it at any time. If you choose to discontinue the survey, you may receive remuneration by declining all further questions until you reach the end of the survey. Any data already collected may be used in the study, unless you contact the researcher to have it deleted.

- This study has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo. If you have any comments or concerns resulting from your involvement in this study, please contact Susan Sykes in the Office of Research Ethics at +01519-888-4567 ext. 36005 or ssykes@uwaterloo.ca.

- If you have any questions about the study you can contact Dr. David Hammond of the University of Waterloo at +01519-888-4567 ext. 36462 or dhammond@uwaterloo.ca.

CONSENT FORM

Based on the information you received, do you agree to take part in this research study being conducted by Dr. David Hammond of the University of Waterloo?

1 Yes

2 No

"Thank you for your time."

SMOKING BEHAVIOUR AND DEMOGRAPHICS

Thank you! Please be assured that all your responses will be kept entirely confidential.

Sb.puff	Have you ever smoked a cigarette, even just a few puffs? 1 Yes 2 No 88 Refused 99 Don't know
Sb.status	In the last 30 days, how often did you smoke cigarettes? 1 Every day 2 At least once a week, but not every day 3 At least once in the last 30 days, but not every week 4 I did not smoke in the last 30 days 88 Refused 99 Don't know

Sb.100cig	Have you smoked 100 cigarettes or more in your lifetime? 1 Yes 2 No 88 Refused 99 Don't know
Sb.consume	On average, how many cigarettes do you smoke each day? _____ [enter number] On average, how many cigarettes do you smoke each week? _____ [enter number] On average, how many cigarettes do you smoke each month? _____ [enter number] 77 Not applicable 88 Refused 99 Don't know
Sb.ttfc	How soon after waking do you usually have your first cigarette? 1 Within the first 5 minutes 2 6-30 minutes 3 31-60 minutes 4 More than 60 minutes 77 Not applicable 88 Refused 99 Don't know
Sb.quitplan	Are you planning to quit smoking cigarettes. . . 1 Within the next month? 2 Within the next 6 months? 3 Sometime in the future, beyond 6 months? 4 or are you not planning to quit? 77 Not applicable 88 Refused 99 Don't know
Sb.light	Have you ever tried light, mild or low-tar cigarettes? 1 Yes 2 No 88 Refused 99 Don't know
Sb.brand	a) Do you have a brand of cigarettes that you usually smoke? 1 Yes 2 No 77 Not applicable 88 Refused 99 Don't know b) What is the full name of your usual cigarette brand? **Please type the brand name, variety, and size in the boxes below.** Example: Marlboro, Red, 72

Sb.products	In the past month, have you used any of the following tobacco products? (Check all that apply) 1 Hookah/ shisha/ narghile/ water pipe 2 Bidis 3 Cigars/ small cigars/ cigarillos 4 Pipe 5 Smokeless tobacco (including chewing tobacco, snuff, or snus) 6 Other (specify): You indicated “Other”. Please specify: _____ 7 None of the above 88 Refused 99 Don’t know
Educ	What is the highest level of formal education that you have completed? 1 Have never attended school regularly 2 Some ‘educação infantile’ 3 Completed ‘educação infantile’ 4 Some ‘ensino fundamental‘ 5 Completed ‘ensino fundamental’ 6 Some ‘ensino médio’ 7 Completed ‘ensino médio’ 8 Some ‘ensino superior’, no degree 9 Completed ‘ensino superior’ degree 10 Some post-graduate, no degree 11 Completed post-graduate degree 12 Other (specify): You indicated “Other”. Please specify: _____ 88 Refused
Occup	Which of the following best describes your “main” work status over the past 12 months? 1 Employed, full-time job 2 Employed, part-time job 3 Attending school, full-time student 4 Attending school, part-time student 5 Homemaker 6 Unemployed, able to work 7 Unemployed, unable to work 8 Other (specify): You indicated “Other”. Please specify: _____ 88 Refused

Race	People in Brazil come from many racial and cultural groups. Are you . . . (Check all that apply) 1 White 2 Black 3 Asian 4 Pardo (mixed ancestry) 5 Indian 6 Another group (specify): What other racial or cultural group? _____ 88 Refused

ATTITUDES AND BELIEFS	
For the next few questions, we'd like to ask for your opinion about different cigarettes. There is no right or wrong answer—we are most interested in your thoughts.	
Att.overall	What is your overall opinion of smoking? Is it . . . ? 1 Positive 2 Neither positive nor negative 3 Negative 88 Refused 99 Don't know
Please indicate whether you agree, disagree, or neither agree nor disagree with each of the following statements.	
Att.society	Society disapproves of smoking. 1 Agree 2 Disagree 3 Neither Agree nor Disagree 88 Refused 99 Don't know
Att.nonsmok	Cigarette smoke is dangerous to non-smokers. 1 Agree 2 Disagree 3 Neither Agree nor Disagree 88 Refused 99 Don't know
Att.weight	Smoking helps people control their weight. 1 Agree 2 Disagree 3 Neither Agree nor Disagree 88 Refused 99 Don't know

Att.slim	Smoking helps people stay slim. 1 Agree 2 Disagree 3 Neither Agree nor Disagree 88 Refused 99 Don't know
Att.addict	Smoking cigarettes is addictive. 1 Agree 2 Disagree 3 Neither Agree nor Disagree 88 Refused 99 Don't know
Att.quit	It is difficult to quit smoking cigarettes. 1 Agree 2 Disagree 3 Neither Agree nor Disagree 88 Refused 99 Don't know
B.harsh	Cigarettes that taste strong and harsh are worse for your health. 1 Agree 2 Disagree 3 Neither Agree nor Disagree 88 Refused 99 Don't know
B.infreq	Smoking a cigarette every once in a while does not damage your health. 1 Agree 2 Disagree 3 Neither Agree nor Disagree 88 Refused 99 Don't know
B.target	Tobacco companies target young people. 1 Agree 2 Disagree 3 Neither Agree nor Disagree 88 Refused 99 Don't know
Att.info	Do you think that cigarette packages should have more health information than they do now, less information, or about the same amount as they do now? 1 More health information 2 Less health information 3 About the same 88 Refused 99 Don't know

HEALTH BELIEFS	
You will now be presented with a list of health effects and diseases that may or may not be caused by smoking cigarettes. Based on what you know or believe, does smoking cause . . .	
Hb.heart	Heart disease? 1 Yes 2 No 3 Don't Know 88 Refused
Hb.stroke	Stroke? 1 Yes 2 No 3 Don't Know 88 Refused
Hb.gang	Gangrene? 1 Yes 2 No 3 Don’t Know 88 Refused
Hb.impot	Impotence in male smokers? 1 Yes 2 No 3 Don't Know 88 Refused
Hb.baby	Harm to unborn babies? 1 Yes 2 No 3 Don't Know 88 Refused
Hb.lung	Lung cancer in non-smokers from breathing cigarette smoke? 1 Yes 2 No 3 Don't Know 88 Refused

PACK COMPARISONS	
You will now be shown a series of cigarette packs, in pairs. Please take a moment to look each pairs of packs as they are shown. For each pair, you will be asked several questions. If you do not currently smoke cigarettes, we would like you to answer as if you were to try each of these brands.	
PC.taste	Which brand do you think would taste better? 1 Brand A 2 Brand B 3 No difference 66 Refused / Don't know [If respondent selects '3' bring to a screen that says the following:] Please specify what you mean by "no difference": 4 Both brands would taste good 5 Neither brand would taste good
PC.smooth	Which brand do you think would be smoother on your throat? 1 Brand A 2 Brand B 3 No difference 66 Refused / Don't know
PC.harm	Which brand do you think would be less harmful? 1 Brand A 2 Brand B 3 No difference 66 Refused / Don't know
PC.seen	Which brand would you like to be seen smoking? 1 Brand A 2 Brand B 3 No difference 66 Refused / Don't know [If respondent selects '3' bring to a screen that says the following:] Please specify what you mean by "no difference": 4 I would like to be seen smoking either brand 5 I would not like to be seen smoking either brand

PC.try	Which brand would you rather try? 1 Brand A 2 Brand B 3 No difference 66 Refused / Don't know [If respondent selects '3' bring to a screen that says the following:] Please specify what you mean by "no difference": 4 I would try either brand 5 I would not try either brand
PC.quit	Which brand would make it easier to quit smoking? 1 Brand A 2 Brand B 3 No difference 66 Refused / Don't know

INDIVIDUAL PACK RATINGS AND SMOKER IMAGE	
You will now be shown a series of cigarette packs, one at a time. Please take a moment to look each pack as it is shown. For each pack, you will be asked several questions about the brand.	
IP.appeal	Compared to other brands you can buy in stores, how appealing is this brand of cigarettes? 1 A lot less appealing than other brands 2 A little less appealing 3 No difference 4 A little more appealing 5 A lot more appealing than other brands 88 Refused 99 Don't know
IP.taste	Compared to other brands you can buy in stores, how do you think these cigarettes would taste? 1 A lot worse than other brands 2 A little worse 3 No difference 4 A little better 5 A lot better than other brands 88 Refused 99 Don't know

IP.harm	Compared to other cigarette brands you can buy in stores, would these cigarettes be: 1 A lot less harmful than other brands 2 A little less harmful 3 No difference 4 A little more harmful 5 A lot more harmful than other brands 88 Refused 99 Don't know
IP.smooth	Compared to other brands you can buy in stores, how smooth do you think these cigarettes would be on your throat? 1 A lot less smooth than other brands 2 A little less smooth 3 No difference 4 A little more smooth 5 A lot more smooth than other brands 88 Refused 99 Don't know
Now we'll ask you several questions about the kind of person you think would smoke this brand. In your opinion, is someone who smokes this brand regularly **more likely** to be:	
Image.female	1 Female, 2 Male, or 3 No Difference 88 Refused 99 Don't know
Image.style	1 Stylish 2 Not Stylish 3 No Difference 88 Refused 99 Don't know
Image.pop	1 Popular, 2 Not popular, or 3 No Difference 88 Refused 99 Don't know
Image.soph	1 Sophisticated, 2 Not sophisticated, or 3 No Difference 88 Refused 99 Don't know
Image.slim	1 Slim, 2 Overweight, or 3 No Difference 88 Refused 99 Don't know

SMOKING SUSCEPTIBILTY	
Sus.future	Do you think in the future you might try smoking cigarettes? 1 Definitely not 2 Probably not 3 Probably yes 4 Definitely yes 77 Not applicable 88 Refused 99 Don't know
Sus.friend	If one of your best friends were to offer you a cigarette, would you smoke it? 1 Definitely not 2 Probably not 3 Probably yes 4 Definitely yes 77 Not applicable 88 Refused 99 Don't know
Sus.year	At any time during the NEXT YEAR, do you think you will smoke a cigarette? 1 Definitely not 2 Probably not 3 Probably yes 4 Definitely yes 77 Not applicable 88 Refused 99 Don't know

SENSATION SEEKING	
Please indicate whether you strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree with each of the following statements.	
Sensation.1	I would like to explore new and unusual places. 1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree 88 Refused 99 Don't know
Sensation.2	I like to do frightening things. 1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree 88 Refused 99 Don't know

Sensation.3	I like new and exciting experiences, even if I have to break the rules. 1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree 88 Refused 99 Don't know
Sensation.4	I prefer friends who are exciting and unpredictable. 1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree 88 Refused 99 Don't know

PACK OFFER	
Pack.offer.1	As part of this study, we would like to send you pack of cigarettes to thank you for your participation. Please select from one of the four packages below: You can also choose not to receive a package. I do not want a pack Pack A Pack B Pack C Pack D
Pack.offer.2	We are interested in your reason for choosing the pack you selected. What are you most likely to do with the package you chose? 1 I will smoke the cigarettes 2 Keep the pack for myself but don't smoke them 3 Give the pack to someone as a gift 4 Sell the pack to someone else 5 Other (specify): You indicated "Other". Please specify: _____ 77 Not applicable 88 Refused 99 Don't know

FEEDBACK AND END

That's all the questions we have for you today. Please take a moment to go over the following information.

Thank you for participating in our study – we appreciate your help.

- As we mentioned earlier, we are interested in people's opinions about cigarette packaging.
- We were interested in people's opinions related to package design, such as the use of color, graphics, and descriptive wording on packages and how they affect health-related perceptions, such as taste and potential health risk, as well as perceptions of brand quality and appeal.
- Different groups of participants were shown different types of cigarette packages: while some participants were shown "normal" branded packages, others were shown packages with the color and words removed so that we can compare responses from the different groups to see whether the color and words affect their opinions of packages.

DECEPTION DEBRIEFING:

- In the last question of the survey, you were told that we would send you a pack of cigarettes to thank you for completing the survey. However, we will NOT be sending any cigarette packs, mainly because we do not want to promote or endorse smoking in any way.
- The reason why we led you to believe we would send you a pack of cigarettes was to create more of a "real" decision about preferences for cigarette brands. In some cases, people may answer differently if they believe they will actually receive real brands. If we had told you what we were interested in, it might have impacted your choice of package.
- We apologize for any confusion or disappointment that this may have caused.
- Because some elements of the study are different from what was originally explained, we have some additional points for you to read and provide consent for if you are willing to allow us to use the information that you have provided. These items are a record that the purpose of the study has been explained to you, and that you are willing to allow your information to be included in the study.

Please answer the following questions regarding the scenario we presented.

I have read the Feedback Letter and I am aware of the true purpose of the study and that some details of the study had to be withheld. I understand that I will NOT receive any cigarette packs.

Yes
No

I give my permission for the researchers to use the data I provided on the pack choice question.

Yes
No

I have questions about the use of deception in this study and would like to contact the researchers to discuss these.

Yes
No

- We hope you understand the need for withholding some details of the study until the end. However, if you later want to discuss this further, or you think of some other questions, please do not hesitate to contact us if you have concerns or comments resulting from your participation.

- As a reminder, this study has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo. If you have any comments or concerns resulting from your involvement please contact either Susan Sykes in the Office of Research Ethics at 519-888-4567 ext. 36005 or ssykes@uwaterloo.ca, or Dr. David Hammond at 519-888-4567 ext. 36462 or dhammond@uwaterloo.ca. - We really appreciate your participation, and hope that this has been an interesting experience for you. - "For further information, please contact: David Hammond. Phone: 1-519-888-4567, ext. 36462. Email: dhammond@uwaterloo.ca"
That's everything for today. Thank you very much for your participation.

Appendix C: Cognitive Interviewing Materials

Interviewer Script

Welcome, and thank you for your interest in this cigarette packaging study. Today I am going to ask you to complete a questionnaire to find out what you think of smoking and cigarette packaging. Once you have completed the questionnaire, I will have some questions about how you arrived at your answer. We are NOT interested in finding out if you are correct or incorrect. We want to make sure we are asking questions in ways that you and other people clearly understand. I will explain this further once you complete the questionnaire – any questions or concerns in the meantime?

[Response]

Great. Could you please complete the following questionnaire?

[Provide the participant with a printed questionnaire and pencil. Collect the questionnaire once the participant has completed the questionnaire. If they have any questions while they are completing the survey, make a note of them, and tell them to answer the question as best as they can and that you will discuss the question and response options when they have completed the survey.]

Thank you. As I mentioned before, I am now going to ask you some questions to find out more about what you think about smoking. In the questions that follow, we want to find out more about what you think about smoking. We are NOT interested in finding out if you are correct or incorrect. We want to make sure that we are asking the questions in ways that you and other people clearly understand. Sometimes, it will seem like we are asking the same question over and over again. Please be patient with us. We do not doubt what you tell us. We just need to double-check that the questions are working like we think they are.

For some of the questions, I will ask you how you arrived at your answer. Again, this is not because we do not believe you. It will be like my asking you to tell me how many windows you have in your house by closing your eyes, visualizing your house, and your telling me how you go from room to room of your house in order to count the windows there. As an exercise, let's try that now. Please close your eyes, and tell me how many windows are in your house, by taking me from room to room."

[Response]

Thanks. Now, when we ask you a question and show you the possible responses from which you chose your response originally, I would like you to do the same thing. You can tell me your understanding of the question and take me through what your thoughts were as you decided on the response that was best for you.

Questionnaire with Probes

SECTION 1

1. How old are you? _____

2. What is the highest level of formal education that you have completed?
(Please circle your answer)

1 Have never attended school regularly
2 Some 'educação infantile'
3 Completed 'educação infantile'
4 Some 'ensino fundamental'
5 Completed 'ensino fundamental'
6 Some 'ensino médio'
7 Completed 'ensino médio'
8 Some 'ensino superior', no degree
9 Completed 'ensino superior' degree
10 Some post-graduate, no degree
11 Completed post-graduate degree
12 Other (please specify): _____

Q1: The responses refer to five different levels of education (further divided by whether the level was complete or incomplete).

a) Were you familiar with these 5 categories?

Yes or No

b) Would you typically refer to different categories? [if so, which categories would you suggest]?

_____

3. In the last 30 days, how often did you smoke cigarettes?

1 Every day
2 At least once a week, but not every day
3 At least once in the last 30 days, but not every week
4 I did not smoke in the last 30 days
5 Don't know
6 Refused

Q2: How easy or difficult is it to remember the number of cigarettes you smoked? OR How did you come up with that answer?

_____

4. Have you ever smoked a cigarette, even just a few puffs?

1 Yes
2 No
3 Don't know
4 Refused

5. Have you ever tried light, mild or low-tar cigarettes?

1 Yes
2 No
3 Don't know
4 Refused

[Note to Interviewer: Cigarette brand does not need to have exact words "light", "mild", or "low tar" in the name. The question is asking about a "class" or general type of cigarette which may or may not use these exact words.]

Q3: What do the words 'light', 'mild' or 'low tar' mean to you in this question?

_____

SECTION 2

Please take a moment to look at the pair of packs shown below. In the following section, you will be asked several questions about this pair of packs. If you do not currently smoke cigarettes, we would like you to answer as if you were to try this brand.

Q4: How easy or difficult was it to understand these instructions? Did you have any questions?

_____

Brand A

Brand B

6. Which brand do you think would <u>taste better</u>?

1 Brand A
2 Brand B
3 No difference
4 Don't know
5 Refused

Q5: This question refers to a brand as "tasting better". What does "taste better" mean to you?

_____

7. Which brand do you think would be <u>smoother on your throat</u>?

1 Brand A
2 Brand B
3 No difference
4 Don't know
5 Refused

Q6: This question refers to a brand as "being smoother on your throat". What does this phrase "smoother on your throat" mean to you as it is used in this question?

_____

8. Which brand do you think would be <u>less harmful</u>?

1 Brand A
2 Brand B
3 No difference
4 Don't know
5 Refused

9. Which brand would you <u>like to be seen smoking</u>?

1 Brand A
2 Brand B
3 No difference
4 Don't know
5 Refused

Q7: Did you have any problems with that question?

_____

10. Which brand would you <u>rather try</u>?

1 Brand A
2 Brand B
3 No difference
4 Don't know
5 Refused

11. Which brand would make it <u>easier to quit smoking</u>?

1 Brand A
2 Brand B
3 No difference
4 Don't know
5 Refused

Q8a [for people who answered they have never smoked a puff]: How easy or difficult was it for you to make an opinion about what cigarettes would be like if you smoked them?

_____

OR

Q8b [for smokers]: How easy or difficult was it to understand the past four questions?

_____

Q9 [for people who did NOT choose 'no difference' in any of the previous six questions (i.e., only chose 'Brand A' or 'Brand B']:

Did you consider choosing the 'no difference' option for any of the past six questions?

[If they say 'yes', ask them to elaborate on their thought process (e.g., ask why they considered it, and decided against that option).]

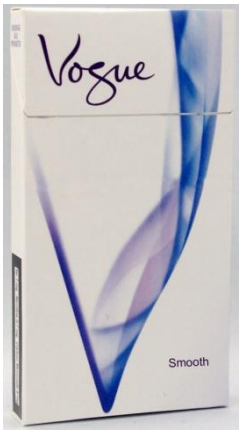
[If they say 'no', ask: "why not?"]

_____

_____

SECTION 3

Now please take a moment to look at the pack shown below. In the following section of the questionnaire, you will be asked several questions about this brand.



12. Compared to other brands, how appealing is this brand of cigarettes?

1 A lot less appealing than other brands
2 A little less appealing
3 No difference
4 A little more appealing
5 A lot more appealing than other brands
6 Don't know
7 Refused

Q10: This question asks about a brand being "appealing". What does the term "appealing" mean to you in the context of this question?

[If the respondent says she "doesn't know", ask her: "what characteristics would make a product appealing?"]

_____

13. Compared to other brands, how do you think these cigarettes would taste?

1 A lot worse than other brands
2 A little worse
3 No difference
4 A little better
5 A lot better than other brands
6 Don't know
7 Refused

14. Compared to other cigarette brands, would these cigarettes be:

1 A lot less harmful than other brands
2 A little less harmful
3 No difference
4 A little more harmful
5 A lot more harmful than other brands
6 Don't know
7 Refused

15. Compared to other brands, how smooth do you think these cigarettes would be on your throat?

1 A lot less smooth than other brands
2 A little less smooth
3 No difference
4 A little more smooth
5 A lot more smooth than other brands
6 Don't know
7 Refused

Q11. How easy or hard was it for you to go through that list?

_____

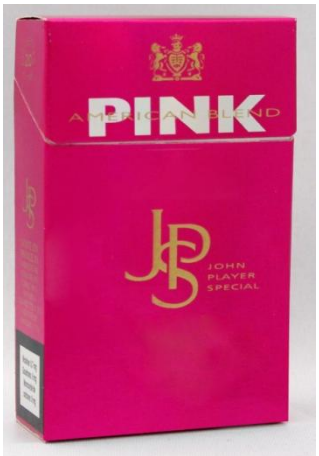
_____

Q12. Was it difficult to differentiate between a little and a lot for any of the above questions?

_____

SECTION 4

You will now be shown another individual cigarette pack. Please take a moment to look at this pack, then answer the following questions about the kind of person you think would smoke this brand.



Q13: How easy or difficult was it to understand these instructions? Did you have any questions?

_____

_____

16. In your opinion, is someone who smokes this brand regularly <u>more likely</u> to be:

1 Female,
2 Male, or
3 No Difference
4 Don't know
5 Refused

Q14: **[ask people who did NOT choose 'no difference' in the above question (i.e., chose 'Female' or 'Male']:** Did you consider choosing the 'no difference' option for this question?

[If they say 'yes', ask them to elaborate on their thought process (e.g., ask why they considered it, and decided against that option).]

[If they say 'no', ask: "why not?"]

_____

1 Glamorous,
2 Not Glamorous, or
3 No Difference
4 Don't know
5 Refused

Q15: Why did you select [glamorous/not glamorous/no difference]?

_____

Q16: What does the term glamorous mean to you in the context of this question? [If don't know, ask who is a good example?]

_____

1 Stylish
2 Not Stylish
3 No Difference
4 Don't know
5 Refused

Q17: Why did you select [stylish/not stylish/no difference]?

_____

Q18: What does the term stylish mean to you in the context of this question? [If don't know, ask who would be a good example?]

_____

1 Popular,
2 Not popular, or
3 No Difference
4 Don't know
5 Refused

Q19: Why did you select [popular/not popular/no difference]?

_____

Q20: Tell me what you were thinking about when you answered this question.

_____

1 Cool,
2 Not cool, or
3 No Difference
4 Don't know
5 Refused

Q21: Why did you select [cool/not cool /no difference]?

_____

Q22: What does the term cool mean to you? [If don't know, ask who would be a good example?]

_____

1 Sophisticated,
2 Not sophisticated, or
3 No Difference
4 Don't know
5 Refused

Q23: Why did you select [sophisticated/not sophisticated /no difference]?

_____

Q24: What does the term sophisticated mean to you? [If don't know, ask who is a good example?]

_____

Q25: Is there a difference between glamorous, sophisticated, and stylish? What is different?

_____

1 Slim,
2 Overweight, or
3 No Difference
4 Don't know
5 Refused

Q26: Why did you select [slim/overweight/no difference]?

_____

SECTION 5

Please indicate whether you agree, disagree, or neither agree nor disagree with each of the following statements.

17. Smoking helps people stay slim.

1 Agree
2 Disagree
3 Neither agree nor disagree
4 Don't know
5 Refused

18. Smoking helps people control their weight.

1 Agree
2 Disagree
3 Neither agree nor disagree
4 Don't know
5 Refused

Q27: The past two questions asked about whether smoking helps "people stay slim" and "control their weight". Does the wording of these questions sound okay to you, or is one better than the other?

_____

19. Smoking cigarettes is addictive.

1 Agree
2 Disagree
3 Neither agree nor disagree
4 Don't know
5 Refused

Q27: Can you think of anything else **besides tobacco** that might be addictive? _____

Q29.What are some other things that are addictive? _____

Q30. What does it mean to say that something is "addictive"? _____

20. It is difficult to quit smoking cigarettes.

1 Agree
2 Disagree
3 Neither agree nor disagree
4 Don't know
5 Refused

Q31: How did you come up with that answer? _____

Q32. Do all the possible answers seem okay, or did it seem like there's one that is supposed to be the right answer?

_____

SECTION 6

Please tell me whether you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree with each of the following statements.

21. I would like to explore strange places.

1 Strongly agree
2 Agree
3 Neither agree nor disagree
4 Disagree
5 Strongly disagree
6 Don't know
7 Refused

Q33: What does "strange places" mean to you? What would an example be?

_____

22. I like to do frightening things.

1 Strongly agree
2 Agree
3 Neither agree nor disagree
4 Disagree
5 Strongly disagree
6 Don't know
7 Refused

Q34: What does "frightening" mean to you in this context? What would an example be?

_____

23. I like new and exciting experiences, even if I have to break the rules.

1 Strongly agree
2 Agree
3 Neither agree nor disagree
4 Disagree
5 Strongly disagree
6 Don't know
7 Refused

Q35: In this question, what would an example of "breaking the rules" be?

_____

24. I prefer friends who are exciting and unpredictable.

1 Strongly agree
2 Agree
3 Neither agree nor disagree
4 Disagree
5 Strongly disagree
6 Don't know
7 Refused

Q36: What would an example of "unpredictable" be?

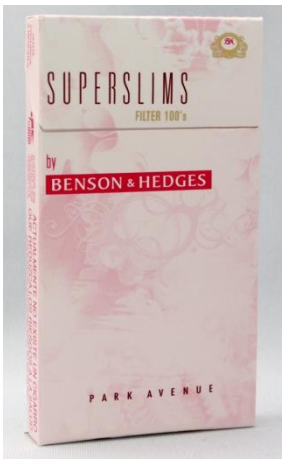
_____

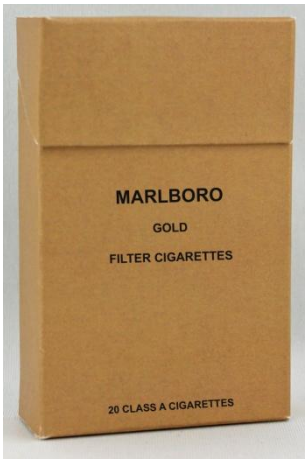
SECTION 7

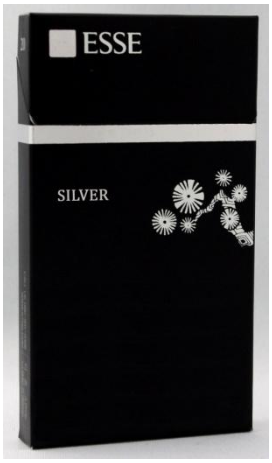
25. As part of this study, we would like to send you a pack of cigarettes to thank you for your participation.

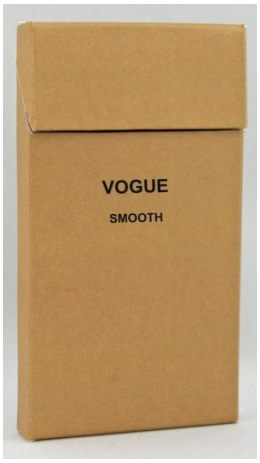
Please select from one of the four packages below:

Brand A **Brand B** **Brand C** **Brand D**









1 Brand A
2 Brand B
3 Brand C
4 Brand D
5 I do not want a pack

Q36: Did you have any problems understanding the instructions for this question?

_____

_____

26. We are interested in your reason for choosing the pack you selected. What are you most likely to do with the package you chose?

1 I will smoke the cigarettes
2 Keep the pack for myself but don't smoke them
3 Give the pack to someone as a gift
4 Sell the pack to someone else
5 Other (please specify below):

_____

6 Don't know
7 Not applicable
8 Refuse

Q35: Was it easy or difficult to find your answer on that list? _____

_____

Q36: Tell me why you chose [answer] instead of some other answer on the list.

_____

Appendix D: Supplementary Results

Table 1: Summary of brand ratings for individual cigarette packages by experimental condition (n=601)

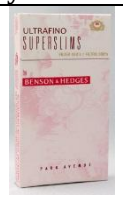
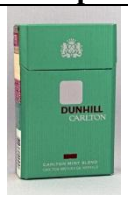
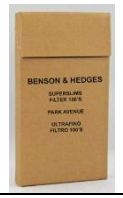
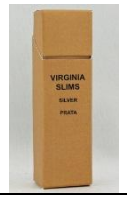
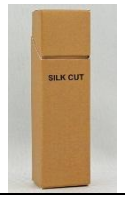
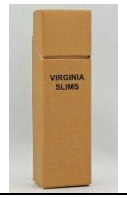
Condition 1										
Condition 2										
Condition 3										
A little or a lot MORE APPEALING than other brands (% agree)										
1 (Standard)	69.5	49.5	68.9	50.0	71.6	23.4	72.5	58.1	77.1	45.9
2 (Plain w/d.)	33.9	45.9	51.1	40.2	32.8	39.8	39.9	60.6	48.7	39.1
3 (Plain no d.)	29.1	27.5	14.6	33.8	29.1	38.5	13.8	50.5	49.5	59.7
A little or a lot BETTER TASTE than other brands (% agree)										
1 (Standard)	56.8	57.7	66.3	45.3	45.7	24.5	65.5	60.6	39.6	25.3
2 (Plain w/d.)	20.5	55.2	55.8	50.3	23.7	29.8	50.0	59.1	25.4	26.6
3 (Plain no d.)	20.6	18.7	12.0	27.0	21.5	30.8	9.7	32.8	35.0	33.2
A little or a lot LESS HARMFUL than other brands (% agree)										
1 (Standard)	24.0	13.9	14.1	9.3	10.3	11.4	22.5	18.0	8.8	12.5
2 (Plain w/d.)	17.9	14.5	9.8	11.5	7.4	16.1	10.7	10.9	9.7	8.5
3 (Plain no d.)	10.6	9.0	11.5	8.9	11.0	10.8	14.1	14.1	11.6	10.6
A little or a lot MORE SMOOTH than other brands (% agree)										
1 (Standard)	46.2	50.0	54.2	40.5	35.0	21.1	56.5	51.5	23.3	26.3
2 (Plain w/d.)	25.9	45.1	42.1	36.0	16.8	25.9	41.1	43.8	22.0	19.5
3 (Plain no d.)	11.1	19.5	7.5	16.2	11.6	13.4	12.2	19.8	29.1	29.1

Table 2: Mean brand ratings for individual cigarette packages (5-point Likert scale data) by experimental condition (n=601)

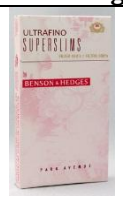
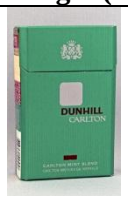
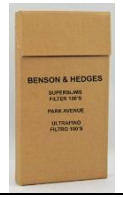
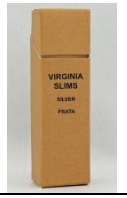
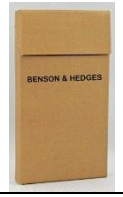
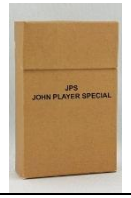
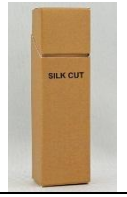
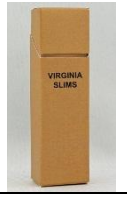
Condition 1										
Condition 2										
Condition 3										
A little or a lot MORE APPEALING than other brands (mean; SD)										
1 (Standard)	3.8 (1.1)	3.4 (1.1)	3.8 (1.3)	3.4 (1.2)	3.9 (1.1)	2.9 (1.1)	4.0 (1.3)	3.6 (1.0)	4.2 (1.0)	3.3 (1.1)
2 (Plain w/d.)	3.1 (1.0)	3.2 (1.3)	3.4 (1.2)	3.2 (1.1)	3.2 (1.0)	3.3 (1.0)	3.1 (1.2)	3.6 (0.8)	3.4 (1.1)	3.2 (1.1)
3 (Plain no d.)	3.0 (1.0)	2.9 (1.1)	2.6 (1.1)	3.1 (1.0)	3.0 (1.1)	3.2 (1.2)	2.6 (1.0)	3.3 (0.9)	3.4 (1.1)	3.7 (1.0)
A little or a lot BETTER TASTE than other brands (mean; SD)										
1 (Standard)	3.7 (0.8)	3.6 (1.0)	3.8 (1.1)	3.4 (1.0)	3.5 (1.0)	3.0 (0.9)	3.8 (1.2)	3.0 (0.7)	3.4 (0.9)	3.1 (0.9)
2 (Plain w/d.)	3.0 (0.8)	3.5 (1.1)	3.6 (1.1)	3.4 (1.0)	3.1 (0.8)	3.2 (0.9)	3.3 (1.2)	3.0 (0.6)	3.1 (0.8)	3.2 (0.8)
3 (Plain no d.)	3.0 (0.8)	3.0 (0.8)	2.8 (0.8)	3.1 (0.9)	3.0 (0.9)	3.2 (1.0)	2.8 (0.8)	2.9 (0.6)	3.3 (0.9)	3.3 (0.9)
A little or a lot LESS HARMFUL than other brands (mean; SD)										
1 (Standard)	2.9 (0.8)	3.0 (0.7)	3.0 (0.8)	3.1 (0.7)	3.0 (0.6)	3.1 (0.8)	2.9 (0.9)	3.5 (0.9)	3.2 (0.7)	3.0 (0.7)
2 (Plain w/d.)	2.9 (0.7)	3.0 (0.7)	3.1 (0.7)	3.0 (0.6)	3.1 (0.7)	3.1 (0.8)	3.0 (0.7)	3.4 (0.8)	3.0 (0.6)	3.1 (0.6)
3 (Plain no d.)	3.0 (0.6)	3.0 (0.6)	3.0 (0.6)	3.0 (0.6)	3.0 (0.6)	3.1 (0.7)	2.9 (0.6)	3.0 (0.8)	3.0 (0.6)	3.0 (0.6)
A little or a lot MORE SMOOTH than other brands (mean; SD)										
1 (Standard)	3.5 (0.8)	3.5 (0.9)	3.7 (0.9)	3.2 (0.9)	3.3 (0.8)	2.9 (0.9)	3.7 (1.0)	2.5 (1.0)	3.0 (0.9)	3.2 (0.8)
2 (Plain w/d.)	3.1 (0.8)	3.4 (0.9)	3.4 (0.9)	3.2 (0.8)	3.0 (0.7)	3.0 (0.9)	3.4 (0.8)	2.2 (1.2)	3.1 (0.7)	3.0 (0.8)
3 (Plain no d.)	2.9 (0.7)	3.1 (0.8)	2.8 (0.7)	3.0 (0.8)	2.9 (0.8)	2.7 (0.9)	2.9 (0.8)	2.2 (1.2)	3.2 (0.8)	3.3 (0.8)

Table 3: Adjusted linear regression predicting individual pack brand appeal ratings (n=599)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance
Pack 1 – Benson & Hedges Superslim	*10.8*	*p<0.001*			
Branded Vs. Plain			*0.76*	*0.55, 0.98*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.86*	*0.64, 1.07*	*p<0.001*
Plain Vs. Plain, no descriptors			0.09	-0.12, 0.31	p=0.389
Pack 2 – Capri Baunilha	*3.8*	*p<0.001*			
Branded Vs. Plain			*0.23*	*-0.46, -0.01*	*p=0.045*
Branded Vs. Plain, no descriptors			*0.48*	*0.25, 0.70*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.24*	*0.02, 0.47*	*p=0.035*
Pack 3 – DJ Mix Strawberry	*15.5*	*p<0.001*			
Branded Vs. Plain			*0.33*	*0.57, 0.10*	*p=0.006*
Branded Vs. Plain, no descriptors			*1.17*	*0.94, 1.41*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.84*	*0.60, 1.08*	*p<0.001*
Pack 4 – Dunhill Carlton Mint	0.8	p=0.63			
Branded Vs. Plain			*0.21*	*-0.01, 0.43*	*p=0.062*
Branded Vs. Plain, no descriptors			*0.24*	*0.02, 0.45*	*p=0.035*
Plain Vs. Plain, no descriptors			0.03	-0.19, 0.25	p=0.812
Pack 5 – JPS American Pink	*12.2*	*p<0.001*			
Branded Vs. Plain			*0.74*	*0.52, 0.95*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.97*	*0.76, 1.18*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.23*	*0.02, 0.45*	*p=0.035*
Pack 6- Marlboro Gold Original	*3.7*	*p<0.001*			
Branded Vs. Plain			*-0.43*	*-0.65, -0.22*	*p<0.001*
Branded Vs. Plain, no descriptors			*-0.36*	*-0.58, -0.15*	*p=0.001*
Plain Vs. Plain, no descriptors			0.07	-0.15, 0.28	p=0.539
Pack 7 – Peel Sweet Melon	*17..79*	*p<0.001*			
Branded Vs. Plain			*0.82*	*0.59, 1.06*	*p<0.001*
Branded Vs. Plain, no descriptors			*1.36*	*1.12, 1.59*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.53*	*0.29, 0.77*	*p<0.001*
Pack 8 – Silk Cut Menthol	0.84	p=0.57			
Branded Vs. Plain			-0.16	-0.39, 0.06	p=0.150
Branded Vs. Plain, no descriptors			-0.01	-0.23, 0.22	p=0.963
Plain Vs. Plain, no descriptors			0.16	-0.07, 0.38	p=0.160
Pack 9 – Virginia Slims Silver	*9.27*	*p<0.001*			
Branded Vs. Plain			*0.78*	*0.57, 0.99*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.75*	*0.54, 0.97*	*p<0.001*
Plain Vs. Plain, no descriptors			-0.02	-0.24, 0.19	p=0.829
Pack 10 – Vogue Bleue	*3.34*	*p=0.001*			
Branded Vs. Plain			0.04	-0.18, 0.25	p=0.753
Branded Vs. Plain, no descriptors			*-0.42*	*-0.64, -0.21*	*p<0.001*
Plain Vs. Plain, no descriptors			*-0.46*	*-0.68, -0.24*	*p<0.001*

*****Adjusted model includes the variables age, education, smoking status, and race/ethnicity. Beta values are unstandardized coefficients.

Table 4: Adjusted linear regression predicting individual pack perceived taste ratings (n=592)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance
Pack 1 – Benson & Hedges Superslim	*10.8*	*p<0.001*			
Branded Vs. Plain			*0.66*	*0.49, 0.82*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.67*	*0.51, 0.84*	*p<0.001*
Plain Vs. Plain, no descriptors			0.02	-0.15, 0.18	p=0.862
Pack 2 – Capri Baunilha	*7.0*	*p<0.001*			
Branded Vs. Plain			0.07	-0.12, 0.27	p=0.473
Branded Vs. Plain, no descriptors			*0.59*	*0.40, 0.78*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.52*	*0.33, 0.71*	*p<0.001*
Pack 3 – DJ Mix Strawberry	*17.3*	*p<0.001*			
Branded Vs. Plain			*0.19*	*-0.01, 0.39*	*p=0.07*
Branded Vs. Plain, no descriptors			*1.04*	*0.84, 1.24*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.85*	*0.65, 1.05*	*p<0.001*
Pack 4 – Dunhill Carlton Mint	1.65	p=0.108			
Branded Vs. Plain			-0.03	-0.22, 0.17	p=0.799
Branded Vs. Plain, no descriptors			*0.23*	*0.04, 0.42*	*p=0.019*
Plain Vs. Plain, no descriptors			*0.25*	*0.06, 0.44*	*p=0.010*
Pack 5 – JPS American Pink	*3.6*	*p<0.001*			
Branded Vs. Plain			*0.33*	*0.15, 0.51*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.42*	*0.24, 0.60*	*p<0.001*
Plain Vs. Plain, no descriptors			0.09	-0.09, 0.27	p=0.310
Pack 6- Marlboro Gold Original	*3.2*	*p<0.001*			
Branded Vs. Plain			-0.15	-0.34, 0.03	p=0.105
Branded Vs. Plain, no descriptors			-0.14	-0.33, 0.04	p=0.125
Plain Vs. Plain, no descriptors			0.01	-0.18, 0.19	p=0.918
Pack 7 – Peel Sweet Melon	*10.9*	*p<0.001*			
Branded Vs. Plain			*0.49*	*0.27, 0.71*	*p<0.001*
Branded Vs. Plain, no descriptors			*1.02*	*0.80, 1.24*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.54*	*0.32, 0.75*	*p<0.001*
Pack 8 – Silk Cut Menthol	*3.4*	*p<0.001*			
Branded Vs. Plain			0.002	-0.18, 0.19	p=0.982
Branded Vs. Plain, no descriptors			*0.38*	*0.20, 0.57*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.38*	*0.20, 0.56*	*p<0.001*
Pack 9 – Virginia Slims Silver	*1.9*	*p=0.014*			
Branded Vs. Plain			*0.26*	*0.08, 0.44*	*p=0.004*
Branded Vs. Plain, no descriptors			0.14	-0.04, 0.31	p=0.136
Plain Vs. Plain, no descriptors			-0.13	-0.31, 0.05	p=0.157
Pack 10 – Vogue Bleue	0.7	p=0.674			
Branded Vs. Plain			-0.07	-0.25, 0.11	p=0.43
Branded Vs. Plain, no descriptors			*-0.18*	*-0.36, -0.01*	*p=0.039*
Plain Vs. Plain, no descriptors			-0.11	-0.29, 0.06	p=0.20

*****Adjusted model includes the variables age, education, smoking status, and race/ethnicity. Beta values are unstandardized coefficients.

Table 5: Adjusted linear regression predicting individual pack perceived health risk ratings (n=597)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance
Pack 1 – Benson & Hedges Superslim	0.99	p=0.447			
Branded Vs. Plain			-0.08	-0.22, 0.06	p=0.237
Branded Vs. Plain, no descriptors			-0.08	-0.22, 0.06	p=0.237
Plain Vs. Plain, no descriptors			-0.01	-0.14, 0.13	p=0.936
Pack 2 – Capri Baunilha	1.13	p=0.344			
Branded Vs. Plain			0.02	-0.11, 0.15	p=0.788
Branded Vs. Plain, no descriptors			0.01	-0.12, 0.13	p=0.934
Plain Vs. Plain, no descriptors			-0.01	-0.14, 0.12	p=0.852
Pack 3 – DJ Mix Strawberry	1.48	p=0.162			
Branded Vs. Plain			-0.02	-0.16, 0.13	p=0.841
Branded Vs. Plain, no descriptors			0.07	-0.07, 0.22	p=0.294
Plain Vs. Plain, no descriptors			0.09	-0.05, 0.23	p=0.219
Pack 4 – Dunhill Carlton Mint	*2.49*	*p=0.012*			
Branded Vs. Plain			0.11	-0.02, 0.25	p=0.094
Branded Vs. Plain, no descriptors			0.11	-0.02, 0.24	p=0.105
Plain Vs. Plain, no descriptors			-0.01	-0.14, 0.13	p=0.938
Pack 5 – JPS American Pink	2.52	p=0.011			
Branded Vs. Plain			-0.09	-0.21, 0.04	p=0.187
Branded Vs. Plain, no descriptors			0.09	-0.04, 0.22	p=0.165
Plain Vs. Plain, no descriptors			*0.18*	*0.05, 0.30*	*p=0.007*
Pack 6- Marlboro Gold Original	1.94	p=0.053			
Branded Vs. Plain			0.08	-0.07, 0.23	p=0.276
Branded Vs. Plain, no descriptors			0.05	-0.10, 0.20	p=0.500
Plain Vs. Plain, no descriptors			-0.03	-0.18, 0.12	p=0.670
Pack 7 – Peel Sweet Melon	1.15	p=0.325			
Branded Vs. Plain			*-0.16*	*-0.31, -0.01*	*p=0.040*
Branded Vs. Plain, no descriptors			-0.01	-0.16, 0.14	p=0.867
Plain Vs. Plain, no descriptors			0.14	-0.01, 0.29	p=0.061
Pack 8 – Silk Cut Menthol	1.28	p=0.253			
Branded Vs. Plain			-0.04	-0.18, 0.09	p=0.546
Branded Vs. Plain, no descriptors			0.09	-0.05, 0.22	p=0.202
Plain Vs. Plain, no descriptors			0.13	-0.01, 0.26	p=0.062
Pack 9 – Virginia Slims Silver	*2.03*	*p=0.041*			
Branded Vs. Plain			*0.17*	*0.04, 0.30*	*p=0.011*
Branded Vs. Plain, no descriptors			*0.22*	*0.09, 0.35*	*p=0.001*
Plain Vs. Plain, no descriptors			0.05	-0.09, 0.18	p=0.485
Pack 10 – Vogue Bleue	*1.99*	*p=0.046*			
Branded Vs. Plain			-0.09	-0.22, 0.03	p=0.153
Branded Vs. Plain, no descriptors			0.02	-0.10, 0.15	p=0.704
Plain Vs. Plain, no descriptors			0.12	-0.01, 0.24	p=0.070

*****Adjusted model includes the variables age, education, smoking status, and race/ethnicity. Beta values are unstandardized coefficients.

Table 6: Adjusted linear regression predicting individual pack perceived smoothness ratings (n=589)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance
Pack 1 – Benson & Hedges Superslim	*9.2*	*p<0.001*			
Branded Vs. Plain			*0.45*	*0.28, 0.61*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.67*	*0.51, 0.83*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.23*	*0.07, 0.39*	*p<0.001*
Pack 2 – Capri Baunilha	*5.0*	*p<0.001*			
Branded Vs. Plain			0.05	-0.12, 0.21	p=0.594
Branded Vs. Plain, no descriptors			*0.41*	*0.25, 0.58*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.37*	*0.20, 0.53*	*p<0.001*
Pack 3 – DJ Mix Strawberry	*14.5*	*p<0.001*			
Branded Vs. Plain			*0.32*	*0.15, 0.49*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.91*	*0.73, 1.07*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.58*	*0.41, 0.76*	*p<0.001*
Pack 4 – Dunhill Carlton Mint	1.9	p=0.057			
Branded Vs. Plain			0.02	-0.15, 0.19	p=0.823
Branded Vs. Plain, no descriptors			*0.24*	*0.07, 0.41*	*p=0.005*
Plain Vs. Plain, no descriptors			*0.22*	*0.05, 0.39*	*p=0.011*
Pack 5 – JPS American Pink	*4.8*	*p<0.001*			
Branded Vs. Plain			*0.33*	*0.17, 0.48*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.45*	*0.29, 0.60*	*p<0.001*
Plain Vs. Plain, no descriptors			0.12	-0.04, 0.27	p=0.128
Pack 6- Marlboro Gold Original	2.5	p=0.12			
Branded Vs. Plain			-0.05	-0.23, 0.14	p=0.599
Branded Vs. Plain, no descriptors			*0.18*	*0.004, 0.37*	*p=0.046*
Plain Vs. Plain, no descriptors			*0.23*	*0.05, 0.42*	*p=0.012*
Pack 7 – Peel Sweet Melon	*10.7*	*p<0.001*			
Branded Vs. Plain			*0.33*	*0.15, 0.50*	*p<0.001*
Branded Vs. Plain, no descriptors			*0.81*	*0.63, 0.99*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.49*	*0.31, 0.67*	*p<0.001*
Pack 8 – Silk Cut Menthol	*5.2*	*p=0.001*			
Branded Vs. Plain			0.13	-0.04, 0.30	p=0.127
Branded Vs. Plain, no descriptors			*0.47*	*0.30, 0.63*	*p<0.001*
Plain Vs. Plain, no descriptors			*0.34*	*0.17, 0.50*	*p<0.001*
Pack 9 – Virginia Slims Silver	*2.7*	*p=0.006*			
Branded Vs. Plain			-0.08	-0.25, 0.08	p=0.316
Branded Vs. Plain, no descriptors			*-0.21*	*-0.37, -0.05*	*p=0.010*
Plain Vs. Plain, no descriptors			-0.13	-0.29, 0.04	p=0.125
Pack 10 – Vogue Bleue	1.9	p=0.062			
Branded Vs. Plain			0.15	-0.01, 0.31	p=0.064
Branded Vs. Plain, no descriptors			-0.10	-0.26, 0.06	p=0.201
Plain Vs. Plain, no descriptors			*-0.26*	*-0.42, -0.10*	*p=0.002*

*****Adjusted model includes the variables age, education, smoking status, and race/ethnicity. Beta values are unstandardized coefficients.

Table 7: Brand appeal: index scores from 5-point scale (n= 538)

Condition	Mean (SD)
Branded	3.62 (0.65)
Plain	3.27 (0.58)
Plain, no descriptors	3.08 (0.57)

Table 8: Adjusted linear regression predicting 5-point scale brand appeal index scores (n= 537)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance	Moderators (β, significance)
	10.21	*p<0.001*				*Education*
Branded vs. Plain			*0.35*	*0.22, 0.47*	*p<0.001*	*(3 vs. 1): -0.16*
Branded vs. Plain, no descriptors			*0.53*	*0.41, 0.66*	*p<0.001*	*(p=0.042)*
Plain vs. Plain, no descriptors			*0.19*	*0.06, 0.32*	*p=0.004*	

Table 9: Perceived taste: index scores from 5-point scale (n=509)

Condition	Mean (SD)
Branded	3.49 (0.58)
Plain	3.30 (0.46)
Plain, no descriptors	3.04 (0.46)

Table 10: Adjusted linear regression predicting 5-point scale taste index scores (n=508)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance	Moderators (β, significance)
	8.99	*p<0.001*				
Branded vs. Plain			*0.18*	*0.08, 0.29*	*p=0.001*	
Branded vs. Plain, no descriptors			*0.45*	*0.34, 0.56*	*p<0.001*	
Plain vs. Plain, no descriptors			*0.26*	*0.15, 0.37*	*p<0.001*	

Table 11: Perceived health risk: index scores from 5-point scale (n=538)

Condition	Mean (SD)
Branded	3.01 (0.42)
Plain	3.02 (0.311)
Plain, no descriptors	2.96 (0.36)

Table 12: Adjusted linear regression predicting 5-point scale health risk index scores (n=536)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance	Moderators (β, significance)
	3.13	*p=0.002*				*Ethnicity*
Branded vs. Plain			0.003	-0.07, 0.08	p=0.932	*(white vs. pardo): 0.13 (p<0.001)*
Branded vs. Plain, no descriptors			0.07	-0.002, 0.15	p=0.056	
Plain vs. Plain, no descriptors			0.07	-0.01, 0.15	p=0.072	

Table 13: Perceived smoothness: index scores from 5-point scale (n=520)

Condition	5-Point Scale Mean (SD)
Branded	3.35 (0.48)
Plain	3.18 (0.42)
Plain, no descriptors	2.96 (0.39)

Table 14: Adjusted linear regression predicting smoothness index scores on a 5-point scale (n=518)

	Model (F)	Significance	Beta (β)	95% CI for β	Significance	Moderators (β, significance)
	9.34	*p<0.001*				
Branded vs. Plain			*0.18*	*0.09, 0.27*	*p<0.001*	
Branded vs. Plain, no descriptors			*0.40*	*0.30, 0.49*	*p<0.001*	
Plain vs. Plain, no descriptors			*0.22*	*0.12, 0.31*	*p<0.001*	