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Is the Power of Aesthetics stronger than the Power of Brand?

The case for Plain Packaging in the Tobacco Industry

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Abstract

Recently, many countries proposed mandatory plain packages for cigarettes in order to fight smoking habits. The main rationale behind this is that packages are the very last advertising media for tobacco companies, and convey all the brand imagery and character that make smoking attractive; allegedly, by reducing the aesthetics of the package, this differentiation will be lost. If packages will be altered this much, will smokers still be so attracted to their preferred brand, irrespective of how it looks, or will they consider all brands by the same standards? This study tries to assess how smokers would unconsciously respond to such a visual change in package, also considering their personal brand preferences. An eye-tracking study will be coupled with a memory task, in order to assess both attentional bias and ability to remember brands according to package information, personal preferences and deprivation level. Our main hypothesis is that smokers will be more attracted to and remember better their preferred brand (with respect to a non-preferred one) and full packages (with respect to plain), thus supporting the legislation's rationale.

Generalized Linear Model analysis and ANOVAs were run, and results show that smokers are more visually attracted to their preferred brand with respect to non-preferred ones only when full packages are displayed: the attentional bias for plain packages shows no meaningful difference among brands. However, this does not seem to translate into a memory effect: the preferred brand is remembered significantly more than non-preferred ones, and equally in full or plain visuals.

In the end, what this experiment seems to suggest is that the looks of a package are very relevant for prospective or non-smokers mainly, because their attentional bias also indicates a marked propensity to stare at full packages. On the other hand, for heavy smokers the looks of their cigarette brands do not really matter in the end: once a Marlboro smoker, always a Marlboro smoker.

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1. Introduction

1.1. Case Presentation

During the last decades, cutting down tobacco consumption has been one of the greatest challenges for many jurisdictions worldwide. Many steps have been undertaken, from forbidding smoking in public places, to imposing mandatory health and health-related pictorial warnings on cigarette packaging (Physicians for a Smoke-Free Canada, 2007), from eliminating advertising on available mass media (Hammond & Assunta, 2003; WHO, 2005; Tobacco Advertising and Promotion Act, 2002) to increasing cigarette prices through arbitrary raises in taxation or banning tobacco products from retail displays.

Even if smoking seems largely reduced in recent years, there is still room for investigating how to lower these figures. In 2008, in response to the innovations the tobacco industry adopted to tackle the imposed restrictions, the United Kingdom proposed a new piece of legislation (British Department of Health, 2007) encompassing the introduction of so-called plain packages, namely neutral blank packages that will only display written health warnings, and that will confine the brand in a specific side position, written in a small, plain typeface, therefore eliminating any recognizable color or character (trademarks, logos or product claims) (Freeman, Chapman, & Rimmer, 2008). Australia followed suit in 2010, planning to enforce the provision starting from July 1st, 2012 (Action on Smoking and Health, 2010) and the European Union, lastly, is currently in the process of passing a similar resolution (Health Life, 2011).

1.2. Marketing Rationale

From a marketing standpoint, regulators here would be taking one of the most carefully branded products in the world, and de-branding it (British Department of Health, 2007). The tobacco industry is a peculiar one for marketers, given the extremely strict regulations it has to comply with (Action on Smoking and Health, 2010; Canadian Cancer Society, 2008; Deloitte, 2011; Physicians for a Smoke Free Canada, 2007). As such, many of the common marketing tools other sectors have in order to promote their items are not available to tobacco players, such as advertising, promotions, discounts and so on (Deloitte, 2011). The only directly accessible means to consumers they have left is the cigarette pack (Hammond, Dockrell, Arnott, & Lee, 2009), which is vested of an even greater importance with respect to other markets: it

goes well beyond the simple container function, by helping identifying, distinguishing and promoting the brand, both at the point of purchase and during consumption (Wakefield, Morley, Horan, & Cummings, 2002; Slade, 1997; McBride, 1987). Since cigarettes are a badge product (Hammond, 2007; Underwood, 2003), publicly exposed often more than once a day and embodying specific attributes and behaviors the smoker believes are pleasurable (BAT, 1978), it is also considered as the ultimate advertising medium and brand ambassador (Cunningham & Kyle, 1995).

It is often claimed and usually encompassed in the definition of plain packaging that its main marketing-related consequence, in all consumer packaged goods sectors, would be for producers to lose their differentiating power, due to the identical looks all the packages would eventually have (Hammond, 2007; Moodie, Hastings, & Ford, 2009; University of Toronto, 1993; Germain, Wakefield, & Durkin, 2010; Freeman *et al.* 2008; Cunningham & Kyle, 1995). Since cigarettes are an addictive product (Slade, 1995) where the brand plays an undisputed relevant role, which means they enjoy exceptionally high levels of brand loyalty, and since plain packaging will still display the different brands, even if devoid of recognizable logos and colors, the extent to which smokers will be affected by aesthetics and by brand preference is not clear-cut.

1.3. Cognitive Neuroscience Considerations

Since packaging is such an important device for the tobacco industry, and since cigarettes are an addictive product – therefore impacting our body's and in particular our brain's functioning – cigarettes and smoking behavior have been studied over the years also in cognitive neuroscience terms. Some of the most important researches done in the past suggest that certain visual stimuli help the uptake and endurance of addictions over time (Deloitte, 2011), because addicts dedicate a special amount of visual attention to drug-related cues linked to their drug of use. This finding means that, for example, smokers consider smoke-related images especially salient and attractive with respect to non-smoke-related cues, and this would happen in a stronger fashion than for non-smokers (Robinson & Berridge, 1993, 1995 and 2000).

In other words, smokers allocate a lot of attention to any visual item that reminds them of their addiction – and the package is for sure a very illustrative example of a memorandum.

On top of that, the brand plays a very critical, mainly social role for smokers, which is not replicated by any other drug. Therefore, these speculations on the drug of addiction can be extended to the brand of preference: one can show a biased attentional pattern towards their preferred cigarette brand, but maybe not on a non preferred one (Field & Cox, 2008). Given that plain packages are going to even out all the aesthetic differences among brands but will still openly display them, the question raises whether this will impact smokers' biased interest in the different packages. These considerations are going to be very important for our main research question.

Past literature, not necessarily addiction-related, also suggests that visual attention in general is strongly driven by how unique and attractive things look (Swann & Miller, 1992; Bower, 1992). Otherwise said, a more distinctive appearance provides a higher likelihood of receiving attentional bias, which means a very colorful and special package would be more appealing than a simpler one. It comes natural to stretch this reasoning to cigarette packages, where it is evident (according to these mentioned theories) how fully branded packages would be much more attractive than white, plain ones.

There exists a number of literature articles debating this particular provision and the effects plain packaging might have on smokers, mainly thanks to self-reporting methodological approaches such as surveys or focus groups. On the other hand, neuro-scientific experiments (of particular relevance for this thesis are eye-tracking studies, since the same technique will be adopted), that tap into emotional responses such as visual attention and memory, have been performed on smoke-related stimuli and cues, but not on tobacco packages or brands. This work aims at linking these two streams of theory, by exploring plain packaging – with a focus on branding – thanks to neuro-scientific techniques, in order to gain the advantage of a deeper understanding of unconscious consumer reactions.

This thesis intends to shed some light on what is that really matters for heavy users by studying both their visual attention and ability to remember: is it the brand itself, irrespective of how it is presented, or is the aesthetics of the package the main driver of differentiation? While it is reasonable to assume that plain packaging will negatively affect visual interest, by matching all brands to the same level, it is interesting to investigate if this effect will actually persist in

smokers' memory, or if the salience they dedicate to their preferred brands will anyways cause recollection patterns driven by the brand preference more than by the aesthetics of the package.

1.4. Topic Relevance

Besides being a marketing case history to stress the relevance of the package, the topic of this thesis is for sure very actual, meaning that many governments worldwide – Denmark included – are currently considering a serious introduction of the reform, and on the other side of the fence tobacco companies are starting to seriously believe that this threat is real.

This can be publicly seen in several recent developments: on the one hand the Australian Government – always at the forefront of the battle against smoking – passed the relative regulation on November 2011 and is planning to introduce plain packaging in the beginning of 2012, while the European Union announced it has the passing on of this legislation in its 2012 agenda. In January 2012, the UK launched its public consultation on mandatory plain tobacco packaging in March, while Canada and New Zealand are also closely watching and considering the proposition themselves (Action on Smoking and Health, 2012).

Part of the UK campaign on http://www.smokefreeaction.org.uk/plain-packaging.html
(retrieved February 12th 2012)

On the other hand, it was announced that Philip Morris International threatened and then served a notice of legal claim to the Australian Government in December 2011 to seek for compensation of lost profits if it eventually introduces plain packaging. The litigation is

currently ongoing, and Australia is filing for defense in the High Court against the four biggest tobacco manufacturers: British American Tobacco, Philip Morris International, Imperial Tobacco and Japan Tobacco International.

Also, a number of websites were created in the past year (e.g. http://www.plain-packaging.com, always by Philip Morris International, or www.plainpack.com, managed by British American Tobacco) where big tobacco firms perorate their cause by suggesting that plain packaging will be useless, if not harmful, and that there's no true evidence so far that it would work.

1.5. Delimitations

The main delimitation of this research lays in its focus, which is only the role of the package itself in attracting smokers' attention and subsequently sticking into smokers' memory, and does not extend to smoking behavior as a whole. Therefore, the literature will be reviewed, the test will be envisaged and the results will be analyzed and commented keeping this in mind.

The focus of the research will therefore be on studying the very quick, immediate response smokers will have towards plain packages; it does not attempt to address future sales forecasts or market and consumption consequences, even if some general considerations will be made in the managerial implications section. However, it is worth noting that such final considerations will be based on the results collected from an experiment lying on these premises, therefore circumscribed in scale and scope.

Also, while the main focus of the thesis are heavy smokers and not adolescents, most of the extant literature revolves around this latter group. Therefore, even if it might seem out of topic, some youngsters-centered papers and articles will be included in the theoretical background, in order to comment findings and methodologies useful for the sake of the thesis itself.

1.6. Thesis Structure

As it was said before, many different theoretical aspects are relevant for the sake of this work. In order to try and be as clear and exhaustive as possible, the thesis will have the following structure:

1. Theoretical background – First of all, an overview of the marketing principles of branding and the relevance of the package – in particular for the tobacco industry – will be reviewed. Afterwards, plain packaging will be explained, its literature reviewed, its rationale explained and some of its pros and cons will be delineated. Then, an overview of the main theories behind consumer visual learning and the relationship between attention, learning and memory – essential to explain the rationale of the experiment conducted – will be carried out. A particular focus will then be put on smokers' learning processes, stressing the relevance of the package in such a mechanism. In particular Robinson and Berridge's neural sensitization theory will be adopted as a basis to explain attentional bias, which is what the experiment will measure thanks to the eye-tracking equipment. Also, memory formation and consolidation will be reviewed in order to support the second, recognition-based part of the experiment.
2. Research Question and Hypothesis will be stated, following the related theories.
3. Methodology – The procedure and techniques to test the hypotheses will be outlined: an eye-tracking study coupled with a memory behavioral test were performed, together with a preference-investigating survey, a general memory test and a distracting task.
4. Results – The main outcomes of the experiments will be displayed split in two sections, dedicated respectively to respondents' visual attention and memory; each part will consist of a general analysis of how either attention or memory are influenced by package informational level, while a more detailed one, explored taking smokers' personal brand preferences into account, will follow.
5. Discussion and Managerial Implications – The results obtained will be commented and discussed, both for their validity and reliability. This section will also try to generalize and apply the results found before for both tobacco firms, governments and last but not least for current and perspective smokers.
6. Limitations and Future Research – The main limitations of the study performed will be outlined, together with potential areas of further research on the topic.

1.7. Methodological Perspectives

As already mentioned before, this thesis draws on many past reports, which are reviewed in order to give a solid theoretical basis to our research question. This approach is mainly inductive, since it builds up hypotheses and assumptions based on others' studies. On the other hand, the experiment itself is not replicated from any other previous work, which implies also a deductive methodology – an original research design is envisioned and our findings are illustrated after a thorough consideration of our results.

It is also worth noting that the methodology adopted here is in compliance with a positivistic approach, which implies that reality is objective and unique, and that recorded data do actually measure reality and that results are replicable in other circumstances. This assumptions are very different from those underlying, for example, the interpretivistic approach, which instead states that each researcher copes with a reality build out of their own experience, that allows many, subjective realities to coexist, very much dependant on everybody's personal interpretation of data and results (Hjørland, 2005).

1.8. Validity and Reliability

This research merges together theories of cognitive psychology, marketing and consumer behavior, in order to try and understand some unconscious responses to a change in a marketing tool such as the package aesthetics. Internal validity is ensured by the strength of the design – that takes into account the possible alternative explanations for the reported causal relationships and tries to rule out those not envisioned in the theoretical background – and thoroughness of performance and carrying out.

However, since the experiment is more of a qualitative than a quantitative nature, the outcomes may not satisfy the external validity and reliability criteria, which means that results cannot be generalized to a large sample/population just yet. Therefore, the project exhibits all the limitations of the case, intrinsic in adopting such techniques: it does attempt to suggest some internally valid results, that should nevertheless be repeated on different sample types and sizes in order to be considered externally valid too. These considerations will anyways be expanded in a later section.

2. Theoretical Background

Tobacco dependence is considered to be a bio-psycho-social condition (Els, 2009), and as such it has repercussions in multiple domains of human experience: biological (medical), psychological (mental) and social/spiritual. This means that there are not only physical addiction-related aspects to it, but also relevant subjective and social implications of smoking.

For the purpose of this thesis, two streams of theories will be reviewed and commented. It is important to outline that the choice of such theories was made always keeping in mind that the focus of the thesis is not the issue of smoking in general, but the power of the package in particular.

First of all, given that the reading key for this thesis is marketing-oriented, cigarette packaging will be explored in its psychological and social sphere. It is common knowledge in consumer culture theories that end users choose their purchases not only based on mere utility or economic value, but also in order to express publicly something about themselves (Belk, 1988; Fırat, Dholakia, & Venkatesh, 1995). In a 1991 article, Beede and Lawson clearly outlined how, among smokers, groups are created according to favorite cigarette brands, since such a preference allows smokers to relate to each other, enhance self-image and classify and categorize each other as well, thanks to the symbolism brands convey. It is worth noting how this communicational role is carried out mainly by the packages' visual dimension, that is thus pivotal for tobacco firms. Therefore, an initial overview of branding and packaging will then be followed by a more detailed analysis of these functions in the tobacco industry, in which the package is worth much more than a simple container.

Afterwards, plain packaging will be presented, and the relative literature will be reviewed, in order to understand the reasoning behind the proposition once more and to overview some pros and cons of this device.

Also, since the main aim is to adopt cognitive neuroscience as a research method, the most important processes behind consumer learning and the advent of applying study fields such as neuromarketing to this kind of research will be explored. Of particular interest for this thesis, the neurological (biological) drivers behind smoking addiction as a consequence of visual stimuli – such as the package – will be framed: among others, the theory of neural sensitization and incentive salience by Robinson and Berridge (1993) will be presented. This paradigm was

chosen over alternative ones because there is a direct link between such a theory and the attentional level of smokers: many studies suggest that smokers pay more attention when presented with smoke-related visual cues than with neutral, non smoke-related cues, and that incentive salience enhances such a mechanism (Chanon, Sours, & Boettiger, 2010; Field, Mogg, & Bradley, 2004).

2.1. The Communicative Role of the Cigarette Package

Very frequently, marketing textbooks tend to give a broad definition of the package, which can be summed up like this: the package is the dress of the product (Vecchia, 2008). This very simple description actually includes all kinds of possible inflections: just as clothing does for people, the package protects and contains a product, performing many functional tasks. However, like clothing, it also talks about its content, and communicates to the rest of the world its product's characteristics, both tangible and intangible (Solomon, 1983; Belk, 1988; Elliott, 1994; Wattanasuwan & Elliott, 1998; Ahuvia, 2005).

Over the years, this communicational role became more and more important: sometimes, the intrinsic and traditional aims of containing and conserving are even overcome and dwarfed by the newly crucial objective of carrying communicational power (Vecchia, 2008).

The package, together with all the other means and channels companies have in order to connect with their clients, is one of the most essential vehicles to convey immaterial assets such as brand personality and brand identity (Underwood, 2003), which grew in importance over the years as discriminant buying criteria.

Such brand symbolism works in two directions: inwards, in constructing self-identity (self-symbolism), and outwards, in constructing the social world (social symbolism) (Elliott, 1994). Therefore, referring back to the bio-psycho-social model, to address the psychological and social needs behind choosing a certain product, some marketing-related literature – mainly about branding and packaging – has to be reviewed, since those needs are met thanks to said intangible brand benefits. A special focus will be maintained on the relevance the package has in the purchasing decision, and more in particular for tobacco products.

2.1.1. Branding and Packaging

Brands in general serve many valuable functions. On the one hand, they are useful to marketers to identify and differentiate their products from competition, while on the other hand, for consumers, they can simplify purchasing choices, by transmitting specific expectations guaranteed when adopting such a brand over others (Assael, 2003). Both these aims have a two-fold nature: the identification can stem from some utilitarian factors, such as functionality or reliability, or from some hedonic elements, such as the experience a brand guarantees, or the feeling of belonging to a group or culture that shares certain alluring characteristics, values or beliefs (McCracken, 1986). It is therefore crucial for firms to manage properly and carefully all the aspects of branding, in order to create specific positioning, personality, relationships, experience and image in compliance with what consumers want and demand (Keller & Lehmann, 2006; Fischer, Völckner, & Sattler, 2010).

Brand management isn't only involved with creating a powerful brand, but also with maintaining, adjusting and nourishing it over the years. In order to do that, firms can manipulate other factors than simply the name, logo and slogan, such as the product range offering, various means of communication (advertising, trade and consumer promotions, direct response, sponsorships and so on) and going-to-market channels (retailers, owned stores, telephone, internet and so on) in order to best reach consumers. Consistency in using these means is crucial not to blur the brand image (Keller, Apéria, & Georgson, 2008).

The package, as outlined above, has raised in importance from the communicative perspective, in all product categories, and has the pivotal function of attracting consumers even for unplanned purchases (Wakefield, Germain, & Henriksen, 2007). However, the tobacco industry is very different from every other sector, since past restrictions and legislations have dramatically reduced the number of means of communications available, therefore causing the package to become even more critical (US National Cancer Institute, 2008).

2.1.2. Tobacco Marketing

Before being expropriated of every other promotional means, tobacco companies managed to reach a remarkably high level of promotional effectiveness in the eyes of both consumers and the advertising industry. Cigarette ad campaigns reached consistently high rankings in

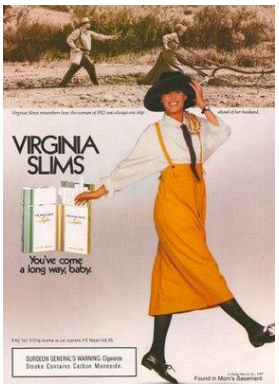
marketing and advertising publications: above all the others, the Marlboro Man was considered the top advertising icon of the century, for what concerned effectiveness, longevity, recognition and cultural impact. Marlboro was ranked as the third best advertising company of the century, behind Volkswagen and Coca Cola, while Interbrand consistently ranked it as one of the top 20 brands worldwide in the last 20 years (Interbrand, 2011). The value of these tobacco trademarks, and of Marlboro in particular, has lasted and persisted over the years, notwithstanding an increased health awareness, stringent regulatory environment and ongoing industry litigations (US National Cancer Institute, 2008).

Promotions are considered especially important for products like cigarettes, where there is almost no difference between one brand's and another's products in terms of physical characteristics. Therefore, the main aim of such promotional activities so far has been to develop a favorable set of brand attitudes and links with desirable images, lifestyles and identities to persuade non-loyal users, or to remind already convinced users of the positive, well-established benefits about such a product, like price, features, availability or image (US National Cancer Institute, 2008).

One of the most important steps in correctly satisfying consumers is to adapt every marketing tool to their closest needs. Therefore, targeting is crucial in order to define how to best approach potential or current users. Over the years, tobacco manufacturers adopted many different expedients in order to attract consumers, for example by clustering them according to variables such as demographics (e.g. gender, age, ethnicity), geography, consumption patterns and behaviors (e.g. usage situation, frequency, benefits sought) or psychographics (i.e. lifestyle). Such strategies brought tobacco producers to provide many types of cigarettes and brands according to whom they are meant for. For instance, brands offering relatively high tar content and strong flavors are addressed to men, promoted as "masculine", and oriented to convey action, excitement and adventure (e.g. red Marlboro); on the contrary, low tar, mild taste, slimmer and longer cigarettes are mainly addressed to women, carrying values such as independence, self indulgence and relaxation (e.g. Virginia Slims). Joe Camel was one of the most recognizable and successful spokespersons ever, but was accused of appealing to youngsters and therefore discontinued. Roughly three fourths of African-Americans in the US consume menthol cigarettes. Some cigarette promotions were designed for specific occasions

such as Halloween, Christmas or Independence Day (in the US), or some special editions were launched (Wakefield, 2002; Slade, 1997).

e.g. Some clearly targeted tobacco ad campaigns and spokespersons (1980s)



2.1.3. The Silent Salesman

As every consumer good, also for cigarettes the package has a decisive importance that goes beyond the simple container function (Shapiro, Perreault, & McCarthy, 1999; Slade, 1997; Underwood & Ozanne, 1998). It helps to identify, distinguish and promote the brand both at the point of purchase and during consumption (Wakefield *et al.*, 2002; Slade, 1997; McBride, 1987). In the tobacco industry, in particular, the pack of cigarettes is even more relevant with respect to other product categories, because it is considered a so-called "badge product" (Hammond, 2007; Underwood, 2003), meaning that it has a very high degree of public visibility and is not thrown away after opening (BAT, 1978); on the contrary, in fact, it is used and displayed many times per day, often not in private settings, being much more visible and exposed to the external world with respect to other product packages, disposed right after opening.

These characteristics, together with all the advertising restrictions tobacco companies had to comply with over the years, make it even clearer how critical the package is in fulfilling the aforementioned advertising functions. As Philip Morris International's executives have noted: "*Our final communication vehicle with our smoker is the pack itself. In the absence of any other marketing messages, our packaging […] is the sole communicator of our brand essence.*" (Hammond, Dockrell, Arnott, & Lee, 2009). The Tobacco Journal International (TJI) confirmed

this marketing value, commenting that "(…) *more than half the brand impact is in the design of the cigarette packet.*" (Spielman, 2008).

Also, many authors emphasize the social character of brands as symbols used by consumers for the purpose of community interaction (Solomon, 1983; Belk, 1988; Elliott, 1994; Wattanasuwan & Elliott, 1998; Ahuvia, 2005), and the tobacco industry isn't an exception at all. The package, embodying brand imagery, has therefore the communicative function of creating self-image and social associations between the smokers and the desirable characteristics expressed by the brand (Grubb & Grathwohl, 1967; Thiboudeau & Martin, 2000; Wakefield *et al.*, 2002). As cigarette pack designer John Digianni notes, every time a smoker exposes his pack, "*… He makes a statement about himself*" (Koten, 1980), his values, attitudes and culture, that are closely represented by his cigarette brand of choice. Some early studies even suggested that there was a close relationship between some smoker personality traits and their brand preferences (Fry, 1971). Tobacco companies undertake a considerable amount of assessment before modifying pack designs, since it is so important that smokers feel comfortable carrying the pack around and uninhibited to take it out to light one up (BAT, 1978).

Given this communicational role, studies suggest that consumers choose their preferred tobacco brand more relying on the self- and social-expression it allows them than the taste of the cigarette themselves, that most of the times is not a discriminant factor: a British American Tobacco official commented that "*One in every two smokers is not able to distinguish in blind (masked) tests between similar cigarettes. For most smokers and the decisive group of new, younger smokers, the consumer's choice is dictated more by psychological, image factors than by relatively minor differences in smoking characteristics*" (BAT, 1978), that are mainly conveyed thanks to the package itself. Such intangible differentiation is considered especially important for products like cigarettes, that display very little uniqueness in terms of organic characteristics (BAT, 1978).

All in all, the aesthetics of such packages are a fundamental element for consumers, in particular adolescents (Grubb & Grathwohl, 1967; Fry, 1971; Beede & Lawson, 1991; Pollay, 2000; Cummings, Morley, Horan, Steger, & Leavell, 2002; Wakefield *et al.*, 2002; Hastings, Gallopel-Morvan, & Rey, 2008; Scheffelds, 2008; US National Cancer Institute, 2008), who seek for personal and social recognition by expressing themselves through their brand of

choice (Grubb & Grathwohl, 1967; Thiboudeau & Martin, 2000; Wakefield *et al.*, 2002). In a 2010 paper, Kinard and Webster tried to rank some of the most recognized main causes or predictors of adolescents' unhealthy consumption of alcohol and tobacco. Among advertising, social factors (parents and peers) and self-efficacy, peer influence is allegedly the most relevant one (Kinard & Webster, 2010). It has been suggested that, for what concerns cigarette consumption, peer groups establish desired brands which members use to associate themselves with the group. Cigarettes project very strong brand images, which influence brand choice in order to enhance self-image and group acceptance (Beede & Lawson, 1991).

Such a brand selection has critical economic value for tobacco players, since it is basically lifelong: cigarettes enjoy the highest brand loyalty of all consumer products with less than 10% switching rate a year (Wakefield *et al.*, 2002; Pollay, 1998). In a tobacco case study, The Brand Marketing Book (2000) reports in fact that, when surveyed smokers were asked, "If your regular brand were not available ...?" a high percentage of those responding said they would go somewhere else to buy the regular brand rather than accept another brand in its place (Marconi, 2000).

Therefore, tobacco companies have been putting all their efforts into innovating the package in order to render it the ultimate advertising media. To achieve differentiation, package design gained more and more importance over the years. Such strategies, combined with targeting and the already well-known brand logos and pictorials, have succeeded in rendering the different brands recognizable to the extent that, for instance, color alone might now be enough to identify brand varieties and emission levels (Moodie *et al.*, 2009). For instance, red normally communicates strong flavor, blue a mild brand extension, and green mentholated cigarettes; in general, the lighter the color, the lighter the tar. The design of the Marlboro pack perhaps represents one of the most successful and identifiable designs in cigarette packaging, to the point that determination of any other tobacco brand takes double the time needed to recognize a Marlboro package (Miller, 1986; Anon, 1980). The Marlboro Man was considered the top advertising icon of the century, in terms of effectiveness, longevity, recognition and cultural impact (US National Cancer Institute, 2008). Marlboro was ranked as the third best advertising company of the century (Deloitte, 2011), behind Volkswagen and

Coca Cola, while Interbrand[1] consistently ranked it as one of the top 20 brands worldwide in the last 20 years (Interbrand, 2011). The value of these tobacco trademarks has lasted and persisted over the years, in spite of an increased health awareness, stringent regulatory environment and ongoing industry litigations (US National Cancer Institute, 2008).

On a side note, packages are also one of the most powerful media for governments to diffuse warnings about the manifold dangers of smoking, given their advantageous reach and frequency of exposure to the target that make it the most cost-effective public health intervention available (Canadian Cancer Society, 2008; Hammond, 2007; Moodie *et al.*, 2009). At present, most countries worldwide require such warnings, even if specific characteristics can differ across jurisdictions. For example, the USA introduced mandatory written warnings in 1966, while a dozen other countries, including Australia and Canada, requested pictorial warnings to be displayed instead. In general, pictorial warnings are more effective than textual warnings, and the larger the warnings, the more effective they tend to be (RAND, 2010).

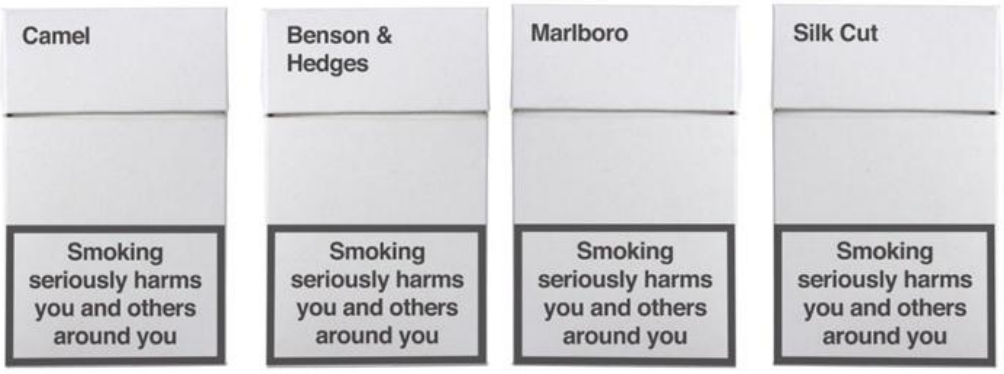
2.2. Plain Packaging

2.2.1. Definition

Also referred to as "standardized", "generic", "homogeneous" and "dissuasive" packaging, it is suggested to eliminate any possibility of differentiation in the appearance of cigarette packs by requiring the removal of every brand imagery, including corporate logos and trademarks. The background would be a standard color (brown or white) and the brand name would be printed in a predetermined size, font, color and position (Hammond, 2007; Moodie *et al.*, 2009; University of Toronto, 1993; Germain *et al.*, 2010; Freeman *et al.*, 2008; Cunningham & Kyle, 1995). Health warnings would still be displayed, together with contents, tax-paid stamps, security markings and toxic constituents, according to country-specific legislative requirements.

[1] Interbrand is the largest brand consultancy firm in the world. It releases an annual ranking of the best global brands by value, known as "The Best Global Brands", which is one of the most influential market indexes worldwide.

The most common forecasted aesthetics of plain packages, as of February 2012 (www.plainpack.com)



Already under discussion since the 1980s, plain packaging might be the more straightforward move regulators undertook to reduce package attractiveness so far. The governments who suggested such a regulation allege that it will make tobacco products less attractive, and therefore will reduce the prevalence of daily smoking through reducing initiation, consumption and quitting relapse (Deloitte, 2011).

2.2.2. Pros and Cons

Plain packaging has been studied with a variety of techniques too, ranging from online tests, surveys, interviews and focus groups. Maintaining a special focus on youngsters, self-reported assessments provide insights on how current or potential smokers will probably react to plain packaging once it will reach the market. Also, it has to be noted that since plain packaging has not been adopted yet, it is hard to replicate the exact same market conditions or forecast accurate reactions.

Nevertheless, there are a number of positive outcomes this restriction is advocated to yield:

1. Plain packaging is suggested to reduce attractiveness and engagement, especially among young people, since the characteristic powerful brand imagery would be missing. This would specifically translate into a reduced perceived appeal of the pack itself, less positive attribute ratings of the potential smoker or unclear target smoker and more negative expectations on cigarette taste, as some of these studies indicate (Beede & Lawson, 1991 and 1992; Goldberg, M. E., Liefeld, J., Kindra, G., & Vredenburg, H., 1995; Rootman & Flay, 1995; Goldberg M. E., Liefeld, Madill, & Vredenburg, 1999; Hammond & Assunta, 2003;

Freeman *et al.*, 2008; US National Cancer Institute, 2008; Germain *et al.*, 2010). For example, in a very recent online study conducted in Australia, Germain et al. (2010) tried to assess attractiveness of different types of packaging, presenting adolescents with five increasingly plainer packages of three cigarette brands. The test was conducted between subjects, and each respondent only had to evaluate one package out of the available 15, therefore no demand effect could be assumed. This study was the first one to adopt different degrees of "plain", therefore allowing for a better understanding of how different should a package be in order to be effective. Results suggest that the plainer the pack, the significantly worse the perception: the pack was considered less positively (i.e. not popular brand, attractive pack, exclusive, brand one would try/smoke); the smoker was perceived worse (i.e. not trendy, young, sociable, confident); the taste was expected to be poorer (i.e. not rich, satisfying or of high quality), cheaper and of lower class.

In a very comprehensive panel study, Goldberg et al. (1995) asked adolescents to identify, out of two very different people (e.g. young girl or fisherman), who would fit better for a certain cigarette brand, both full and plain. While for the full package significantly consistent answers were recorded, plain packaging didn't suggest any specific imagery appropriate to a specific type of person, even if the brand was displayed. The same respondents were asked to choose in semantic differential scales some words describing the owner of full, plain and plain with "lungs" symbol packages of three different brands; results conclude that there is a dramatic difference in the perception of the three brands, and also in the perception of full versus plain packages: smokers of plain packages are seen in a more negative way than those carrying regular packages, consistently with Germain et al.'s.

Similar results have been encountered for adult smokers as well (Wakefield, Germain, & Durkin, 2008). Through an online survey, the authors replicated the same design they adopted in 2010, therefore showing respondents four different types of plain packages for three cigarette brands, and asking them questions about the pack attractiveness, the smokers' identity and cigarette taste. Overall significant differences were found between the four types of plain packages, in the same direction as it was with adolescents.

2. Health warnings would be made more prominent: past research infers that they would not only be considered more salient and believable (Centre for Behavioral Research in Cancer,

1992; Center for Health Promotion, 1993; Linthwaite, 1985), but also more serious (Goldberg M. E. *et al.*, 1999; Beede & Lawson, 1992). In this way, their effectiveness would be increased. In a behavioral study on adolescents, Goldberg et al. (1999) showed three different warnings ("Smoking can kill you", "Cigarettes are addictive" and "Tobacco smoke can cause fatal diseases in nonsmokers") on both regular and plain packages, checking for recall levels, which were significantly higher for two out of the three warnings in plain than in full package, the briefer and starker ones.

3. It would also prevent the deception of consumers through statements about reduced damage of smoking. For example, past studies have proposed that "weight" specifications (light/medium) induce consumers into thinking lighter cigarettes are less harmful, even if this differential effects has not been properly studied or suggested by researchers yet. Plain packaging, it is hinted, wouldn't mislead consumers any longer (Freeman *et al.*, 2008; Goldberg M. E *et al.*, 1995; Hammond, Dockrell, Arnott, & Lee, 2009; Moodie *et al.*, 2009; US National Cancer Institute, 2008).

4. It would allegedly help reducing tobacco consumption (Cunningham & Kyle, 1995). This argument is pretty controversial, due to contrasting evidence. On the one hand, Cunningham and Kyle report four empirical studies (conducted in US, New Zealand, Australia and Canada) suggesting how plain packaging would likely decrease tobacco consumption, and bring the existence and poor performance of generic cigarettes both in Canada and USA as further proof of it. Similar results were found by Beede and Lawson (1991), who conducted 80 focus groups on New Zealand adolescents discussing about both plain and full packages of US and New Zealand brands, to control for prior exposure to NZ cigarette brands and advertising. Other than confirming different user profiles associated with different brands, throughout all 80 focus groups students expressed consistent opinions that plain packs would discourage smoking consumption among adolescents, as a consequence of reduced attractiveness.

   However, Goldberg et al. (1995) found only marginal effects for plain packages, meaning that respondents (both adolescents and adults) believed that plain packaging would reduce smoke uptake and induce cessation more than other packages, but with very high standard deviations: therefore, no absolute outcome can be drawn.

On the other hand, Rootman et al. (1995) found the exact opposite effect, namely that adolescents believed plain packaging would have absolutely no effect on smoking behavior. In a survey on Ontario adolescents, other than confirming the worse brand and usage imagery, the majority of respondents stated that plain packaging wouldn't change the likelihood of current young smokers to reduce smoke intake (71%) or the likelihood of nonsmokers to take up smoking (62%).

On top of this, in a 2011 report for BAT, Deloitte stated that it is practically impossible to assess such effect, since these packages are not uniformly compulsory in the market, therefore there is no chance to find out concretely how people would react to it.

As a consequence of the loss of brand attraction, that would commoditize cigarettes, prices will decrease and competition will be boosted (RAND, 2010; Deloitte, 2011). Given such an effect, premium brands will lose market power and therefore be compelled to reduce prices in order to meet consumer demand. Due to this move, also competition should increase, since there will be no need of strong power incumbents generally have in order to enter the market and sell new brands. On the other hand, however, some other studies note how governments would only have to increase taxation in order to bring prices back to the original value, therefore eliminating any such consequence (Freeman *et al.*, 2008; Cunningham & Kyle, 1995).

The other side of the coin is that many recent reports suggest there might also be a number of potential unintended negative drawbacks of plain packaging on the market.

First of all, illicit tobacco trading and smuggling would be facilitated by such a move, since it will be virtually impossible to distinguish between a regular and a fake white package. The illicit market can be broken down in two areas: counterfeit tobacco, including identical copies of branded products; and contraband tobacco, genuine goods imported from lower excise taxes regimes to other countries, without payment of the appropriate taxes. The issue with plain packaging would be to make these products even more available to mass markets: extensive missed profits would be caused not only to tobacco manufacturers, but also to governments, importers and retailers, besides injuring consumers, who might be exposed to potentially riskier products, such as counterfeit ones, produced without the minimum health standards of controls (Deloitte, 2011; RAND, 2010).

Also, some governments have been reluctant to consider the introduction of plain packaging due to intellectual property rights and trade issue (Freeman *et al.*, 2008). Tobacco firms, in fact, claim that such provision would be infringing their copyright and trademark enjoyment, among their main sources of income (McGrady, 2004). This is for instance why Philip Morris International and British American Tobacco are now threatening to file a lawsuit against the Australian Government (Robinson, 2011), which is planning to introduce plain packaging in January 2012, and also why, on March 30th 2010, the Lithuanian parliament rejected plain packaging proposal, considering it in breach of the said intellectual properties (Ivanauskienė, 2010).

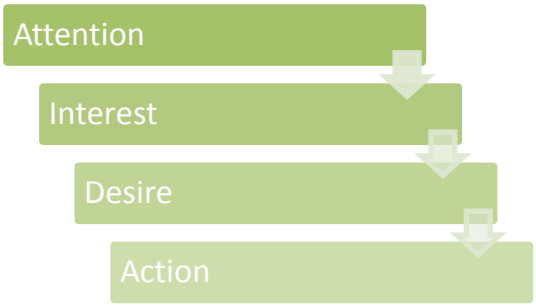
The most relevant limitation regarding such literature is based on the fact that, first of all, cited studies rely on self reported data (surveys, focus groups, interviews), which means conclusions were drawn on the basic assumption that what respondent reported was exactly what they meant and thought, and that their behavior could be inferred from their statements (LECG, 2010). Besides, respondents might not want or be able to really express their opinion, and, on top of that, since plain packaging is not yet on the market, it is hard to assume they could predict with due confidence what their behavior would be (Deloitte, 2011).

2.3. Consumers' Learning, Memory and Visual Imagery

2.3.1. Classical Theories

Brands, of course, are built to leave a mark in consumers' minds: strike them, be remembered and thus induce purchase and loyalty (Allan, 2006). Classical theories investigate the way consumers learn and process information through models, such as the Hierarchy of Effects or AIDA (Strong, 1925; Lewis, 1911), that assume a linear and conscious relationship from attention to action. In particular, the AIDA model consists in four phases that lead to the purchase of a product or service: attention is the first phase, in which something in the product sparks consumers' attention, usually driven by unique design, pricing, and marketing. A consumer will in turn want to know more about the product/service, its functions and features: interest is then created for the product, which is the second phase of the process.

Curiosity can then create a desire for the product/service, which subsequently stimulates an action to buy, the fourth and last phase; here, consumers will purchase the product/service after completing the three phases listed above.

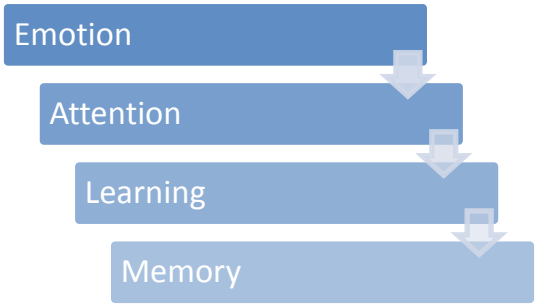


The developments of this extremely well known pillar theory are multiple. Other classical theories, in a breakthrough fashion, challenged the exact sequence of these steps, and suggested that the three main components of cognition (comprehension and learning), attention and conation (intention, behavior) can occur in different moments of the hierarchical stair step. Also, they suggested a linear and causal relationship does not necessarily underlie these processes, but one may reinforce the other two in a cyclical pattern. The most popular theory built upon these basic assumptions is the Three-Orders Hierarchy model, which is an evolution of the Hierarchy of Effects that posits how the three elements listed above can follow three different orders: cognitive-affective-conative (the so-called Learning Hierarchy, typical of high-involvement situations with very distinctive alternatives available); conative-affective-cognitive (the Dissonance-Attribution Hierarchy, common with high involvement products that however are poorly differentiated); cognitive-conative-affective (the Low Involvement Hierarchy, where personal interest is basically missing) (Ray, 1973).

Over the years, these and other similar theories became the basis of classical communication studies. Among other things, it is worth noting that they all support research methodologies such as surveys, focus groups, interviews, that assume very high rationality and consciousness on consumers' side. This kind of assumptions and therefore methodologies are the ones that were employed in past studies regarding plain packages, as we said before, with all the drawbacks and weaknesses of the case.

2.3.2. Cognitive Neuroscience

However, the recent application of brain science in economic fields challenges such rational mechanisms, suggesting how unconscious responses are other extremely relevant drivers of consumers' brand choices and learning (Penn, 2006). The proposed underlying process, still under verification and study, wants emotional stimuli to attract attention, which in turn affects learning and thus memory (Thornson, Chi, & Leavitt, 1992).



According to such a model, brands have to first of all attract consumers' attention, for instance by being more visible with respect to other players: it is commonplace knowledge that what we encode and remember better in an event is what we pay more attention to, that is, the more vivid a visual stimulus is, the more it attracts us (Swann & Miller, 1992; Bower, 1992). Packages at points of purchase, for instance, have to speak to consumers, to attract them, and to induce them to purchase all by means of their looks (Underwood, 2003; van der Lans, Pieters, & Wedel, 2008; MacInnis & Price, 1987; Wakefield *et al.*, 2007).

Once attention is raised, learning has to take place. In our everyday life, the most routine learning processes, including acquiring information about brands and products in general, are driven by incidental memory, a part of episodic memory (long-term memory linked to specific happenings of our lives, usually enhanced by the concurrence of emotional involvement) that is unorganized, unstructured and unintentional, occurring at any time and in any place (UNESCO, 2005; Penn, 2006). The literature unanimously considers learning and remembering the given information of undisputed relevance in terms of influencing critical variables such as repeated purchase and creation of brand knowledge, which are the necessary (even if not sufficient) conditions in order to build constructs such as brand preferences and consideration sets, the pillars that can eventually drive brand loyalty (Keller, 1993; Assael, 2003).

In order to enhance memory, one advantageous strategy is to use very direct and simple visuals and messages: the simpler a visual cue is, the easier to recall, since visual complexity

can perhaps be confusing (McGuire, 1969; Wedel & Pieters, 2000; Pieters, Wedel, & Batra, 2010). Many of the most successful advertising campaigns rely on direct, simple messages, to be straightforward and immediately understandable (Keller *et al.*, 2008). Being the ultimate advertising tool, these considerations are relevant for cigarette packages too.

On the other hand, it goes without saying that the more loyal and emotional one is towards a product or a brand, the more he is prone to remember it (Penn, 2006; O'Donnel & Brown, 2011). Being addictive products (Slade, 1995), cigarettes are a perfect example.

2.4. Smokers' Learning, Memory and Visual Imagery

As it was said before, visual cues are only the first step in order to induce consumer learning, thus memory and loyalty. Some studies suggest that certain visual stimuli are what lays behind the maintenance and reinforcement of addictions (Deloitte, 2011), because addicts consider drug-related cues as especially salient and attractive with respect to non-addicts or non-drug-related cues (Robinson & Berridge, 1993, 1995 and 2000). In particular, the hypothesis has been advanced that smokers have increased attentional bias for smoking-related stimuli with respect to non-smokers (Ehrman, Robbins, Bromwell, Lankford, Monterosso, & O'Brien, 2002; Bradley, Mogg, Wright, & Field, 2003; Walters, Shiffman, Bradley, & Mogg, 2003; Mogg, Field, & Bradley, 2005; Kwak, Na, Kim, Kim, & Lee, 2007), both for tobacco-related words and pictures (Field *et al.*, 2004; Mogg, Bradley, Field, & Houwer, 2003; Mogg *et al.*, 2005; Chanon *et al.,* 2010). Such a mechanism, through a process of classical conditioning (Franken, 2003), causes some even extremely trivial drug-related cues or stimuli to be strongly associated with the intake of the addictive drug, therefore triggering the same wanting effects as the substance itself (Robbins & Ehrman, 2004; Field & Cox, 2008; Berridge, 2009). When deprived of smoke, this effect is supposed to be even stronger (Field *et al.*, 2004; Wilson, Sayette, Fiez, & Brough, 2007; Field & Cox, 2008), due to a mutual excitatory relationship between craving and attentional bias (Field, Munafò, & Franken, 2009).

2.4.1. Incentive Salience

The salience smokers invest drug-related visual stimuli with, in comparison to non-drug related cues, is a significant driver of product recognition, which means that certain shapes, colors or words remind addicts of their favorite drug, triggering a craving urge. Robinson and Berridge's theory of neural sensitization and incentive salience tries to address this mechanism.

As postulated in a 1993 paper, addictions in general (which include food disorders, drug addictions and smoking, for instance) can be explained through the so-called incentive sensitization theory (Robinson & Berridge, 1993; Berridge & Robinson, 1995; Berridge & Robinson, 2000), that tries to address the main conscious and unconscious reasons why people consume drugs.

Compulsive drug seeking is the result of a progressive and persistent hypersensitivity of specific neural systems, induced by the intermittent use of such substances. The drugs increase the response rate of those neurobehavioral systems (*neural sensitization*), which means that those systems will respond quicker and more intensely the more they come into contact with the interested drug. In other words, the higher the consumption of such drugs, the more such brain areas will trigger drug craving, and this principle will repeat itself over and over again, creating a vicious circle.

The neural systems mostly sensitized by drug assumption are also those that have an influence on the "wanting" psychological process, which is more formally identified as the process of attribution of *incentive salience*. Incentive salience is a psychological process that transforms the perception of stimuli, imbuing them with salience and making them attractive to us. When this process takes place, some things that we see, touch or feel assume a whole different meaning to us. As a result, those stimuli are subconsciously considered as appealing and "wanted". The "wanting" system is generally closely linked to the "liking" system, which consists of the pleasure-seeking neuronal areas in our brain, that lays behind our ability to enjoy something. It must be considered that the said "wanting" and "liking" are not conscious responses, but are underlying preconscious psychological tenets that, together with other additional cognitive sequences, induce us to be aware of wanting or liking something in the conscious meaning we know. As a corollary of this, under some circumstances, people might be led to want something without actually knowing why.

Generally, the two systems are bound together and form our so-called *reward system*: liking something triggers our reward expectation system, that in turn makes us want to have that something. The reverse is also true: the less we like something, the less we want it. However, when speaking about addictive substances, there is a dissociation of such systems, in that they no longer act in response to one another: addictive products are proven to be altering the wanting but not liking system. This translates in the fact that, even if addicts don't like the drug anymore, they feel compelled to search for it, through the neural sensitization and incentive salience mechanisms outlined above.

2.4.2. Other theories

Various theories behind the correlation between addiction and attentional bias exist. In a 2008 article, Field and Cox reviewed most of the available literature of addiction-related attentional bias and evaluate the main theoretical backgrounds: according to some, attentional bias can develop either as a consequence of Robinson and Berridge's neural sensitization and classical conditioning; others, instead, suggest subjective motivational states, for example the craving levels, as main drivers of visual attentiveness.

These two theories are of course not mutually excludable, which means they can both be present and interacting with each other. The authors, in fact, propose an integrated model in which conditioned drug use causes both attentional bias and craving, that are mutually excitatory (Field & Cox, 2008).

As a further support for Robinson and Berridge's neural sensitization, Chanon et al. tried to investigate the mechanisms behind attentional bias in smokers and non smokers, aiming at understanding whether it was mainly due to addictive processes – namely nicotine habituation and sensitization – or stimulus familiarity. Using very short cue presentations, smokers showed a much quicker biased response towards smoking stimuli. The advantage of such a study over comparable others is that such a short exposure only allows for reflexive attention to take place, in comparison to voluntary attention (Chanon *et al.*, 2010). Results indicate therefore that the most relevant process behind attentional bias seems to be sensitization.

2.4.3. Attentional Bias

Neural sensitization of addictive substances can be highly enhanced by associative learning, particularly via Pavlovian or classical conditioning (Franken, 2003). This means that, after a certain number of exposures, even some very trivial cues or stimuli will be strongly associated with the act of taking the addictive drug (or smoking a cigarette), and will consequently trigger the same wanting effects. Practical examples of smoking-concerned stimuli could be the cigarette, a puff of smoke, an ashtray and so on.

When linked to a stimulus representation, *incentive salience* transforms the mere sensory shape, smell or sound into an attractive and attention-riveting incentive. In other words, once attributed, the incentive perception becomes difficult to avoid noticing: the eyes naturally move toward the cue, it captures the gaze and becomes motivationally attractive, and the rest of the body may well follow to obtain it (Berridge, 2009; Field & Cox, 2008; Robbins & Ehrman, 2004). This kind of *attentional bias* plays an important role in the maintaining and eventual relapsing of drug intake, and drug addicts are suggested to be specifically attracted by these drug-associated stimuli.

Smoking behavior has been studied over the years with a number of different methodologies, including neuro-scientific techniques such as fMRIs, eye-tracking and computer-based behavioral studies. Since the present thesis is mainly concerned with eye-tracking and behavioral studies, a review of the relevant existing will be carried out.

2.4.3.1. Behavioral Studies

Many techniques have been adopted to study such link over the years. In their article, Field and Cox move on to describing the more widely used behavioral tests of substance-related attentional bias – such as the addiction Stroop, flicker ICB and visual probe tasks – and some evidence obtained with said paradigms related to different types of drugs, mainly alcohol and tobacco.

The first task consists in the presentation of two categories of words, substance-related and neutral, in different font colors, and participants have to perform a primary task (e.g. color naming) on both types of words. It is suggested that drug addicts will take longer in naming

the color of substance-related words. However, interpreting results is very demanding, since there can be multiple reasons behind one's slow performance: for example deeper processing or, on the contrary, avoidance of substance-related words.

The second task shows two similar photographs, both containing substance-related and neutral cues, repeatedly exhibiting them. Small changes are present between these pictures, one substance-related and one neutral. Respondents will be shown pictures over and over until they can detect the difference. Those who detect the drug-related cue first are suggested to have attentional bias towards addictive cues. These results were found with heavy alcoholics, but not with smokers.

The latter task provides a more direct measure of attention allocation, by matching a substance-related and a neutral image on the screen, and afterwards presenting a probe on either side of the screen, asking participants to respond to it. Since response is generally faster in regions of visual display to which one is attending, substance users generally display quicker response times and therefore attentional bias towards probes replacing drug-related stimuli, while non-users do not (Ehrman *et al.*, 2002). Waters et al. got similar results for deprived smokers too (Walters *et al.*, 2003). However, many interpretations are available here too, with contrasting meanings as for why addicts should take less in responding; also, characteristics such as duration of exposure to stimuli have been found to cause different outcomes (Field & Cox, 2008).

2.4.3.2. Eye Tracking Studies

A lot of past studies explore the relationship between addiction and attentional bias, meant as gaze length or initial fixation. For example, in a 2003 study, smokers and non-smokers were shown both smoke-related and neutral cues while they had to complete a visual probe task. Results found that smokers gazed longer at smoke-related cues with respect to non-smokers and neutral images, and they had quicker response times during the probing task. Also, smokers tended to evaluate those pictures containing drug cues better than non-smokers. However, initial fixation did not significantly differ between groups, even if smokers looked slightly more than non-smokers to smoke-related cues (Mogg *et al.*, 2003).

These results were later confirmed by a number of studies (Chanon *et al.*, 2010; Ehrman *et al.*, 2002), including Kwak et al., who found differences in attentional bias between smokers and non-smokers. Smokers were found to initially fixate aversive cues more than smoke-related or neutral images, but then gazing much longer than non-smokers to smoke-related stimuli (Kwak *et al.*, 2007). However, the authors noted how deprivation state was not taken into consideration, which instead allegedly plays a relevant role in attention-grabbing mechanisms.

Therefore, many other researchers focused on the role of deprivation on such a process (Field *et al.*, 2009; Wilson *et al.*, 2007). For example, in a 2004 paper, Field, Mogg and Bradley tried to assess eye movements during a visual probe task between deprived and non-deprived smokers. The main results suggested that deprived smoker gazed significantly longer than non-deprived smokers to smoking pictures with respect to control pictures, while no specific pattern was identified for the direction of initial fixation and probe response time. However, deprived subjects expressed a higher craving for cigarettes and perceived pleasantness of smoking-related pictures, as well as the degree of craving elicited by such pictures (Field *et al.*, 2004). The main drawback of this, as well as other studies, is the lack of a proper control group (e.g. non-smokers), that would have isolated smoking as one of the main possible explanations to these results.

Summing up, a relationship has been inferred between smokers' visual attention on smoking-related cues, intended as gaze length but not necessarily as initial fixation. The main issue with these studies is that none of them tries to evaluate the power of the package or brand, but only to smoke-related visual stimuli, such as images of cigarettes on ashtrays or people smoking. However, given the previous theoretical analysis, it is clear how important a visual stimulus it is, especially in the tobacco industry.

2.4.4. The Package

An example of smoking-concerned stimuli not considered in the literature so far relates to the aesthetics of cigarette packages: once we are used to buy always the same brand, say Marlboro Gold, we would recall the pleasure of smoking every time we see the word Marlboro or the typical Marlboro logo shape. Since cigarettes are different from any other

drug in terms of how relevant brands are, one might display different addictive levels according to their brand preferences, as much as addicts show different addictive levels according to their drugs of consumption (Field & Cox, 2008).

According to the theory outlined above, this might mean that smokers would be able to remember better those stimuli showing their preferred package of cigarettes, because these are the ones they are addicted to and that thus attract their attention the most. However, the issue of plain packages would be that brands could no longer be differentiated among each other, at least from the aesthetic point of view. Yet, brands will still be the same, even if displayed differently. Therefore, the question is: are aesthetics so much more important than brand preferences? Will people, in particular heavy smokers, still be so attracted to packages, and therefore pick a specific brand, even if they all look plain white?

3. Research Question

Following the reasoning carried out in the previous sections, our main question is: will plain packages reduce recognition and therefore differentiation? Or will smokers just re-calibrate their attentional bias, therefore still remembering better their preferred brand irrespectively of how the pack looks like?

With reference to the outlined theoretical background, we can hypothesize what follows:

first of all, following the theories reviewed above, we aim at understanding whether there is a differential effect in attentional bias according to the informational complexity (full vs. plain package), personal brand preferences and smoking level (smokers and deprived smokers, with non-smokers as a control group).

H_1: Attention will be positively driven by aesthetics.

H_2: Attention will be also positively driven by personal preferences.

H_3: Deprived smokers should exhibit an even stronger pattern than smokers.

H_4: Non smokers should be less attracted to smoke-related stimuli.

Secondly, the memory performance will be evaluated, in order to understand whether it is driven more by personal preferences or information load, and whether deprivation level matters. In other words, we want to weigh the brand factor against the aesthetic factor. Since according to the reviewed theory both elements are essential drivers of memory, we can expect the following patterns:

$H_{5.1}$: Smokers will remember full more than plain packages.

$H_{5.2}$: Smokers will remember their preferred brand more than non-preferred one.

H_6: Deprived smokers should exhibit an even stronger pattern than smokers.

A more precise definition of what we mean by “attention” and “memory” will follow in the methodological section.

4. Methodology

4.1. Materials and Procedures

The experiment is structured as a 3 (non-smokers, smokers and deprived smokers) x 2 (full and plain information) x 2 (cigarettes and beers) factor design. Beers were added to the test as a distracting category in order to disguise the main aim of the experiment and avoid memory ceiling effects.

Pre-Test

During a pre-test recruitment via email and online survey *[See Appendix A]*, respondents were first of all asked to assess their consumption of cigarettes per day and beers per week; which was, if they had any, their preferred brand in both cigarette and beer categories; and finally their personal ranking (1 as most favorite and 7 as least favorite) and rating (1 as "I do not like at all", 7 "I like very much") of seven proposed brands per category, chosen according to sales volume share in the Danish market (Euromonitor, 2010) *[See Appendix B]*.

Beer was chosen as a distracting product category because, just like cigarettes, it has a very high usage and exposure rate among young university students, it also is a badge product with important social visibility, and the several competing brands possess minimal product differentiation, making brand choice again mostly a matter of brand image. It is also considered function- and image-wise complementary to cigarettes (US National Cancer Institute, 2008, p.63).

The average time it took to complete the test was around one hour per test person. All respondents received the same, standardized verbal instructions.

Before starting the actual test, respondents were asked how much time elapsed since they smoked their last cigarette. Those assigned to the deprived smokers group had to be at least 10 hours away from the last cigarette.

CVLT[2] - California Verbal Learning Test

Since the core test concerns memory, and it might happen that intrinsic memory abilities differ among respondents, it is important to control for this variable. In order to take this into account during the analysis, the California Verbal Learning Test (Delis, Kramer, Kaplan, & Ober, 1987) was performed in English on all respondents, to have an assessment of general memory abilities. The list was composed of 16 common words, belonging to the four categories of tools, fruits, clothing and spices, tested for their simplicity and understandability on a sample of five people. The first five recalls were performed before the eye-tracking tests, while the final free and cued recalls were required after the memory task, which translates into a time span of approximately 30 minutes, in order to allow incidental memory to consolidate (O'Donnel & Brown, 2011) *[See Appendix C]*.

Eye-tracking Study 1 – Liking Task

Participants were accommodated to the eye-tracking equipment. All the behavioral tasks were implemented in E-Prime 2.0 (PST Inc., Pittsburgh, PA), while the eye-tracking software used was iViewX for recording and BeGaze 2.4 for the analysis. The packages of the said 14 brands were presented in two variants, one branded and one plain, photoshopped as described in the literature review, together with abstract art paintings by non-famous or recognizable artists, in order to avoid any personal or emotional link for respondents *[See Appendix D]*. Since plain packages are not yet in commerce at this time, it is important to familiarize respondents with them before the actual test, in order to avoid confusion between arousal and excessive attention due to novelty for unpredicted anomalies, instead of genuine interest. This was achieved through a liking test, where respondents were asked to rate on a Likert scale how much did they like each single package (range: 1 to 9, where 1 means “I do not like it at all” and 9 is “I like it very much”), both plain and branded (for a total of 25) and each single painting (total of 100) that were then used for the subsequent task. Each screen thus only showed one of these 125 images. Each experimental session was preceded by a nine-point grid calibration and validation. Between trials, the fixation cross reappeared to

[2] The California Verbal Learning Test is a well established neuropsychological test for verbal memory, which is often used to assess a number of memory aspects, including long term memory abilities.

correct for drift due to head movements. Every image was shown for 3 seconds, and the liking scoring was self-paced afterwards.

Eye-tracking Study 2 – Discrimination Task

After this first step, another eye tracking study was performed. Each of the said 25 packages was coupled with four different paintings of those 100 shown in the first eye-tracking; of the four couples of packages and paintings *[See Appendix E]* obtained, two showed the package on the right and two on the left.

Figure 4.1.1: Cigarette package couples example: brand L&M

After calibration and validation, these couples (each screen was made up of one package and one painting) were randomly presented for 3 seconds. During that time, participants were required to accomplish a very simple right-left discrimination task, i.e. pressing a key to

indicate whether the painting was in the left ("C") or right ("M") side of the screen during each trial.

This task was specifically adopted in order to let respondents' attention move freely in between the presented images, without any external constraint about where to fixate. The main aim here was to drive incidental instead of induced learning, therefore not providing respondents with too narrow or specific instructions. In other words, without explicitly training respondents to look at both the painting and the package, their genuine attraction towards any element in the displayed screen (product or painting) was observed.

Distracting Task

To let enough time elapse between the stimuli presentation and the memory task, thus allowing incidental memory to consolidate (O'Donnel & Brown, 2011), a distracting task was introduced. It consisted of two small tasks, respectively entailing ranking 30 faces and 26 art paintings, different from those presented in the previous tasks.

The choice of such an activity over other was due to some studies suggesting that nicotine intake has a positive causal relationship with how smokers perceive other people; in other words, it is possible that nicotine intake increases ratings of attractiveness of facial cues (Attwood, Penton-Voak, & Munafò, 2009). From this, it would be interesting to study the other way around too: it could be possible to infer whether smoke deprivation causes more negative attitudes towards facial cues in smokers. However, since not strictly related to the general research question of this work, the results of this task will not be displayed in this paper.

Memory Task

The core task, in which respondents were randomly shown 50 of the couples also presented in the discriminating task (the 25 product packages with paintings to the left, and the same 25 packages with the painting to the right) and 10 invented couples, made up of 10 beer packages and unseen paintings. The task required participants to state how confident they were that the exact same couple they were shown at the moment was also presented during

the experiment at the eye-tracker. Notably, in case of plain packages, they were explicitly told that also the brand mattered when stating recognition level.

Recognition in particular was chosen over recall because in a recent article David Penn (2006), a groundbreaking researcher of neuroscience applied to marketing research, suggests how recognition is the best method to investigate such unconscious processes, because it taps into both conscious and long-term memories of branding and advertising, which is a whole different level of depth with respect to working memory, which is temporary, short-term and a very simple cognitive process (Penn, 2006; O'Donnel & Brown, 2011).

Figure 4.1.2: One true couple and one false couple, compared with the "true" ones

True

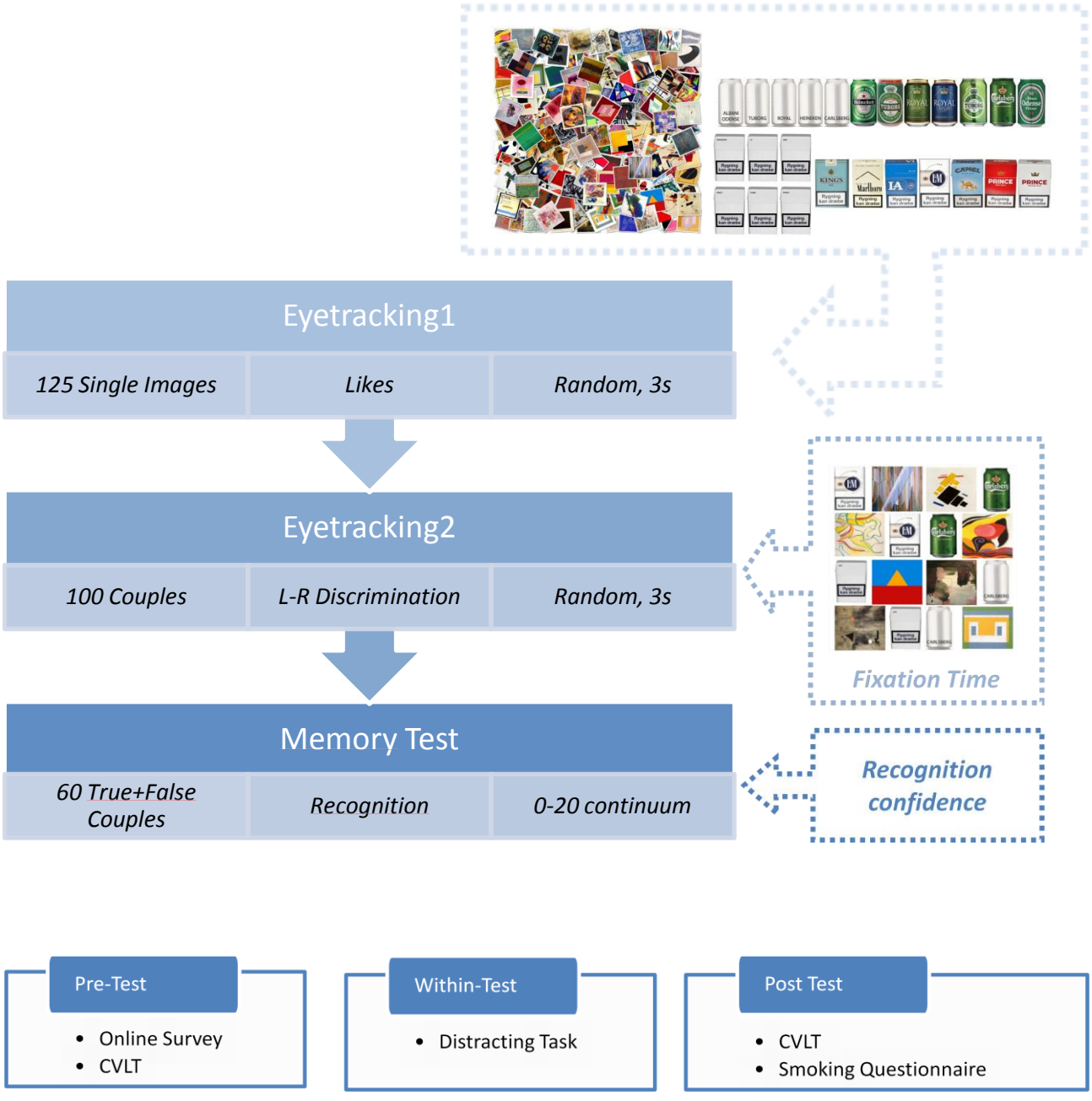
False

Smoking questionnaires

Two smoking questionnaires were both filled out by test persons at the very end of the experiment. The first one was regarding some general smoking behavior questions - the Fagerström test for Nicotine Dependence (Fagerström, 1978; Heatherton, Kozlowski, Frecker, & Fagerström, 1991), while the second one, a Questionnaire of Smoking Urges (Cox, Tiffany, & Christen, 1991), was set in order to capture respondents' craving levels *[See Appendix F].*

Before running it, the whole test was completed by two pilot participants, both non-smokers, in order to assess the level of difficulty of CVLT and the speed of eye-tracking screens. Satisfactory feedbacks led to no change in the final experimental design.

Figure 4.1.2: Study Outline



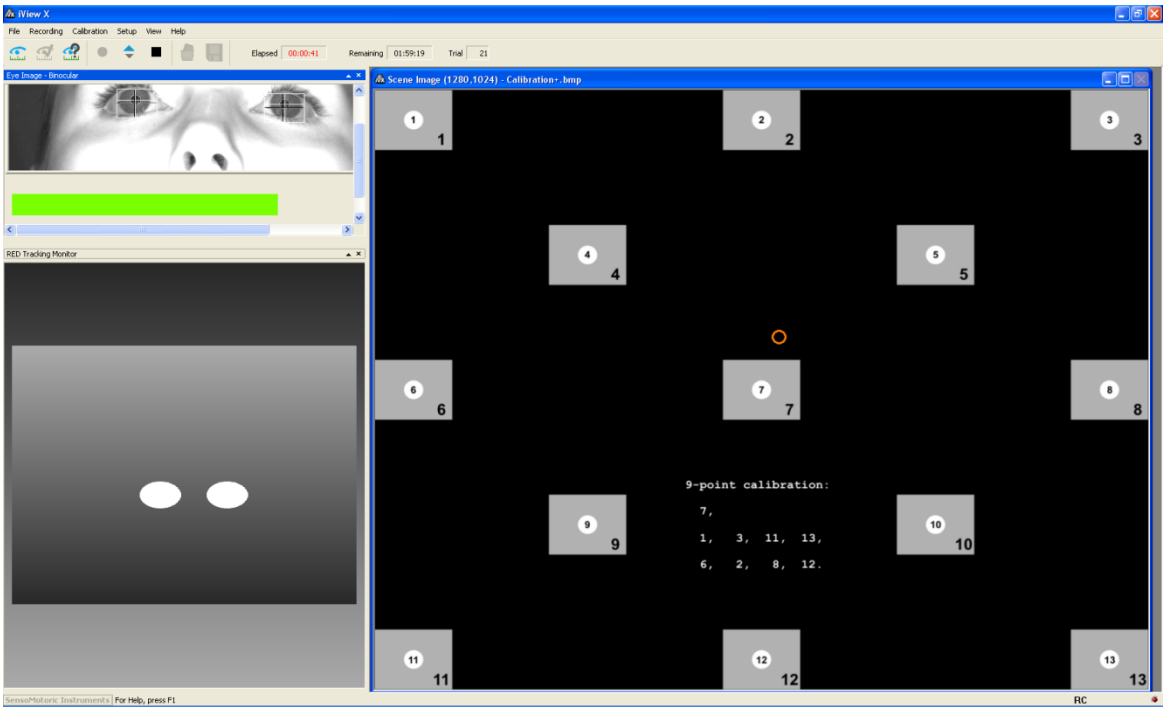
4.2. Measures

Visual Attention will be analyzed split into Areas of Interest (AOIs), broadly divided into Painting and Package – which is then subdivided into Brand, Logo and Warning – that will be taken into careful consideration. For the sake of the research it is important to check especially how much attention do the package and brand receive, in particular the comparison between full and plain packages. It has to be noted that the logo was removed in plain packages, therefore it will not be compared.

Visual attention will be measured as Fixation Time (how long one stares at a specific AOI) and Duration Before (how soon one looks at a specific AOI). These variables exhibited distributions very much skewed to the right (respectively, skewness of 1.885 and .891); that is due to the fact that, out of 5 to 6 areas of interest, respondents did not manage to stare at all of them for each screen in the time lap of 3 seconds, which results in many records being equal to 0. This makes sense, as explained, and was corrected for during the analysis.

Figure 4.2.1: AOIs for full and plain package example: brand King's

Figure 4.2.2: The screen from the researcher's position during the eye-tracking experiment



Memory was measured on a continuum from 0 ("I'm totally confident the couple was not shown at the eye-tracker") to 20 ("I'm totally confident I saw this exact couple at the eye-tracker"), where 10 was meaning "I'm not sure".

Preference was measured according to the rankings recorded in the online survey filled out before the physical experiment. As the most desirable item, brand ranked number one was chosen, even if it was not the absolute preference but only relative to those seven brands shown in the experiment. For non-preferred, brand ranked number four was chosen, since lower rankings could have some biasing negative connotations (Kern, Libkuman, & Otani, 2002).

4.3. Manipulation Checks

Deprivation Groups 2 and 3 differed significantly for deprivation status, and this is confirmed by the brief Questionnaire of Smoking Urges, which showed higher craving values for deprived than non-deprived smokers ($M_{smokers}$=3.22, SD=1.37; $M_{deprived\ smokers}$=4.65, SD=1.23; p=.006); still, smoking behavior did not significantly differ between groups, as confirmed by an ANOVA performed on the scores of the Fagerström test ($M_{smokers}$=3.20, SD=1.93; $M_{deprived\ smokers}$=2.80, SD=1.47; p=.529). This manipulation check shows that the only difference between groups was the abstinence level, as required by the experiment design.

Full vs Plain Packages Actual responses to the E-primes of both single and coupled eye-tracking were also recorded: the liking scores for each product and painting alone (ranging from 1 to 9, where 1 means "I don't like it at all" and 9 is "I like it very much") and the left-right discrimination task for the coupled screens ("C" key – the painting is on the left ; "M" key – the painting is on the right), together with the relative reaction time.

Therefore, in order to control for the aesthetic perception, we run some ANOVA tests on the outcomes of the liking scores recorded during the first eye-tracking experiment. Results show that respondents report a marked preference for full packages ($M_{non\text{-}smokers,full}$=2.44, SD=1.518; $M_{non\text{-}smokers,plain}$=1.77, SD=1.212; $p_{non\text{-}smokers}$=.0000. $M_{smokers,full}$=3.9, SD=2.251; $M_{smokers,plain}$=2.92, SD=2.02; $p_{smokers}$=.0000. $M_{deprived\ smokers,full}$=4.6, SD=2.397; $M_{deprived\ smokers,plain}$=3.13, SD=2.056; $p_{deprived\ smokers}$=.0000), which is consistent with the literature reviewed.

Also, significant differences are recorded between groups, with non-smokers scoring lower than smokers, and deprived smokers scoring the highest (p<.0000 for both full and plain packages between all three groups).

4.4. Sample

45 participants were recruited, of which 20 females, aged between 19 and 33 (M_{age}= 24, SD=3.135). 15 of them were non-smokers and 30 were heavy smokers.

The sample was basically convenience-based, because participants were all recruited in a university setting, even if not all of them were students. However, in general, they can be

representative of Copenhagen's lifestyle, while it is probably hard to extend their external validity to other social settings.

Smoking participants were recruited based on self-reporting smoking an average of at least 10 cigarettes per day, which is commonly considered as belonging to the "heavy smoker" category, because, according to the incentive-motivational model, substance-related attentional bias is suggested to be directly proportional to the quantity and frequency of use (Field & Cox, 2008). Therefore, adopting heavy smokers would make the research even more significant. However, results on smokers so far have been mixed, so there is no clear-cut causal relationship or correlation between the two characteristics. Half of these smokers were required to take the test in a tobacco deprivation state, namely after not having smoked for at least 10 hours ($M_{deprivation}$=14.6 hours, SD=9.9; range=10-48 hours), which should enhance both their visual and memory-related responses (Mogg *et al.*, 2003 and 2005).

Occasional and ex-smokers were excluded from the recruitment process, since they might not exhibit the brand loyalty a heavy smoker is supposed to have. Non-smoker participants, instead, reported having never regularly smoked in the past, even if half of them tried to smoke once but never started smoking on a regular basis.

Since beer was only a distractor, there was no minimum requirement for its consumption. All subjects were compensated with a 30dkkr meal voucher and two packs of their favorite cigarette brand (smokers only) and gave their informed consent for data treatment.

Most of the test persons were Danish, but for 16 respondents of other nationalities. Foreign test persons, however, were recruited only if they had lived at least for 6 months in Denmark, since some psychological research suggests that expatriates take some time to adapt to the host country's popular brands (Sussman, 2001). Given that the acculturation process is also driven by other factors, such as personality traits and cultural diversity, the period of permanence was considered for each respondent on a case-by-case basis, in order to control for their level of knowledge of the Danish brands proposed during the tests.

4.5. Peculiar Cases

Two unexpected patterns of response to the left/right discrimination task e-primes were detected. Respondent #15 (non smoker) pressed the exact opposite keys than expected for every screen, but since his gaze records showed a compatible pattern with all other respondents (i.e. he always stared at the painting first), we assumed this was a systematic error and just reversed all his responses. Respondent #29 (smoker non deprived), instead, didn't really press any key. This was probably because he thought he should press once the screen changed, since the few responses he gave had very late reaction times. However, we decided to keep him in the database because all other measures were well recorded and this was not a crucial one.

On the other hand, a 46th respondent was recruited, but had to be discarded from the analysis due to technical issues with the eye-tracker.

5. Results

To start with, it is important to remind that, since beers were just distractors, the following analysis is entirely focused on cigarettes.

The next sections, concerning attentional bias first and memory performance afterwards, consist of two parts each: after showing the general results of the effects of information load and deprivation, a more in depth analysis will be carried out also considering personal preferences, in order to cover the role these elements have in the found trends according to the hypotheses stated above. It made more sense to us to exclude non-smokers from this second part of the analysis, simply because we believed they could not possibly have reliable preferences for what concerns cigarettes, given that they are non-users and therefore, supposedly, not knowledgeable enough to state which brands are their most or least favorites.

5.1. Attentional Bias

5.1.1. General Results

This section will address whether some differential effect will be present when studying visual attention by group, information load and group*information interaction towards different AOIs of cigarette packages.

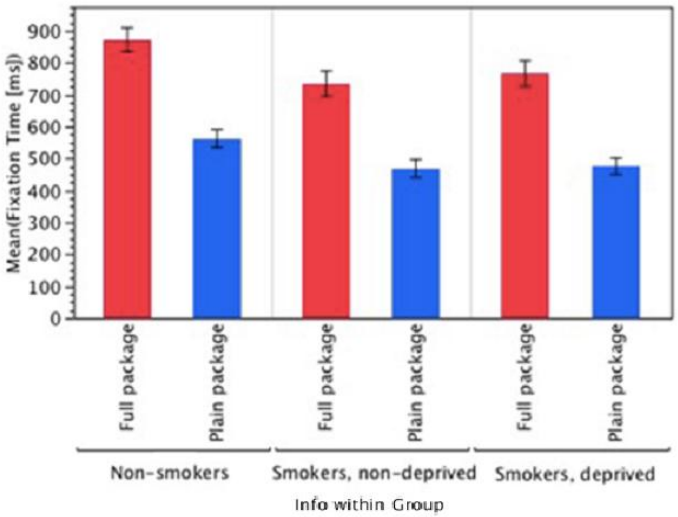
Fixation Time

How long do respondents dwell on a specific portion of the screen? A Generalized Linear Model analysis was run, to correct for the exponential distribution of the variables and to take into account both repeated and non-repeated measures.

The package as a whole attracts in general more in its full than in its plain version (χ^2=131.83, p<.0001), therefore confirming our hypothesis H_1, according to which the aesthetics play a crucial role in attracting respondents' attention. A group (p=.0013) and information (p<.0001) effect are recorded, with non-smokers staring more at packages than smokers (both deprived and not deprived), while there is no interaction between the two variables (p=.5716), which means all three groups of respondents stare more to full than plain packages in equal

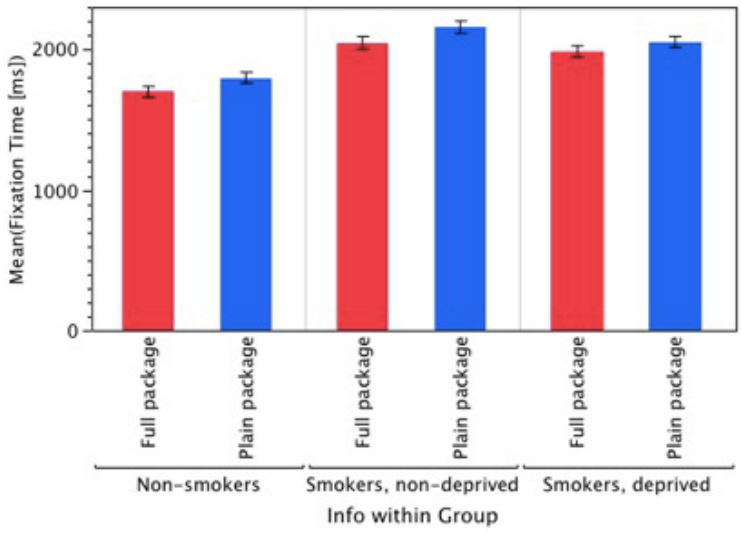
measure. In essence, for what concerns packages, our hypotheses H_3 and H_4 are therefore not verified, respectively because deprivation level does not really significantly positively affect results and non-smokers are actually more attracted to packages than smokers, which is unexpected according to the theories reviewed before.

Figure 5.1.1: Total Fixation Duration - Package



Complementary to this, paintings are stared much more at by smokers, but with no significant difference between couples exhibiting full and plain packages (whole model: χ^2=15.81, p=.0074; group: p=.0008, info: p=.2515, group*info: p=.9617). It is worth noting how deprived smokers do stare a little bit more to the package and slightly less to the painting, even if not in a significant way.

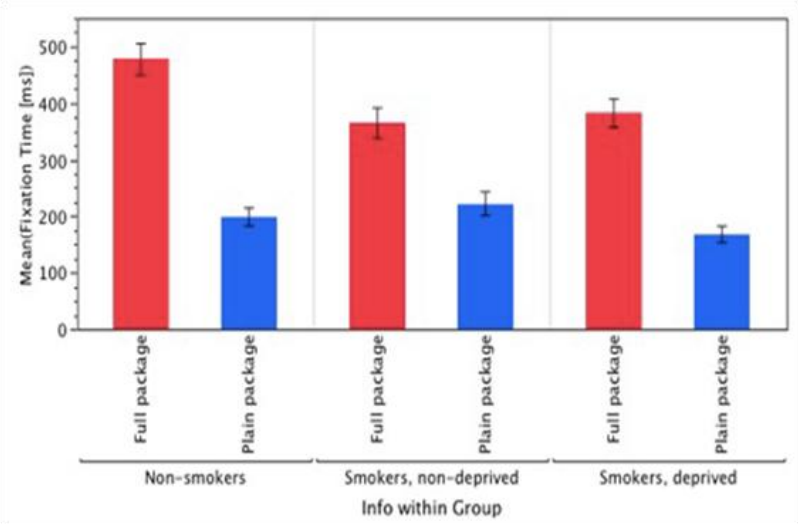
Figure 5.1.2: Total Fixation Duration - Painting



Statistically different patterns were also identified when it comes to tobacco brands (χ^2=334.15, p<.0001) and warnings (χ^2=30893.38, p<.0001) both as group, information and group*information effects.

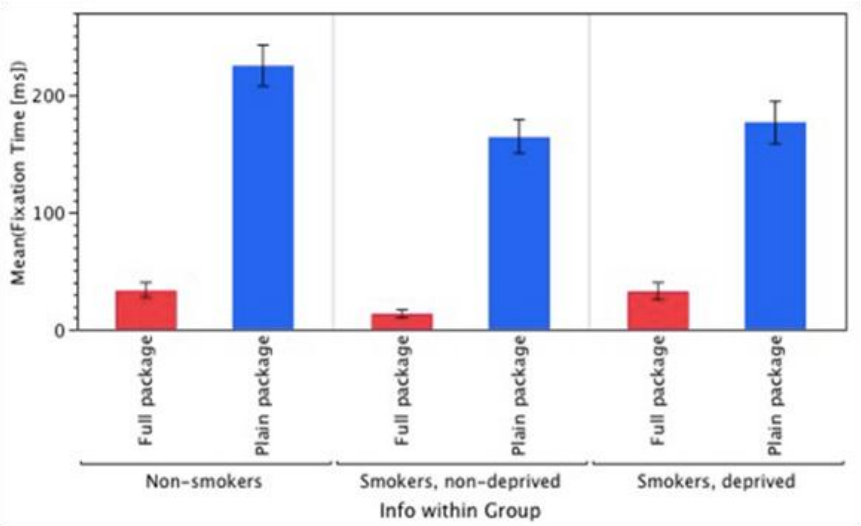
More in general, the brand receives much more attention when the package is full than when it is plain, which is coherent with literature and supportive of our hypothesis H_1.

Figure 5.1.3: Total Fixation Duration – Brand



Warnings, instead, are devoted a lot more attention with plain than full package, especially by non smokers and deprived smokers, both in absolute and relative terms when compared to the other areas of interest. The latter group also seems to gaze equally to both packages, showing no particular higher or lower relevance dedicated to the warning, and longer than non-deprived smokers. This makes sense, also according to the reviewed literature, because warnings suddenly become the most prominent piece of information of the whole package, therefore attracting most of the attention (Warning: group: p<.0001, info: p<.0000, group*info: p<.0001). One of the alleged advantages of plain packaging is precisely the enhanced preponderance of the warning element in comparison to current full packages, which is exactly replicated by our results.

Figure 5.1.4: Total Fixation Duration – Warning



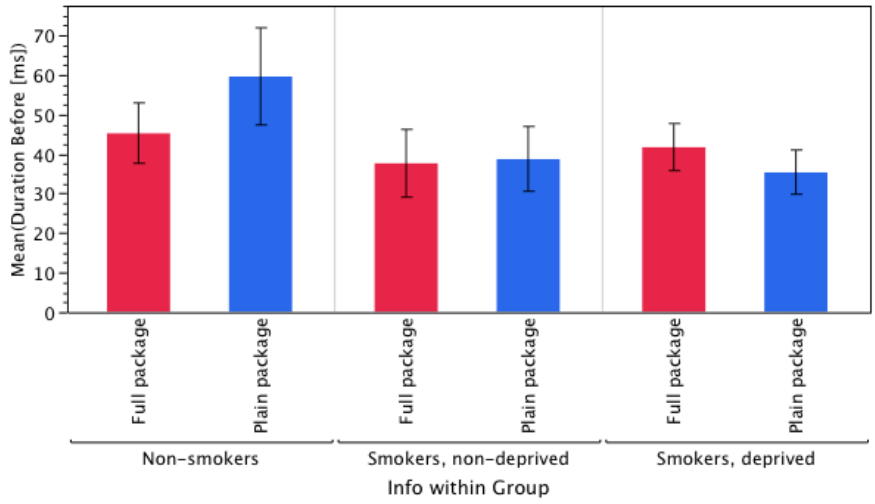
However, it is curious to note how non-smokers seem to gaze much more to the brand with respect to smokers when full packages are shown. Among smokers, no true effect due to deprivation can be assessed for full package, while non-deprived smokers seem to be more interested in the brand even when the package is plain (Brand: group: p=.0012, info: p<.0001, group*info: p=.0005). Both these outcomes reinforce the non-verifiability of our hypotheses H_3 and H_4.

Duration Before

How long does it take for respondents to stare at a specific AOI?

Considering that the task was to identify where the painting was on the screen, it is interesting to see the outcome on such area first. While the overall model turns out not to be significant (F=1.08, p=.3674), some differential effect between groups (p=.048) can be found: non-smokers seem to wait more time before looking at the painting, and on top of that they seem to exhibit this trend more with couples exhibiting plain packages. Therefore, smokers are attracted to paintings earlier than non-smokers, even if not in a significant way.

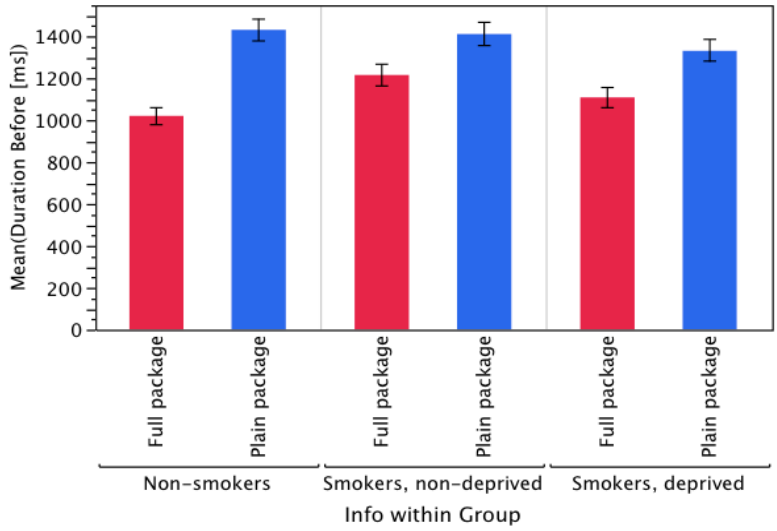
Figure 5.1.5: Duration Before - Painting



Complementary with what is found above, the opposite holds for the package: non-smokers seem to be attracted to the package before than smokers, even if the overall model is again not significant (F=1.02, p=.3845).

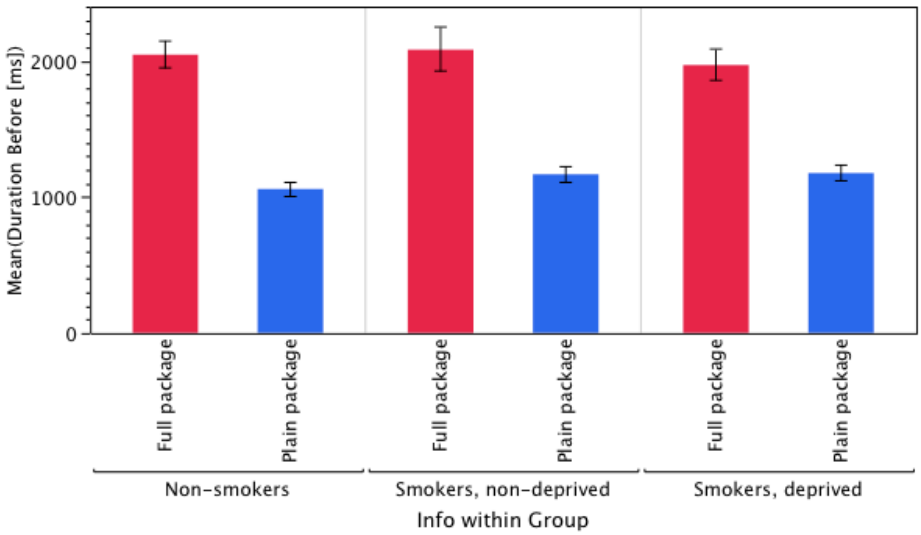
For what concerns the brand, there seems to be a significant difference both concerning groups, info and group*info elements, according to which all groups look at the brand with full packages earlier than plain packages, and this is valid even more for non-smokers (whole model: F=11.6, p<.0001; info: p<.0001; groups: p=.047; group*info: p=.021).

Figure 5.1.6: Time to First Fixation - Brand



For sure, all three groups are attracted by the warning much later in full than plain packages; also, package information is the only driving parameter for the whole model's significance, since there was no difference in between groups and in the interaction between groups and information load (whole model: F=26.54, p<.0001; info: p<.0001; groups: p=.5675; group*info: p=.4152).

Figure 5.1.7: Time to First Fixation - Warning



These further findings support once again the strength of aesthetics when it comes down to attracting attention (H_1), even if deprivation and smoking status do not turn out to drive behavior as expected in our hypotheses H_3 and H_4. Anyways, these results are consistent with our previous outcomes and throughout the whole analysis.

Given these outcomes, it is presumable to state that aesthetics, in any case, are definitely important for attention raising, both for smokers and non smokers. This supports the general belief that package looks are especially important for non smokers, particularly adolescents, due to their powerful brand imagery. The brand, which is a critical element, receives in absolute terms much more attention from all groups when shown in the context of a full package, particularly if compared to the warning. In fact, with plain packages the two AOIs obtain almost the very same quantity of attention, while colored packages almost disguise the warning in their colorfulness, as it receives very little attention and very late: it is worth noting that, in full packages, warnings receive significantly less relative amount of attention with

respect to plain ones (around 50ms out of 880ms for the package when it is full, and 200ms out of 500ms for the package when it is plain).

For smokers, attention will be further investigated according to personal preference levels.

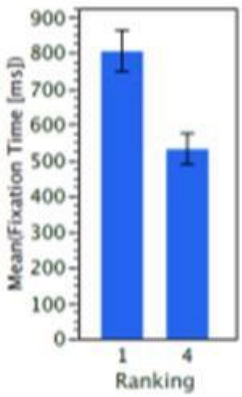
5.1.2. Preferences

After this first general investigation regarding respondents' visual attention, we will now move to exploring whether personal brand preferences also drive sight paths. However, we will focus on Fixation Time more than Duration Before, since the general analysis carried out before suggests that the latter did not exhibit significant patterns for the package in general. In fact, it is reasonable to suppose that this measure was probably biased by the task requirement (to say where the painting was on the screen), which is why we drop it in this second part of the analysis.

In other words, this other section is set out to study whether smokers were attracted differently to stimuli showing their preferred or non-preferred brand, also considering the informational amount of the package. Therefore, taking into account Group, Info and Group*Info effects, we run a Generalized Linear Model among differently ranked brands, with total fixation time as the main variable and results split by AOIs.

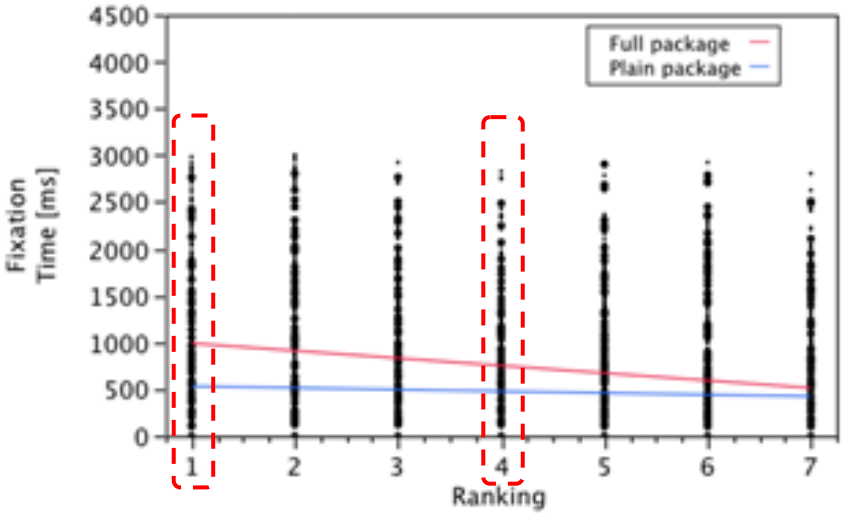
Our analysis suggests there is a significant difference in the fixating behavior smokers have with their mostly preferred and their non-preferred brands, as it can be seen from the graph below, representing full packages as information load and Package as AOI. The number of milliseconds allocated in looking at the package of the top-choice brands is significantly higher (χ^2=40.33, p<.0001) than those spent on brands that are less cared for. However, it is important to stress that this pattern is only identified for the Package area, and not all AOIs. Brand is close to 10% significance level (χ^2=2.52, p=.1124), while Warning does not reach significance at all (χ^2=.11, p=.7423), just like Painting (χ^2=.18, p=.6750).

Figure 5.1.8 Total Fixation Duration by Ranking – Whole Package, Full packages



On top of this, further analysis on Package, carried out with a full Generalized Linear Model analysis with all variables and their interactions, suggests that these fixation differences are only present with full packages, while no apparent pattern is shown with plain packages (info: p<.0001; ranking p<.0001; info*ranking p=.0008), as it can be clearly seen in the graph below. In other words, supporting our hypothesis H_2, personal preferences appear to have an influence on how much attention a package gets when full information is displayed, while no difference seems to be found when the packages are plain. The liking rankings, commonly present in smokers' everyday life – which cause smokers to have different attentional bias patterns – do not seem to persist once the aesthetics of the package are removed. Every brand is attractive the same way, and preferences seem to disappear.

Figure 5.1.9. Total Fixation Duration by Ranking – Cigarette Packages, Full vs Plain



Interestingly, further ANOVAs proved that the difference in response between full and plain packages is highly significant for brands ranked first, second and third (p<.0001). Starting from the fourth brand, p values are less significant.

Figure 5.1.10: Total Fixation Duration by Ranking – Info Comparison

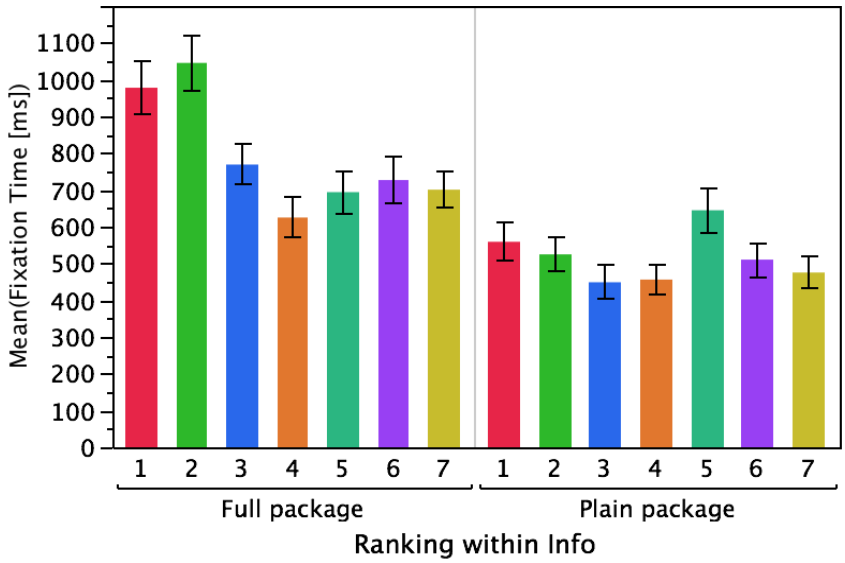
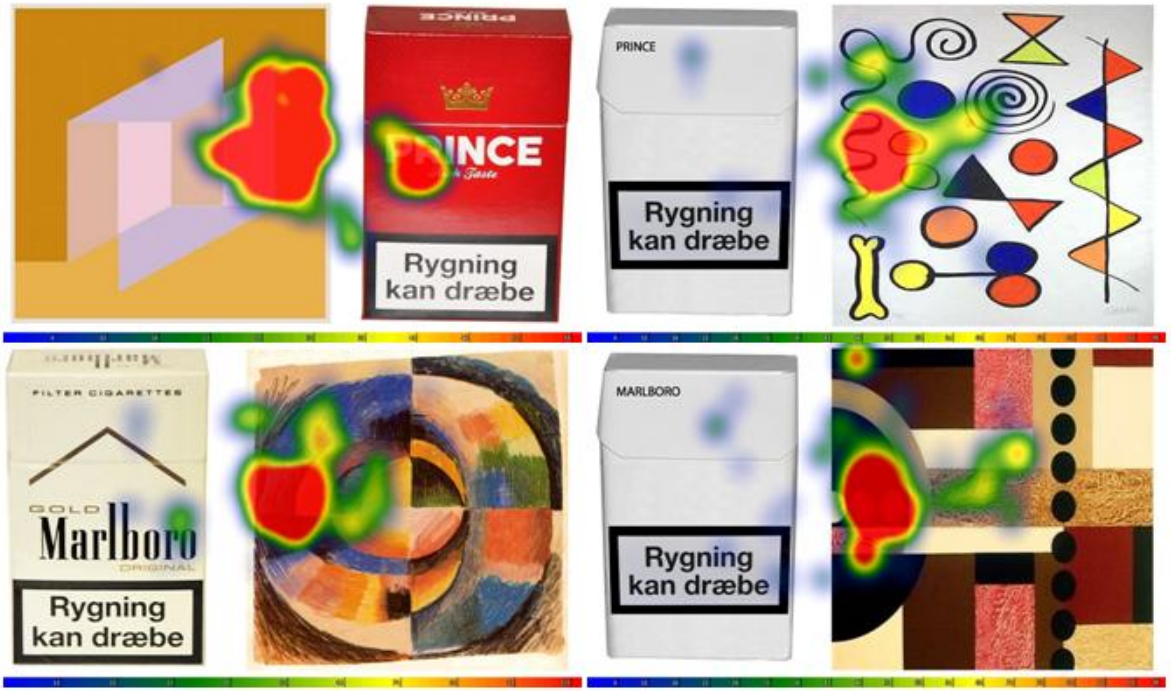


Figure 5.1.11:. Heat maps of Respondent #33: preferred (Prince) vs non-preferred (Marlboro) brand, full vs plain packages



It still remains to be checked whether deprivation plays a role in such visual attention bias results. As per our theoretical background, the results we found in general for smokers should be amplified by withdrawal from drug intake: the more one stays without smoking, the more drug-related attentional bias in comparison to non-smokers. However, further analysis suggests that there is no significant effect of deprivation: an ANOVA analysis found that the mean values for fixation time do not statistically differ between smokers and deprived smokers, even taking preferences into account (for brand ranked #1: $p_{full\ pack}$=.607, $p_{plain\ pack}$=.322; for brand ranked #4, $p_{full\ pack}$= .19, $p_{plain\ pack}$=.632). This is also consistent with the analysis performed at a more general level above, where attention towards full and plain packages did not significantly differ between the two groups. Once again, our hypothesis H_3 does not receive sufficient support.

5.2. Memory performance

In this section we will try to evaluate whether different packages induce diverse responses in terms of memory and preference. It has to be noted that, out of all the couples respondents were shown during this memory experiment, only the ones that were actually displayed at the eye-tracker are analyzed. This is due to the fact that we did not have any eye-tracking data for the invented ones, and for the purpose of our research question we believe it is fundamental to investigate one in the light of the other. Therefore, the "fake" couples were discarded from the analysis.

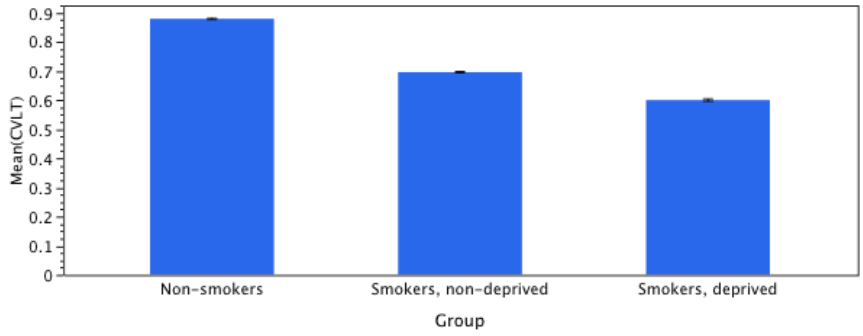
5.2.1. General Results

It is important in the first place to establish respondents' memory ability level beforehand, in order to take it into consideration when analyzing memory performance afterwards. This is also necessary because the literature suggests smokers perform worse than non-smokers in memory tests, and even more so in condition of deprivation (Merritt, Cobb, Moissinac, & Hirshman, 2010). Therefore, the CVLT score was analyzed and compared between groups.

There appears to be a significant difference between groups, which translates into non-smokers performing better, followed by non-deprived smokers and finally by deprived

smokers (F=1393.4, p<.0001). These results seem to be coherent with the general stream of literature we mentioned above, thus this score has to be taken in due consideration within the analysis.

Figure 5.2.1: CVLT Scores by Group

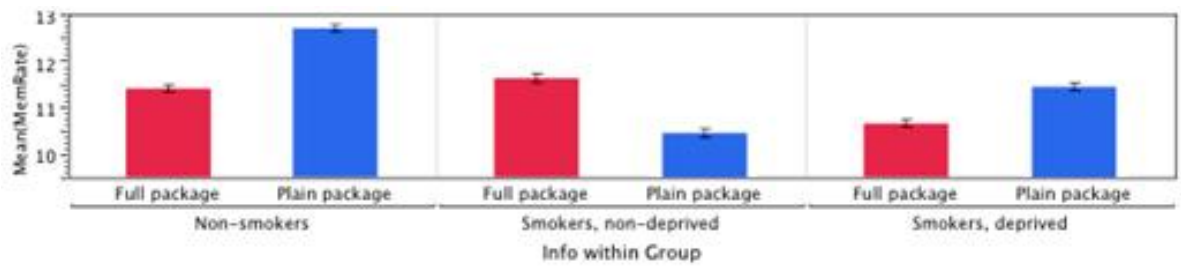


In spite of this, once this variable was added as a covariate in the model, it did not influence the final memory score at all. In fact, when we run the Generalized Linear Model in order to investigate the ability to remember couples of painting and package by info and group, a main effect is found (F=11.65, p<.0001), with significant effects for all independent variables but CVLT (group: p<.0001, info: p=.0293, group*info: p<.0001, CVLT: p=.7693).

Results state that non-smokers in general perform significantly best in the memory test for what concerns plain packages, remembering them more than full ones and better than smokers. Deprived smokers show the same pattern, performing slightly (but not significantly) worse than non-smokers.

In general, therefore, plain packages are remembered much more than full ones, possibly due to carrying overall less information. On the other hand, non-deprived smokers remember full better than plain packages, in compliance with the theories that state that the more vivid a visual stimulus, the more attractive. Our hypothesis $H_{5.1}$ is thus only partially verified.

Figure 5.2.2: Memory Scores

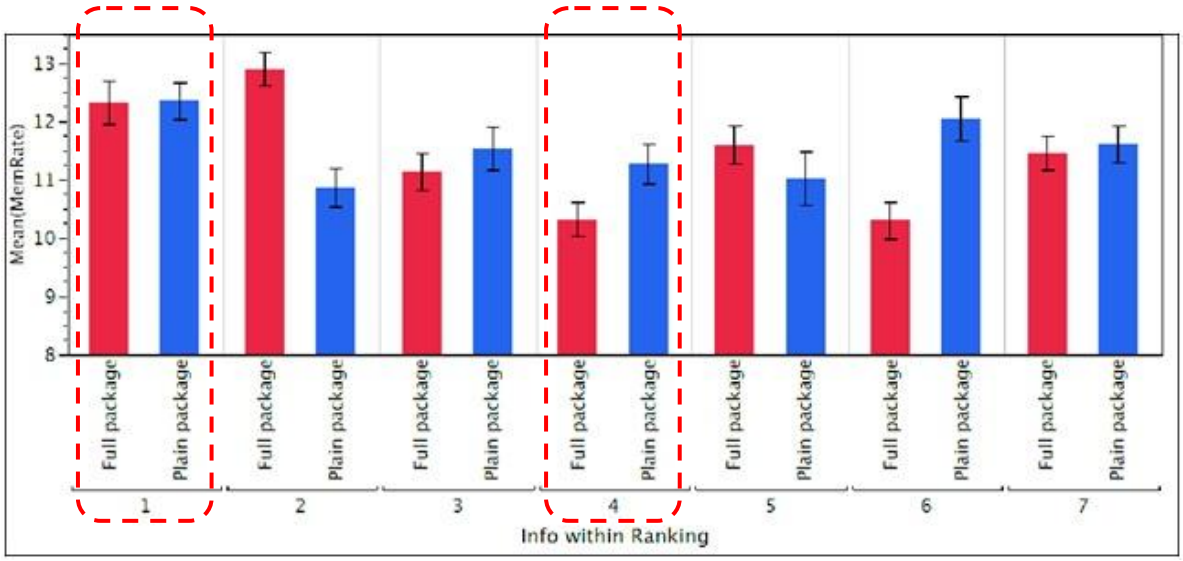


5.2.2. Preferences

When getting to the analysis of whether personal brand preferences influence the ability to remember couples, we once more disregard non-smokers' insights. We therefore run another Generalized Linear Model analysis, in order to understand whether there is a difference in how salient and memorable packages are, according to how much information they are carrying and how liked the brands are.

The whole model is highly significant (χ^2=7.21, p=0.007); more specifically, information alone is significant (p=.039), while ranking and info*ranking are highly significant (both p-values<.0001). In other words, there is a relevant difference in behavior between differently ranked brands; more in detail, concerning our hypothesis $H_{5.2}$, it is clearly evident how much better one can remember those brands more liked (i.e. brand ranked number 1) in comparison with a brand not so highly considered (i.e. brand ranked number 4). These outcomes help heavily to support our hypothesis, according to which brand preferences will still influence memory, irrespectively of what the packages look like.

Figure 5.2.3: Memory Scores by info and preference of smokers



The graph shows clearly the decreasing pattern of remembering from the top brands towards the ones less liked, in particular with respect to the fourth, "average" one.

It is interesting to observe how the seventh brand seems to emerge from the crowd of "indifferent" brands, especially in its full version. This is supportive of the reasoning we made when we decided to compare the preferred brand with brand number four, as opposed to

other, worst-ranked brands: past research suggests that disliked items can actually increase the memory we have of them with respect to neutral stimuli, because due to their negative connotation they are allocated more attentional resources and computational efforts. As a result, they are detected and remembered more accurately (Kern *et al.*, 2002).

It is also worth noting that test persons overall responded correctly to the task, since the mean value of their scores falls on the top-half of the continuum (0-10 is to be interpreted as "I did not see that couple before" and 10-20 is "I am confident I have seen it before at the eye tracker"), especially when keeping in mind that the images included in this analysis are the ones that were really shown in the previous experiment.

Deprivation was also taken into account as a covariate in our analysis, given our study outline as explained above. However, it is important to stress how, in real life, smokers can crave cigarettes differently at any time of the day and in any condition, therefore it is admissible to generalize the results obtained by combining both smokers groups, reported in Figure 5.2.2. Comparing how package information contributes to these scores, we find out that, for smokers in general, no matter how it looks, the best-ranked brand is remembered significantly much more than the medium-ranked brand. What this implies is that personal preferences overcome aesthetics, since the mean score for full and plain packages are virtually identical for the preferred brand. Moreover, coherently with above-described attentional-based analysis and the literature, the non-preferred brand is more remembered in its plain version, which, as it was suggested before, carries less information in comparison to full packages.

Conclusively, one could say that while normal, full packages are definitely more attractive than plain packages, this does not translate into an improved memory effect, because after all smokers still remember better their preferred brand, irrespective of the way it looks. Actually, displaying simpler visuals, plain packages seem to be easier to remember. Therefore, in essence, the aesthetic dimension is irrelevant to smokers, who still maintain higher unconscious learning and memory for their preferred brand, even if they do not necessarily pay more attention to it. Once a Marlboro smoker, always a Marlboro smoker.

6. Discussion and Managerial Implications

6.1. Smokers

Packages play a critical role for firms, protecting products at their inside and silently advertising both at points of purchase and during usage. This is especially true for tobacco companies, who due to stringent legislations are deprived of any other means of communication towards their users. The recent proposal to introduce plain packages tries to take away from the sector this last marketing tool as well, to disrupt brand differentiation and attractiveness. However, will this aesthetic impoverishment really do the trick, or will brands maintain their status to smokers?

A vast body of marketing literature advocates that differentiation is important in two, potentially related ways: products can be differentiated by means of their aesthetics, which is particularly meaningful for tobacco firms since the package is the very last marketing tool available for them, and by means of brand strength, which goes beyond the simple graphics and colors of a package. Smokers are a particular kind of consumers, because cigarettes are addictive and thus cause an especially high level of loyalty. Therefore, it is not immediately clear which of the two aspects matters more for smokers, and if plain packages are going to change anything in their brand choices or perception. The present work tries to understand exactly this point.

The core analysis, carried out with Generalized Linear Models and ANOVAs, suggests that, once brand preferences are taken into consideration, interesting results are recorded: visual attention addressed to preferred brands is significantly higher than non-preferred brands when full packages are presented, while in general plain packages are stared at much less and without any preference pattern. In spite of this, memory performance seems to indicate that, no matter how it looks, the top brand is remembered more than other brands and equally between full and plain packages, while for non-preferred brands plain packages are recognized more than full ones.

The main explanation behind the results related to the non-preferred brand may lay in visual complexity (Wedel & Pieters, 2000): white packages are for sure more straightforward than full ones, enabling respondents to stare equally to the two elements that most of all pop out, namely warnings and brands. This would allow smokers to anyway remember better elements

on plain packages even if overall fixation time is lower than for full packages. In any case, it is worth noting that even if they are stared at as little as any other brand, the preferred brand is still better recognized: this means that exposure time and overall looks do not matter, and personal preferences are decisive when it comes to testing memory. Also, it is important to stress how the top-choice brand was individual, which means it is possible to rule out alternative explanations involving for example the looks of other elements (such as the uniqueness of the accompanying painting) when interpreting such a pattern.

From the point of view of tobacco firms, these results are highly encouraging and very important, because they challenge one of the core consequences that has been attributes to generic packages, namely differentiation. Even if plain packages are in general less liked and less visually attractive than full ones, our work suggests that the favorite brand is anyways what matters for smokers. This means that the bulk of heavy consumers will not change or reduce their preferences simply due to an aesthetic modification: whatever is (not) displayed on their top brand, that's still the main choice in their consumption consideration set.

Therefore, the analysis points in the direction that for heavy smokers nothing really will change; having said that, one must then take into consideration which other stakeholders might be affected by the provision. As outlined in the theoretical background, governments and consumers would have to face major negative consequences such as smuggling, incurring into breach of trademark law and being potentially exposed to counterfeit products, that would be connected to the introduction of generic packaging. Both these arguments, together with the suggested poor efficacy found for heavy smokers, induce us to advance how the overall picture does not look promising, and that plain packages would hurt more than heal.

6.2. Deprived Smokers

Unexpectedly, as not completely in line with past research – reporting that smoke withdrawal should enlarge the magnitude of attentional bias – deprivation seems to play only a partial role. However, there exists contrasting evidence in the literature (e.g. Field et al., 2004) supporting the hypothesis that deprivation has only selective effects according to what cognitive aspects are being evaluated and which attention indices are being studied. Therefore, it is not completely irrational to have the results we got.

6.3. Non smokers

On the other hand, having non-smokers as a control group allowed us to observe interesting outcomes: in fact, when studying attentional bias, those non-users also showed a marked propensity to stare at the full packages more than plain ones. This is especially important if we remind ourselves of the alleged steps involved in the process of decision making, in particular when unconsciousness is accounted for (Thornson *et al.*, 1992). The process starts with attention drawing, which then influences learning and finally memory. A great deal of literature research put huge efforts in trying to understand all the possible implications of this suggested path, together with all the variables that might influence or mediate every step of it; as a result, many theories converge into attempting to explain it and merging this recent framework together with all the past knowledge regarding consumer decision making. As we outlined in the theoretical background, trying to capture attention is of terrific relevance for brands and products in general, because going unnoticed greatly reduces the likelihood of being remembered afterwards, which after all is the final goal for everyone (Allan, 2006). In general, this aspect is covered by advertising, or packages in low-involvement categories and products (McCracken J.C. & MacKlin, 1998; Swann & Miller, 1992; MacInnis & Price, 1987), which is why they are mostly designed to strike people and induce them to take a glimpse, even if only a brief one.

The second step is learning. There are plenty of ways in which we learn every day, consciously, unconsciously (Penn, 2006), willingly or not, in an incidental or induced way (O'Donnel & Brown, 2011), due to the item we focus on or to the context (Nielsen, Shapiro, & Mason, 2010), due to its familiarity or novelty (Holden & Vanhuele, 1999), from all kinds of sources and through all kinds of means. Learning is a very complex process, and there is no unique way to explain it for every situation and in a fashion that holds for everybody, which is also well beyond the scope of this paper. What is sure is that if we do not learn about something, there is no way we can remember it, either in a positive or negative connotation. More specifically, acquiring information about a brand and remembering both such information and the connected brand is the only way we can create our personal knowledge of said brand (Keller, 1993). According to Assael (2003), consumers learn thanks to their past experience with brands, thanks to which they gain consciousness of what they like and what they do not like about that firm, its products, its categories (van Osselaer & Alba, 2000). Thus, learning and remembering what we learned are the backbone of the creation of brand knowledge, which in turn is the

central pillar allowing us to construct consideration sets, brand preferences and eventually brand loyalty (Assael, 2003; Hutchinson, Roman, & Mantrula, 1994; Akçura, Gönül, & Petrova, 2004; Lynch, Mermorstein, & Weigold, 1988; Nedungadi, 1990; Khan, 1999; Kabiraj & Shanmugan, 2010; O'Donnel & Brown, 2011).

Therefore, while for heavy smokers memory is the important element to look at, because of their rooted loyalty, for non smokers, who still have no familiarity and therefore poor knowledge about cigarette brands, it is reasonable to step back and investigate what comes directly before learning, which is visual attention (Lynch & Srull, 1982). As far as they are concerned, non smokers too considered plain packaging less likeable than full ones, and also show significantly higher visual attraction to the latter, which as we said before is the basis behind visual differentiation. Given this, it is licit to assume that full packages are considered as generally more attractive than plain ones, and that this holds for non smokers too. Following our reasoning above, this attention drawing ability increases the likelihood of moving along the attention-learning-memory path which as the literature suggests can eventually lead to brand loyalty.

However, it is worth reminding that, of course, this path is not necessarily covered from the beginning to the end, as there are a lot of potential obstacles along the way. Among them, the very first one is the lack of attractive power. What this leads us to suggest is that, given that they are non-users, the category of perspective smokers might be positively affected by plain packaging, which would make cigarette packs, and thus smoking, much less inviting, thus decreasing the likelihood of being interested in the packages and, in turn, in smoking. In other words, we can go as far as conjecturing that if plain packages do not draw attention, perspective smokers can decrease the likelihood of taking up smoking at all, consistently with the reasoning behind generic packaging (Kinard & Webster, 2010).

These considerations are especially critical when one recognizes that consumer turnover will eventually take place: the more years go by, the more perspective smokers will be prevented from seeing the colorful packages full of imagery available now. In other words, it is presumable that future non smokers who will only be exposed to plain packages will have an even lower probability of become smokers in comparison to those that have been exposed to full packages, according to our theories. Therefore, plain packaging can be considered as a potentially successful long term strategy for governments and future smokers, who will be prevented from

taking up smoking thanks to this proposal. Of course, as a matter of fact, the former will anyways be required to protect the latter from the soaring and dangerous illegality surrounding plain packages.

A parallelism comes to mind between tobacco players and Harley Davidson, since both experience radical market changes: Harley has to face a similar change in its core target, the baby boomers, who will one day (soon) be too old to buy its bikes. As a main consequence, of course, sales will drop and these bikes will no longer attract the target they were originally born for, simply because such a target will not exist anymore. In such a situation, tobacco firms will definitely have to adapt and try to respond to the changes in the market, just as Harley Davidson is trying to do now.

The next section tackles potential further research, and encloses some considerations on this point too.

7. Limitations and Further Research

It has to be noted that most of the experiments for this work took place in the morning, since it was impossible to physically check on respondents and make sure they would not smoke all day. However, 92% of participants stated the cigarette they would most hardly give up is the first one in the morning, and results from an ANOVA test show that, according to the Questionnaire of Smoking Urges performed at the end of the experiment, the deprivation manipulation was effective in increasing subjective craving for cigarettes, while no such difference was scored on the general level of nicotine dependence as measured by the Fagerström test. On top of that, evidence from past researches advances the hypothesis that craving levels are known to increase significantly within an hour from smoking a cigarette (Schuh & Stitzer, 1995). Therefore, after all, we can consider respondents in group 3 quite sufficiently and reliably deprived. However, a thorough and scientific proof of such abstinence could have provided better evidence (Benowitz, 2002).

Another potential limitation of the study (and all plain package-related literature) is that plain packaging is not yet in commerce now, which means the consumer behavior observed so far might not be exactly replicated once full packages will be entirely out of the market and substituted by their generic version. We tried to familiarize respondents with plain packages by exposing them to both beer and tobacco in white packages during the first eye-tracking liking task, that is before they were shown the actual couples eye-tracking test on which they were later tested for memory. However, there was no other way to control for this in the experiment and not risk to induce demand effect, which would have caused test persons to sense the aim of the experiment and therefore provide biased responses. Most probably, this issue will keep on arising up until plain packaging will actually be introduced.

Also, one should be cautious in validly extending these results, because since the experiment was held in a highly controlled environment, far from what is the real everyday purchasing process, there's a thick chance it might not precisely forecast smokers' behavior once plain packages will be introduced, also because in that case full packages will be removed from shelves. Moreover, the experiment should be repeated with non-university based sample, as past research suggest it is a very peculiar one and results are not necessarily extendible to non-students (Peterson, 2001).

On a positive note, channelling multiple streams of research into it, this work opens up for a wide body of potential research. As a first point, both smokers and non-smokers seem to react differently to cigarette packages with respect to what is alleged by the literature so far for what is concerning other smoke-related visual stimuli. In fact, while past eye-tracking and visual attention research mainly identified smoke-related words and images as the center of attention for smokers, results here seem to advance the hypothesis that packages attract non-smokers' attention in a marked way. Since packages have never been studied before in the eye-tracking literature, it might suggest that people respond differently to packages with respect to smoke-related words and images, probably because they have different complexity and familiarity levels. Further research should be carried out to investigate such effects.

More specifically, such a research could be repeated on adolescents, in order to explore plain packages effects on such an aesthetics-oriented target. This would be especially important in the long run, because even if current smokers seem prone to stick to their preferred brand, probably also thanks to past legacy and advertising when it was licit, this might not be hold anymore in the future once the next generation will step in. For them, there will be no Marlboro Cowboy or Jon Camel to look up to, and no specific package to show off with their friends. This might be key for the success of plain packages, and therefore of extreme importance to tackle.

Another point is that plain package is going to annull any brand variety on the market. For example, in the Danish market both Prince and Prince Gold are very widespread brands, that would converge into just one pack with a laconic "PRINCE" on the top left corner. It would be interesting to extend the current research in order to address which variant, if any, is more associated to the plain package. Is it the preferred one? Is it the one whose pack resembles the white pack more? Some further research on this theme might also help to better understand smokers' response in behavior when faced with generic tobacco packaging.

8. Conclusions

We believe that our study provided a relevant insight into the stream of research revolving around plain packaging, by shedding some light on what is it that matters most for heavy smokers between the aesthetics of the package and their personal brand preferences, exploring such consumer behavior via the analysis of non-self reported measures and unconscious responses. The results of the analysis confirm our hypotheses that, while full packages are for sure more visually attractive than plain ones, the brand is anyways the main driver of differentiation, which in practical terms posits some questions on the actual effectiveness of plain packaging for the category of heavy users. As one of the few studies so far that tackles plain packaging (and smoking in general) as a matter of branding and neuro-scientific responses, this work opens up to many streams of further investigation: first of all, a similar analysis on adolescents might provide interesting outcomes on prospective smokers, which anyways are a crucial category given that current smokers will someday fade away; secondly, cigarette packages as visual cues seem to cause patterns of attention inconsistent with the literature so far, and it would be important to figure out why; thirdly, it would be meaningful to dig deeper into the role of cigarette variants, in order to understand which, if any, variant is associated in consumers' mind when faced with plain packages.

Sitography

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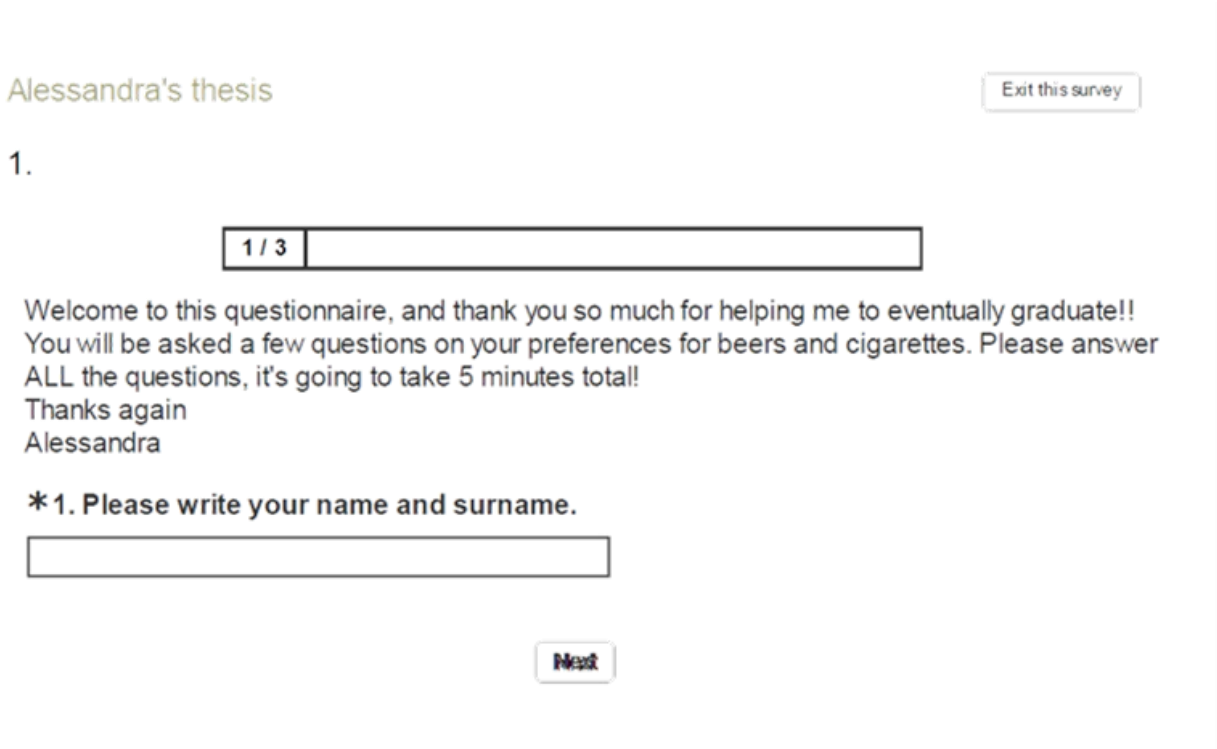
Appendixes

A. Survey

The survey was meant to understand the ranking and rating of the 7 proposed brands of both cigarettes and beer, to control for personal preferences during the analysis. Not to have anonymous responses, the first question was to state name and surname. After, cigarette brands and category was assessed; the brands in the last ranking question pull-down menu are the same as in the rating question above. Rating went from 1 – 'I don't like it at all' to 7 – 'I like it very much'.



2.

2 / 3

***1. Have you ever smoked?**

Yes

No

***2. How many cigarettes per day do you smoke?**

0

1-10

10-20

>20

***3. Which is your favorite brand of cigarettes? (Please write N/D if you're a non smoker)**

***4. Out of the following CIGARETTE BRANDS, please rate how much you like them.**

	Don't like at all					Like very much	N/D
Prince Gold							
Prince							
L&M							
LA							
King's							
Marlboro							
Camel							

***5. Please rank your favorite brands of CIGARETTES. 1 is your favorite, 7 is your least favorite.**

	Brands
1	
2	
3	
4	
5	
6	
7	

Prev Next

3.

3 / 3

***1. How many beers do you drink a week?**

0

1-10

10-20

>20

***2. Which is your favorite brand of beer?**

***3. Out of the following BEER BRANDS, please rate how much do you like them.**

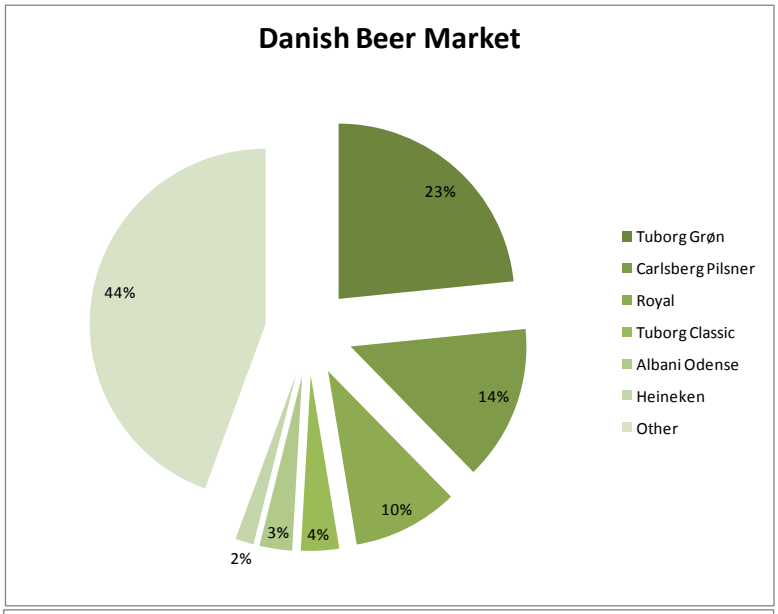
	I don't like it at all						I like it very much
Albani Odense							
Carlsberg							
Heineken							
Royal Pilsner							
Royal Classic							
Tuborg Grøn							
Tuborg Classic							

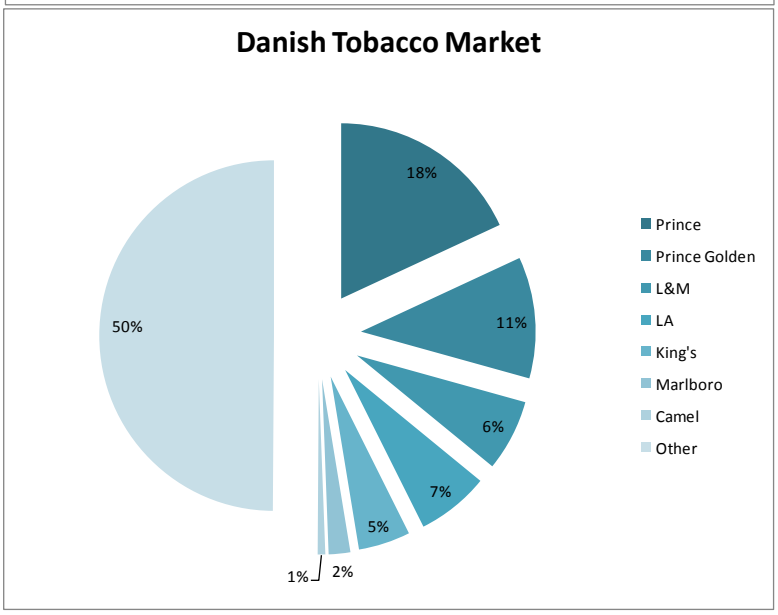
***4. Please rank your favorite brands of BEERS. 1 is your favorite, 7 is your least favorite.**

	Brands
1	
2	
3	
4	
5	
6	
7	

Prev Done

B. Beers and Cigarettes in Denmark





Source: Euromonitor, December 2010

C. California Verbal Learning Test

Respondent #_____

	Words	Order of recall				Recall 1	Recall 2	Recall 3	Recall 4	Recall 5	Recall 20min
1	Drill										
2	Plums										
3	Shirt										
4	Curry										
5	Grapes										
6	Paprika										
7	Jersey										
8	Hammer										
9	Pepper										
10	Clementines										
11	Screwdriver										
12	Jacket										
13	Saffron										
14	Apricots										
15	Nails										
16	Pants										

Spices	Fruits
Tools	Clothing

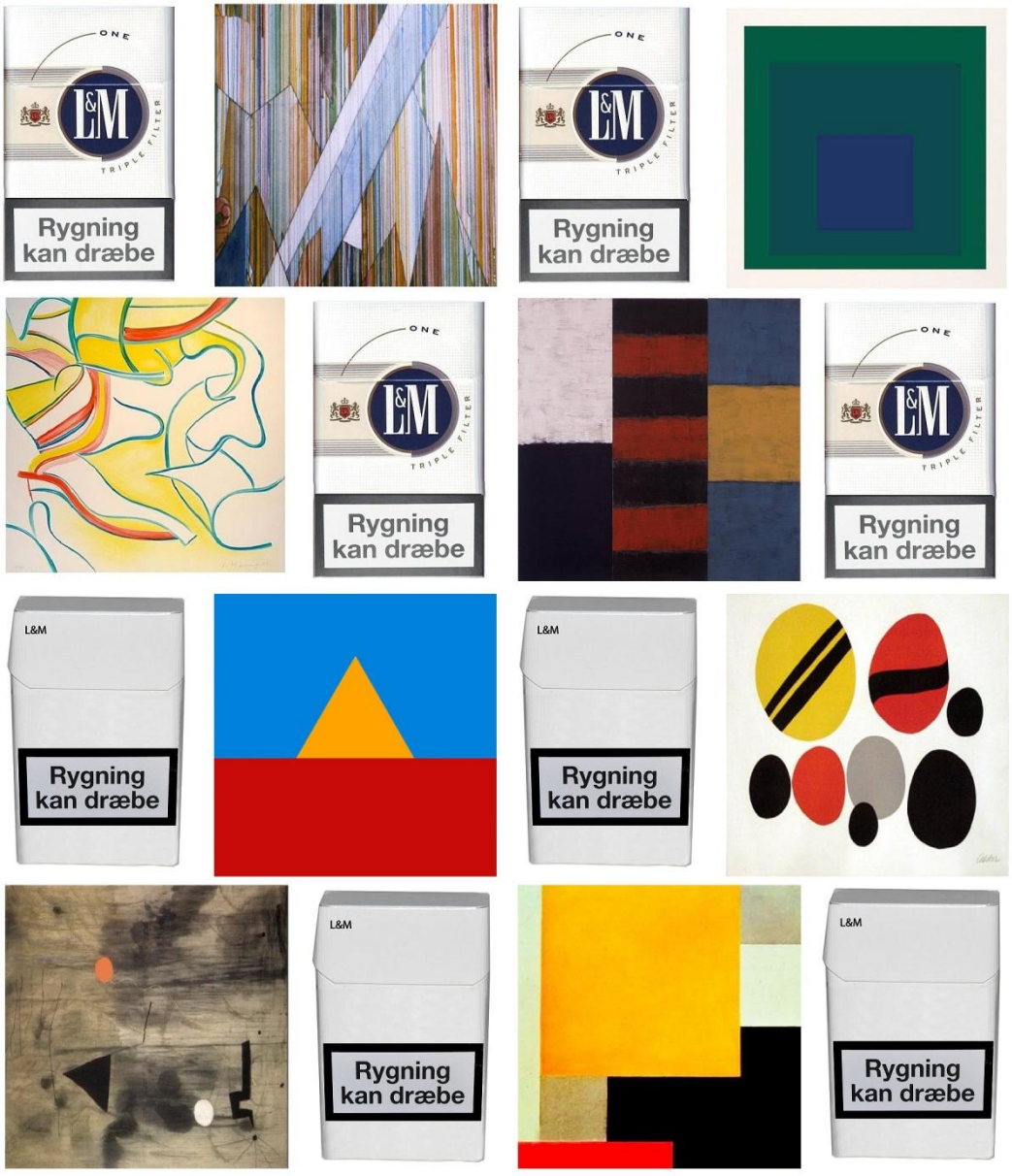
D. Single Images

This is a collage of all the paintings that were coupled with the products (below).

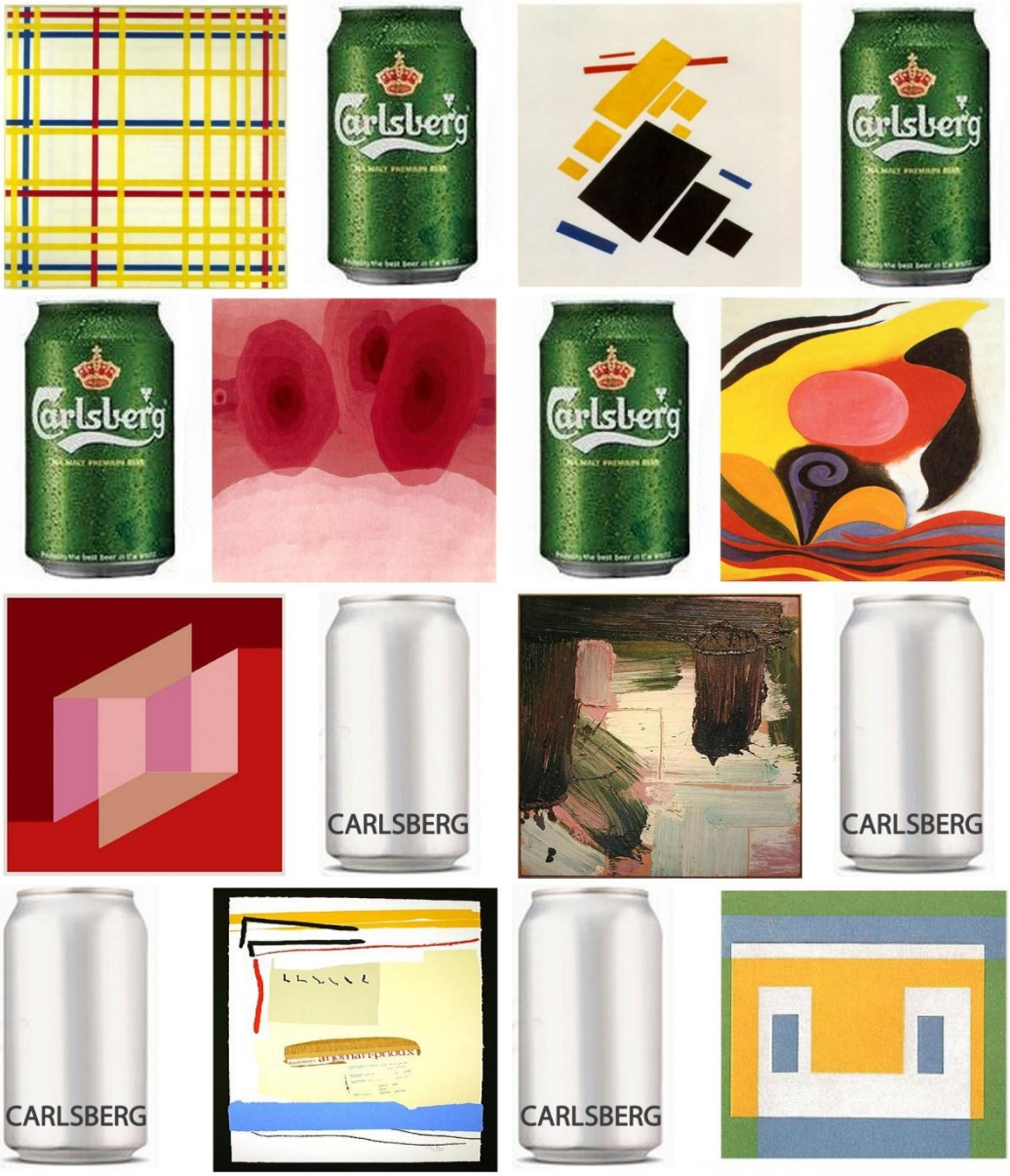

ALBANI
ODENSE
TUBORG
ROYAL
HEINEKEN
CARLSBERG
Heineken
TUBORG
ROYAL
ROYAL
TUBORG
Carlsberg
Odense
Pilsner
Rygning kan dræbe
KINGS
Marlboro
LA
CAMEL
PRINCE
PRINCE

E. Couples

For example, L&M was presented in the following four screens, randomized among all the others:



Carlsberg, instead, was presented like this:



F. Smoking Questionnaires

FINAL QUESTIONNAIRE Respondent # _____

Please tick the correct answer (only one per question)

FTND

1. How soon after you wake up do you smoke your first cigarette?
   __ Within 5 minutes
   __ 6-30 minutes
   __ 31-60 minutes
   __ After 60 minutes

2. Do you find it difficult to refrain from smoking in places in which it is forbidden? (e.g. church, cinema..)
   __ Yes
   __ No

3. Which cigarette would you hate most to give up?
   __ First one in the morning
   __ Any other

4. How many cigarettes do you smoke per day?
   __ Less than 10
   __ 11-20
   __ 21-20
   __ More than 31

5. Do you smoke more frequently during the first hours after waking than during the rest of the day?
   __ Yes
   __ No

6. Do you smoke if you are so ill you are in bed for most of the day?
   __ Yes
   __ No

QSU

Please rate how true these sentences are for you right now, where 1 is "*Not at all*" and 7 is "*Definitely Yes*"

		1	2	3	4	5	6	7
1.	I have a desire for a cigarette right now.							
2.	Nothing would be better than smoking a cigarette right now.							
3.	If it was possible, I probably would smoke now.							
4.	I could control things better right now if I could smoke.							
5.	All I want right now is a cigarette.							
6.	I have an urge for a cigarette.							
7.	A cigarette would taste good now.							
8.	I would do almost anything for a cigarette now.							
9.	Smoking would make me less depressed.							
10.	I am going to smoke as soon as possible.							